KU Leuven Biomedical Sciences Group Faculty of Kinesiology & Rehabilitation Sciences Department of Kinesiology Physical Activity, Sports & Health Research Group



DOCTORAL SCHOOL BIOMEDICAL SCIENCES

# ATHLETE LEADERS AS KEY FIGURES FOR OPTIMAL TEAM FUNCTIONING:

## THE MEDIATING ROLE OF PLAYERS' TEAM CONFIDENCE AND THEIR TEAM IDENTIFICATION

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"Do not follow where the path may lead. Go instead where there is no path and leave a trail."

~ Ralph Waldo Emerson ~

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English Summary

The legendary baseball player Babe Ruth once claimed: "The way a team plays as a whole determines its success. You may have the greatest bunch of individual stars in the world, but if they don't play together, the club won't be worth a dime" (Williams, 1997). In order to optimize team functioning, effective leadership and team confidence have often been proposed as crucial determinants. The present PhD thesis elaborated the theoretical foundation of both athlete leadership (Part 1 and Part 2) and team confidence (Part 3). By doing so, we developed new methodological instruments to support future research in this area. Furthermore, this PhD thesis went beyond mere description and sought to explain the mechanisms through which athlete leaders influence teammates' team confidence and as such foster an optimal team functioning (Part 4). In this summary, we will shortly elaborate on the most important contributions of this PhD thesis to the current research knowledge.

### Part 1 – Theoretical Foundation of Athlete Leadership

In contrast with the abundant literature on leadership of the coach, leadership of athletes within the team (i.e., athlete leadership) has received only limited research attention and focused predominantly on the team captain as formal athlete leader. The sparse existing research emphasized the benefits of high-quality athlete leadership for athlete satisfaction, team confidence, team cohesion, and team performance. Coaches, players, and sports psychologists all acknowledge the crucial role of athlete leaders for optimal team functioning. For instance, Chuck Noll, the head coach of the Pittsburgh Steelers, a professional American football team and winner of four Super Bowls, stated; "On every team there is a core group that sets the tone for everyone else. If the tone is positive, you have half the battle won. If it is negative, you are beaten before you even walk out on the field" (Pim, 2010, p. 127). Nevertheless, a considerable gap exists between the importance assigned to athlete leadership and the efforts made to understand it. In Part 1, encompassing three papers, we attempted to create a solid theoretical foundation of athlete leadership in order to inspire further research in this area.

Paper 1 relied on a sample of 4451 players and coaches within nine different team sports in Flanders. In this paper, we developed and validated a new four-fold athlete leadership classification, which extended the previous three-fold classification of Loughead, Hardy, and Eys (2006). Our new classification includes four leadership roles that athletes

can occupy; two leadership roles on the field, namely the task leader (who provides tactical instructions to his/her teammates) and the motivational leader (who is the biggest motivator on the field), and two leadership roles off the field, namely the social leader (who cares for a good team atmosphere outside the field) and the external leader (who handles the communication with club management, media, and sponsors).

The findings of Paper 1 emphasized the relevance of this leadership classification by demonstrating that an effective fulfillment of the four leadership roles resulted in higher team confidence, stronger team identification, and a better team ranking. In contrast with the wide-spread belief that the team captain is the only athlete leader of the team, the results of Paper 1 demonstrated that only 1% of the participants indicated that their team captain was the best leader on the four leadership roles. Even more remarkable is that in 44% of the teams the team captain was not perceived as best leader on any of the four leadership roles, neither on the field, nor of the field. It can thus be concluded that in most of the teams the informal leaders, rather than the team captain, were perceived as best leaders, both on and off the field.

Paper 2 relied on the same sample as was used for Paper 1 (i.e., 4451 players and coaches, active in nine different team sports) and identified the characteristic attributes of each of the four leadership roles. In order to take the surrounding team context into account, we used a novel context-dependent measure that assessed leaders' characteristics in a relative way (i.e., in comparison with the other team members). The results revealed that 'the leader's impact on teammates' team confidence' emerged as the most decisive characteristic (of the 27 characteristics that were examined) of the perceived quality of a leader. This finding held for each of the four leadership roles (i.e., task, motivational, social, and external leader). 'Being socially well accepted by teammates' emerged as the second most important characteristic of high-quality athlete leaders. In other words, the more a leader is perceived as having impact on teammates' team confidence and the more a leader is socially well accepted in the team, the higher his/her perceived leadership quality on the different leadership roles.

Paper 3 provides a deeper insight in the Social Identity Approach to Leadership (Haslam, Reicher, & Platow, 2011), which was used as theoretical framework in the present PhD thesis to discuss our findings. The Social Identity Approach asserts that the psychology and behavior of team members is not only shaped by their capacity to think, feel, and behave, as individuals (in terms of personal identity as 'I' and 'me'), but also, and often

more importantly, as group members (in terms of a shared social identity as 'we' and 'us'). The recent application of this approach to leadership argues that leaders' effectiveness depends on the extent that leaders are able to create and manage a shared identity within a group. In other words, effective leaders are able to create a shared sense of 'we' and 'us' within the team. A quote from Drucker (1992, p. 14), a well-known researcher on leadership, nicely illustrates this leadership theory: "The leaders who work most effectively, it seems to me, never say 'I'. And that's not because they have trained themselves not to say 'I'. They don't think 'I'. They think 'team'." In short, team identification lays the platform for effective leadership.

In Paper 3, we created and validated the *Identity Leadership Inventory (ILI)* to assess this identity based leadership style. An international cooperation resulted in four different samples: Study 1 (N = 238, general population in USA), Study 2 (N = 645, general population in USA), Study 3 (N = 338, employees in China), and Study 4 (N = 421, sport teams in Belgium). The last study relied on a data collection in the framework of the present PhD thesis and included athletes from four different sports: basketball, soccer, volleyball, and handball. This new measure provides a means to assess this identity based leadership style in organizations (Study 1, 2, and 3), but also in a sports setting (Study 4).

More specifically, the ILI distinguished between four dimensions of effective identity based leadership. First, leaders need to be *in-group prototypes* (i.e., represent the unique qualities that define the group and what it means to be a member of the group). Second, they need to be *in-group champions* (i.e., advance and promote the core interests of the group). Third, leaders need to be *entrepreneurs of identity* (i.e., bring people together by creating a shared sense of 'we' and 'us' within the group). Fourth and finally, leaders need to be *embedders of identity* (i.e., develop structures that facilitate and embed shared understanding, coordination, and success). The present inventory can be used to advance theory and practice in order to achieve a more comprehensive examination of the Social Identity Approach to Leadership.

### Part 2 – Social Network Analysis as Pioneering Tool to Examine Athlete Leadership

Athlete leaders do not lead in a social vacuum, but instead are imbedded in a web of interpersonal relationships with their teammates and coach. Leadership is a socially constructed phenomenon and therefore, highly dependent on the surrounding context. As leadership expert Ladkin (2010, p.21) stated: "trying to understand leadership without looking at the context is like trying to comprehend 'love' abstracted from the people who feel and enact it. You may be able to capture a trace of it, but it is virtually impossible to really appreciate its full impact and significance as a detached observer."

Nevertheless, one of the major limitations of the existing athlete leadership research is that most studies focused on individual perceptions when examining athlete leadership and that they failed to capture the complete surrounding context. Also Paper 1 and Paper 2 only provided insight in the characteristics of the *best* leaders on the different roles. As such, information on the leadership provided by other team members, who may not be the best but still influential leaders, is missing. As a consequence, the possibility cannot be excluded that important aspects of the leadership structure in the team remain concealed.

Social Network Analysis (SNA) is a suitable technique to examine the complete leadership structure in the team because it takes the leadership perceptions of all team members into account. SNA pictures teams in terms of networks, consisting of nodes (representing the players) and ties (representing the relationships between the players, such as leadership perceptions). Only very recently, the social network approach has entered organizational research to explain leadership phenomena. In the present PhD thesis, we have used SNA for the first time in a sport setting to obtain a deeper insight in the formal and informal leadership structure within sports teams. By doing so, the three papers in this part addressed *four limitations* that characterize organizational research that used SNA to examine leadership.

First, previous studies distinguished categorically between leaders and non-leaders, thereby using *binary networks* to examine leadership (i.e., networks based on dichotomous relations represented by 0 '*no leader*' or 1 '*a leader*'). As such, the strength of the leadership quality remains concealed. Second, being a leader does not necessarily imply that a person is also a *good* leader. From the perspective of leadership effectiveness, the *quality of leadership* is obviously most essential. Therefore, Paper 4, Paper 5, and Paper 6 focused on the perceived leadership *quality* of athlete leaders, thereby using *valued* networks, in

which the strength of the ties refers to different degrees of athlete leadership quality, ranging from 0 (*very bad leader*) to 4 (*very good leader*).

Third, previous studies that examined leadership in organizational settings with an SNA approach focused on *leadership in general*. Paper 4, Paper 5, and Paper 6 did not only investigate leadership in general, but these studies went more in depth by investigating the perceived leadership quality on each of the four different *leadership roles* (i.e., task, motivational, social, and external leadership role).

Fourth, previous studies that used SNA in a sport setting (to examine other constructs than leadership) tested only one to three teams. Paper 4, Paper 5, and Paper 6 encompass data from 46 complete teams (including 575 players) in their social network analyses, which exceeds the *sample sizes* used in previous research by far. In addition, the stratified sampling technique to constitute the sample yielded a variety of male and female teams, in four different sports (soccer, basketball, volleyball, and handball), playing both at high and low competition levels.

The use of valued leadership networks, the focus on leadership quality, the inclusion of role-specific leadership networks, the large sample size, and the variety within the sample are innovative elements that characterize our research in team sports. Moreover, the combination of these characteristics also underlies the uniqueness and novelty of these papers in other research areas, such as the organizational setting.

With respect to the specific research questions of the different papers, Paper 4 established the validity of the four-fold athlete leadership classification, as developed in Paper 1, for the leadership structure in the whole team. Furthermore, Paper 4 provided more insight in the formal and informal leadership structure of the teams: on the task and external leadership roles, no difference emerged between the leadership quality of athlete leaders and coaches. However, on leadership in general, and on the motivational and social leadership roles in particular, athlete leaders were perceived as better leaders than their coach. Furthermore, our findings revealed that informal athlete leaders and the team captain shared the lead, both on and off the field.

In Paper 5, we investigated the *attributes of high-quality athlete leadership* at the *individual level* and at the *team level*. It was demonstrated that the extent to which other team members felt connected to the leader was most decisive for the leader's perceived leadership quality in general and also for the leader's perceived leadership quality on each

of the four specific leadership roles. At the team level, teams with high quality athlete leadership were characterized by higher levels of team identification and stronger social connectedness perceptions.

In Paper 6, we constructed networks for task and social cohesion and revealed that teams with *higher athlete leadership quality* demonstrated higher levels of *task and social cohesion*. This finding held for each of the four leadership roles. Given the results of the present study and of the above-mentioned papers, coaches and sport psychologists should educate athletes about the importance of providing tactical advice to teammates (i.e., task leader), motivating group members (i.e., motivational leader), promoting harmony and social relationships within the team (i.e., social leader), and representing the team in the community (i.e., external leader).

### Part 3 – Theoretical Foundation of Team Confidence

In Part 1 and Part 2, we tried to build a sound foundation for a more comprehensive view on athlete leadership. However, before the relation between our two key concepts is investigated in Part 4, in Part 3 we elaborate the theoretical foundation of team confidence. This second key concepts has been highlighted as an important precursor of performance. Part 3 included four papers: in Paper 7 we clarified the conceptual meaning of team confidence (N = 4451; nine different sports); in Paper 8 and Paper 9 the sources of team confidence were identified in respectively volleyball (N = 2365), soccer (N = 1028), and basketball (N = 1692); and in Paper 10 we conducted two field studies in soccer (N = 259) to provide a deeper insight in the reciprocal relation between team confidence and team performance during a game.

The existing research on team confidence is characterized by inconsistencies in the manner in which team confidence has been conceptualized, and operationalized. In this regard, Paper 7 provided more conceptual insight by distinguishing between a *process-oriented type* of team confidence (i.e., *collective efficacy*; e.g., "I believe that my team will demonstrate a strong work ethic during this game") and an *outcome-oriented type* of team confidence (i.e., *collective efficacy*; e.g., "I believe that my team will win this game"). The papers within this PhD thesis revealed similarities between the two constructs, but they pointed also at important differences: both constructs are related to different background characteristics (Paper 7), are predicted by different sources (Paper 9), and are in a different way related to outcome variables such as team identification (Paper 11 and Paper

12) and performance (Paper 10 and Paper 12). In order to realize a coherent advancement of the research on team confidence, both constructs should be distinguished and assessed separately. We hope that the findings in the present PhD contribute to this aim by creating more conceptual clarity for future research on team confidence.

In Paper 8 and Paper 9, we examined the sources of team outcome confidence in volleyball (N = 2365), soccer (N = 1028), and basketball (N = 867), and the sources of collective efficacy in basketball (N = 825). Positive supportive communication among the athletes and positive coaching were perceived as most predictive sources for high levels of team confidence. It should be noted that while outcome-oriented sources (e.g., being in the lead) were more predictive for athletes' team outcome confidence, process-oriented sources (e.g., team enthusiasm) were more predictive for athletes' collective efficacy. Negative communication and emotions emerged as most predictive sources for low levels of team outcome confidence and collective efficacy.

Although previous research had suggested that past performance was the strongest source of team confidence, the findings of the present PhD thesis suggest that in-game sources were even more important predictors of team members' team outcome confidence and their collective efficacy. These papers also highlighted the important role of athlete leaders in affecting teammates' team confidence, both in a positive and in a negative way. When analyzing the worst competition start in 15 years of the Belgian soccer champion R.S.C. Anderlecht journalist Peter Vandenbempt emphasized the detrimental impact of low team confidence, thereby underlining the essential role of athlete leaders: "The main problem is the organization and the confidence in defense. With every counterattack, the players are trembling with fear. There is a harrowing lack of leadership on the field. We already noted that before. No one takes the team in tow when the team encounters difficulties. The best proof is that not once this season Anderlecht has been able to come back after being behind" (Sporza, 2013). Athlete leaders thus seem to hold the flaming torch of team confidence. The sparks, emanating from the leader's torch, can ignite the other team members, thereby causing the fire to quickly spread throughout the team. This fire can foster the passion in a positive way (when the leader expresses high team confidence) or (and this may be even more pertinent) cause a stifling feeling in a negative way (when the leader expresses low team confidence).

Paper 10 presented two field studies in soccer: Study 1 (N = 134) and Study 2 (N = 125). Both studies addressed the two major limitations in the existing research on the

relation team confidence—team performance: (1) the inability to capture the dynamic nature of team confidence and therefore the impossibility to obtain an insight in the dynamic relation between both constructs in the course of a game, and (2) the fact that the distinction between collective efficacy and team outcome confidence has been disregarded. Paper 10 demonstrated that both types of team confidence before the game were not significantly related to the team performance during the first half. However, both types of team confidence during half-time did relate to the performance in the second half. In other words, the more confident athletes were concerning the abilities of their team during half-time, the better they perceived the team performance during the second half. With regard to the opposite relation, it was shown that a better team performance consistently led to higher subsequent levels of team confidence.

Paper 10 also demonstrated that team confidence is a dynamic construct that varies within a single game instead of being a trait-like characteristic with a strong cross-temporal stability. However, a major limitation of the existing research is its inability to capture this dynamic nature of team confidence. Because the assessment through long questionnaires appeared to be the major barrier in past research to realize frequent in-game assessments during a game, observations could provide a viable alternative. In Paper 7, we developed a new short scale that is based on observations and therefore constitutes a first step towards such a dynamic in-game measure of collective efficacy; the *Observational Collective Efficacy Scale for Sports (OCESS)*.

### Part 4 – The Impact of Athlete Leaders on the Team Functioning

After we established a sound foundation for athlete leadership (Part 1 and Part 2) and for team confidence (Part 3), all tools are available to investigate in the fourth and final part how athlete leaders shape team members' confidence in the abilities of their team, and in turn affect the team's performance. As summarized in Figure 1, we expected that the creation of a stronger team identification and confidence in the controllable processes (i.e., collective efficacy) constitute important tools by which athlete leaders can foster team members' team outcome confidence, and in turn the team's performance.





Paper 11 described a cross-sectional study (N = 2867; nine different team sports), which demonstrated a positive relation between athlete leaders' perceived quality and team members' collective efficacy and team outcome confidence. These findings provided support for the applicability of the Social Identity Approach to Leadership in sport settings: high-quality athlete leaders seem to be able to cause their teammates to think, feel, and behave in terms of 'we' (as a team), rather than 'I' (as individuals), thereby enhancing team members' confidence in the abilities of their team. This is nicely illustrated by CEO Lewis Ergen, who noted that "the ratio of We's to I's is the best indicator of the development of a team" (Quick, 1992, p. 20). The present findings suggest that the athlete leaders are of crucial importance to foster this sense of 'we'.

Moreover, collective efficacy mediated the impact of athlete leaders on teammates' team outcome confidence. In other words, by creating a strong belief in the team's abilities to perform the requested processes successfully (i.e., increase athletes' collective efficacy), athlete leaders fostered team members' confidence in obtaining the outcome.

Paper 12 presented an experimental study with male basketball players (N = 102) who participated in groups of four. The appointed leader of this newly formed basketball team (a research confederate) was asked to express either high or low team confidence. The results revealed an effect of team confidence contagion throughout the team such that team members had greater team confidence when the leader expressed high (rather than low) confidence in the team's success. In line with the Social Identity Approach to Leadership, this effect was partially mediated by team members' identification with their team. In addition, the findings indicated that when leaders expressed high team confidence, team members' *performance increased* during the test. By contrast, when leaders expressed low confidence, team members' *performance decreased*. Athlete leaders thus seem to have the

capacity to shape team confidence among team members (in both positive and negative ways), thereby significantly affecting team members' performance.

### Conclusion

We can conclude that the present PhD thesis extends current scientific knowledge in different research areas. First, we extended the *conceptual knowledge* of the two central concepts of this thesis: athlete leadership and team confidence. Furthermore, we developed two *methodological tools* (i.e., ILI and OCESS) and demonstrated that *Social Network Analysis* is a pioneering and promising tool to investigate athlete leadership. Third, the present PhD thesis was the first to use the Social Identity Approach to Leadership as *theoretical framework* in a sport setting.

With regard to the leadership structure in sports teams, the Theory on *Shared Leadership*, which only recently entered the organizational leadership literature, was supported by our findings: coaches, team captains, and informal athlete leaders are sharing the lead. More specifically, the present PhD thesis provided support for each of the following leadership approaches: (1) *top-down* leadership, (2) *lateral* leadership, and (3) *bottom-up* leadership.

First, with regard to *top-down leadership*, Paper 4 demonstrated that in more than half of the teams, the coach took the lead on the task and external leadership role, which supported the top-down influence of the coach. Furthermore, Paper 9 demonstrated the team confidence expressed by the coach to be an important predictor of team members' team confidence.

Second, several papers in the present PhD provided support for *lateral leadership*, (i.e., shared leadership among athletes). Paper 1 and Paper 4 demonstrated that informal leaders, rather than the captain, take the lead on and off the field. Furthermore, Paper 1 demonstrated that the number of different athlete leaders in a team (i.e., extent of shared leadership) was positively related to athletes' team confidence, their team identification, and the team's performance. The Appendix that supplements Paper 6 added that even shared leadership within a single leadership role (e.g., more than one task/motivational/ social/external leader) is beneficial for the task and social cohesion within the team.

Third and finally, with regard to *bottom-up leadership*, Paper 4 demonstrated that with respect to the motivational and social leadership role, the informal athlete leaders

within the team were clearly perceived as better leaders than their coach and their team captain. Furthermore, Paper 11 revealed that the perceived quality of athlete leaders determined coaches' team confidence and their identification with the team. In addition, Paper 8 and Paper 9 demonstrated that the expression of team confidence by athlete leaders is one of the most decisive sources for coaches' team confidence.

In conclusion, we hope that this comprehensive research endeavor, including conceptual, methodological, and theoretical aspects, will inspire further research in the different research areas. The translation of our findings from sport teams to other settings, such as organizational, educational, or academic settings, would meet the increasing interest in informal and shared leadership. The consistency of the relationships in the overarching model (see Figure 1), as demonstrated across the different papers, testifies to the reliability of the findings of this PhD thesis. Creating a shared team identification and confidence in the controllable processes (i.e., players' collective efficacy) appears important for athlete leaders to foster their teammates' team outcome confidence, and in turn their performance. It can thus be concluded that athlete leaders who believe in 'our team', are able not only to make 'us' a psychological reality, but also to transform 'us' into an effective operational unit. In this way, a team of champions can become a champion team.

# Dutch Summary – Samenvatting

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De legendarische honkbalspeler Babe Ruth beweerde ooit: "De manier waarop een team in zijn geheel speelt, bepaalt het succes. Een team kan bestaan uit allemaal individuele wereldsterren maar als ze niet samenspelen, is het team geen cent waard" (Williams, 1997). Effectief leiderschap en teamvertrouwen worden vaak vooropgesteld als cruciale factoren om het functioneren van een sportteam te optimaliseren. Deze doctoraatsthesis verdiept de theoretische kennis van zowel atleetleiderschap (Deel 1 en Deel 2) en teamvertrouwen (Deel 3). Hierbij ontwikkelden we nieuwe meetinstrumenten die toekomstig onderzoek in deze gebieden kunnen ondersteunen. Daarenboven beperkt deze doctoraatsthesis zich niet enkel tot het beschrijven van wat er gebeurt, maar werd er ook gezocht naar het hoe, met andere woorden naar de mechanismen waarmee atleetleiders het teamvertrouwen van hun teamgenoten kunnen beïnvloeden en zo ook een optimaal teamfunctioneren kunnen creëren (Deel 4). In deze samenvatting zullen we kort uitweiden over de belangrijkste bijdragen van deze doctoraatsthesis tot de huidige literatuur.

### Deel 1 – Theoretische Basis van Atleetleiderschap

In tegenstelling tot de uitgebreide literatuur over het leiderschap van de coach, werd het leiderschap van spelers binnen het team (atleetleiderschap) slechts zeer beperkt onderzocht. Verder richtte dit onderzoek rond atleetleiderschap zich bijna uitsluitend tot de kapitein, als formele atleetleider van het team. De weinige bestaande studies benadrukken het belang van kwaliteitsvol atleetleiderschap voor de tevredenheid van de andere spelers, het teamvertrouwen, de samenhang in het team en de teamprestatie. Coaches, spelers en sportpsychologen bevestigen allen het cruciale belang van atleetleiders voor een optimaal teamfunctioneren. Zo liet Chuck Noll, de coach van de Pittsburgh Steelers, een professioneel American football team waarmee hij vier keer de Super Bowl won, optekenen: "In elk team is er een groep spelers die de toon zet voor alle anderen. Als deze toon positief is, dan is het gevecht al half gewonnen. Als de toon echter negatief is, dan ben je verloren nog voor je het veld op gaat" (Pim, 2010, p. 127). Desondanks bestaat er een aanzienlijke kloof tussen het belang dat aan atleetleiderschap wordt toegekend en de geleverde inspanningen om atleetleiderschap te begrijpen. In Deel 1, dat drie verschillende artikels omvat, proberen we een uitgebreide theoretische basis over atleetleiderschap te vormen om toekomstig onderzoek in dit gebied te inspireren.

Artikel 1 is gebaseerd op een steekproef van 4451 spelers en coaches in negen verschillende teamsporten in Vlaanderen. In dit artikel ontwikkelden en valideerden we een nieuwe classificatie van atleetleiderschap. Deze classificatie vormt een uitbreiding op de vroegere drievoudige classificatie van Loughead, Hardy en Eys (2006). Onze nieuwe classificatie bestaat uit vier leiderschapsrollen die spelers op zich kunnen nemen: twee leiderschapsrollen op het veld, namelijk de taakleider (die zijn teamgenoten tactische aanwijzingen geeft) en de motivationele leider (die zijn teamgenoten motiveert om tot het uiterste te gaan), en twee leiderschapsrollen naast het veld, namelijk de sociale leider (die zorgt voor een goede teamsfeer naast het veld) en de externe leider (die de communicatie met clubbestuur, media en sponsors verzorgt).

De bevindingen van Artikel 1 bevestigden de relevantie van deze leiderschapsclassificatie door aan te tonen dat een effectieve invulling van deze vier leiderschapsrollen in een team resulteert in een groter teamvertrouwen, een sterkere identificatie met het team en een hogere plaats in het klassement. In tegenstelling tot de algemene veronderstelling dat de teamkapitein de enige atleetleider is in het team, tonen de resultaten van Artikel 1 aan dat slechts 1% van de deelnemers hun teamkapitein de beste leider vindt op de vier leiderschapsrollen. Nog opmerkelijker is dat in 44% van de teams de teamkapitein op geen enkele van de vier leiderschapsrollen gezien werd als beste leider, noch op het veld, noch naast het veld. We kunnen dus besluiten dat in de meeste teams de informele leiders, eerder dan de teamkapitein, als beste leiders worden aanzien, zowel op als naast het veld.

Artikel 2 steunde op dezelfde steekproef als deze die gebruikt werd voor Artikel 1 (4451 spelers en coaches uit negen verschillende teamsporten) en onderzocht de specifieke eigenschappen voor elk van de vier leiderschapsrollen. Om ook de specifieke teamcontext in rekening te brengen, werd in dit artikel gebruikt gemaakt van een nieuw contextafhankelijk meetinstrument dat de eigenschappen van leiders op een relatieve manier meet, dit wil zeggen, in vergelijking met de andere teamleden. De resultaten toonden aan dat 'de invloed van de leider op het teamvertrouwen van zijn/haar teamgenoten' als belangrijkste eigenschap werd gezien voor de kwaliteit van een leider (van de 27 onderzochte kenmerken). Deze bevinding gold voor elk van de vier leiderschapsrollen (taak, motivationeel, sociaal en extern leiderschap). 'Goed liggen in de groep' bleek de tweede belangrijkste eigenschap van kwaliteitsvolle leiders. Met andere woorden, hoe meer invloed een leider lijkt te hebben op het teamvertrouwen van zijn/haar teamgenoten en hoe beter de

leider in de groep ligt, des te beter zal zijn/haar leiderschapskwaliteit op elk van de vier leiderschapsrollen worden geëvalueerd.

Artikel 3 levert meer inzicht in de Sociale Identiteitsbenadering van Leiderschap (Social Identity Approach to Leadership; Haslam, Reicher, & Platow, 2011), die in deze doctoraatsthesis gebruikt werd als theoretisch kader om onze bevindingen te onderbouwen. De Sociale Identiteitsbenadering poneert dat de psychologie en het gedrag van teamleden niet enkel gevormd wordt door hun vaardigheid om te denken, te voelen en te handelen als individuen (in termen van de persoonlijke identiteit als '*ik*' en '*mij*'), maar ook, en vaak belangrijker, om te denken, te voelen en te handelen als groepsleden (in termen van de gedeelde sociale identiteit als 'wij' en 'ons'). De recente toepassing van deze benadering op leiderschap stelt dat de effectiviteit van leiders bepaald wordt door de mate waarin leiders een dergelijke gedeelde identiteit kunnen vormen binnen de groep. Met andere woorden, effectieve leiders kunnen een gedeeld gevoel van 'wij' en 'ons' creëren binnen het team. Deze leiderschapstheorie wordt mooi geïllustreerd door een citaat van Drucker (1992, p. 14), een bekend leiderschapsonderzoeker: "De leiders die het meest effectief werken, zo lijkt mij, zeggen nooit 'ik'. En dat is niet omdat ze zichzelf geoefend hebben om het gebruik van 'ik' te vermijden. Ze denken zelfs niet 'ik'. Ze denken 'team'." Kortom, teamidentificatie legt de basis voor effectief leiderschap.

In Artikel 3 ontwikkelden en valideerden we de *Identity Leadership Inventory (ILI)*, een vragenlijst om deze identiteitsgebaseerde leiderschapsstijl te meten. Een internationale samenwerking resulteerde in vier verschillende steekproeven: Studie 1 (N = 238, algemene populatie in de VS), Studie 2 (N = 645, algemene populatie in de VS), Studie 3 (N = 338, werknemers in China), en Studie 4 (N = 421, sportteams in België). De data van deze laatste studie werden in het kader van de voorliggende doctoraatsthesis verzameld. De steekproef van Studie 4 omvatte spelers van vier verschillende sporten: basketbal, voetbal, volleybal en handbal. Dit nieuwe meetinstrument opent de weg om deze identiteitsgebaseerde leiderschapsstijl te meten zowel in organisaties (Studie 1, 2 en 3), als in een sportcontext (Studie 4).

Meerbepaald onderscheidt de ILI vier verschillende dimensies van een effectieve identiteitsgebaseerde leiderschapsstijl. Ten eerste moeten leiders *prototypes* zijn van de groep (ze belichamen de unieke eigenschappen die de groep definiëren en wat het betekent om deel uit te maken van de groep). Ten tweede moeten leiders *voorvechters* zijn van de groep (ze bevorderen en begunstigen de belangen van de groep). Ten derde moeten leiders

de *scheppers* zijn van een identiteit (ze brengen mensen samen door een gedeeld gevoel van 'wij' en 'ons' te creëren binnen de groep). Ten vierde en als laatste moeten leiders deze identiteit *verankeren* (structuren ontwikkelen die een gedeeld begrip, coördinatie en succes vooruit helpen en verankeren in de realiteit). Deze vragenlijst kan gebruikt worden om vooruitgang te boeken zowel in theorie als in praktijk om zo een uitgebreidere kennis van de Sociale Identiteitsbenadering van Leiderschap te bewerkstelligen.

### Deel 2 – Sociale Netwerkanalyse als Innovatief Instrument om Atleetleiderschap te Onderzoeken

Atleetleiders handelen niet in een sociaal vacuüm maar ze zijn ingebed in een web van interpersoonlijke relaties met hun teamgenoten en hun coach. Leiderschap is een sociaal geconstrueerd fenomeen en daardoor erg afhankelijk van de omringende context. Zoals leiderschapsexpert Ladkin (2010, p. 21) stelde: "Trachten om leiderschap te begrijpen zonder naar de context te kijken, is zoals 'liefde' proberen te begrijpen los van de mensen die het belichamen. Je kunt misschien een vleugje vatten, maar het is in essentie onmogelijk om de volledige impact en betekenis van liefde echt aan te voelen als afstandelijke waarnemer."

Desondanks is één van de grootste beperkingen van het bestaande onderzoek rond atleetleiderschap de focus op individuele percepties waarbij het merendeel van de studies er niet in slaagt om ook de volledige omringende context te vatten. Ook Artikel 1 en Artikel 2 leverden enkel inzicht in de eigenschappen van de *beste* leiders in de verschillende leiderschapsrollen. Op die manier ontbrak informatie over het leiderschap dat uitgeoefend wordt door andere teamleden, die misschien niet de beste leiders zijn, maar toch nog een belangrijke invloed kunnen uitoefenen. Bijgevolg kan het zijn dat belangrijke aspecten van de leiderschapsstructuur in het team verborgen blijven.

Sociale Netwerkanalyse (SNA) neemt de leiderschapspercepties van alle teamleden in beschouwing en is daardoor een geschikte techniek om de volledige leiderschapsstructuur in een team te onderzoeken. SNA bekijkt teams in termen van netwerken, bestaande uit knooppunten (symbool voor de spelers) en verbindingen (symbool voor de relaties tussen de spelers, bv. leiderschapspercepties). Zeer recent maakte deze netwerkbenadering zijn intrede in het organisatieonderzoek om leiderschapsfenomenen te verklaren. In deze doctoraatsthesis hebben we SNA voor de eerste keer in een sportcontext gebruikt om een beter inzicht te krijgen in de formele en informele leiderschapsstructuur binnen sportteams.
De drie artikels in dit deel probeerden vier beperkingen van het bestaande SNA-gebruik in het organisatieonderzoek naar leiderschap te remediëren.

Ten eerste, voorgaande studies maakten het onderscheid tussen leiders en niet-leiders waarbij ze binaire netwerken gebruikten om leiderschap te onderzoeken (netwerken gebaseerd op dichotome relaties voorgesteld door 0 'geen leider' of 1 'een leider'). Op deze manier blijft de sterkte van deze relatie verborgen. Ten tweede, een leider zijn, betekent niet automatisch dat de persoon ook een goede leider is. Met het oog op leiderschapseffectiviteit is de *kwaliteit* van het leiderschap uiteraard het meest essentieel. Bijgevolg richten Artikel 4, Artikel 5 en Artikel 6 zich op gepercipieerde leiderschapskwaliteit van atleetleiders en gebruiken hiervoor valued netwerken, waarin de sterkte van de relatie verwijst naar de mate van leiderschapskwaliteit, gaande van 0 (zeer slechte leider) tot 4 (zeer goede leider).

Ten derde, vroegere SNA studies die leiderschap onderzochten in een organisatiecontext focusten op *algemeen leiderschap*. Artikel 4, Artikel 5 en Artikel 6 onderzochten niet enkel dit algemeen leiderschap, maar brachten ook een dieper inzicht in atleetleiderschap door de gepercipieerde leiderschapskwaliteit op elk van de vier *leiderschapsrollen* te onderzoeken (taak, motivationeel, sociaal en extern leiderschap).

Ten vierde, voorgaande studies die SNA gebruikten in een sportcontext (om andere aspecten dan leiderschap te onderzoeken) hebben slechts één tot drie teams getest. Artikel 4, Artikel 5 en Artikel 6 gebruiken de data van 46 volledige teams (die 575 spelers omvatten) in hun sociale netwerkanalyses, wat de *steekproefgrootte* van voorgaande studies ver overschrijdt. Daarenboven werd een gestratificeerde steekproef samengesteld die gekenmerkt werd door een variëteit van heren- en damesteams, in vier verschillende sporten (voetbal, basketbal, volleybal en handbal), spelend op zowel een hoog als een laag competitieniveau.

Het gebruik van *valued* netwerken, de focus op leiderschapskwaliteit, de toevoeging van rolspecifieke leiderschapsnetwerken, de grote steekproefomvang en de variëteit binnen de steekproef zijn innovatieve elementen die ons onderzoek in teamsporten kenmerken. Meer nog, de combinatie van deze elementen kenmerkt ook de uniciteit en vernieuwing van deze artikels in andere onderzoeksgebieden, zoals de organisatiecontext.

Met betrekking tot de specifieke onderzoeksvragen van de verschillende artikels bevestigde Artikel 4 de validiteit van de viervoudige atleetleiderschapsclassificatie, ontwikkeld in Artikel 1, voor de leiderschapsstructuur in het volledige team. Verder bracht Artikel 4 meer inzicht in de formele en informele leiderschapsstructuur in sportteams: met betrekking tot de leiderschapsrollen van taakleider en externe leider werden geen verschillen gevonden tussen de leiderschapskwaliteit van atleetleiders en coaches. Echter, met betrekking tot algemeen leiderschap, en tot motivationeel en sociaal leiderschap in het bijzonder, werden de atleetleiders als betere leiders gezien dan hun coach. Verder toonden onze bevindingen aan dat atleetleiders en de teamkapitein samen de leiding nemen, zowel op als naast het veld.

In Artikel 5 onderzochten we de *eigenschappen van kwaliteitsvol atleetleiderschap* op *individueel niveau* en op *teamniveau*. Er werd aangetoond dat de mate waarin teamleden zich verbonden voelen met hun leider het meest bepalend was voor de gepercipieerde algemene leiderschapskwaliteit en ook voor de gepercipieerde leiderschapskwaliteit op elk van de vier specifieke leiderschapsrollen. Op het teamniveau werden teams met beter atleetleiderschap gekenmerkt door een hogere teamidentificatie en een sterkere sociale verbondenheid.

In Artikel 6 onderzochten we netwerken voor taak en sociale cohesie en toonden hierbij aan dat teams met *beter atleetleiderschap* ook gekenmerkt werden door een sterkere *taak- en sociale cohesie*. Deze bevinding gold voor elk van de vier leiderschapsrollen. Gegeven de resultaten van de huidige studie en deze van de voorgaande artikels zouden coaches en sportpsychologen hun spelers moeten wijzen op het belang van tactisch advies geven aan teamgenoten (taakleiderschap), het motiveren van teamgenoten (motivationeel leiderschap), het bevorderen van een goede sfeer en verbondenheid (sociaal leiderschap) en het vertegenwoordigen van het team naar de buitenwereld toe (extern leiderschap).

#### Deel 3 – Theoretische Basis van Teamvertrouwen

In Deel 1 en Deel 2 probeerden we een uitgebreide basis te leggen om zo een bredere kijk te krijgen op atleetleiderschap. Vooraleer de relatie tussen de twee centrale concepten in deze doctoraatsthesis onderzocht wordt in Deel 4, bouwen we in Deel 3 een theoretische basis voor teamvertrouwen. Dit tweede centrale concept wordt voorop gesteld als een belangrijke voorloper van prestatie. Dit deel bestaat uit vier verschillende artikels: in Artikel 7 verduidelijken we de conceptuele betekenis van teamvertrouwen (N = 4451; negen verschillende sporten); in Artikel 8 en Artikel 9 werden de bronnen van teamvertrouwen bepaald in volleybal (N = 2365), voetbal (N = 1028) en basketbal (N = 1692); en in Artikel 10 voerden we twee veldstudies uit binnen voetbal (N = 259) om een dieper inzicht te

verkrijgen in de wederkerige relatie tussen teamvertrouwen en prestatie tijdens een wedstrijd.

bestaande onderzoek rond Het teamvertrouwen wordt gekenmerkt door tegenstrijdigheden in de manier waarop het concept teamvertrouwen gedefinieerd werd en in de manier waarop dit concept vervolgens gemeten werd. In dit verband levert Artikel 7 meer conceptueel inzicht door twee types van teamvertrouwen te onderscheiden, namelijk een processericht type van teamvertrouwen (collective efficacy; bv. "Ik geloof dat mijn team een sterke werklust zal vertonen tijdens de wedstrijd") en een uitkomstgericht type van teamvertrouwen (team outcome confidence; by. "Ik geloof dat mijn team deze wedstrijd zal winnen"). De artikels in deze doctoraatsthesis toonden gelijkenissen tussen deze twee concepten aan, maar ze wezen ook op belangrijke verschillen: beide concepten zijn verbonden met verschillende achtergrondkenmerken (Artikel 7), ze worden voorspeld door verschillende bronnen (Artikel 9), en ze houden op een verschillende manier verband met uitkomstvariabelen zoals teamidentificatie (Artikel 11 en Artikel 12) en prestatie (Artikel 10 en Artikel 12). Om een coherente vooruitgang van het onderzoek naar teamvertrouwen te realiseren, moeten beide concepten dus worden onderscheiden en afzonderlijk gemeten. We hopen dat de bevindingen van deze doctoraatsthesis bijdragen tot dit doel door meer conceptuele duidelijkheid te scheppen voor toekomstig onderzoek naar teamvertrouwen.

In Artikel 8 en Artikel 9 onderzochten we de bronnen van uitkomstgericht teamvertrouwen (*team outcome confidence*) in volleybal (N = 2356), in voetbal (N = 1028) en in basketbal (N = 867), evenals de bronnen van procesgericht teamvertrouwen (*collective efficacy*) in basketbal (N = 825). Positieve aanmoedigende communicatie door de spelers en een positieve coaching werden aanzien als de belangrijkste bronnen voor een hoog teamvertrouwen. Het is belangrijk op te merken dat uitkomstgerichte bronnen (zoals 'aan de leiding staan') meer voorspellend waren voor het uitkomstgericht teamvertrouwen van de spelers, terwijl procesgericht teamvertrouwen. Negatieve communicatie en negatieve emoties waren de sterkste voorspellers van laag teamvertrouwen, zowel uitkomst- als procesgericht.

Hoewel eerder onderzoek vooropstelde dat de voorgaande prestatie de sterkste voorspeller was van teamvertrouwen, suggereren de bevindingen in de voorliggende doctoraatsthesis dat bronnen tijdens de wedstrijd nog belangrijker zijn voor het voorspellen van het uitkomst- en procesgericht teamvertrouwen van de spelers en coaches. Deze artikels belichten eveneens de belangrijke rol van de atleetleiders in het beïnvloeden van het teamvertrouwen van de teamgenoten, zowel in positieve als in negatieve zin.

Bij het analyseren van de slechtste competitiestart in 15 jaar van de Belgische voetbalkampioen R.S.C. Anderlecht wijst journalist Peter Vandenbempt op de nadelige impact van laag teamvertrouwen, waarbij hij ook de essentiële rol van atleetleiders benadrukt: "De organisatie en het vertrouwen achterin zijn een ramp. Bij elke tegenaanval staan ze daar te bibberen op hun benen. Er is een schrijnend gebrek aan leiderschap op het veld. Dat hebben we al vaker vastgesteld. Niemand neemt deze ploeg op sleeptouw als het moeilijk gaat. Het beste bewijs daarvan is dat Anderlecht dit seizoen niet één keer een achterstand heeft opgehaald" (Sporza, 2013). Atleetleiders lijken dus een fakkel van teamvertrouwen in de hand te hebben. De vonken, ontsprongen aan de fakkel van de leider, kunnen ook het vuur bij de andere teamleden ontsteken, waardoor het vuur zich snel verspreidt doorheen het team. Dit vuur kan de passie aanwakkeren in een positieve zin (wanneer de leider hoog teamvertrouwen uitstraalt), ofwel (en vermoedelijk met een sterkere impact) een verstikkend gevoel teweeg kan brengen in een negatieve zin (wanneer de leider laag teamvertrouwen uitstraalt).

Artikel 10 omvat twee veldstudies in voetbal: Studie 1 (N = 134) en Studie 2 (N = 125). Beide studies leggen zich toe op twee grote beperkingen in het bestaande onderzoek rond de relatie tussen teamvertrouwen en teamprestatie, namelijk (1) het onvermogen om de dynamische aard van teamvertrouwen te vatten en daardoor het ontbreken van inzicht in de dynamische relatie tussen de twee concepten in de loop van de wedstrijd, en (2) het feit dat het verschil tussen uitkomst- en procesgericht teamvertrouwen niet in rekening werd gebracht. Artikel 10 toonde aan dat beide types van teamvertrouwen voor de wedstrijd niet significant gerelateerd waren aan de prestatie tijdens de eerste helft. Toch waren beide types van teamvertrouwen tijdens de rust wel significant gerelateerd aan de teamprestatie tijdens de tweede helft. Met andere woorden, hoe meer vertrouwen de spelers tijdens de rust hadden in de capaciteiten van hun team, hoe beter ze de prestatie van hun team tijdens de tweede helft vonden. Met betrekking tot de omgekeerde relatie werd consistent aangetoond dat een betere teamprestatie leidde tot een hoger teamvertrouwen.

Artikel 10 toonde ook aan dat teamvertrouwen een dynamisch concept is dat varieert binnen eenzelfde wedstrijd, eerder dan een vast kenmerk te zijn met een hoge stabiliteit doorheen de tijd. Nochtans is één van de voornaamste beperkingen van het bestaande onderzoek precies het onvermogen om deze dynamische aard van teamvertrouwen in kaart te brengen. Het gebruik van lange vragenlijsten om teamvertrouwen te meten vormde hierbij de grootste hindernis om meer frequente metingen tijdens een wedstrijd uit te voeren. In dit opzicht kan het werken met observaties een goed alternatief vormen. In Artikel 7 ontwikkelden we daarom een nieuwe korte schaal die gebaseerd is op observaties en daardoor de eerste stap zet naar dynamische metingen van teamvertrouwen tijdens de wedstrijd: de *Observational Collective Efficacy Scale for Sports (OCESS)*.

#### Deel 4 – De Invloed van Atleetleiders op het Teamfunctioneren

Nadat we een uitgebreide basis hebben gelegd voor atleetleiderschap (Deel 1 en Deel 2) en voor teamvertrouwen (Deel 3), zijn we klaar om in het vierde en laatste deel te onderzoeken hoe atleetleiders invloed uitoefenen op het teamvertrouwen van hun teamgenoten en langs deze weg ook de teamprestatie beïnvloeden. Zoals voorgesteld in Figuur 1, verwachtten we dat door het creëren van een hogere identificatie met het team en een sterker vertrouwen in de controleerbare processen (*collective efficacy*) atleetleiders het uitkomstgericht teamvertrouwen van hun teamgenoten verhogen, en zo ook de teamprestatie verbeteren.





Artikel 11 omvat een cross-sectionele studie (N = 2867; negen verschillende teamsporten) die een positieve relatie aantoont tussen de gepercipieerde kwaliteit van de atleetleiders en zowel het procesgericht teamvertrouwen (*collective efficacy*) als het uitkomstgericht teamvertrouwen (*team outcome confidence*) van de teamgenoten. Onze bevindingen bevestigen de toepasbaarheid van de Sociale Identiteitsbenadering van Leiderschap in de sportcontext: kwaliteitsvolle atleetleiders lijken ervoor te kunnen zorgen dat hun teamgenoten denken, voelen en handelen in termen van 'wij' (als een team), eerder dan 'ik' (als individuen), waardoor het vertrouwen van hun teamgenoten in de capaciteiten van het team versterkt wordt. Dit wordt mooi geïllustreerd door de CEO Lewis Ergen, die

stelde dat "de verhouding Wij's tot de Ik's de beste indicatie is van de ontwikkeling van een team" (Quick, 1992, p. 20). Onze bevindingen duiden erop dat de atleetleiders van cruciaal belang zijn om dit 'wij'-gevoel aan te wakkeren.

Verder medieert het procesgerichte teamvertrouwen (*collective efficacy*) de invloed van de atleetleiders op het uitkomstgericht teamvertrouwen (*team outcome confidence*) van de teamgenoten. Met andere woorden, door het creëren van een sterk vertrouwen in de capaciteiten van het team om de nodige processen succesvol te doorlopen (dit wil zeggen, het versterken van de *collective efficacy* van de spelers) verhogen de atleetleiders ook het vertrouwen van hun teamgenoten dat ze het doel zullen kunnen bereiken.

Artikel 12 omvat een experimentele studie met mannelijke basketbalspelers (N = 102), die deelnamen in groepen van vier spelers. De aangeduide leider van deze nieuwgevormde teams (een onderzoeksmedewerker) werd gevraagd om ofwel hoog ofwel laag teamvertrouwen uit te stralen. De resultaten duidden op een verspreiding van teamvertrouwen doorheen het team zodat teamgenoten een sterker vertrouwen hadden in hun team wanneer de leider hoog (eerder dan laag) vertrouwen uitstraalde in het succes van het team. In de lijn van de Sociale Identificatie van de teamgenoten met hun team. Verder toonden de resultaten aan dat wanneer de leiders hoog teamvertrouwen uitstraalden, de prestatie van de teamgenoten *verbeterde* gedurende de test. Omgekeerd, wanneer leiders laag teamvertrouwen uitstraalden, *verslechterde* de prestatie van de teamgenoten gedurende de test. Atleetleiders hebben dus de kracht om het teamvertrouwen van de teamleden te beïnvloeden (zowel in positieve als in negatieve zin), waardoor ze ook een significante impact hebben op de prestatie van de teamleden.

## Conclusie

We kunnen besluiten dat de huidige doctoraatsthesis de bestaande wetenschappelijke kennis op verschillende onderzoeksdomeinen uitbreidt. Ten eerste, verdiepten we de *conceptuele kennis* van de twee centrale concepten van deze thesis: atleetleiderschap en teamvertrouwen. Verder ontwikkelden we twee valide *meetinstrumenten* (ILI en OCESS) en toonden aan dat *Sociale Netwerkanalyse* een innovatief en veelbelovend instrument is om atleetleiderschap te onderzoeken. Ten derde, gebruikte deze doctoraatsthesis als eerste de Sociale Identiteitsbenadering van Leiderschap als *theoretisch kader* in een sportcontext.

Met betrekking tot de leiderschapsstructuur binnen sportteams bevestigen onze bevindingen ook de Theorie rond Gedeeld Leiderschap (of nog *Shared Leadership*) die recent zijn intrede maakte in de leiderschapsliteratuur van organisaties: coaches, teamkapiteins en de informele atleetleiders nemen samen de leiding. Meerbepaald bracht deze doctoraatsthesis evidentie voor elk van de volgende leiderschapsbenaderingen: (1) *topdown* leiderschap, (2) *lateraal* leiderschap en (3) *bottom-up* leiderschap.

Ten eerste, met betrekking tot *top-down leiderschap* toonde Artikel 4 aan dat in meer dan de helft van de teams de coach gezien werd als beste taak- en externe leider, wat de topdown invloed van de coach bevestigt. Verder bewees Artikel 9 dat het teamvertrouwen uitgestraald door de coach een belangrijke voorspeller was van het teamvertrouwen van de spelers in het team.

Ten tweede vonden verschillende artikels in deze doctoraatsthesis evidentie voor *lateraal leiderschap* (gedeeld leiderschap onder de spelers). Artikel 1 en Artikel 4 toonden aan dat informele atleetleiders, eerder dan de teamkapitein, de leiding namen op en naast het veld. Verder toonde Artikel 1 aan dat het aantal verschillende atleetleiders binnen een team (dit wil zeggen de mate van gedeeld leiderschap) positief gerelateerd was aan het teamvertrouwen en de teamidentificatie van de spelers alsook aan de teamprestatie. De Appendix horende bij Artikel 6 voegt toe dat zelfs gedeeld leiderschap binnenin eenzelfde leiderschapsrol (bv. meer dan één taak-, motivationele, sociale of externe leider) bevorderlijk is voor de taak- en sociale cohesie binnenin het team.

Ten derde en ten laatste, met betrekking tot *bottom-up leiderschap*, toonde Artikel 4 aan dat de informele atleetleiders binnen het team duidelijk als betere motivationele en sociale leiders worden gezien dan hun coach en hun teamkapitein. Verder vond Artikel 11 ook evidentie die aantoonde dat de gepercipieerde kwaliteit van de atleetleiders het teamvertrouwen van de coach en de identificatie van de coach met zijn/haar team beïnvloedde. Tot slot, toonden ook Artikel 8 en Artikel 9 aan dat de uitstraling van teamvertrouwen door atleetleiders één van de meest bepalende voorspellers is voor het teamvertrouwen van de coach.

Als besluit hopen we dat dit uitgebreide onderzoekswerk, dat zowel conceptuele, methodologische, als theoretische aspecten omvat, verder onderzoek in verschillende onderzoeksdomeinen zal inspireren. De vertaling van onze bevindingen bij sportteams naar andere contexten, zoals organisaties, onderwijsinstanties of de academische wereld, zou tegemoetkomen aan de groeiende belangstelling voor informeel en gedeeld leiderschap. De stabiliteit van de relaties in het overkoepelende model (zie Figuur 1), aangetoond doorheen verschillende artikels, draagt bij tot de betrouwbaarheid van de bevindingen van deze doctoraatsthesis. Een gedeelde teamidentificatie creëren en vertrouwen in de controleerbare processen (*collective efficacy* van de spelers) blijkt belangrijk voor atleetleiders om het uitkomstgericht teamvertrouwen van hun teamgenoten (*team outcome confidence*) te versterken en zo ook hun prestatie te verbeteren. We kunnen dus besluiten dat atleetleiders die geloven in 'ons team', er niet enkel in slagen om 'wij' om te vormen tot een psychologische realiteit, maar er eveneens in slagen om dit 'wij'-gevoel te kunnen omzetten in een effectief functionerend geheel. Op deze manier kan een team van individuele sterren een kampioenenteam worden.

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#### 1. Abstract of the PhD Thesis

The legendary baseball player Babe Ruth once claimed: "The way a team plays as a whole determines its success. You may have the greatest bunch of individual stars in the world, but if they don't play together, the club won't be worth a dime" (Williams, 1997). In order to optimize team functioning, effective leadership and team confidence have often been proposed as crucial determinants (e.g., Cotterill, 2013; Pain & Harwood, 2009; Weinberg & Gould, 2007). With regard to leadership, research in sport has typically focused on leadership of the coach (Chelladurai, 2007). However, recent research has also established the importance of high-quality *athlete leaders* for the effective functioning of sports teams (Price & Weiss, 2011, 2013). In this regard, athletes are an important, but so far underinvestigated, source of leadership within sports teams.

The main aim of the present PhD thesis was to investigate the impact of athlete leaders on team members' team confidence, and in turn on their performance. Given the sparse existing research on athlete leadership and the considerable gaps in the literature on team confidence, we first attempted to create a solid theoretical foundation of both constructs. Furthermore, we moved beyond mere description and sought to explain the mechanisms through which athlete leaders influence teammates' team confidence and as such foster an optimal team functioning. Section 2 and Section 3 of the Introduction will provide a background for leadership in general and for athlete leadership in particular. Subsequently, Section 4 will introduce the construct of team confidence, after which Section 5 will move to the impact of athlete leaders on team functioning. Finally, we will highlight the gaps in the current literature, thereby demonstrating how we attempted to address these challenges by the different papers in the present PhD thesis.

## 2. Leadership – A Continuous Evolving Research Line

High-quality leadership is essential for the numerous groups that shape the way we live, work, and play. Countries are striving for good political leaders, the quality of top management is stated as the crucial factor for the success of a business organization, and the quality of teachers determines the education of our future generation (Chelladurai, 2012). The quest for the perfect leader resembles the quest for the Holy Grail. If it could be captured, distilled, and replicated, it would lead to guaranteed success for whichever

government, military organization, academic institution, or business organization is in possession of it (Medina, 2011).

Not only today, but also throughout history, leadership has been an essential part of peoples' lives. History books are characterized by numerous stories about inspirational leaders who have influenced the unfolding of history in positive or negative ways. The never-ending fascination for leadership has always been a source of inspiration for leadership research. Why is it that some leaders succeed to inspire and motivate their followers and that others only cultivate apathy, burn-out, and turn-over intentions among their followers? What are the key ingredients of the recipe for a high-quality leader? Several leadership theories throughout history have tried to answer these questions. In this first part of the Introduction, we will give a short historical overview of how the theorizing on leadership has evolved. Instead of striving for comprehensiveness, we will rather constrain our overview to the leadership approaches that characterized crucial historical changes in the leadership evolution.

#### 2.1 The Great Man Approach to Leadership

The first studies about leadership (1930-1950) were based on 'the Great Man Approach' also termed the Trait Perspective to Leadership. This approach highlights the heroic aspect of leadership. In this viewpoint, leadership is rooted in the personality of a person: certain individuals have special innate or inborn characteristics that make them leaders, and it is exactly these characteristics that differentiate them from non-leaders (Northouse, 2010). Some personality theories also postulate that these stable personality traits can be acquired through environmental influences during the early childhood. All theories agree however that these personality traits are stable and lead to effective leadership in all situations. Selecting the perfect leader is then just a matter of determining the decisive leader characteristics (Bass & Stogdill, 1990). The range of leader-specific characteristics is widespread and includes, among others, characteristics such as intelligence, dominance, charisma, wisdom, and an extraverted personality (e.g., Locke, 1997). In this approach, leadership is restricted to those people who have special, usually inborn talents.

General Introduction

#### 2.2 Situational leadership theories

In the late 1940s, a critical review on the Trait Approach to Leadership forced researchers to adopt a drastically different view on leadership. While some traits were demonstrated as leader-differentiating characteristics in numerous studies, Stodgill (1948) and Mann (1959) argued that persons who are leaders in one situation might not necessarily be leaders in another situation. This criticism paved the way for a new leadership approach in the 1950s: the Situational Leadership Theories, which highlighted the situational determinants of leadership. In other words, different situations call for different leaders.

One of the most prominent situational leadership theories is Fiedler's Contingency Model (Fiedler, 1967). In this theory, leader's effectiveness is grounded in the interaction of the leadership style and the situation. In this framework, two types of leaders have been distinguished, namely task-oriented leaders (i.e., prime concern is carrying out the task) and relationship-oriented leaders (i.e., prime concern is the development of good relationships within the group). Fiedler posits that the ideal leader does not exist. Instead, the situation determines which type of leader is most effective.

#### 2.3 Evolution towards a more process-oriented view on leadership

One of the major criticisms was that both the Great Man Theory and the Situational leadership theories embrace the idea that the leadership characteristics or the leadership style of an individual are inherent to that individual. As a consequence, leadership cannot be learned, developed, or changed dependent on the situation. The emergence of the Behavioral Theories in the 1950s characterized a first trend towards a more process-oriented view on leadership. Instead of focusing on the traits of leaders, this new research line investigated effective leadership behaviors. The Managerial Grid Model, developed by Blake and Mouton (1964), is illustrative for this behavioral perspective. This model presents five different leadership styles, dependent on the leader's concern for goal achievement (on a scale from 1 to 9) and their concern for people (on a scale from 1 to 9). The five resulting leadership styles are impoverished management (Production-People: 1-1), authoritarian management (Production-People: 9-1), country club management (Production-People: 1-9), middle-of-the-road management (Production-People: 5-5), and team management (Production-People: 9-9). In this regard, leadership is not restricted to some individuals, but instead available to everyone because it consists of leadership behaviors that can be learned and adopted dependent on the situation.

#### 2.4 Leadership as an interactive process

To date, leadership research in organizational settings has been predominantly leader-centered (for a review see Judge, Piccolo, & Kosalka, 2009). By focusing on the leader, researchers have traditionally neglected the important role of followers' perceptions in mediating and moderating the effect of leadership behavior on followers' behavior (Thomas, Martin, & Riggio, 2013). Therefore, the idea of leadership being a linear, one-way event, shifted towards a more interactive view on leadership: a leader affects and is affected by followers.

Corresponding to the evolution in leadership approaches, the definition of leadership was also characterized by radical changes (Northouse, 2010): in the first decades of the 20<sup>th</sup> century 'dominance' was the central theme. In the 1930s 'traits' became the focus of defining leadership, followed by 'influencing behaviors' in the 1960s. From the 1970s onwards, the interactive view on leadership has been reflected in the definition of leadership. For example, Northouse (2010, p. 8) embodied this transformation by stating that leadership is a phenomenon that resides in the context of interactions between leaders and followers. In the present PhD thesis, we will use his definition of leadership: "Leadership is a process whereby an individual influences a group of individuals to achieve a common goal" (Northouse, 2010, p. 5). Four elements can be highlighted in this definition. First, defining leadership as a process, opposed to traits or behaviors, emphasizes the interactive transfer between leaders and followers. Second, leadership involves influence. Although leadership is an interactive event, the main concern remains on how the leader affects the followers. Third, groups are the typical context in which leadership processes take place. Because leadership is a socially constructed phenomenon, no leadership exists without followers. Finally, leadership includes a striving for a goal, which is shared by leader and team members.

#### 2.5 Transactional Approach to Leadership

The idea of leadership being an interactive event has laid the foundation for the development of the Transactional Approach to Leadership (Hollander, 1978). In this approach, the leader-follower relationship is based on social exchange: leaders set clear objectives and goals for the followers, thereby using either rewards or punishments to encourage compliance with these goals. An important critique against this approach is that it leads to a cold economic relationship between leaders and followers in which each party is

thinking in terms of its own benefits or rewards by asking "What am I getting out of this?" (Haslam, Reicher, & Platow, 2011). However, there is evidence that the introduction of these extrinsic factors have a *de*motivating rather than a motivating impact on both leaders and followers (e.g., Lepper, Greene, & Nisbett, 1973).

#### 2.6 Transformational Approach to Leadership

Burns (1978) stated that effective leadership is much more than a social contract whereby leaders simply satisfy the wants and needs of their followers in exchange for support. Instead, true leadership arises from *working with* followers: effective leaders have the ability to inspire the people to do things because they *want* to do them rather than because they feel *obliged* to do them. This notion is at the heart of the Transformational Approach to Leadership. The commonly used Multifactor Leadership Questionnaire (MLQ; Bass & Avolio, 1997) distinguishes between four components of transformational leadership: (1) idealized influence or charisma (e.g., 'the leader displays a sense of power and confidence'); (2) inspirational motivation (e.g., 'the leader expresses confidence that goals will be achieved') ; (3) intellectual stimulation (e.g., 'the leader seeks different perspectives when solving problems'); and (4) individualized consideration (e.g., 'the leader treats others as individuals rather than just as a member of a group').

Although the Transformational Approach to Leadership highlights important aspects of effective leadership, the downside of this approach is that the characteristics of the MLQ are still treated as stable rather than dynamic. Furthermore, the approach is rather descriptive in nature and provides little or no insights into the *processes* that actually lead to a given leader being seen as influential, inspiring, stimulating, and considerate (Haslam, Reicher, & Platow, 2011, p. 40). In part, this is because the analytic focus remains mainly on the leader as an individual. In a critical review of this approach, Haslam et al. (2011, p. 42) noted: "While it may be acknowledged that transformational qualities have to be recognized by followers, this transformational leadership approach stops with the recognition of these qualities. There is no focus on how transformations are justified to followers; when, that is, the leader's vision becomes shared rather than his or hers alone. Without addressing these questions, the promises of transformational leadership prove attractive, but ultimately incomplete."

#### 2.7 Social Identity Approach to Leadership

A core element of leadership that has not yet been discussed is *the group*. The relationship between leaders and followers is in essence characterized by the fact that both are part of the same group. Haslam et al. (2011, p. 44) pointed at a significant research gap by stating that "the causal role played by the social group remains conspicuously absent from most (if not all) previous treatments of leadership." The Social Identity Approach to Leadership (Haslam, Reicher, & Platow, 2011) is the first to transform the group itself from a marginal to a central presence in its leadership analysis.

The Social Identity Approach asserts that the psychology and behavior of team members is shaped by their capacity to not only think, feel, and behave as individuals (in terms of personal identity as 'I' and 'me'), but also, and often more importantly, as group members (in terms of a shared social identity as 'we' and 'us'; Haslam, 2001; Postmes & Branscombe, 2010; Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Group identification, also termed team identification, refers to the extent in which we define ourselves in terms of our group membership. It is precisely this internalized sense of a shared identity (their sense of themselves as part of 'us') that "makes group behavior possible" (Steffens, Haslam, & Reicher, 2014; Turner, 1982, p. 21).

The recent application of this approach to leadership argues that leaders' effectiveness depends on the extent that leaders are able to manage a shared identity within a group: effective leaders are able to create a shared sense of 'we' and 'us' within the group; they make different people feel that they are part of the same group, and they clarify their understanding of what the group stands for. More specifically, this leadership approach proposes four key rules for effective leadership (Haslam et al., 2011). First, leaders need to be *in-group prototypes* (i.e., represent the unique qualities that define the group and what it means to be a member of the group). Second, they need to be *in-group champions* (i.e., advance and promote the core interests of the group). Third, leaders need to be *entrepreneurs of identity* (i.e., bring people together by creating a shared sense of 'we' and 'us' within the group). Fourth and finally, leaders need to be *embedders* of identity (i.e., develop structures that facilitate and embed shared understanding, coordination, and success).

We will attempt to clarify the meaning of these dimensions in a sport setting by using the example of the female volleyball team of the KU Leuven. First, the unique quality that characterizes all the members of this team and distinguishes this team from other groups is that all the athletes are students of the KU Leuven. Furthermore, loyalty and cohesion are two other qualities that distinguish the KU Leuven team from other university teams. Attendance on the official tournaments cannot be forced and the students often have other academic obligations at the same time. Nevertheless, KU Leuven always shows up at tournaments with its complete team of 20 team members (although half of the players realize in advance that they will not play), in contrast with the other teams, in which only the small core of best players are present. In order to be an *in-group prototype*, leaders should thus be a member of the same university and always express their loyalty to the team.

Being an *in-group champion* is revealed by the way in which the leader always promotes the interests of the group, for instance when scheduling a date for a tournament, when investing time to scout the opponent, and when giving priorities to the team tournaments above more urgent work-related issues.

Third, an effective leader should be an *entrepreneur of identity* by creating a sense of 'us'. The common identity can be created through many different ways: it is captured in the opening speech when selecting new players at the start of the year, in the preparation of a tournament, in the comparison with the other teams (i.e., the out-groups), and in the speech after winning this year's Flemish and Belgian Championship: "Not the players on the field made the difference, but all the team members at the sideline did. The commitment, the loyalty, and the fact that all 20 players are here characterize our team, and once again made the difference between winning and losing."

Fourth, and finally, leaders need to be *embedders of identity*. The common T-shirts and sweaters visualize the common identity to the out-groups. Furthermore, the organization of after-training team activities and an international tournament fosters the cohesion and loyalty of the members and strengthen their identity with the KU Leuven university team.

It should be noted, though, that leadership is grounded in the perceptions of the followers. As Shaver (1975) noted: "an individual's perception of a situation is more important than the objective situation in determining one's feelings and actions." In this regard, it is followers' perception of the four listed identity-shaping behaviors of the leader that will determine an individual's feelings and behavior, rather than the leader's actual behavior.

Group membership thus provides people with a sense of identity—a social identity and leaders express, epitomize, and shape this group identity. More specifically, in order to mobilize followers' support and direct their energies, leaders need not only to 'be one of us' (*identity prototypicality*), but also to 'do it for us' (*identity advancement*), to 'craft a sense of us' (*identity entrepreneurship*), and to 'embed a sense of us' (*identity impresarioship*) (Haslam et al., 2011; Reicher, Haslam, & Hopkins, 2005; Steffens, Haslam, & Reicher, 2014; Steffens, Haslam, Reicher, et al., 2014). As such, effective leaders cause their followers to think, feel, and behave in terms of 'we' (as a group), rather than 'I' (as individuals). A quote from Drucker (1992, p. 14) nicely illustrates this leadership theory: "The leaders who work most effectively, it seems to me, never say 'I'. And that's not because they have trained themselves not to say 'I'. They don't think 'I'. They think 'team'." In short, social identification lays the platform for effective leadership.

#### 2.8 Shared leadership

The majority of the research on team leadership in organizational settings has focused narrowly on the influence and behavior of one single team leader (usually a manager external to the team). In general, traditional leadership theories assumed that the individual who possesses all behavioral characteristics for effective leadership in a given situation would emerge as a team leader. Behling and Schriesheim (1976) were probably the first to argue that it is difficult to find a single leader who possesses both task- and relationoriented behaviors at the same time. Therefore, they proposed a functional model of leadership in which two or more individuals, having different strengths, are appointed as leaders. It should be noted though that this functional model still represents 'vertical leadership' (Pearce & Sims, 2002). More specifically, the manager, or in the functional model two managers with different strengths, are still positioned hierarchically above and external to a team, have formal authority over the team, and are responsible for the team's processes and outcomes (Druskat & Wheeler, 2003; Hackman & Walton, 1986; Kozlowski, Gully, Salas, & CannonBowers, 1996).

Carson, Tesluk, and Marrone (2007) point to the importance of internal team leadership because the complexity that teams often experience makes it unlikely that a single external leader can successfully perform all necessary leadership functions. Only in the course of the last decade, the concept of shared leadership, which is also termed collective or distributed leadership, has been introduced in the organizational leadership literature. Shared leadership contrasts with the conventional paradigm of 'vertical leadership' (Pearce & Sims, 2002). The idea that "shared leadership is a more useful predictor of team effectiveness than vertical leadership" (Pearce & Sims, 2002, p. 183) seems to be at the heart of the growing interest in shared forms of organizational leadership (Pearce & Conger, 2003).

The Integrative Model of Locke (2003) constitutes a useful theoretical framework that encompasses the three different leadership approaches: (1) the top-down model (i.e., leader influences followers), (2) the model of shared leadership (distribution of leadership among followers), and (3) the bottom-up model (i.e., followers influence the leader). According to the Integrative Model of Locke (2003) and as stated by some other authors (Carson et al., 2007; Cox, Pearce, & Perry, 2003), shared leadership only points to the lateral influence among peers. In contrast, Pearce and Conger (2003, p. 1) defined shared leadership as an umbrella concept for all three leadership approaches: "Shared leadership is a dynamic, interactive influence process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both. This influence process often involves peer or lateral influence and at other times involves upward or downward hierarchical influence."

#### **2.9** Leadership in sport settings

Both business teams and sport teams are often characterized by a hierarchical structure in which groups of individuals are led by one person who is formally appointed as the leader of the team (i.e., respectively the manager or the coach). Furthermore, both types of teams strive for common goals, which take the form of visible performance outcomes such as sale increases or a sport victory. Therefore, it is plausible that leadership processes in organizations and in sport teams are similar, with their effectiveness relying on similar factors (Weinberg & McDermott, 2002). For a review on the different approaches that have been used to study leadership in sport settings, we refer to the work of Chase (2010).

To date, in line with leadership research in organizations, most sport research has focused on the coach of the team (see Chelladurai, 1994; Chelladurai & Riemer, 1998 for reviews). In this respect, coaches have been shown to influence athletes' identification with their team, their team confidence, the team's cohesion, and the team's functioning (De Backer et al., 2011; Felton & Jowett, 2013; Hampson & Jowett, 2012; Price & Weiss, 2013). However, following the definition of Northouse (2010), leadership is not restricted to

the coach of a team. Also athletes within the team can fulfill important leadership functions. In this regard, athlete leadership has been defined as "an athlete, occupying a formal or informal role within a team, who influences a group of team members to achieve a common goal" (Loughead, Hardy, & Eys, 2006).

#### 3. Athlete Leadership – Approaching the Frontiers of Knowledge

#### 3.1 Towards a new paradigm of shared leadership within sport teams

The most talented group of players does not always win a sport game. What matters is how well these players function as a team. As Yankees baseball player Babe Ruth noted: "The way a team plays as a whole determines its success. You may have the greatest bunch of individual stars in the world, but if they don't play together, the club won't be worth a dime" (Williams, 1997). In order to optimize this team functioning, effective leadership has been proposed as a crucial determinant (Cotterill, 2013).

In line with recent theorizing in organizational psychology, leadership research in sport settings also manifests an upcoming trend towards the importance of shared leadership. For example, a recent qualitative study examined the leadership style of three of the most successful college coaches in the history of the United States, namely basketball coach Bobby Knight and American football coaches Joe Paterno and Tom Osborne (Manz, Pearce, Mott, Henson, & Sims, 2013). All three coaches adopted a top-down leadership approach in the beginning of their coaching careers (i.e., the coach as the only leader in charge). However, along their careers, all coaches realized the importance of sharing their leadership with those below them. By sharing the lead, not only through their assistant coaches, but also with their athletes, all coaches moved towards the cutting edge leadership idea of sharing leadership responsibilities. Also Marc Lammers, former head coach of the Belgian hockey team, acknowledged that he has been guilty to one-way communication (2007, p. 7): "I treated my players as tamed, meek cheeps who had to obey what I told them to do. Along the way, I realized that communication is a valuable instrument to achieve mutual understanding and hence better performance."

Sven-Göran Eriksson already realized the importance of shared leadership in the early days of his tenure as England's soccer head coach. Together with his Scandinavian sport psychologist Willi Raio, he introduced the term 'cultural architects', which represented those influential individuals within a team who, if on board with the direction of

change, could subtly influence others towards the new way (Railo, 1986). The cultural architects became the core strategy of England's soccer team. David Beckham was an outstanding example of such a cultural architect: he had a very great influence on the attitudes of the other players, he was confident, and he was able to transfer this confidence to his teammates (Ridley, 2002). Because he was thinking along the same lines as Eriksson, he was able to successfully implement the strategy that Eriksson had devised. Railo noted that not only Beckham, but also two or three other players in the team served as cultural architects (Ridley, 2002). England's strategy was thus characterized by shared leadership.

Recently, other studies have emerged that have demonstrated the benefits of having high-quality athlete leaders in the team for important team outcomes, such as athletes' satisfaction, athletes' team confidence, the team's cohesion, and the team's performance (Crozier, Loughead, & Munroe-Chandler, 2013; Price & Weiss, 2011; Vincer & Loughead, 2010). Coaches and players also acknowledge the importance of athlete leaders. For instance, Chuck Noll, former head coach of a professional American football team and winner of four Super Bowls, stated; "On every team there is a core group that sets the tone for everyone else. If the tone is positive, you have half the battle won. If it is negative, you are beaten before you even walk out on the field." (Pim, 2010, p. 127). Although all these observations stress the crucial role of athlete leaders, a considerable gap exists between the importance assigned to athlete leadership and the efforts made to understand it (Loughead et al., 2006). As such, further research efforts are necessary to obtain a deeper insight in athlete leadership.

## 3.2 Athlete leadership roles

Empowering athletes with leadership responsibility strengthens athletes' belief that their input contributes to the team's functioning, which in turn causes a higher commitment to the team goals (Martens, 1987). Based on the role differentiating theory (Bales, 1950), two types of athlete leaders can be distinguished according to their function: (1) leaders with an *instrumental* function are focused on the accomplishments of the group tasks, and (2) leaders with an *expressive* function are concerned with interpersonal relationships. It should be noted that these two functions are not mutually exclusive. In other words, athlete leaders can simultaneously engage in both instrumental and expressive functions (Rees & Segal, 1984; Todd & Kent, 2004; Voelker, Gould, & Crawford, 2011).

Similarly, Kogler Hill (2001) distinguished between two critical leadership functions: task and maintenance. The task functions resemble the instrumental functions of Bales (1950): getting the job done, making decisions, solving problems, adapting to changes, making plans, and achieving goals. The maintenance functions on the other hand are similar to the expressive functions: developing a positive climate, solving interpersonal problems, satisfying members' needs, and developing cohesion.

In their more recent athlete leadership classification, Loughead, Hardy, and Eys (2006) termed the leaders with the instrumental/task functions as task leaders and the leaders with the expressive/maintenance functions as social leaders. Following the authors' definition, a *task leader* helps the team to focus on its goals, helps clarifying team member's responsibilities, assists in decision making, and offers instructions to teammates when required. By contrast, a *social leader* contributes to the harmony within the team, ensures that teammates are involved and included in team events, helps to solve interpersonal conflicts that may arise within the team, offers support, and is trusted by his/her teammates. In addition, Loughead et al. (2006) identified a third athlete leadership role, namely the role of *external leader*. Following their definition, an external leader promotes the team well within the community, represents the team's interests in meetings with coaching staff or league organizers, attempts to secure necessary or desired resources, support, and recognition for the team, and buffers team members from outside distractions (e.g., media or financial issues).

#### **3.3** Formal versus informal leaders

Besides the classification of athlete leaders according to their role within the team, another way to classify athlete leaders is based on their degree of formality (Martin, Bruner, Eys, & Spink, 2014). In this regard, formal and informal athlete leaders can be distinguished. A formal leader is a player who has been prescribed that function formally by the coach or by the team (e.g., the team captain who has been formally appointed to be captain of the team). By contrast, informal leaders have no formally recognized leadership position but acquire their leadership role through group member interactions.

To date, most athlete leadership research has been centered on the team captain (Dupuis, Bloom, & Loughead, 2006; Grandzol, Perlis, & Draina, 2010; Kent & Todd, 2004; Voelker et al., 2011). It is a wide-spread belief that the team captain is 'the' leader of the team; he/she is expected (a) to act as a liaison between the coaching staff and the players,

(b) to act as a leader during all team activities, and (c) to represent the team at receptions, meetings, and press conferences (Mosher, 1979). Furthermore, the captain engages in task behaviors (e.g., coaching his/her teammates), as well as in social behaviors (e.g., providing social support) (Voelker et al., 2011). Following the above-mentioned classification of Loughead et al. (2006), the team captain is thus expected to fulfill the role of task, social, and external leader. Coaches, players and sport media all seem to agree that the team captain takes the lead both on and off the field.

However, more recently, researchers have acknowledged that informal leadership can no longer be ignored (Cope, Eys, Beauchamp, Schinke, & Bosselut, 2011). For example, Loughead and colleagues (2006) revealed that, although most athlete leaders occupy a formal leadership position (i.e., captain or assistant captain), other players within the team are also perceived as leaders by their teammates. Furthermore, two other studies revealed that the majority of athletes pointed out that both team captain and other players occupied a leadership function in their team (Holmes, McNeil, & Adorna, 2010; Loughead & Hardy, 2005).

We already argued for shared leadership within sport settings by stating that the coach does not lead alone, but instead coach and athletes are leading together. The above findings suggest that this shared leadership also characterizes athlete leadership: the team captain and the informal leaders take the lead together. In this regard, shared athlete leadership was demonstrated to be an important characteristic of highly resilient sport teams (i.e., teams that are able to withstand stressors positively) (Morgan, Fletcher, & Sarkar, 2013). The athletes in their study recognized the need for a core set of athlete leaders in challenging situations, illustrated by the following quote from a professional football player: "You need a few types of leaders within the team. My experience of resilient teams is that you have six or more players who could easily have done the captaincy job" (Morgan et al., 2013, p. 552).

#### **3.4** Characteristics of athlete leaders

To date, the sparse research on athlete leadership has been predominantly leadercentered, driven by the search for the key features of a high-quality athlete leader (Glenn & Horn, 1993; Holmes et al., 2010; Price & Weiss, 2011; Todd & Kent, 2004). In its quest for the perfect leader, the majority of research focused on the traits that differentiate the athlete leaders from the other players. For example, Klonsky (1991) revealed that athlete leaders demonstrate higher levels of dominance, ambition, competitiveness, and responsibility, compared with their teammates. Glenn and Horn (1993) focused on the behaviors that athlete leaders differentiate from the others. In this regard, the authors validated a shortened version of the Sport Leadership Behavior Inventory, which included the following eleven athlete leader characteristics: determined, positive, motivated, consistent, organized, responsible, skilled, confident, honest, leader, and respected.

Furthermore, team tenure emerged as an essential characteristic for athlete leaders (Rees & Segal, 1984; Tropp & Landers, 1979; Yukelson, Weinberg, Richardson, & Jackson, 1983). Loughead and colleagues (2006) supported these findings for varsity student-athletes, by demonstrating that the majority of the athlete leaders were senior players. In addition, sport competence, also operationalized as athletes' playing time or their starting status, was put forward as a differentiating leader characteristic (Moran & Weiss, 2006; Price & Weiss, 2011). Rees and Segal (1984) distinguished between task and social leaders in college football teams, thereby showing that team tenure was characteristic for social leaders, whereas the starting status was more important for task leaders.

In analogy with the trend in organizational leadership research to view leadership as an interactive process, attributes associated with the relation between leader and followers became also more prominent in sport research. For example, social connectedness, also referred to as 'friendship quality' or 'peer acceptance', emerged as an important attribute of good athlete leaders (Moran & Weiss, 2006; Price & Weiss, 2011; Tropp & Landers, 1979; Yukelson et al., 1983). However, it should be noted that when examining student-athletes' perceptions of formal and informal team leaders, likeability was not seen as a necessary attribute for good leadership (Holmes et al., 2010). In other words, both male and female athletes reported that they could play for and respect a leader, even when that leader was not popular within the team.

# 3.5 Athlete leadership within the framework of organizational leadership research

To situate our study within the traditional leadership theories in organizational research, we will use the classification scheme of Behling and Schriesheim (1976). This scheme categorically distinguishes between four types of leadership theories, based on two dimensions: (1) the characteristics of the leaders (i.e., inborn traits or more process-oriented

behaviors) and the generality of the situation (i.e., leader characteristics as universal or situation-specific).

		Characteristics of the leaders		
		Traits	Behaviors	
Generality of the situation	More universal	e.g., Trait Approach or Great Man Theory	e.g., Behavioral Theories	
		Great leaders are born with personality traits that lead to success in all situations	Great leaders possess general behavioral characteristics that can be learned.	
	More specific	e.g., Fieldler's Contingency Theory Personality traits that lead to leader effectiveness in one situation may lead to failure in another.	e.g., Situation-specific Theories Effective leadership is a function of learned behaviors that are situation-specific.	

Figure 1. The classification scheme of Behling and Schriesheim (1976)

A theory of sport leadership that would be situated within the 'Behaviors—More Specific' segment is Chelladurai's (1990) Multidimensional Model of Sport Leadership. More specifically, Chelladurai (1990) suggested that the compatibility between coach and athletes, team member's satisfaction, and the team's performance are a result of the congruence among required, preferred, and actual leadership behavior. This congruence is dependent on characteristics of the situation, the leader, and the members of the group. In other words, leadership consists of behaviors that can be learned and that can differ according to the specific situation.

We believe that the present PhD thesis on athlete leadership can best be situated in the "Behaviors—More Specific" segment. Two arguments motivate our assumption. First, the definitions of the various leaders, as defined in Section 3.2 by Loughead and colleagues (2006), are characterized in terms of behaviors (e.g., a task leader assists in decision making, a social leader offers support, and an external leader promotes the team within the community). Because these are behaviors rather than fixed traits, leadership can be learned and players can learn how to take up leadership roles.

Second, like the contingency theories of leadership, an interaction between the leader and the situation is hypothesized. This infers that leader effectiveness is somehow situationspecific and that leaders that are effective in one situation may not be effective in another situation. However, according to the contingency theories of leadership, leadership behavior is a stable trait and cannot be changed depending on the situation. As such, leaders who are effective in one situation will not be effective in another situation. In contrast, although some athletes might be more natural leaders than others, we believe that athlete leadership is predominantly about behaviors that can be learned and adapted according to the situation. For instance, the tactical advice that a task leader provides to his/her teammates or the degree in which he/she assists in decision making may depend upon the specific opponent. A task leader's behavior may even vary within a specific game according to the player he/she addresses: more experienced players might not need as many instructions as the younger novice players.

However, the leadership structure in a sport team is too complex to be captured in one of the above-postulated categories. The recent trend in organizational research towards shared leadership constitutes, in our opinion, the best framework for athlete leadership. Although many studies on athlete leadership only focused on the role of the team captain as formal leader of the team (Dupuis et al., 2006; Grandzol et al., 2010; Voelker et al., 2011), more recent research infers that informal athlete leadership, exhibited by other players besides the team captain, is equally if not more important (Loughead & Hardy, 2005; Loughead et al., 2006).

Therefore, we will adopt an expanded view of shared leadership, similar to the one of Conger and Pearce (Pearce & Conger, 2003, p. 286). Instead of viewing shared leadership only as lateral leadership among peers, these authors postulate that shared leadership involves both upward, lateral, and vertical leadership, but with the key attribute being more than just downward influence on the players by an appointed or an elected leader (such as the coach or team captain). As a framework to understand leadership in a sport team, we thus include the three leadership approaches as proposed by Locke (2003), outlined more in detail in Section 2.8: (1) top-down leadership from the coach or captain to athlete leaders, (2) lateral leadership, termed by Locke (2003) as shared leadership, in which the team captain and the informal leaders take the lead together, and (3) bottom-up leadership from the athlete leaders to the coach.

The present PhD thesis aimed to provide a deeper insight in the leadership structure within sport teams, by applying the integrative model of Locke (2003). In the present PhD thesis, we will follow the broader definition of shared leadership by Pearce and Conger (2003, p. 1) and we will consider shared leadership as umbrella construct of top-down, lateral, and bottom-up leadership. However, in line with the integrative model of Locke

(2003), we will discuss our findings in the light of each of the three leadership styles separately.

In this section, we provided a sound background for one of the spearheads of this PhD thesis, namely athlete leadership. The main aim of this thesis is to examine the impact of athlete leaders on team members' team confidence and performance. In order to appear fully armed at the start of the twelve papers included in this thesis, we will provide in the next section a background on the second spearhead of this PhD thesis: team confidence.

## 4. Team Confidence

The performance of athletes can vary strongly during a sport game. Newspapers' headlines frequently focus on these highs and lows, relating it often to changes in confidence (e.g., "After an excellent performance in the first half, the players suddenly lost strength and confidence, resulting in a severe defeat" or "Team remains confident despite offensive struggles and outplays the opponent"). Also coaches often point to their team's confidence as the decisive factor that made the difference between winning and losing. For example, in the recent final of the Europa League in football FC Sevilla triumphed in the penalty shoot-outs. After the game, Jorge Jesus, the losing coach of Benfica, stated: "At the end of the game we were the better team. We created opportunities, but they did not work out. The team that was most confident in the penalties was Sevilla. With regard to the play, the best team did not win the Europa League" (Sporza, 2014). Apparently, sometimes team confidence even outscores the performance.

## 4.1 Conceptualization of team confidence

Bandura (1997, p. 477) termed this confidence in the team's abilities originally 'collective efficacy' and defined the construct as "a group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment". In other words, collective efficacy is the confidence in the team's skills to accomplish the processes that can lead to successes. Although the importance of team confidence is beyond dispute, the existing literature is characterized by inconsistencies in the way in which collective efficacy has been conceptualized, operationalized, and measured (Shearer, Holmes, & Mellalieu, 2009).

Collins and Parker (2010) distinguished between two types of collective efficacy: 'team process efficacy' and 'team outcome efficacy'. Team process efficacy pertains to the team's confidence in their ability to work collectively, whereas team outcome efficacy refers to the team's belief in achieving the team goals. In sports, this outcome-oriented confidence in winning or performing better than the opponent has also been termed 'competitive efficacy' or 'comparative efficacy' (Myers & Feltz, 2007).

In the present PhD thesis, two types of team confidence will be distinguished. The first type is termed 'process-oriented collective efficacy' or in short '*collective efficacy*'. This type of confidence refers to collective efficacy as it was originally defined by Bandura (1997, p. 477) and is usually assessed by athletes' confidence in the skills of their team required to accomplish a certain task (e.g., "I believe that my team will demonstrate a strong work ethic during this game").

Whereas collective efficacy comprises athletes' confidence in the process of their own team, the second type of team confidence is grounded in the comparison with the opposing team. The latter type of outcome-oriented team confidence is termed '*team outcome confidence*'. This construct focuses on outperforming the opponent and comprises athletes' confidence in their team's abilities to obtain a certain outcome (e.g., "I believe that my team will win this game"). In previous research, this type of team confidence was termed 'team outcome efficacy' (Collins & Parker, 2010), 'competitive efficacy', or 'comparative efficacy' (Myers & Feltz, 2007). It is important to note though that this outcome-oriented measure does not capture the process-oriented nature of collective efficacy as described in the original definition by Bandura (1997). Consequently, the 'efficacy' label that has often been used appears inappropriate, and we therefore opted for the label of 'team outcome confidence'. Both concepts will be assembled under the umbrella term 'team confidence'.

## 4.2 The sources of team confidence

To date, the research on sources contributing to the development of team confidence is sparse. To obtain more insight in the factors which strengthen or undermine athletes' confidence in their team's abilities, we will have to dig deeper into the sources of selfefficacy. Bandura (1997, p. 3) defined self-efficacy as "the belief in one's capabilities to organize and execute the courses of action required to produce given attainments". To explain group behavior (e.g., group choices, coordinated team efforts, group motivation, and team performance), Bandura (1982) extended his theory on self-efficacy later on with the concept of 'collective' efficacy.

Bandura (1997) identified four sources that were essential in influencing selfefficacy. The first and most important source is mastery experiences or past performance: successes foster a robust belief in one's self-efficacy, whereas failures undermine it. The second way of influencing one's self-efficacy beliefs is through vicarious experiences: seeing similar people succeed after persistent effort strengthens an individual's belief that he/she too possesses the capabilities to succeed. In the same way, observing others' failure despite high efforts undermines an individual's self-efficacy. Social persuasion is the third way to affect an individual's belief that he/she has what it takes. This social persuasion can take the form of others who persuade an individual that he/she possesses the abilities required to master given activities. Finally, people also rely on their physiological and emotional states (e.g., arousal, fatigue, or stress) to judge their capabilities. Stress reactions, for example, can be misinterpreted as signs of shortcomings in one's abilities required to master a task. In a sports environment, additional sources of athletes' self-confidence have been proposed, such as preparation, the received social support, and coaches' leadership (Hays, Maynard, Thomas, & Bawden, 2007; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998; Wilson, Sullivan, Myers, & Feltz, 2004).

Bandura (1997) suggested that the four main sources of self-efficacy may also serve as sources of collective efficacy. However, in team sports, the resulting performance is not simply the sum of individual efforts, but instead a more complex interaction between the efforts of the different team members. Similarly, it is reasonable to assume that also the development of efficacy beliefs may differ between an individual and a team. In fact, this difference is supported by the existence of sources of collective efficacy in a team sport context, other than the four sources proposed by Bandura (1997), such as past performance in practice or training sessions, preparation effort, and confident leadership (Chase, Feltz, & Lirgg, 2003; Chase, Lirgg, & Feltz, 1997; Watson, Chemers, & Preiser, 2001).

## 4.3 Team confidence as precursor of optimal team functioning

The sparse research on sources of team confidence is in sharp contrast with the abundant number of studies focusing on the consequences of team confidence. It is beyond dispute that team confidence is an important precursor of optimal team functioning (Bandura, 1997; Stajkovic, 2009). Although collective efficacy is a relatively new construct

in sport psychology, it has already been linked to several favorable outcomes. Bandura (1997) stated that collective efficacy has an effect on what a team chooses to do, how much effort is instilled into a task, and how persistent the team is. These claims have been supported in quantitative research showing that athletes with a strong confidence in the capabilities of their team set more challenging goals (Silver & Bufanio, 1996), exert more effort, and persist longer when facing difficulties or defeat (Greenlees, Graydon, & Maynard, 1999). Furthermore, teams with high levels of team confidence demonstrated higher resilience when facing adversities (Morgan et al., 2013) and were more cohesive (Kozub & Mc Donnel, 2000; Parrow, 2002; Ramzaninezhad, Keshtan, Shahamat, & Kordshooli, 2009).

An increased confidence of team members in their potential to succeed as a team is likely to increase their internalization of the group goals as well as their motivation to exert effort on behalf of the team, thereby ultimately enhancing their performance (Haslam, Powell, & Turner, 2000). In short, not only does higher team confidence lead to a better team functioning, highly confident teams typically perform better as well (Edmonds, Tenenbaum, Kamata, & Johnson, 2009; Stajkovic, Lee, & Nyberg, 2009). This positive relationship between team confidence and performance has been observed in various team sports such as football (Myers, Feltz, & Short, 2004), ice hockey (Feltz & Lirgg, 1998; Myers, Paiement, & Feltz, 2004), basketball (Watson et al., 2001), softball (Chou, Yu, & Chi, 2010), and volleyball (Dithurbide, Sullivan, & Chow, 2009; Keshtan, Ramzaninezhad, Kordshooli, & Panahi, 2010).

It should be noted though that the above-mentioned studies have disregarded the distinction between the two types of team confidence: process-oriented *collective efficacy* and outcome-oriented *team outcome confidence* (as described in Section 4.1). To create a sound foundation for the current PhD thesis, previous studies had to be reinterpreted based upon the actual measurements that were used to assess the team confidence–performance relation. Based on the distinction described above, we classified these studies as targeting either collective efficacy or team outcome confidence.

First, with respect to the relation between *collective efficacy* and team performance, inconsistent results emerged. A meta-analytic review including 96 studies demonstrated a positive relation between collective efficacy and group performance (Stajkovic et al., 2009). Likewise, professional volleyball teams with high levels of collective efficacy were positioned higher in the ranking than teams with low levels of collective efficacy (Keshtan

et al., 2010). However, some studies failed to reveal the positive relation between collective efficacy and team performance. In this regard, no significant relation emerged between basketball teams' collective efficacy and their performance, measured by shooting percentage and difference in rebounds (MacLean & Sullivan, 2003). Chen and colleagues (2002) conducted a similar study but assessed the team's performance by the season winning percentage and the point difference. Also in this study, no significant relation emerged between collective efficacy and team performance.

Second, with respect to the relation between *team outcome confidence* and team performance, the literature consistently revealed a positive relation. For example, Stanimirovic (2004) conducted an experiment in which teams of secondary school students were assigned to either a repeated success or a repeated failure condition. The success and failure conditions were manipulated by having participants compete against an imaginary opponent, who scored lower or higher. The study findings revealed a positive impact of performance on team outcome confidence; teams in the repeated success condition reported higher confidence in winning the game than teams competing in the repeated failure condition. The reversed relation (i.e., impact of team outcome confidence on performance) was demonstrated in two lab studies, revealing that teams who were confident in winning the competition performed better than teams who lost all confidence in their winning chances (Chen et al., 2002; Hodges & Carron, 1992). Additionally, two field studies in intercollegiate ice hockey teams observed a reciprocal relation between team outcome confidence and team performance, measured by official game statistics (Feltz & Lirgg, 1998; Myers, Paiement, et al., 2004).

### 5. The Impact of Athlete Leaders on Team Functioning

Effective leadership has been proposed as a crucial determinant to optimize team functioning (Cotterill, 2013). More specifically, athlete leadership has been associated with several indicators of optimal team functioning such as team satisfaction and increased effort (Zacharatos, Barling, & Kelloway, 2000), higher team resilience (Morgan et al., 2013), unity, trust, and cooperation (Bass & Riggio, 2006), and team communication (Hardy, Eys, & Loughead, 2008). In this concise literature overview, we will shortly elaborate on two key indicators of optimal team functioning that will be examined in the present PhD thesis, namely team confidence and team cohesion.

#### 5.1 The impact of athlete leaders on teammates' team confidence

Research has demonstrated that effective leaders can affect team members' team confidence. Several leadership theories have linked effective leadership with team members' confidence in the abilities of their team. For example, Shamir, House, and Arthur (1993) suggested that charismatic leaders increased team members' team confidence through four behaviors: (1) expressing positive evaluations, (2) communicating higher performance expectations of followers, (3) showing confidence in followers' ability to meet such expectations, and (4) emphasizing the individual's ties to the collective.

Hoyt and colleagues (2003) confirmed the positive impact of leaders' team confidence by performing two laboratory studies in which groups of three people (one of them designated as leader) performed employee hiring tasks. Their results revealed that leaders who strongly believed in their own abilities to perform the task (i.e., high selfefficacy), also had a stronger confidence in the team's abilities (i.e., high team confidence). Moreover, this team confidence of the leader predicted followers' team confidence, and in turn the team performance.

In a qualitative study in a elite handball team, Ronglan (2007) observed the production and regaining of team confidence throughout a season. His observations revealed that team confidence building might be facilitated if the coach and the athlete leaders in the team affected team members' team confidence positively. Furthermore, Watson and colleagues (2001) demonstrated in a basketball setting that perceptions of athlete leaders' effectiveness were positively related to athletes' team confidence. As such, it seems that athlete leaders hold the key to affect team members' team confidence, and in turn their performance.

#### 5.2 The impact of athlete leaders on team cohesion

A qualitative study with varsity athletes in basketball, volleyball, and hockey demonstrated that the presence of formal and of informal athlete leaders within a sport team fosters higher levels of cohesion in the team (Crozier et al., 2013). Participants stressed the importance of athlete leadership for the team's task cohesion by stating that having athlete leaders in the team "gets everybody on the same page" and "make everyone on the floor cares about harmony when playing". With regard to social cohesion, athletes emphasized

that "athlete leaders provide a better team chemistry" and that "they make every player feels like a part of the team".

Vincer and Loughead (2010) provided quantitative support for these findings by examining the relation between athlete leadership behaviors and perceptions of team cohesion. Their results revealed that leader behaviors of training and instruction and social support influenced both task and social cohesion. Furthermore, Price and Weiss (2011) demonstrated a positive association between athlete leadership ratings and perceptions of task and social cohesion in adolescent female soccer players. In short, the sparse research to date suggested that athlete leaders have the potential to impact both task and social cohesion in sport teams.

## 6. Gaps in Literature

## 6.1 Gaps with respect to athlete leadership

#### 6.1.1 Predominant focus on one single athlete leader

To date, most athlete leadership research has focused on the formal leader of the team, namely the team captain (e.g., Dupuis et al., 2006; Grandzol et al., 2010; Voelker et al., 2011). In contrast, only sparse research attention has been paid to the informal leaders of the team. Loughead, Hardy, and Eys (2006) constructed a three-fold athlete leadership classification (task leader, social leader, and external leader) as an initial framework to study informal athlete leadership. Although this athlete leadership classification, which has been outlined in Section 3.2, already encompasses various functions of athlete leaders, it might still not be comprehensive enough. More specifically, the role of social leader was characterized by qualities similar to the expressive leader function described by Bales (1950), for example "this leader ensures teammates are involved and included in team events" and "this leader offers support and is trusted by teammates" (2006, p. 148). Because the role of social leader mainly refers to the concern for good interpersonal relations *off* the field, we propose that the three-fold leadership classification lacks a leadership role that cares for the interpersonal interactions *on* the field, which are directly related to the team performance.

In contrast with the task leader, who focuses on providing tactical instructions, this additional leadership role of motivational leader would encompass behaviors such as motivating team members on the field and steering their emotions and reactions towards an optimal zone for performing. The need for such a motivational leader is supported by the numerous studies demonstrating that motivating and encouraging behaviors are crucial for effective athlete leadership (Cotterill, 2013; Dupuis et al., 2006; Holmes et al., 2010). Furthermore, it was shown that the absence of a leader who creates a positive atmosphere on the field could lead to a collective collapse (Apitzsch, 2009). Despite the research evidence corroborating the importance of these on-field motivating leadership behaviors, such behaviors have not yet been incorporated in the current athlete leadership classification.

## 6.1.2 Role-specific characteristics of high-quality athlete leaders

With regard to the differentiating attributes of high-quality athlete leaders, previous research has been predominantly leader-centered, driven by the search for the characteristics of a good athlete leader in general (Glenn & Horn, 1993; Holmes et al., 2010; Price & Weiss, 2011; Todd & Kent, 2004). Only very few studies have distinguished between the different leadership roles. In this regard, it was demonstrated that all of the perceived task leaders were starters, whereas only half of the perceived social leaders were starting players (Rees & Segal, 1984). Loughead et al. (2006) partly refuted this finding by revealing that the majority of task, social, and external leaders were starters. Also with respect to team tenure, differences between the leadership roles emerged: whereas the social leaders were mostly seniors, the task leaders were spread out amongst juniors and seniors (Rees & Segal, 1984).

A second shortcoming of the current literature is that, when examining leader characteristics, research often focused on the team captain and/or on a limited number of appointed informal leaders. Subsequently, participants were asked to rate the characteristics of these leaders. However, designating someone as a leader does not necessarily imply that the appointed leader also fulfils his/her leadership function well. For example, an athlete might designate a teammate as leader because of the dominance and authority this teammate conveys, which does not necessarily go hand in hand with high-quality athlete leadership. The lack of leadership quality perceptions in previous research is unfortunate given that in particular the quality with which a leadership role is fulfilled is decisive for the effectiveness of leadership.

All together, these preliminary observations argue for a deeper investigation of the role-specific attributes of high-quality athlete leaders. Given the clearly distinct role content
of the leadership roles, we assume that different leader attributes will be predictive in determining the leadership quality in a given role.

### 6.1.3 Context-dependency of athlete leadership

It is important to point out that athlete leaders do not lead in a social vacuum, but instead are imbedded in a web of interpersonal relationships with their teammates and coach. As noted before, leadership is a socially constructed phenomenon and therefore, highly dependent on the surrounding context. As Ladkin (2010, p. 21) stated: "trying to understand leadership without looking at the context is like trying to comprehend 'love' abstracted from the people who feel and enact it. You may be able to capture a trace of it, but it is virtually impossible to really appreciate its full impact and significance as a detached observer." Nevertheless, previous research has typically focused on individual perceptions when examining athlete leadership, thereby ignoring the surrounding team context.

For example, the characteristics of athlete leadership have so far been measured in absolute terms (e.g., Loughead & Hardy, 2005; Price & Weiss, 2011). For instance, the experience of an athlete was typically assessed by the absolute number of years that the athlete was active in his/her sport. However, although a young athlete with only a few years of experience might not be perceived as a leader in an experienced senior team, the same athlete might emerge as a leader in a younger team with novice players. As such, measuring leader attributes in absolute terms clearly conflicts with the context-dependency of athlete leadership. In this regard, Chelladurai's (1990) Multidimensional Model for Leadership of the coach also applies for the athlete leaders within the team: the effectiveness of leadership strongly depends on the surrounding team context. One possible approach to take into account this surrounding team context is to determine the leader's characteristics relative to the characteristics of the other team members (e.g., having more/less experience than the other team members), rather than determining the leader's characteristics in absolute terms (e.g., years of experience).

It should be noted though that such an approach is still based on individual perceptions. As Lord and Emrich (2000, p. 551) stated "if leadership resides, at least in part, in the minds of followers, then it is imperative to discover what followers are thinking." The best-suited technique to take the perceptions of the followers into account is Social Network Analysis (SNA). SNA is a pioneering and promising tool to obtain a full insight in the

leadership relations within a team. This network approach pictures groups in terms of networks, consisting of nodes (representing the individual actors) and ties (representing the relationships between the actors) (Wasserman & Faust, 1994). Over the past decade, the theory of networks yielded explanations for social phenomena in a wide variety of areas, ranging from sociology and politics, over the use of social media and information sharing, to organizational research (Borgatti, Mehra, Brass, & Labianca, 2009). Only very recently, this network approach has entered the organizational research to explain leadership phenomena. SNA has been shown to be a well-suited approach to investigate leadership because of three reasons (Emery et al., 2013): (1) this technique can model patterns of relationships among interconnected individuals, (2) it is able to represent how leadership is distributed among group members, and (3) it can identify the emergence of multiple leaders.

Sport teams have been proposed as the ideal object of investigation for such a network approach (Lusher, Robins, & Kremer, 2010). In fact, a sport team is a well-defined group of interdependent individuals (i.e., 'a full network' in social network terms) and the relations between the team members have a direct impact on measurable performance outcomes. Nevertheless, SNA has hardly found its way to the sport research. The few preliminary studies that used social network measures in sport teams mainly focused on the relations between the players with regard to their interactive play (i.e., the players were considered as the nodes of the network, the given passes as the relationships between the nodes). Although SNA has been recommended as a valuable tool to analyze the leadership structure in sport teams (Nixon, 1993), to our knowledge no study has yet used this network approach to obtain a better insight in formal and informal leadership in sport teams.

### 6.1.4 Social Identity Approach to Leadership unfamiliar in sport settings

Similar to the evolution in organizational research, the trend to put the social group instead of the leader in the centre of attention has recently entered the sport literature. As outlined in Section 2.7, the Social Identity Approach to Leadership is one of the upcoming theories that embrace this principle (Haslam et al., 2011), thereby encompassing the notion that effective leaders are able to create a shared sense of 'we' and 'us' within the group. This identification with the group has been related to various individual and group-level outcomes (Haslam, 2004). For example, Van Zomeren and colleagues (2010; 2008) established a positive association between group identification and collective efficacy in various studies on collective action tendencies. Furthermore, group identification has been shown to foster higher levels of collective efficacy among group members in a large multi-

industry company (Wang & Howell, 2012). In a sport setting, it was demonstrated that a strong identification of athletes with their team reduced social loafing and significantly enhanced the team performance (Hoigaard, Boen, De Cuyper, & Peters, 2013).

Two shortcomings in the current literature should be noted. First, although the Social Identity Approach to Leadership has yielded explanations for leadership outcomes in a variety of domains, ranging from society, over politics, to organizations (Ellemers, De Gilder, & Haslam, 2004; Haslam et al., 2011; Steffens, Haslam, et al., 2014), this leadership approach has not yet entered the sport literature. Second, although it was demonstrated that the Identity Leadership Approach of Haslam (2011) is a promising framework to explain leadership phenomena, to date no measure exists that is able to capture the four dimensions of an identity-based leadership style (i.e., identity prototypicality, identity advancement, identity entrepreneurship, and identity impresarioship as outlined in Section 2.7).

### 6.2 Gaps with respect to team confidence

#### 6.2.1 Conceptualization of team confidence

As outlined in Section 4.1, the existing team confidence research is characterized by inconsistencies in the manner in which team confidence has been conceptualized, operationalized, and measured (Shearer et al., 2009). For example, current measures vary with respect to the extent in which they correspond to Bandura's (1997) original definition of efficacy. As outlined in Section 4.1, we will therefore distinguish between two different types of team confidence: process-oriented collective efficacy and outcome-oriented team outcome confidence. Given the fact that a number of studies used the outcome-oriented measurement to allegedly assess collective efficacy, it can be concluded that a clear conceptualization of team confidence that differentiates between the process-oriented part and the outcome-oriented part is required to move this research field forward in a coherent way.

### 6.2.2 Team confidence as dynamic construct

FC Arsenal coach Arsene Wenger noted that "confidence is the easiest thing to lose in football and the most difficult to win back" (Mangan, 2013). And he should know, after nine years without any trophies. Also in the FA cup against Hull City, history seemed to repeat itself when Arsenal was down two to zero after only eight minutes of playing. However, the perseverance of the Arsenal players led to a 3-2 victory and as such the FA cup, which, after nine lean years, caused the rebirth of Arsenal's team confidence. As the quote of Arsene Wenger illustrates, it is important to emphasize that team confidence is a dynamic construct, rather than a trait-like characteristic showing strong cross-temporal stability (Myers & Feltz, 2007). In other words, athletes' confidence in the abilities of their team may vary in the course of weeks, days, or even within a single game. Especially these in-game changes in athletes' confidence sometimes make the difference between winning and losing.

To investigate this close link between team confidence and performance, Bandura (1997, p. 67) stated that the relation between team confidence and performance is revealed most accurately when both constructs are measured in close temporal proximity. Myers and Feltz (2007) added that only research designs allowing for simultaneous measures of both team confidence and performance would provide maximal information about their dynamic relationship during a competition.

However, in sharp contrast with these guidelines and the dynamic nature of team confidence, the concept has traditionally been measured as a trait concept or at best before or after a game, but not during a game. The inability to capture the dynamic nature of team confidence constitutes a second important shortcoming in the current literature. Myers, Paiement, and Feltz (2007) attempted to obtain a deeper insight in the importance of the temporal proximity between the measurements of confidence and performance. Therefore, they tested the relation between team confidence (measured 24 hours before the game) and three cumulative performance intervals within ice hockey games (three game periods). The magnitude of the relation between team confidence and performance decreased. It should be noted though that the time span between the measurement of team confidence and the team's performance was at least 24 hours, which allowed for intervening experiences that possibly affected athletes' team confidence (e.g., a pre-game speech of the coach).

In order to capture the dynamic relation between team confidence and performance within a game, it is essential to measure players' team confidence during the performance (Myers & Feltz, 2007). To our knowledge, there is only one study that attempted to measure athletes' team confidence during the performance (Edmonds et al., 2009). More specifically, these authors measured team confidence at three time points during an adventure race, including five different disciplines (i.e., trekking, canoeing, mountain-bike racing, climbing, and orienteering). Their results demonstrated a positive impact of athletes' team confidence

on the team performance: the higher athletes' confidence in the team's abilities to perform the next discipline successfully, the better they performed. However, the inverse direction of the team confidence—performance relation was not supported. The effects of the performance in a previous discipline on the team confidence in successfully performing the next discipline were only very small. It could well be that the variety in the disciplines involved in this adventure race caused these non-significant findings. In addition, this variety complicates generalizing these findings to sport teams in which players perform a similar task during the entire game (e.g., soccer). Therefore, further research is requested to obtain a deeper insight in the dynamical in-game relation between team confidence and performance.

### 6.2.3 Sources of team confidence

Despite all the positive outcomes of team confidence, little is known about the sources contributing to the development of athletes' team confidence. As outlined in Section 4.2, Bandura (1997) suggested that the four sources of self-efficacy may also serve as sources of team confidence. However, because the team confidence of a sport team is much more complex than simply summing up the self-efficacy beliefs of the individuals, the same complexity could also hold for the sources of these constructs. The existence of team-specific sources of team confidence corroborates this assumption (Chase et al., 2003; Chase et al., 1997; Watson et al., 2001; Wilkinson, Fletcher, & Sachsenweger, 2011).

Another shortcoming in the literature on sources of team confidence is that, to date, researchers have focused only on team confidence sources before the game, not during the game. As outlined in the previous section, team confidence is a dynamical construct that can change within the course of a game. In this regard, it has been suggested that the relation between team confidence and performance is most accurately demonstrated when both constructs are measured in close temporal proximity. Similarly, we expect that sources of team confidence within the game are more predictive of team confidence than sources before the game.

Furthermore, no distinction has been made between sources of positive team confidence (i.e., confidence in performing well or in winning the game) and sources of negative team confidence (i.e., confidence in performing poorly or in losing the game). However, it is likely that the sources of negative team confidence could differ from their positive counterparts. Having a deeper insight in the development of negative team confidence is essential to prevent the detrimental influence of negative team confidence on the team's performance. As such, downward spirals, in which negative team confidence and poor performance amplify each other, can be prevented (Lindsley, Brass, & Thomas, 1995).

Finally, also in the quest for the sources of team confidence, the difference between collective efficacy and team outcome confidence has been disregarded. Given the different focus on (1) the process (with regard to collective efficacy) and (2) the outcome (with regard to team outcome confidence), is it plausible that the most important sources of each of these constructs reflect either the process- or the outcome-orientation.

#### 6.2.4 Team confidence as precursor of performance

As we noted in Section 6.2.2, team confidence is a dynamic construct but the current literature does not capture the construct's dynamic nature. As such, most studies investigating the relation between team confidence and team performance (for a meta-analysis see Stajkovic et al., 2009) relied on team confidence measures before or after the game, but not during the game. To capture the dynamic interplay between team confidence and team performance, it is absolutely essential to measure both constructs in close temporal proximity.

A second shortcoming of the literature investigating the reciprocal relation between team confidence and performance is that the difference between process-oriented team confidence (i.e., collective efficacy) and outcome-oriented team confidence (i.e., team outcome confidence) has been disregarded. Moreover, a number of studies used the outcome-oriented measurement to allegedly assess collective efficacy (e.g., Chen et al., 2002; Spink, 1990; Tasa, Taggar, & Seijts, 2007; Vargas-Tonsing & Bartholomew, 2006). In Section 4.3, an overview is given of the current literature after reinterpreting the measures that were used to assess team confidence. However, studies that investigate the relation between both constructs and team performance at the same time, thereby using the same sample, are still lacking in the current literature.

#### 6.3 Gaps with respect to athlete leaders' impact on the team functioning

### 6.3.1 The impact of athlete leaders on team confidence

As outlined in Section 5.1, athlete leaders have the potential to strengthen team members' confidence in their team's abilities. But how do these leaders inspire confidence among team members? Is confidence a bug that followers catch from the leader? In other words, is the confidence of leaders contagious such that team members mimic the level of confidence that the leader sets? Or, can this process instead be explained by the ways in which leaders' activities strengthen team members' attachment to, and belief in, the team? The answers to these questions are not yet addressed in the current literature. Although it is assumed that leaders' confidence does not transfer to followers through a mystical process of contagion (Reicher, 1987), the present literature lacks an understanding of the social psychological mechanisms through which the athlete leader's confidence transfers to that of other team members. The Social Identity Approach to Leadership (Haslam et al., 2011), as outlined in Section 2.7, is used as a theoretical framework to address these questions.

### 6.3.2 Athlete leaders' impact on performance

In addition to athlete leaders' impact on team confidence and team cohesion (as we outlined in detail in Section 5.1 and Section 5.2), athlete leadership has also been associated with other indicators of optimal team functioning such as team satisfaction and increased effort (Zacharatos et al., 2000), higher team resilience (Morgan et al., 2013), improved team communication (Hardy et al., 2008), stronger unity, more trust, and better cooperation (Bass & Riggio, 2006). However, although effective leadership has been identified as the most decisive factor in achieving team success, to our knowledge, no research study has actually linked athlete leadership with direct performance measures.

#### 6.3.3 Team-level attributes of teams with high athlete leadership quality

As outlined in Section 3.4, research on leadership attributes has been situated at the individual level. The quest for the perfect athlete leader has inspired numerous studies to determine the characteristic attributes of high-quality athlete leaders. However, the attributes of athlete leadership at a team level remain concealed. More specifically, the current literature has not yet provided an answer to the question: What are the attributes of teams with high-quality athlete leadership? Also in organizational research, the contribution of leadership perceptions to organization-level outcomes remains unclear (Hoppe & Reinelt, 2010). Hogan and Kaiser (2005) argued for a radical departure from the conventional

wisdom where research focused on the individual 'leader'. Although very few studies have already used indices of group effectiveness as the criterion for leadership, they believe that team-level effects should become 'the gold standard' to define and evaluate leadership.

A recent qualitative study in sport settings demonstrated that the presence of athlete leaders in the team positively impacted a variety of group dynamic constructs at the team level, such as improved team communication, enhanced role clarity within the team, a stronger cohesion, and ultimately a better team performance (Crozier et al., 2013). However, the qualitative study of Crozier and colleagues (2013) is to our knowledge the only one investigating attributes of high-quality athlete leadership at the team level. Quantitative studies that use such a team-level approach to examine the attributes of teams with high-quality athlete leadership are required to obtain a deeper insight in this area.

### 7. The Contribution of the Present PhD Thesis

The present PhD thesis contributes to the current research knowledge on four different parts: (1) Athlete Leadership, including three chapters; (2) Social Network Analysis as Pioneering Tool to Examine Athlete Leadership, including three chapters; (3) Team Confidence, including four chapters; and (4) Athlete Leaders as Key Factors for Optimal Team Functioning, including two chapters. Each of these 12 chapters presents an individual paper that has been published, is in press, or has been submitted for publication. Figure 2 presents how the different papers of the present PhD thesis are situated within the general framework, as will be outlined in more detail in Part 4.

#### **Part 1 – Athlete Leadership**

Part 1 expands the current knowledge on athlete leadership in three ways. First, Paper 1 develops a *four-fold* athlete leadership classification (including the new role of motivational leader), thereby comparing the importance of formal and informal leadership. Second, Paper 2 determines the characteristic attributes of each of the four leadership roles, thereby taking into account the surrounding team context by using a novel, contextdependent measure of athlete leadership. Third, Paper 3 demonstrates the value of the Social Identity Approach to Leadership (Haslam et al., 2011) as theoretical framework and validates a new measure, allowing future research to assess this identity-based leadership style. In sum, in this part we attempted to create a solid theoretical foundation of athlete leadership in order to inspire further research in this area. We will now shortly elaborate on each of these subchapters.





### Chapter 1.1 – The myth of the team captain as principal leader: Extending the athlete leadership classification within sport teams.

<u>Paper 1</u>: Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). The myth of the team captain as principal leader: Extending the athlete leadership classification within sport teams. *Journal of Sports Sciences*. http://dx.doi.org/10.1080/02640414.2014.891291

Section 6.1.1 of the Introduction illustrated that one of the main gaps in the current literature on athlete leadership is the predominant focus on a single leader (mostly the team captain as formal leader of the team). In addition, the most comprehensive athlete leadership classification to date (Loughead et al., 2006) did not include any motivating functions of athlete leaders.

By addressing this void, Paper 1 develops a four-fold athlete leadership classification, which encompasses the role of motivational leader, in addition to the roles of task, social, and external leaders. The second aim of Paper 1 was to compare the importance of the captain as formal team leader with the importance of the informal leaders. Therefore, we established the number of leadership roles in which the team captain was perceived as the best athlete leader of the team.

## Chapter 1.2 – When is a leader considered as a good leader? Perceived impact on teammates' confidence and social acceptance as key ingredients.

<u>Paper 2</u>: Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). When is a leader considered as a good leader? Perceived impact on teammates' confidence and social acceptance as key ingredients. Manuscript submitted for publication.

Section 6.1.3 of the Introduction outlined the inability of the current literature to capture the context-dependency of characteristics of effective athlete leadership. In addition, previous research predominantly focused on the attributes of athlete leadership in general (as outlined in Section 6.1.2), rather than examining the role-specific attributes, which constitutes a second shortcoming in the existing literature.

Paper 2 addresses the need to take the specific surrounding team context into account when examining the characteristic attributes of athlete leaders. In this regard, a novel context-dependent measure was developed that assesses a leader's characteristics in a relative way (i.e., in comparison with the other team members). For example, sport experience of a leader was assessed in relative terms (i.e., more/less experienced than teammates), rather than in absolute terms (i.e., number of years of experience). Furthermore, the present chapter will focus on the specific attributes for each of the four leadership roles (i.e., task, motivational, social, and external leadership).

### Chapter 1.3 – Leadership as social identity management: Introducing the Identity Leadership Inventory (ILI) to assess and validate a four-dimensional model.

<u>Paper 3</u>: Steffens, N. K., Haslam, S. A., Reicher, S. D., Platow, M. J., Fransen, K., Yang, J., Peters, K. O., Ryan, M. K., Jetten, J., & Boen, F. (2014). Leadership as social identity management: Introducing the Identity Leadership Inventory (ILI) to assess and validate a four-dimensional model. *The Leadership Quarterly*. http://dx.doi.org/10.1016/ j.leaqua.2014.05.002.

Section 6.1.4 of the Introduction outlined two shortcomings in the current leadership. First, the Social Identity Approach to Leadership (Haslam et al., 2011) has not yet been applied in sport settings. However, preliminary evidence demonstrated that coaches are able to influence team members' identification with their team (De Backer et al., 2011). It should be verified whether the same holds for the athlete leaders in the team. Second, although this leadership approach is a promising framework for sport leadership, to date, no measure exists that captures the different dimensions of an identity-based leadership style, as described by Haslam (2011).

Paper 3 provides a deeper insight in the Social Identity Approach to Leadership. Furthermore, Paper 3 will develop and validate the Identity Leadership Inventory (ILI) in four different studies. The ILI is the first measure that captures the four dimensions of an identity-based leadership style (i.e., identity prototypicality, identity advancement, identity entrepreneurship, and identity impresarioship, as have been outlined in Section 2.7 of the Introduction). It should be noted that the manuscript presented in Paper 3 includes four studies, conducted in different contexts, and with diverse samples from the United States, China, and Belgium. Study 1 demonstrates that the ILI has content validity such that the items meaningfully differentiate between the four dimensions. Studies 2, 3, and 4 provide evidence for the scale's construct validity (distinguishing between the four dimensions), discriminant validity (distinguishing identity leadership from authentic leadership, leaders' idealized influence/charisma, and perceived leader quality) as well as criterion validity (relating the ILI to key leadership outcomes).

Although Dr. Nik Steffens and Prof. Alex Haslam took the lead in the development of the ILI and the writing out of the manuscript, we realized the data collection for Study 4, in which 421 athletes assessed their team captain on all dimensions of the ILI, thereby relating this identity based leadership style to outcomes such as team confidence and task cohesion. Study 4 is the first to apply the Social Identity Approach to Leadership to athlete leadership in sport settings. In this regard, it will be argued that this approach offers a sound theoretical framework to explain the underlying mechanisms of athlete leaders' impact on their followers (see also Paper 11 and Paper 12 in Chapter 4).

#### Part 2 – Social Network Analysis as Pioneering Tool to Examine Athlete Leadership

Paper 1 provided a four-fold athlete leadership classification that allows to examine formal and informal leadership in sport teams. Instead of focusing on one single leader, as most previous research did, this classification distinguishes between four different leadership roles. However, participants in the study were only asked to indicate the *best* leader on each of these leadership roles. More specifically, participants had to indicate the *best* task leader, the *best* motivational leader, the *best* social leader, and the *best* external leader in the team. Paper 2 also focuses on the attributes of the athletes that were indicated as the *best* leader on each of the leadership roles.

As outlined in Section 6.1.3 of the Introduction, one of the major limitations of the existing athlete leadership research is that most studies focused on individual perceptions when examining athlete leadership and failed to capture the complete surrounding context. Although Paper 2 attempts to encompass the surrounding team context by assessing leaders' characteristics in a relative way, the study is still based on individual perceptions of the leader's relative position in the team, instead of determining this relative position objectively by including the perceptions of all team members. Furthermore, because these previous papers only provide insight in the leadership of the best leader, information on the leadership provided by other team members, who may not be the best but still influential leaders, is missing. As such, the majority of the leadership structure in the team remains concealed.

Although SNA has been recommended as a valuable tool to analyze the leadership structure in sport teams (Nixon, 1993), to our knowledge, no study has yet effectively used

this network approach to study leadership in sport teams. In the present PhD thesis, we will use SNA for the first time in sport teams to obtain a deeper insight in their formal and informal leadership structure. By doing so, the three chapters in the present part will address four limitations that organizational research encountered when using SNA to examine leadership.

First, previous studies distinguished categorically between leaders and non-leaders, thereby using binary networks to examine leadership (i.e., networks based on dichotomous relations represented by 0 '*no leader*' or 1 '*a leader*'). As such, as outlined in Section 6.1.1 of the Introduction, the strength of the leadership remains concealed. Second, being a leader does not necessarily imply that that person is also a *good* leader. From the perspective of leadership effectiveness, the quality of leadership is obviously most essential. Therefore, Paper 4, Paper 5, and Paper 6 will focus on the perceived leadership quality of athlete leaders. Because leadership is a process that can be learned, we chose to take different degrees of leadership quality into account. Therefore, the present papers will use valued networks, in which the strength of the ties refers to the athlete leadership quality, ranging from 0 (*very bad leader*) to 4 (*very good leader*).

Third, previous studies that examined leadership in organizational settings with an SNA approach focused on leadership in general. The present papers will not only investigate this general leadership, but also go more in depth by investigating the leadership structure connected with each of the four different leadership roles (i.e., task, motivational, social, and external leadership role).

Fourth, previous studies that used SNA in a sport setting (to examine other constructs than leadership) tested only one to three teams (Cotta, Mora, Merelo, & Merelo-Molina, 2013; Kyoung-Jin & Yilmaz, 2010; Lusher, Kremer, & Robins, 2013; Lusher et al., 2010; Passos et al., 2011; Warner, Bowers, & Dixon, 2012). Paper 4, Paper 5, and Paper 6 are, to our knowledge, the first in a sport setting that encompass data of 46 teams (including 575 players) in their social network analyses, which exceeds the sample sizes used in previous research by far. In addition, the stratified sampling technique to constitute the sample yielded a variety of male and female teams, in four different sports (soccer, basketball, volleyball, and handball), playing on high and low competition level.

The inclusion of role-specific leadership networks, the focus on leadership quality, the large sample size, and the variety within the sample are four innovative elements that characterize our pioneering research in team sports. However, the combination of these four characteristics also underlies the uniqueness of these papers in other research areas, such as the organizational setting. We will now shortly elaborate on each of the three papers.

### Chapter 2.1 – Who takes the lead? Social Network Analysis as pioneering tool to investigate shared leadership within sports teams.

<u>Paper 4</u>: Fransen, K., Van Puyenbroeck, S., Loughead, T. M., De Cuyper, B., Vanbeselaere, N., Vande Broek, G., & Boen, F. (2014). Who takes the lead? Social Network Analysis as pioneering tool to investigate shared leadership within sports teams. Manuscript submitted for publication.

The four-fold leadership classification, developed in Paper 1, was based on perceptions of the *best* leader for each leadership role. Because Social Network Analysis (SNA) takes into account the leadership structure of all players in the team, Paper 4 will establish whether the previous classification still holds for the leadership network structure of the complete team. Furthermore, SNA was used to obtain a full insight in the leadership structure within sport teams, by comparing the leadership quality of the coach, the team captain, and the informal leaders with regard to (1) leadership in general and (2) leadership on each of the four roles.

### Chapter 2.2 – The art of athlete leadership: Identifying high-quality leadership at the individual and team level through Social Network Analysis.

<u>Paper 5</u>: Fransen, K., Van Puyenbroeck, S., Loughead, T. M., De Cuyper, B., Vanbeselaere, N., Vande Broek, G., & Boen, F. (2014). The art of athlete leadership: Identifying highquality leadership at the individual and team level through Social Network Analysis. Manuscript submitted for publication.

Section 6.1.3 of the Introduction outlined the inability of the current literature to capture the specific team context when determining the attributes of effective athlete leadership. In addition, as highlighted in Section 6.3.3 of the Introduction, a team-level approach to examine the attributes of teams with high-quality athlete leadership is required to obtain a deeper insight in this area.

Paper 5 moves athlete leadership forward by using SNA as a novel tool to determine the characteristic attributes of high-quality athlete leaders. In this regard, we will not assess what is required for an athlete to be a leader, but more importantly, we will determine what is required for players to be perceived as *good* leaders by their teammates. Using valued leadership networks, in which leadership quality perceptions ranged between 0 and 4, the characteristic attributes were investigated for athlete leadership quality in general, but also for role-specific athlete leadership quality. In contrast to the predominant practice to rely on trait characteristics as illustrated in Section 3.4 of the Introduction, Paper 5 examined not only trait-oriented characteristics (e.g., age, sport competence), but also more process-oriented attributes (e.g., social acceptance by others). Finally, Paper 5 moves beyond the individual-level approach and investigated the extent to which the average leadership quality within the team is related to important team-level attributes, such as team identification (i.e., the extent to which players identify with their team) and social connectedness (i.e., the extent to which players feel connected with each other).

### Chapter 2.3 – An examination of the relationship between athlete leadership and cohesion using Social Network Analysis.

<u>Paper 6</u>: Loughead, T. M., Fransen, K., Van Puyenbroeck, S., Hoffmann, M. D., De Cuyper,
B., Vanbeselaere, N., & Boen, F. (2014). An examination of the relationship between athlete leadership and cohesion using Social Network Analysis. Manuscript submitted for publication.

Research examining athlete leadership and its relationship to various correlates (e.g., cohesion) has typically used questionnaires that focus on the attitudes of team members about the team as a whole. However, researchers should equally be concerned about dyadic relations between team members (Lusher et al., 2010). In this regard, Paper 6 further explores the potential of SNA to investigate the attributes of high-quality athlete leadership. By doing so the present paper focuses on the link between athlete leadership and team cohesion, both at the individual level and at the team level.

Paper 6 consists of two studies: Study 1 examined the relation between a general leadership quality network and measures of task and social cohesion, using the Group Environment Questionnaire (GEQ; Carron, Widmeyer, & Brawley, 1985). Study 2 investigated the link between the leadership quality networks for each of the four leadership roles (i.e., task, motivational, social, and external leader) and task and social cohesion, as operationalized by networks.

Although Prof. Todd Loughead took the lead in the writing out of the introduction and discussion of the manuscript, it should be noted that we completed the data collection, conducted the analyses, and provided a first draft of the method section and the result section.

### Part 3 – Team Confidence

The present PhD thesis focuses on the impact of athlete leaders on team members' team confidence. Part 1 and Part 2 build a sound foundation for a more comprehensive view on athlete leadership. However, before the relation between our two key concepts (i.e., athlete leadership and team confidence) will be investigated in Part 4, more insight will be provided in the construct of team confidence. Therefore, Part 3 includes three chapters: Paper 7 enhances the conceptual clarity of team confidence, Paper 8 and Paper 9 identify the sources of team confidence, and finally, Paper 10 provides a deeper insight in the reciprocal relation between team confidence and team performance.

### Chapter 3.1 – Collective efficacy or team outcome confidence? Development and validation of the Observational Collective Efficacy Scale for Sports (OCESS).

<u>Paper 7</u>: Fransen, K., Kleinert, J., Dithurbide, L., Vanbeselaere, N., & Boen, F. (2014). Collective efficacy or team outcome confidence? Development and validation of the Observational Collective Efficacy Scale for Sports (OCESS). *International Journal* of Sport Psychology, 45, 121-137. doi: 10.7352/IJSP 2014.45.121.

Because the existing collective efficacy research is characterized by inconsistencies in the manner in which collective efficacy is conceptualized and operationalized (Shearer et al., 2009), a first aim of Paper 7 is to investigate the validity of previous measures used to assess collective efficacy. The chapter thereby distinguishes between two types of team confidence: process-oriented collective efficacy and outcome-oriented team outcome confidence, as was more elaborately explained in Section 4.1 of the Introduction.

Second, as outlined in Section 6.2.2 of the Introduction, a major limitation of the existing research is its inability to capture the dynamic nature of team confidence. Although researchers acknowledge the need for more dynamic in-game measures of team confidence, in their attempts of doing so, they experienced a practical barrier: in team sports it is unrealistic to interrupt a player repeatedly during a competition game to measure his or her team confidence (Myers et al., 2007). Therefore, to date, the concept has only been

measured as if it was a trait concept or at best before or after a game, but never during a game.

Dynamic in-game measures of team confidence could provide more insight in the variation of athletes' team confidence within a game, in the extent to which team confidence spreads throughout team, and in the dynamic in-game relation with team performance. In order to advance the literature on team confidence, in-game measures of team confidence are thus essential. Because the assessment through questionnaires appears to be the major barrier to realize frequent in-game measures during a game, observations could provide a viable alternative. In Paper 7, we develop a new scale that is based on observations and therefore constitutes a first step towards a dynamic measure of collective efficacy; the Observational Collective Efficacy Scale for Sports (OCESS).

# Chapter 3.2 – "Yes, we can!": Perceptions of collective efficacy sources in volleyball.

<u>Paper 8</u>: Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., Ceux, T., De Backer, M., & Boen, F. (2012). "Yes, we can!": Perceptions of collective efficacy sources in volleyball. *Journal of Sports Sciences*, 30(7), 641-649. doi: 10.1080/02640414.2011.653579

Despite all the positive outcomes of team confidence, little is known about the sources contributing to the development of athletes' team confidence. Paper 8 addresses the existing limitations, as outlined in Section 6.2.3 of the Introduction, in three ways. First, using a large sample of players and coaches, Paper 8 not only identifies the sources of high team confidence, but also the sources of low team confidence. Moreover, to further assess the importance of temporal proximity, the chapter included not only sources before the game, but also sources during the game.

It should be noted that, in Paper 8, we used the term 'collective efficacy' for athletes' confidence in winning the game. Although most previous research used the same conceptualization, according to our recent conceptualization presented in Paper 7, we acknowledge that 'team outcome confidence' would have been the appropriate term for the construct that was investigated in Paper 8. Research practice is characterized by continuous changes and developments. It is only by learning of earlier mistakes, that we can overcome the limitations of our previous studies thereby pushing research forward.

### Chapter 3.3 – On traffic-jams, speed bumps, and gas stations along the road to team confidence: Perceived sources of team confidence in soccer and basketball.

<u>Paper 9</u>: Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). On traffic-jams, speed bumps, and gas stations along the road to team confidence: Perceived sources of team confidence in soccer and basketball. Manuscript submitted for publication.

Although the main focus remains on the sources of team confidence, this chapter extends the previous chapter in two ways. First, whereas Paper 8 relied on a single study in volleyball teams, Paper 9 is based on three different samples in soccer and basketball, thereby verifying the generalizability of our findings over different sports. Furthermore, in contrast to previous studies, Paper 8 identifies not only the sources of team outcome confidence (as Paper 8 did), but also the sources of the process-oriented collective efficacy.

### Chapter 3.4 – Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games.

<u>Paper 10</u>: Fransen, K., Decroos, S., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games. *Journal of Sports Sciences*. http://dx.doi.org/10.1080/02640414.2014.942689.

As outlined in Section 6.2.4 of the Introduction, the major limitations of the existing research on the relation team confidence—team performance include (1) the inability to capture the dynamic nature of team confidence and therefore the impossibility to obtain an insight in the dynamic relation between both constructs within a game, and (2) the fact that the distinction between collective efficacy and team outcome confidence has been disregarded.

Paper 10 presents two field studies in soccer, which addresses both limitations. In Study 1, both types of team confidence were assessed before the game and at the start and the end of the half-time break. By this approach, we were able to account for the possible motivating effect of the half-time speech of the coach (Vargas-Tonsing & Bartholomew, 2006; Vargas-Tonsing, Myers, & Feltz, 2004). In Study 2, a measure of team confidence after the game was added. To measure team performance, we assessed players' perceptions of the team's performance during half-time and after the game. In this regard the present manuscript provides a deeper insight in the reciprocal relationship between both types of team confidence and team performance.

### Part 4 – Athlete Leaders as Key Factors for Optimal Team Functioning

After we established a sound foundation on athlete leadership in Part 1 and Part 2 and on team confidence in Part 3, all tools are available to investigate in Part 4 how athlete leaders shape team members' confidence in the abilities of their team, and in turn affect the team's performance. Against the backdrop outlined before, we generated a series of hypotheses summarized in Figure 3. In short, we expect that creating a shared team identification and confidence in the controllable processes (i.e., collective efficacy) is important for athlete leaders to foster team members' team outcome confidence, and in turn the team's performance.





Rather than only testing the impact of athlete leaders on team members' team confidence, we also seek to explain the underlying mechanism through which this process happens. In this regard, the Social Identity Approach to Leadership (as outlined in Section 2.7 of the Introduction), which focuses on team identification as the essential key to influence followers, constitutes a promising framework. In the present PhD thesis, we apply the Social Identity Approach to Leadership for the first time in a sport setting. More specifically, we expect that athlete leaders are able to create a shared sense of 'we' and 'us' within the team, thereby fostering team members' identification with the team. In addition, we expect that higher levels of team identification will foster a stronger confidence in the

team's abilities, in line with previous research in organizational settings and on collective action tendencies (van Zomeren et al., 2010; van Zomeren et al., 2008; Wang & Howell, 2012). In other words, we expect that, the more athletes identify with their team, the more they will adopt the behaviors of their leader and thus the more they will adapt to the team confidence standards displayed by their leader.

Although the Social Identity Approach to Leadership constitutes a valuable framework to explain leaders' impact on team members' collective efficacy, we believe that also other mechanisms exist through which athlete leaders can affect their teammates' confidence, such as verbal persuasion and modeling (Zaccaro, Rittman, & Marks, 2001). Therefore, we only expect a partial mediation by team identification.

Furthermore, the few studies that have investigated the two types of team confidence merely focused on the conceptual distinction between the two constructs, but not on their causal interrelationship (Myers & Feltz, 2007). However, Collins and Parker (2010) noted that collective efficacy explains a smaller amount of variance in performance than team outcome confidence does, because collective efficacy relates to processes that are more distinct to performance outcomes. The literature review presented in Section 4.3 of the Introduction already demonstrated that studies measuring the confidence in winning (i.e., team outcome confidence) consistently revealed a positive relation with performance. With regard to the confidence in the team's abilities (i.e., collective efficacy), inconsistent results emerged. Therefore, we expect collective efficacy to impact team outcome confidence, rather than vice versa. In other words, leaders affect athletes' confidence in the team's skills to accomplish the requested processes, which in turn will increase their confidence in winning the game.

Finally, as outlined in Section 4.3 of the Introduction, previous research demonstrated a positive impact of athletes' team outcome confidence on the team performance. In line with these findings, we assume that the more athletes are confident to win the game, the better they will perform. To summarize, we expect athlete leaders to create a shared team identification and confidence in the controllable processes (i.e., players' collective efficacy), which in turn fosters players' team outcome confidence, and as a consequence the team's performance.

Part 4 includes two chapters: Paper 11 will test the impact of athlete leaders' on team members' collective efficacy and team outcome confidence by a cross-sectional study. Paper 12 uses an experimental design to test the model as outlined in Figure 2. Both studies use the Social Identity Approach to Leadership as theoretical framework for explaining the observed relations.

## Chapter 4.1 – Do athlete leaders affect team outcome confidence? A test of mediation by team identification and collective efficacy.

<u>Paper 11</u>: Fransen, K., Coffee, P., Vanbeselaere, N., Slater, M., De Cuyper, B., & Boen, F. (2014). Do athlete leaders affect team outcome confidence? A test of mediation by team identification and collective efficacy. *The Sport Psychologist.* http://dx.doi.org/10.1123/tsp.2013-0141.

Leaders are typically told that, in order to succeed, they have to strengthen team members' confidence in the capabilities of their team. Paper 11 investigates leaders' impact on team members' collective efficacy and team outcome confidence by using a cross-sectional design. More specifically, Paper 11 verifies whether the perceived quality of athlete leaders is related to athletes' team confidence. Furthermore, in this paper we will explore whether this process can be explained by the ways in which leaders strengthen team members' attachment to, and belief in, the team.

## Chapter 4.2 – Believing in us: Exploring leaders' capacity to enhance team confidence and performance by building a sense of shared social identity.

<u>Paper 12</u>: Fransen, K., Haslam, S. A., Steffens, N. K., Vanbeselaere, N., De Cuyper, B., & Boen, F. (2014). Believing in us: Exploring leaders' capacity to enhance team confidence and performance by building a sense of shared social identity. *Journal of Experimental Psychology: Applied.* Manuscript accepted for publication, pending revisions.

Paper 12 extends the previous chapter in two ways. First, Paper 12 uses an experimental design in a basketball setting to test the relation as outlined in Figure 2. Instead of using measures of perceived quality of the leader, we manipulated the behavioral expression of confidence by the leader (i.e., highly or lowly confident). Second, in Paper 12 we have used objective measures to assess performance (i.e., the number of scored free throws).

We expected that leaders are able to inspire confidence in their team members when they express (and are perceived to have) confidence in the team's ability to achieve success. In turn, higher levels of team confidence are expected to lead to an improved performance. Extending the ideas of the Social Identity Approach to Leadership, we anticipated that leaders' expressed confidence transfers to the team members to the extent that they are able to create a shared sense of 'us' within the team (i.e., team identification).

#### **Overview of the Present PhD Thesis**

Figure 2 presents how the different papers of this PhD thesis are situated within the general framework outlined in Part 4. In short, Papers 1 and Paper 4 validate the four-fold athlete leadership classification. Paper 1 only takes into account the best leader in the team, whereas Paper 4 encompasses the complete leadership structure in the team. Paper 2, Paper 5, and Paper 6 identify the characteristics of high-quality athlete leadership both at the individual and at the team level. Paper 3 develops the ILI as measure of identity-based leadership. Paper 7 focuses on the conceptualization of team confidence and the distinction between collective efficacy and team outcome confidence, thereby also developing the OCESS. Paper 8 and Paper 9 identify the sources of both types of team confidence and Paper 10 evaluates the reciprocal relation between the two types of team confidence and team performance. Paper 11 and Paper 12 test the overarching model with a cross-sectional and experimental design, respectively.

The following four parts will include the 12 chapters as outlined above. Each of these chapters will present an individual paper that has been published, is in press, or has been submitted for publication. These chapters will be followed by a general discussion of our findings.

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### Part 1 Athlete Leadership

"Having great leadership is a big key to success. Our team will go as far as our leaders are willing to take us"

~ Mike Candrea, head coach of the USA Olympic softball team ~
The myth of the team captain as principal leader: Extending the athlete leadership classification within sport teams

Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014) Journal of Sports Sciences, http://dx.doi.org/10.1080/02640414.2014.891291

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### Abstract

Although coaches and players recognize the importance of leaders within the team, research on athlete leadership is sparse. The present study expands knowledge of athlete leadership by extending the current leadership classification and exploring the importance of the team captain as formal leader of the team. An on-line survey was completed by 4,451 participants (31% females and 69% males) within nine different team sports in Flanders (Belgium). Players (N = 3,193) and coaches (N = 1,258) participated on all different levels in their sports. Results revealed that the proposed additional role of motivational leader was perceived as clearly distinct from the already established roles (task, social and external leader). Furthermore, almost half of the participants (44%) did not perceive their captain as the principal leader on any of the four roles. These findings underline the fact that the leadership qualities attributed to the captain as the team's formal leader are overrated. It can be concluded that leadership is spread throughout the team; informal leaders rather than the captain take the lead, both on and off the field.

*Keywords*: peer leaders, informal leadership, shared leadership, team performance, sport psychology

#### 1. Introduction

Newspaper headlines routinely illustrate the importance of effective leaders; a prime minister leading the country, a business director leading a company or a coach leading a sport team. Based on a generic definition of leadership as 'a process whereby an individual influences a group of individuals to achieve a common goal' (Northouse, 2010, p. 3), leadership processes should be similar in different contexts and their success and effectiveness should rely on similar factors (Weinberg & McDermott, 2002). However, in contrast with the abundant literature on leadership in organisational settings, the literature on leadership in sports is sparse (Crust & Lawrence, 2006; Riemer & Chelladurai, 1995). Moreover, most studies have concentrated on the coach of a team (see Chelladurai, 1994; Chelladurai & Riemer, 1998 for reviews) even though leadership needs not to be restricted to the coach; players within the team can also fulfil important leadership functions (Northouse, 2010).

## 1.1 Athlete Leadership

Athlete leadership has been defined as "an athlete, occupying a formal or informal role within a team, who influences a group of team members to achieve a common goal" (Loughead, Hardy, & Eys, 2006). Athlete leaders influence team cohesion, athlete satisfaction and team confidence (Fransen et al., 2012; Price & Weiss, 2011, 2013; Vincer & Loughead, 2010). Coaches and players on the field confirm the importance of athlete leaders. For instance, Chuck Noll, former head coach of a professional American football team and winner of four Super Bowls, stated; "On every team there is a core group that sets the tone for everyone else. If the tone is positive, you have half the battle won. If it is negative, you are beaten before you even walk out on the field." (Pim, 2010, p. 127). Although these observations stress the crucial role of athlete leadership and the efforts made to understand it (Loughead et al., 2006). Therefore, in the present study our goals were to extend our knowledge of athlete leadership by refining the current athlete leadership classification (first aim) and by exploring the importance of the team captain as formal role of the team (second aim).

### **1.2 Classification of Athlete Leadership**

Using role differentiation theory (Bales, 1950) athlete leaders can be classified based on their function. Leaders with an instrumental function are focused on the accomplishments of group tasks, whereas leaders with an expressive function are concerned with interpersonal relationships. These two functions are not mutually exclusive; athlete leaders can simultaneously engage in both task and social behaviours (Rees & Segal, 1984; Todd & Kent, 2004; Voelker, Gould, & Crawford, 2011). A third, and more recent identified function of athlete leaders is an external function by which leaders represent the group at meetings and media gatherings (Eys, Loughead, & Hardy, 2007; Loughead et al., 2006).

Although this threefold leadership classification (i.e. task leader, social leader and external leader) already specifies various functions of athlete leaders, it may still not be comprehensive enough. More specifically, Loughead and colleagues (2006, p. 148) characterised a social leader by qualities such as 'this leader ensures teammates are involved and included in team events' and 'this leader offers support and is trusted by teammates.' These characteristics relate to the expressive function in the role differentiation theory, but mainly refer to the concern with interpersonal relationships off the field, not on the field. We therefore propose that the current classification lacks a leadership role that embodies the interpersonal interactions that are directly linked to the on-field performance. This proposition is supported by numerous coaches and players who emphasise the importance of motivating and cheering during the game. In accordance with these on-field experiences, several studies indicated that motivating and encouraging behaviours are crucial for effective athlete leadership (Cotterill, 2013; Dupuis, Bloom, & Loughead, 2006; Holmes, McNeil, & Adorna, 2010). Apitzsch (2009) even stated that the absence of a socioemotional leader (i.e. a leader who creates a positive atmosphere on the field) can lead to a collective collapse.

Despite these preliminary indications, the on-field motivating function has not yet been empirically established and has, therefore, not yet been incorporated into current athlete leadership classifications. Consequently, the first aim of our study was to explore the validity and relevance of a more comprehensive classification of athlete leadership by including a fourth role, namely the motivational leader on the field. We hypothesise that the four leadership roles (task, motivational, social and external leader) will emerge as clearly distinct roles. In addition, we examine the importance of these four leadership roles for the optimal functioning of a sport team.

### **1.3 Formal Versus Informal Leaders**

Another way to classify athlete leaders is based on the formal or informal character of their leadership function. A formal leader is a player who has been prescribed that function formally by the coach or by the team, e.g. the team captain who has been formally appointed to be captain of the team. An informal leader, on the other hand, has no formal leadership position but becomes a team leader as a result of the interactions occurring within the team. Previous studies acknowledge the existence of both formal and informal athlete leaders within sport teams (Holmes et al., 2010; Loughead et al., 2006).

So far, most studies focused on the team captain (Dupuis et al., 2006; Grandzol, Perlis, & Draina, 2010; Voelker et al., 2011). The captain is often considered as "the" leader of the team; he/she is expected (a) to act as a liaison between the coaching staff and the players, (b) to act as a leader during all team activities and (c) to represent the team at receptions, meetings and press conferences (Mosher, 1979). Furthermore, the captain engages in both task and social behaviours, such as coaching his/her teammates or providing social support (Voelker et al., 2011). Coaches, players and sports media all seem to assume that the team captain takes the lead both on and off the field. Although the captain has received most research attention, some studies have explored the impact of informal leadership (Loughead et al., 2006). In this regard, Morgan and colleagues (2013) identified shared leadership roles as an important characteristic of highly resilient sport teams (i.e. teams that are able to withstand stressors positively). Their participants recognised the need for a core set of leaders in challenging situations, illustrated by the following quote from a professional football player: "You need a few types of leaders within the team. ... My experience of resilient teams is that you have six or more players who could easily have done the captaincy job." (Morgan et al., 2013, p. 552). These studies emphasised that, although athlete leaders often have the formal position of team captain, other players within the team also have an important role as informal leaders.

The second aim of the present study was to compare the importance of the captain as formal team leader with the importance of the informal leaders. Therefore, we examined how many leadership roles are perceived as being primarily fulfilled by the team captain. Based on previous research, we expect that the team captain is perceived as the most important leader (i.e. fulfilling most leadership roles) but that other players on the team also act as informal leaders.

### 2. Method

### 2.1 Recruitment

To contact coaches and players within nine different team sports in Flanders (Belgium), we cooperated with the Flemish Trainer School, the organizer of the sport-specific schooling of coaches in Flanders. Their database was used to invite 5,535 certified coaches to complete a web-based questionnaire. To enhance the variability of our sample, we also contacted noncertified coaches and their teams through the different Flemish sport federations. In total, 8,509 players and 7,977 coaches were invited to participate during the last months of the season (i.e. March – May, 2012). APA ethical standards were followed in the conduct of the study and informed consent was obtained from all participants. Coaches and players who did not respond, received a reminder two weeks later. No rewards were given and full confidentiality was guaranteed.

### 2.2 Participants

In total, 4,451 participants (3,193 players and 1,258 coaches) completed our questionnaire, resulting in an estimated total response rate of 27% (i.e. 37.5% for players and 15.8% for coaches). This response rate is somewhat lower than the average response rate of web-based questionnaires (Shih & Fan, 2008). However, there are reasons to believe that 27% is the lower limit of the actual response rate. First, the database that we used was not very accurate, in that a considerable number of e-mail addresses were no longer in use or referred to coaches who were not active anymore. Second, the database of the Flemish Trainer School revealed some overlap with the databases of the sport federations. As a result some players or coaches were contacted twice. Third, only participants above 15 years of age were included, because a pilot study (N = 30) had revealed that younger players encountered too many difficulties to complete the questionnaire. This restriction further decreased the actual response.

More detailed information on the participants can be found in Table 1. The participants played or coached in 2,366 different teams. The sample included players and coaches from nine different team sports in Flanders; basketball (n = 1,959; 44%), handball (n = 116; 3%), hockey (n = 127; 3%), ice hockey (n = 72; 2%), korfball (n = 118; 3%), rugby (n = 84; 2%), soccer (n = 589; 13%), volleyball (n = 1,287; 29%) and water polo (n = 99; 2%). Players and coaches from various competitive levels participated, ranging from

elite level (i.e. corresponding to the highest level), over national, provincial and regional level (i.e. three competition levels decreasing in importance), to recreational level (i.e. lowest level of competitive sport; sometimes only competition games without any training sessions) and youth level (i.e. only players below 21 years old).

Function	M <sub>age</sub> (years)	M <sub>experience</sub> (years)	Team gender	Level
3,193 Players (72%)	23.92	14.21	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	177 E       (6%)         836 N       (26%)         1,733 P       (54%)         209 RG       (7%)         122 RC       (4%)         116 Y       (4%)
1,258 Coaches (28%)	41.94	13.97	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	90 E       (7%)         268 N       (21%)         613 P       (49%)         102 RG       (8%)         22 RC       (2%)         163 Y       (13%)

**Table 1.** Sample characteristics

<sup>a</sup>Korfball is a mixed-gender team sport.

*Note*:  $M_{age}$ , mean age;  $M_{experience}$ , mean years of experience;  $\Diamond$ , male;  $\heartsuit$ , female; E, elite level; N, national level; P, provincial level; RG, regional level; RC, recreational level; Y, youth.

### 2.3 Measures

## 2.3.1 Athlete leadership

To determine the athlete leaders within a team, we extended the existent classification (Loughead et al., 2006) by including an additional leadership role, namely the role of motivational leader on the field. The definition of the motivational leader was constructed based on motivational leadership behaviours outlined in literature (Dupuis et al., 2006; Holmes et al., 2010; Mosher, 1979) and was subsequently tested by a focus group including three research experts in the area of sports psychology, an applied sport psychologist and an expert coach on elite level. The motivational leader was characterised by the encouragement of teammates to go the extra mile. This leader steers all the emotions on the field in the right direction in order to perform optimally as a team. The descriptions of the four leadership roles were presented to all participants (see Table 2). The role of both task and motivational leader are fulfilled mainly on the field, but with a strong link to

the on-field performance (e.g. tactical advice and encouragement before the game or during half-time), are also included in these on-field leadership roles. The roles of social and external leaders are fulfilled off the field.

Leadership role	Definition
Task leader	A task leader is in charge on the field; this person helps the team to focus on our goals and helps in tactical decision-making. Furthermore the task leader gives his/her teammates tactical advice during the game and adjusts them if necessary.
Motivational leader	The motivational leader is the biggest motivator on the field; this person can encourage his/her teammates to go to any extreme; this leader also puts fresh heart into players who are discouraged. In short, this leader steers all the emotions on the field in the right direction in order to perform optimally as a team.
Social leader	The social leader has a leading role besides the field; this person promotes good relations within the team and cares for a good team atmosphere, e.g. in the dressing room, in the cafeteria or on social team activities. Furthermore, this leader helps to deal with conflicts between teammates besides the field. He/she is a good listener and is trusted by his/her teammates.
External leader	The external leader is the link between our team and the people outside; this leader is the representative of our team towards the club management. If communication is needed with media or sponsors, this person will take the lead. This leader will also communicate the guidelines of the club management to the team regarding club activities for sponsoring.

**Table 2.** The definition of the four leadership roles, as presented to the participants.

After presenting the description of each leadership role, participants had to indicate which player in their team corresponded best with the description of each of the four leadership roles. Only one player could be ascribed to each of the leadership roles but one and the same player could occupy several leadership roles. Participants could also indicate that a specific leadership role was not present in their team. In addition, they were asked whether these perceived leaders corresponded with the team captain and/or with the players ascribed to other leadership roles. With this type of assessment it can be established whether one or more leadership roles are concentrated in one single player or that different players occupy the different roles.

## 2.3.2 Optimal team functioning

As indicators of the team functioning, we assessed players' and coaches' collective efficacy, their identification with the team and the team's place in the ranking. The 20-item Collective Efficacy Questionnaire for Sports (Short, Sullivan, & Feltz, 2005) was used to assess participants' collective efficacy. The internal consistency of this collective efficacy scale (Cronbach's  $\alpha = .95$ ) was excellent. Team identification was measured using five items based on previous research (Doosje, Ellemers, & Spears, 1995). The internal consistency of this identification scale proved to be excellent (Cronbach's  $\alpha = .91$ ). The place of the team in the ranking was assessed on a 7-point scale including 1 (*first place*), 2 (*place 2 of 3*), 3 (*little above the middle*), 4 (*half way*), 5 (*little below the middle*), 6 (*second or third last place*), 7 (*last place*).

### 3. Results

## 3.1 Occurrence and Overlap of Leadership Roles in a Sport Team

Frequency analyses revealed that most participants perceived that the roles of task leader, motivational leader and social leader were present in their teams; respectively 77.5%, 77.4% and 71.3% of the participants identified a task, a motivational and a social leader in their team. Almost half of the participants (47.9%) indicated that no player fulfilled the role of external leader in their team. Frequency analyses with regard to the age of players and coaches revealed only small differences between the different age groups, and no fixed trend could be detected.

As noted earlier, a single player can occupy multiple leadership roles within a team. Table 3 gives an overview of the overlap between the different leadership roles. The number of players who occupy a single leadership role is provided in italics on the diagonal. For example, half of the players (49.9%) who performed the role of task leader were not considered the most prominent individual for championing the other leadership roles (motivational, social or external). The percentage of task leaders, who were also perceived as best motivational, best social or best external leaders, was 18.8%, 10.2% and 9.8%, respectively. In 22.5% of the participants' teams no task leader was perceived to be present. Because one player can occupy three or four leadership roles, it is understandable that these percentages do not add up to 100%.

	Task leader	Motivational leader	Social leader	External leader
Task leader	2,220 (49.9%)			
Motivational leader	838 (18.8%)	2,214 (49.7%)		
Social leader	454 (10.2%)	512 (11.5%)	2,127 (47.8%)	
External leader	434 (9.8%)	283 (6.4%)	451 (10.1%)	1,482 (33.3%)
No leader present	1,003 (22.5%)	1,008 (22.6%)	1,276 (28.7%)	2,132 (47.9%)

**Table 3.** Overlap between the different leadership roles performed by one player. The number of players who occupy only a single leadership role is provided in italics on the diagonal.

Furthermore, our results revealed that in only 2% of the teams, the same player fulfilled all four leadership roles. The overlap between the leadership roles was relatively limited; not more than 19% of the athlete leaders fulfilled two leadership roles in the same team. These findings indicate that the four leadership roles emerged as clearly distinct roles and that leadership is spread throughout the team so that different players within the team occupy the various leadership roles.

The number of athlete leaders who are perceived to occupy only one leadership role (see Table 3; in parentheses on the diagonal) was relatively high in each of the nine team sports; the number of unique task leaders varied between 45.9% and 59.6%, for motivational leaders this number varied between 40.9% and 55.9%, for social leaders between 46.3% and 55.9% and for external leader between 26.0% and 48.8%. Given the high percentage of unique motivational leaders, this newly proposed leadership role appeared to be clearly distinct from the other leadership roles; the overlap with each of the other leadership roles did not exceed 18.8% on average. Within the nine different sports, the highest overlap was found in ice hockey where 26.4% of the motivational leaders also performed the role of task leader. Linear regression analyses revealed that the overlap between the different leadership roles within a team was not significantly predicted by the examined background characteristics ( $\beta > .05$ ); players and coaches of male and female teams, regardless of the level, perceived a similar overlap between the different leadership roles in their team.

### **3.2 The Most Important Leader**

After assigning the leadership roles to players within their team, participants indicated which of these players they perceived as the most important leader. If this leader had multiple leadership roles, participants had to indicate his/her most important role. Table 4 presents which leader participants indicated as most important.

The most important leader	nost important leader N		Valid Percentage
Task leader	1,668	37.5	42.1
Motivational leader	1,263	28.4	31.9
Social leader	703	15.8	17.8
External leader	325	7.3	8.2
Total	3,959	88.9	100.0
Missing values	492	11.1	

 Table 4. The most important leader

The results indicate that most participants perceived the task leader as the most important leader, followed by the motivational leader. The social leader and the external leader were perceived as less important. The nine different team sports all revealed the same order of perceived importance of the different leaders by both players and coaches; the task leader was always perceived as the most important leader (39.7% - 51.1%), followed by the motivational leader (22.6% - 35.8%). The number of coaches and players who perceived the social or the external leader as the most important leader did not exceed 20%, with exception of handball where 25% of the players and coaches listed the social leader as the most important leader. As a result, leadership roles on the field were clearly perceived as more important than leadership roles off the field, regardless of the sport or the level on which participants played or coached.

### 3.3 The Importance of Athlete Leaders for an Optimal Team Functioning

The correlations in Table 5 indicate that the presence of more leadership roles in the team made players and coaches more confident in the abilities of their team (i.e. higher collective efficacy beliefs) and enhanced their connectedness with their team (i.e. higher team identification). In addition, the results suggested that for an optimal team functioning,

it is better to have different athlete leaders in the team than one leader who is perceived as best leader on all different areas.

**Table 5.** Correlations indicating the importance of athlete leaders for an optimal team functioning

	Collective efficacy	Team identification	Place in ranking
Number of occupied leadership roles	.13*	.16*	06*
Number of different athlete leaders	.10*	.12*	06*
n < 01			

p < .01

## **3.4** The Team Captain

The results in Table 6 show that only 1% of the participants perceived their captain as the best leader on all four leadership roles. In addition, almost half of the participants (43.6%) reported that the team captain is not the best leader on one of the four domains, neither on the field, nor off the field. On average, over the four leadership roles thereby excluding the cases in which a specific leadership role was not fulfilled, 29.5% of the participants indicated the captain as the best leader on a specific leadership role, whereas 70.5% of the participants indicated an informal leader. These findings were consistent for both coaches and players of the male and female teams, ranging from the recreational to the elite level and within each of the nine sports.

Number of leadership roles occupied by the captain	Ν	Percentage
0	1,940	43.6%
1	1,635	36.7%
2	659	14.8%
3	171	3.8%
4	46	1.0%

**Table 6.** Participants' perceptions of the leadership roles performed by the team captain

If the captain is perceived as being a primary leader, participants indicated most frequently that the captain was a task leader (31.7%) or a motivational leader (24.6%). Only

15.5% and 10.1% of the participants indicated that the team captain primarily fulfilled the role of social and external leader. In general, the team captain was more often perceived to perform a primary leadership role on the field than off the field, a finding that held for the nine different sports.

## 4. Discussion

The present investigation extends current knowledge on athlete leadership in two respects. First, a more comprehensive classification with four different athlete leadership roles was established and its relevance for optimal team functioning was demonstrated. Second, we compared the perceived importance of the formal leader (i.e. the team captain) with the informal leaders of the team.

## 4.1 Classification of Athlete Leadership

With regard to the classification of athlete leadership, the newly added motivational leadership role appears to be equally prominent as the already established task and social leadership roles. Our results corroborate earlier studies, which also found that the external leadership role is less prominent (Eys et al., 2007; Loughead et al., 2006).

Although a player can perform several leadership roles at the same time, maximum 18.8% of our athlete leaders combined two specific leadership roles. In other words, the four leadership roles emerged as clearly distinct roles. Leadership appears to be spread throughout the team; different players within the team are perceived as being the primary leader with respect to the four roles.

Regarding the importance assigned to these different leadership roles, both task and motivational leader are perceived as more important than the social and external leadership roles. In contrast to previous research that assigned an equal importance to leaders' on- and off-field characteristics (Bucci, Bloom, Loughead, & Caron, 2012), our findings reveal that both players and coaches perceive the on-field leadership roles as more important than the off-field leadership roles, regardless of the sport or level they play or coach. The fact that half of the participants indicated no external leader on their team corresponds with the perception of the external leader as the least important leader on the team. A possible alternative explanation is that this external function is not fulfilled by players but by the coach or club management.

The new role of motivational leader is perceived as the second most important leadership role. This confirms our hypothesis that the proposed new leadership classification, including the motivational leader, is more comprehensive than previous classifications. Given the key role of motivating and encouraging behaviours for effective athlete leadership (Apitzsch, 2009; Cotterill, 2013; Dupuis et al., 2006; Holmes et al., 2010), the new leadership classification improves the relevance of this new leadership classification for coaching practice on the field.

### 4.2 The Team Captain

In order to better understand the function of team captain, we analysed which leadership roles the team captain performs. Our findings revealed that in only 1% of the teams, the captain is perceived as being the primary leader in all four roles. Even more remarkable is that almost half of the participants did not perceive their captain as the most important leader, neither on, nor off the field. These results clearly contradict the general conception of players and coaches that the team captain is "the" leader of the team, both on and off the field.

Previous research already suggested that not only team captains but also other players can function as athlete leaders (Loughead & Hardy, 2005; Loughead et al., 2006). Our findings add that it is common (i.e. 70.5% of the time) that informal athlete leaders rather than the formal leader, take the principal lead, both on and off the field. This pattern is obtained in all teams, regardless of team gender, sport or level, and thus underlines the general overrating of the leadership qualities of the team captain. Although many studies on athlete leadership only focus on the role of the team captain (Dupuis et al., 2006; Grandzol et al., 2010; Voelker et al., 2011), our findings infer that informal athlete leadership, exhibited by other players besides the team captain, is indeed important and should be acknowledged.

These findings are consistent with the new paradigm of shared leadership in the organisational literature (Pearce & Conger, 2003). Although most existing research on organisational team leadership has focused narrowly on the behaviour of an individual leader, the latest research trends acknowledge the importance of leadership provided by team members. Because it is unlikely that a single leader can successfully perform all necessary leadership functions, Carson and colleagues (2007) argued for 'shared leadership' in teams (also called collective or distributed leadership), which they define as "an emergent

team property that results from the distribution of leadership influence across multiple team members." Based on our findings, we propose a slightly expanded view of shared leadership, similar to the one of Pearce and Conger (2003, p. 286). They suggested that shared leadership involves informal influence as part of a dynamic, interactive influence process among players in teams, both lateral and vertical, but with the key attribute being more than just downward influence on the players by an appointed or an elected leader (such as the coach or team captain). We extended the model of 'shared leadership' by not only providing evidence that there are different athlete leaders in the team, but also by demonstrating that these leaders occupy different leadership roles.

Previous findings within the organisational setting showed that the emergence of informal leaders was positively related with higher individual and team performance (Zhang, Waldman, & Wang, 2012). Furthermore, co-leadership in sports has already been associated with positive outcomes for both team members and leaders (Cotterill, 2013). These findings are in line with our results that shared leadership within the team was positively linked with higher collective efficacy beliefs, stronger team identification and a better place in the ranking.

### **4.3** Strengths, Limitations and Suggestions for Further Research

The strengths of our study include the broad variety of players and coaches in our sample; men and women, of all ages and experience levels, active at all levels of nine different team sports in Flanders. The consistency of our findings, regardless of level, sport or team gender, testifies to the reliability of our findings.

In addressing the limitations of the present study, several opportunities for future research emerge. First, in our study we only asked which player and which leadership role constituted the best match. It is possible that the team captain is not perceived as the best leader on and off the field, but instead as second best. Therefore, we cannot conclude that the captain does not perform the given leadership roles at all. Future research could assess the leadership capacities of every player in the team with respect to the different leadership roles. This would provide a deeper insight in the leadership function of the captain compared to the other players. It remains true, however, that other players in the team are perceived as more important leaders than the captain.

Second, the team captain was only evaluated with regard to his/her leadership capacities. It is possible then that the team captain has other qualities than those we studied.

#### Athlete leadership within sport teams

As such, the captain's function might be focused on other issues than leadership, e.g. on being the confidant of the coach. Future research can clarify the exact function of the team captain by interviewing coaches and players about their definition of the captain's function and about the selection criteria used to assign this function.

Third, regarding the design of the present study, individual players and coaches, rather than complete teams, completed the online questionnaire, which resulted in 4,451 participants active in 2,366 different teams. This makes it impossible to conduct analyses at team level. From a research perspective, it is clear that further investigation on team level is warranted to determine to which extent players and coaches of the same team indicate the same player as task, motivational, social and external leader.

Fourth, the present study utilised a cross-sectional design, as did most other studies on leadership (Moran & Weiss, 2006; Price & Weiss, 2011). Previous longitudinal research revealed that the percentage of task, social and external leaders within a team remained relatively stable from the beginning to the end of a season (Eys et al., 2007; Loughead et al., 2006). We examined athlete leadership only at the end of the season to give all players adequate time to develop team relationships and to gain insight in the athlete leadership within their team. However, a longitudinal design would allow researchers to verify whether informal leaders are perceived as the most important leaders during the whole season or whether the influence of formal leaders shifts towards informal leaders during the season. Furthermore, such a design would enable researchers to gain an understanding of the stability of informal leadership over the course of a season (e.g. whether the same players are occupying the different leadership roles during the whole season).

#### 4.4 Implications for Theoretical Knowledge and Coaching Practice

The findings of the present study contribute both to theoretical knowledge and to coaching practice. First, the results provide clear insight into the nature of athlete leadership within sport teams. Besides investigating formal and informal leadership, and the extent to which leadership is shared within a team, we also examined the different leadership roles that athletes can occupy. Future research can translate these findings to other settings, such as the organisational or educational setting. In this regard, researchers should look more closely into the concept of 'shared leadership' by determining whether the different leaders occupy different leadership roles. Based on our findings, we assume that the already established positive impact of shared leadership on team performance (Carson et al., 2007)

would become even stronger when the different leaders in the team take on different leadership roles.

Second, coaches can use these findings to elect their team captain in a wellconsidered way according to the needs of their particular team, thereby focusing on his/her leadership qualities in the different areas. Furthermore, coaches should realize that not only the team captain but also other team members can and should take up leadership roles. Therefore, coaches should allocate time and effort to the identification and development of leadership (Bucci et al., 2012; Price & Weiss, 2011). Identification of the informal leaders within the team can help coaches to guide these leaders and further develop their leadership capabilities. This strengthened athlete leadership has the potential to create a more optimal team functioning, which, in turn, may result in an improved team performance.

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When is a leader considered as a good leader? Perceived impact on teammates' confidence and social acceptance as key ingredients

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### Abstract

The present study aimed to identify the characteristics of athlete leaders with respect to four different leadership roles (i.e., task leader, motivational leader, social leader, and external leader), while recognizing the surrounding team context. An on-line survey was completed by 4451 players and coaches within nine different team sports in Flanders (Belgium). The present study assessed leaders' characteristics in comparison with the other players in the team. The findings revealed two decisive characteristics for athlete leaders' perceived leadership quality: (1) the impact on teammates' team confidence, and (2) being socially well accepted by the other players. Furthermore, informal leaders outscored the team captain on all leadership characteristics, except team tenure.

*Keywords*: leader attributes, informal leadership, team captain, leadership development, coaching

#### 1. Introduction

High-quality leadership is essential for the numerous groups that shape the way we live, work and play. Countries are striving for good political leaders, the quality of top management is stated as the crucial factor for the success of a business organization, and the quality of teachers is assumed to determine the education of our future generation (Chelladurai, 2012). Also in sports settings, effective leadership is perceived as one of the key determinants for optimal team functioning (Hackman & Wageman, 2005). Therefore, the abundant research on coach leadership and, more specifically, on the characteristics of high-quality coaches is not surprising. By contrast, leadership within the team has only recently become the object of sport leadership research (Cotterill, 2013). The sparse research on athlete leadership demonstrated that high-quality athlete leadership in the team was associated with higher levels of team identification, team confidence, and team cohesion, and an improved team performance (Crozier, Loughead, & Munroe-Chandler, 2013; Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014; Fransen et al., 2012; Price & Weiss, 2011; Vincer & Loughead, 2010).

In the search for the recipe of the perfect leader, several attributes have been suggested as characteristic for athlete leaders. For example, sport competence, playing time, and starting status were put forward as typical characteristics for athlete leaders (Moran & Weiss, 2006; Price & Weiss, 2011). Other characteristics that have been proposed are peer acceptance and off-field friendship (Moran & Weiss, 2006; Tropp & Landers, 1979; Yukelson, Weinberg, Richardson, & Jackson, 1983). Three significant shortcomings of previous literature on athlete leadership attributes can be noted, which are tackled by the current manuscript.

The first shortcoming in the literature so far is that athlete leaders' characteristics have been measured in absolute terms (e.g., Loughead & Hardy, 2005; Price & Weiss, 2011). For example, the experience of an athlete was typically assessed by the absolute number of the years of experience. However, leadership is a socially constructed phenomenon and thus highly dependent on the surrounding context. Therefore, measuring leader attributes in absolute terms conflicts with the context-dependency of athlete leadership. For example, a young player with two years of experience might function as a leader in a youth team with novice players but not in an adult team with more experienced players. As a result, the perceived effectiveness as a leader might not be determined by the

characteristics of the leader in absolute terms, but by the leader's characteristics relative to the characteristics of the other players in the team. In order to address the need for a context-dependent measure of athlete leadership, the present study measured the characteristics of athlete leaders in a relative way by comparing the characteristics of the leader with the characteristics of the other players on the team.

The second shortcoming of previous literature refers to the fact that, in their search for leadership attributes, previous studies predominantly focused on general athlete leadership. Fransen, Vanbeselaere, et al. (2014) however distinguished between four different leadership roles that athletes can occupy: (1) the task leader, who helps the team to focus on its goals and who gives his/her teammates tactical advice during the game; (2) the motivational leader, who is the biggest motivator on the field and steers teammates' emotions in the right direction to perform optimally as a team; (3) the social leader, who takes care of a good atmosphere within the team besides the field, thereby serving as a confidant for his/her teammates; and (4) the external leader, who handles the communication with club management, media, and sponsors. In contrast with most previous research, the present study did not examine the attributes of athlete leaders in general, but instead, went more in-depth by identifying the specific characteristics for each of the four leadership roles (i.e., task, motivational, social, and external leadership).

The third shortcoming in the research on leadership attributes relates to the distinction between attributes of formal athlete leaders (i.e., the team captain) and attributes of informal athlete leaders (i.e., athletes who do not occupy a formal leadership function, but receive their leadership status as a result of the interactions that occur among group members; Loughead, Hardy, & Eys, 2006). Previous research demonstrated that in most teams informal leaders, rather than the team captain, take the lead on the four different leadership roles (Fransen, Vanbeselaere, et al., 2014). However, it still remains unclear which attributes distinguish between the team captain and the informal leaders. To obtain more insight in the leadership role of the team captain, the present study assessed the most frequently cited leader characteristics in previous literature for both the team captain and the task, motivational, social, and external leader. As such, it can be determined whether attributes such as playing time, team tenure, and sport competence are most characteristic for either formal or informal athlete leaders.

First, we expected that leader attributes related to the on-field play (e.g., sport competence, years of experience, and playing time) would be more characteristic for the

task and motivational leaders, whose main function lies on the field (H1a). By contrast, attributes related to the social atmosphere in the team (e.g., social acceptance by teammates) were expected to be more characteristic for the social leader (H1b). Second, previous research has established that high-quality athlete leaders are able to impact their teammates' confidence in the abilities of their team to win the game (Fransen, Coffee, et al., 2014; Fransen et al., 2012; Hoyt, Murphy, Halverson, & Watson, 2003; Ronglan, 2007; Watson, Chemers, & Preiser, 2001). Therefore, we predicted that in the present study, the leader's impact on teammates' team confidence would be most decisive for the leader's perceived leadership quality (H2). Third, Fransen, Vanbeselaere, et al. (2014) demonstrated that the informal leaders, rather than the team captain, take the lead on the different leadership roles. Therefore, we expected that informal leaders would outscore the team captain on all leadership attributes (H3).

### 2. Method

### 2.1 Participants

We cooperated with the Flemish Trainer School, the organization for sport-specific schooling of coaches in Flanders, and with several sport federations to contact coaches and players within nine different team sports in Flanders (Belgium). In total, 4451 participants (3193 players and 1258 coaches) completed our questionnaire, which corresponded to an approximate response rate of 27%. The players were on average 23.9 years old (SD = 7.1) and had 14.2 years of experience (SD = 7.0), whereas the coaches were on average 41.9 years old (SD = 12.2) and had 14.0 years of coaching experience (SD = 10.2).

The sample included participants from nine different team sports in Flanders; basketball (n = 1959; 44%), handball (n = 116; 3%), hockey (n = 127; 3%), ice hockey (n = 72; 2%), netball (n = 118; 3%), rugby (n = 84; 2%), soccer (n = 589; 13%), volleyball (n = 1287; 29%), and water polo (n = 99; 2%). Players and coaches from various competitive levels participated, ranging from the elite level (6%), over national (25%), provincial (53%), and regional levels (7%), to the recreational level (3%) and youth level (6%).

Data from this sample have been used for three other manuscripts (Fransen, Coffee, et al., 2014; Fransen, Kleinert, Dithurbide, Vanbeselaere, & Boen, 2014; Fransen, Vanbeselaere, et al., 2014). However, these manuscripts focused on different research

questions and used different variables of interest. All the leader characteristics that are described in the current manuscript have not been included in any of the above manuscripts.

### 2.2 Measures

## 2.2.1 Athlete leadership quality

We used the athlete leadership classification developed by Fransen, Vanbeselaere, et al. (2014) to identify the athlete leaders within each team. After presenting the description of each leadership role (the original definitions of task, motivational, social, and external leader, as proposed by Fransen, Vanbeselaere, et al. (2014)), participants were asked to indicate which players in their team corresponded best with the description of each of the four leadership roles. Subsequently, the perceived quality of each of the appointed leaders with respect to their specific leadership role was assessed on a 7-point Likert scale, ranging from -3 (*very bad*) to 3 (*very good*).

### 2.2.2 Characteristics associated with the athlete leaders

To address the need for context-dependent measures of athlete leadership, the present study assessed the characteristics of athlete leaders in a relative way by comparing the leader with the other players in the team. The best leader on each of the four leadership roles was evaluated with respect to (a) personal characteristics (e.g., experience, competence), (b) behaviors (e.g., communicating, encouraging), and (c) the impact on teammates' team confidence.

### 2.2.3 Personal characteristics

With respect to the personal characteristics, two different types of assessment scales were used. The status of the player (starter versus bench player) and the average playing time were assessed on a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). More specifically, a score of 5 on player's status meant that this player was always a starter, a score of 1 referred to a bench player.

The other characteristics (age, years of sport experience, highest level ever played, team tenure, sport competence, social acceptance by the teammates, and optimism) were assessed relatively to their teammates on a scale, which included the following labels: -3 (*the worst of my team*), -2 (*clearly worse than average*), -1 (*a little worse than average*), 0 (*average*), 1 (*a little better than average*), 2 (*clearly better than average*), and 3 (*the best of* 

my team). An example characteristic is "Compared to my teammates, this person is optimistic."

#### 2.2.4 Leadership behaviors

Regarding the behaviors of the leaders, we measured both perceptions of body language (e.g., expression of enthusiasm, self-confidence, positive emotions) and perceptions of actual behaviors (e.g., communicating, effort on training, cheering). All behavioral characteristics were measured in comparison with the other players within the team on a relative scale, anchored by -3 (*the worst of my team*) and 3 (*the best of my team*). An example is "Compared to my teammates, this person exerts most effort on the field."

#### 2.2.5 Impact on teammates' team confidence

With respect to the leader's impact on his/her teammates, we focused on players' team confidence, and more specifically the perception of winning confidence contagion ("If this leader clearly believes during the game that our team will win the game, I will have more confidence that our team will win"). Team confidence contagion was measured on a scale ranging from -3 (*strongly disagree*) to 3 (*strongly agree*).

#### 2.2.6 Characteristics of the team captain

It is important to note that it is plausible that the team captain equals the appointed task, motivational, social, and/or external leader. However, it can also be that other players are perceived as better athlete leaders than the team captain. Therefore, each participant had to rate the characteristics of the formal team captain of his/her team. More specifically, we restricted the questionnaire to the most cited leader characteristics in previous literature, namely starting status (starter versus bench player), average playing time, age, sport experience, team tenure, highest level ever played, sport competence, and training effort. These characteristics were measured in comparison with the other players within the same team on a scale anchored by -3 (*the worst of my team*) and 3 (*the best of my team*).

# 3. Results

## 3.1 Characteristic Attributes for the Four Leadership Roles

All participants rated each of the four appointed athlete leaders in their team (i.e., task leader, motivational leader, social leader, and external leader) on 27 characteristics. Table 1 presents the mean values of the measured characteristics for each leadership role, thereby demonstrating to what extent each of these characteristics is associated with each of the four different leadership roles. The bold values represent which leader outscored the other leaders on a specific characteristic. Moreover, the characteristics most strongly associated with each of the leadership roles (i.e., the values in bold) were grouped together. It is important to note that all leaders scored significantly above the scale midpoint '0' on all characteristics (all p < .001), which means that they are perceived to express these characteristics above team average. In other words, all these attributes are more characteristic for leaders than for the average non-leader.

Characteristics	Task leader	Motivational leader	Social leader	External leader
Starter in the game <sup>a</sup> Most playing time <sup>a</sup>	4.74 ± .72 4.58 ± .72	$4.52 \pm .97$ $4.37 \pm .89$	$4.12 \pm 1.33$ $3.99 \pm 1.20$	$3.96 \pm 1.50$ $3.84 \pm 1.40$
Dares to adjust his teammates on the field when they do something wrong	2.08 ± .98	$1.56 \pm 1.18$	$1.16 \pm 1.35$	$1.31 \pm 1.39$
Gives the most tactical advice to his teammates during the game	$\textbf{2.02} \pm \textbf{1.06}$	$1.28 \pm 1.27$	$.84 \pm 1.40$	$1.01 \pm 1.53$
Best player	$1.78 \pm .92$	$1.42 \pm 1.06$	$1.07 \pm 1.20$	$.91 \pm 1.30$
Radiates the most self-confidence on the field	1.73 ± 1.06	$1.49 \pm 1.16$	$1.15\pm1.20$	$1.03 \pm 1.32$
Most years of experience	1.69 ± 1.16	$1.26 \pm 1.32$	$1.17 \pm 1.33$	$1.43 \pm 1.38$
Communicates the most when the team is performing poorly	1.60 ± 1.20	$1.53 \pm 1.13$	$1.09 \pm 1.26$	$1.08 \pm 1.36$
Most capable of creating a turnaround in performance when the team is behind	1.58 ± 1.23	$1.36 \pm 1.26$	.96 ± 1.35	$.80 \pm 1.46$
Played on the highest level	$1.37 \pm 1.29$	$.96 \pm 1.25$	$.76 \pm 1.28$	$.79 \pm 1.41$
Communicates the most when this leader is performing poorly himself	.84 ± 1.43	.78 ± 1.37	.44 ± 1.40	.43 ± 1.50
Facial expressions or body language most clearly express positive emotions during the game	2.03 ± 1.08	2.20 ± .97	2.10 ± 1.04	1.93 ± 1.13
Encourages his teammates strongly during the game	$1.72 \pm 1.01$	2.13 ± .85	$1.65 \pm 1.03$	$1.46 \pm 1.17$

**Table 1.** The characteristics for each leadership role, including means and standard deviations.

Exerts most effort on the field	$2.02\pm0.91$	$2.09 \pm .87$	$1.86 \pm 1.00$	$1.74 \pm 1.12$
Most influence on the team confidence of his teammates	$1.97 \pm 1.11$	$\textbf{2.01} \pm \textbf{1.07}$	$1.77 \pm 1.14$	$1.71 \pm 1.22$
Most expression of team confidence when the team is in the lead	$1.75 \pm 1.00$	1.91 ± .94	$1.61 \pm 1.02$	$1.55 \pm 1.07$
Most enthusiastic when the team makes a point	$1.51 \pm 1.05$	$\textbf{1.78} \pm \textbf{1.00}$	$1.58 \pm 1.04$	$1.43 \pm 1.11$
Most optimistic	$1.50 \pm 1.10$	$\textbf{1.73} \pm \textbf{1.02}$	$1.64 \pm 1.06$	$1.34 \pm 1.16$
Most expression of team confidence when the team is behind	$1.43 \pm 1.17$	1.63 ± 1.10	$1.23 \pm 1.14$	$1.14 \pm 1.21$
Cheers the most	$1.16 \pm 1.29$	$1.56 \pm 1.24$	$1.40 \pm 1.27$	$1.20\pm1.30$
Exerts most effort during practice	$1.41 \pm 1.11$	$1.47 \pm 1.10$	$1.20 \pm 1.18$	$1.06 \pm 1.30$
Most enthusiastic when the team is performing poorly	$.67 \pm 1.32$	$1.00 \pm 1.27$	.74 ± 1.27	.57 ± 1.33
Most enthusiastic when this leader is performing poorly himself	.25 ± 1.36	.43 ± 1.35	.21 ± 1.33	.12 ± 1.38
Socially best accepted by his teammates	$1.67 \pm 1.07$	$1.77 \pm 1.02$	1.94 ± .98	$1.51 \pm 1.15$
Exerts most effort outside the field	$1.48 \pm 1.17$	$1.57 \pm 1.10$	$1.91 \pm 1.04$	1.93 ± 1.07
The oldest player	$1.04 \pm 1.40$	$.79 \pm 1.37$	$.91 \pm 1.35$	$1.30 \pm 1.35$
For the longest time player in the team	.69 ± 1.84	.63 ± 1.83	.83 ± 1.75	1.19 ± 1.73

Note. The highest mean value for each characteristic is in boldface.

<sup>a</sup>These characteristics were rated on a 5-point Likert scale (1 to 5). All the other characteristics were measured on a 7-point Likert scale (-3 to 3).

With regard to the four leadership roles, our findings indicate that the task leader outscored the other leaders regarding his/her sport-specific talent (e.g., best player, most experienced player, most playing time, and played on highest level), followed by the motivational leader. This finding supports H1a, in that the on-field attributes are most characteristic for the on-field athlete leaders. Furthermore, the task leader was characterized by his/her tactical communication, in particular when the team is performing poorly. The motivational leader was perceived as having a key impact on teammates' motivation and confidence. A positive body language, an optimistic attitude, strong enthusiasm, and the expression of team confidence were all perceived as characteristic attributes for the motivational leader. The social leader was socially best accepted in the team, which confirms H1b that attributes related to the social atmosphere in the team are most characteristic for the social leader. In addition, the external leader outscored the other leaders in age and team tenure.

### **3.2** Attributes of High-Quality Athlete Leaders

Although it is interesting to know which attributes are characteristic for a specific type of leader, it is even more important to know which attributes are related to the quality of an athlete leader. In other words, which characteristics cause the leader to be perceived as a good leader by the other players in the team? Separate linear regression analyses were performed for each leadership role to establish the relative perceived impact of each characteristic on the perceived quality of task, motivational, social, and external leaders. In each regression, the perceived quality of that leader was the criterion and all 27 characteristics described in Table 1 served as predictor variables. Table 2 presents the standardized regression coefficients for the characteristics that have a significant relation (p < .001) with the perceived quality of a leader. Because our large sample resulted in extreme statistical power, only significant relations with a  $\beta$ -value above .10 will be discussed (i.e., explaining at least 1% of the variance in perceived quality of that leader). These significant relations with  $\beta$  above .10 will be designated as 'relevant'.

**Table 2.** Regression analyses for each of the four leadership roles evaluating the association between the 27 tested characteristics and the perceived quality of the four different leaders. Only the significant associations ( $\beta > .10$ ; p < .001), including their standardized regression coefficient, are shown.

Specific characteristics	Task leader $(R^2 = .26)$	Motivational leader $(R^2 = .22)$	Social leader $(R^2 = .16)$	External leader $(R^2 = .19)$
Most influence on the team confidence of his teammates	.16	.16	.17	.17
Socially best accepted by his teammates	.12	.14	.16	
Encourages his teammates strongly	.11	.15		
during the game				
Most enthusiastic when the team is	.12			
performing poorly				
Exerts most effort outside the field				.23

*Note.* All p < .001

In line with H2, our findings demonstrated that the leader's perceived impact on teammates' team confidence had a significant relation with the perceived quality of each of the four leadership roles. Moreover, this attribute was the strongest predictor of the perceived quality of the task, motivational, and social leader. The second most predictive characteristic was the social acceptance by teammates. In other words, the more athlete

leaders are accepted by their teammates, the better their perceived leadership quality. Encouragement on the field was perceived as a characteristic attribute for on-field leaders (i.e., task and motivational leader), whereas the effort exerted outside the field was most characteristic for high-quality external leaders, whose main function lies off the field.

To establish differences with respect to team gender (i.e., male or female teams), function (i.e., player or coach), and sports, we conducted separate linear regression analyses for each of these categories. Appendix A presents the relevant results ( $\beta > .10$ ; p < .05) emerging from the regression analyses for male and female teams separately, for each of the four leadership roles. We can conclude that, apart from some small differences, the results for male and female teams are very similar for each of the four leadership roles. In other words, in both male and female teams, the same predictors determined the perceived quality of task, motivational, social, and external leader.

In Appendix B, the relevant results ( $\beta > .10$ ; p < .05) are presented for the viewpoint of players and of coaches separately. The results for the players strongly resemble the general results, as were displayed in Table 2. However, for the coaches, some differences can be noted. The influence on teammates' confidence and the encouragement of teammates only emerged as relevant predictors for the perceived quality of social leaders. The social acceptance by teammates was also by coaches perceived as a relevant predictor of the perceived quality of motivational and social leader.

Finally, in Appendix C, we presented all relevant results ( $\beta > .10$ ; p < .05) that emerged from the linear regression analyses, separately conducted for each of the nine sports. The three most popular team sports (i.e., soccer, basketball, and volleyball) confirmed the findings in Table 2; the influence on teammates' confidence and the social acceptance by teammates emerged as the two most important predictors for the perceived quality of the athlete leaders. For the other smaller sports, differences could be noted and other predictors than the ones listed in Table 2 became relevant for athlete leaders' quality. A few examples of these sport-specific predictors were: the capability of creating a turnaround when the team is performing poorly (for task leaders' quality), communicating when the team is performing poorly (for motivational leaders' quality), optimism and expressing positive emotions (for social leaders' quality). It can thus be concluded that relatively few differences emerged between male and female teams, and between the perceptions of players and coaches. However, dependent on the specific sport, other relevant attributes of leadership quality emerged.

# 3.3 Attributes of Formal Versus Informal Leadership

Previous research has revealed that informal leaders, rather than the team captain, take the lead within sport teams. In order to gain a better understanding of the leadership role of the team captain, we compared the team captain with the other leaders on the most frequently cited leader attributes in literature (see Table 3).

**Table 3.** The mean values for the characteristics of both the team captain and the fourleadership roles. The highest value for each characteristic is indicated in bold.

	Team captain	Task leader	Motivational leader	Social leader	External leader
Status (starter versus bench player) <sup>a</sup>	4.61	4.74	4.52	4.12	3.69
Average playing time <sup>a</sup>	4.44	4.58	4.37	3.99	3.84
Highest level ever played	1.00	1.37	.96	.76	.79
Sport competence	1.38	1.78	1.42	1.07	.91
Sport experience	1.54	1.69	1.26	1.17	1.43
Training effort	1.23	1.41	1.47	1.20	1.06
Age	1.14	1.04	.79	.91	1.30
Team tenure	1.23	.69	.63	.83	1.19

<sup>a</sup>These characteristics were assessed on a scale from 1 (*almost never*) to 5 (*almost always*), while the other characteristics were assessed on a scale from -3 (*the worst of my team*) to 3 (*the best of my team*).

With regard to the characteristics related to players' sport competence (i.e., starting status, playing time, sport experience, highest level ever played, and sport competence), our findings demonstrated that the task leader outscored the other leaders. On training effort, the motivational leader scored the highest. The external leader was on average the oldest leader on the team. There was only one attribute that was characteristic for the team captain, namely team tenure. On average, the team captain was thus the player who played the
longest on the team. With respect to all the other characteristics, there was at least one other leader who outscored the team captain.

To obtain more insight in possible difference between male and female teams, Appendix D presents the mean values for male and female teams separately. The results reveal a high correspondence between the characteristics of formal and informal leaders in male and female teams. Only two differences emerged: (1) in male teams, the motivational leader outscored the task leader on training effort, in female teams it was the other way around; (2) the female team captains were demonstrated to play the longest in their team, whereas in male teams the external leader outscored the captain on team tenure.

Appendix E presents the mean values for the captain and the other leaders separately with regard to the viewpoint of players and coaches. The results revealed high similarity between the perceptions of players and coaches. Only one difference can be noted: according to the players, the team captain outscored the other leaders on team tenure, whereas according to the coaches, the external leader played on average the longest in the team.

Finally, Appendix F revealed detailed information for the leadership attributes of formal and informal athlete leaders within each of the nine sports separately. Again, between the sports some differences emerged. The team captain only outscored the other leaders on team tenure in four of the nine sports (i.e., basketball, handball, hockey, and water polo). In the other sports, the external leader or the task leader played on average the longest in the team. With regard to the other attributes, the results revealed that the team captain outscored the other leaders with regard to age in basketball and handball, and with regard to starting status and playing time in netball, rugby, and soccer. However, it should be noted that, in all sports, the other leaders outscored the captain on most attributes.

Not only in male teams, but also in the perception of coaches, other leaders outscored the team captain on each of the measured attributes. These findings are in line with H3, stating that other leaders would outscore the team captain on all leadership-specific attributes.

## 4. Discussion

The present study extended previous research in four ways. First, we used a contextdependent scale to assess the distinctive leader characteristics. Because players and coaches had to assess a leader's relative characteristics (i.e., characteristics of the leader had to be compared with the characteristics of the other players in the team), this measure accounts for the team-specificity of athlete leadership. Second, instead of focusing on the characteristics of athlete leaders in general, we identified specific characteristics for each of the four leadership roles. Third, we provided more insight in the leadership function of the team captain by comparing the team captain with the other appointed leaders in the team on often cited leader characteristics. Fourth, we used a large sample, including players and coaches of male and female teams in nine different sports. This variety allowed us to explore differences with regard to function, team gender, and sport.

#### 4.1 Characteristic Attributes for the Four Leadership Roles

Our findings revealed that the task leader outscored the other leaders in sport competence and playing time, followed by the motivational leader. This finding confirms H1a that on-field attributes are most characteristic for on-field athlete leaders. Furthermore, our results corroborate previous research, indicating that all task leaders were starters, whereas only 50% of the social leaders had a starting position (Rees & Segal, 1984). In addition, the task leader was perceived to have an important role as tactical communicator. Furthermore, the capability to create a turnaround when the team is performing poorly was also indicated as a characteristic attribute for a task leader.

While the task leader focused on tactical communication, the motivational leader was perceived as the emotional communicator within the team. The leader's optimism and enthusiasm, together with a positive body language expressing team confidence, caused the motivational leader to have the highest impact on the team confidence of his/her teammates. While previous research already indicated that athlete leaders are the most important source of their teammates' team confidence (Fransen et al., 2012), the present study adds that it is the motivational leader in particular who plays the key role in optimizing teammates' team confidence. Considering that players' team confidence has been found to strongly influence goal setting, effort, and persistence (Bray, 2004; Greenlees, Graydon, & Maynard, 1999), our results indicated that athlete leaders, and the motivational leader in particular, might

serve as important catalysts in the relationship between team confidence and performancerelated outcomes.

Both the social leader and the external leader are characterized by the effort they exert for their team outside the field. Furthermore, in line with H1b, the social leader is the most socially accepted leader by the other players in the team, which is consistent with earlier findings on peer acceptance as a typical characteristic for athlete leaders (Moran & Weiss, 2006; Tropp & Landers, 1979; Yukelson et al., 1983). In accordance with previous findings (Loughead et al., 2006), the external leader is on average the oldest player in the team with the longest team tenure.

#### 4.2 Attributes of High-Quality Athlete Leaders

In order to improve players' leadership qualities, it is essential to know which characteristics are most decisive for the quality of a leader. In line with H2, our results suggested that leaders with the strongest impact on the team confidence of their teammates were perceived as the best leaders. This finding holds for all four leadership roles and confirms the perception of ice hockey coaches that leaders have a large impact on their team by sharing their desire to win (Bucci, Bloom, Loughead, & Caron, 2012). Furthermore, these results are in line with earlier findings that athlete leaders are an important source of their teammates' team confidence (Fransen, Coffee, et al., 2014; Fransen et al., 2012; Hoyt et al., 2003; Ronglan, 2007; Watson et al., 2001).

Although these results contradict previous findings that likeability is not a requirement for good leadership (Holmes, McNeil, & Adorna, 2010), being socially well accepted by the team emerged as the second most important predictor for the perceived quality of task, motivational, and social leaders. This predictor can be related with the most important predictor of this study (i.e., impact on teammates' team confidence) through the emotional contagion theory. There is abundant evidence that people automatically mimic other persons' emotional behavior (Hatfield, Cacioppo, & Rapson, 1994; Totterdell, 2000). More specifically, a field study among engineers revealed the presence of emotional contagion between leaders and followers: leaders' positivity had a positive effect on followers' positivity (Avey, Avolio, & Luthans, 2011). Social acceptance has the potential to boost this contagion process, because it has been demonstrated that people who like each other more (i.e., higher social acceptance) exhibit more spontaneous mimicry (McIntosh, 2006). Although more research is necessary, we suggest that social acceptance functions as

a moderator of the relation between team confidence expressed by the leader and the team confidence of the other players. In other words, the more the leader is socially accepted by the team, the stronger the emotional contagion will occur, and the faster players will adopt the team confidence standards of their leader. In short, the more the leader is socially accepted by his/her teammates, the higher leaders' impact on teammates' confidence.

#### 4.3 Attributes of Formal Versus Informal Leadership

With regard to the team captain's characteristic attributes, the captain only outscored the other leaders in terms of team tenure. It thus seems that, instead of the leadership qualities of a player, a player's team tenure might be the implicit criterion to assign a player as team captain. It is even questionable whether team tenure is in fact a requested attribute for high-quality leadership. Moreover, further analyses revealed that in male teams, according to the perceptions of coaches, and in five of the nine sports, other leaders outscored the team captain also on team tenure, which confirms H3.

These findings corroborate previous research, demonstrating that in most teams informal leaders, rather than the captain, take the lead. However, it should be noted that the team captain always scored above the midpoint of the scale, implying that the team captain scored better on these attributes than the average team member. Although many studies on athlete leadership still solely focus on the role of the team captain (Dupuis, Bloom, & Loughead, 2006; Grandzol, Perlis, & Draina, 2010; Voelker, Gould, & Crawford, 2011), our findings emphasize that informal athlete leadership, exhibited by other players than the team captain, is indeed very important and can certainly no longer be ignored.

#### 4.4 Strengths and Limitations

When interpreting the present findings, it is worth considering the strengths and limitations of the current study. A major strength of this study is the large number of participating teams, including male and female athletes and coaches across diverse team sports and levels of competition. The consistency in the results between male and female teams, and between the perceptions of players and coaches contribute to the reliability of the study findings. In contrast to previous studies, the presented study relied on a considerable number of participants within nine different sports, thereby allowing for an inter-sport comparison. Although some findings were consistent across all nine sports, our results were also characterized by several differences between the sports and demonstrated the emergence of sport-specific attributes as characteristic for the leadership quality on the four

different roles. Future research should take this sport-specificity into account when generalizing their findings to other sports.

Second, a new context-dependent measure was used to assess the characteristic attributes of the leaders on all four leadership roles. In this regard, the attributes were not measured in an absolute way (e.g., years of experience), but relative to the other team members (e.g., more/less experience than other team members). Because leadership strongly depends on its surrounding context, it is recommended for future research to take into account the team-specific nature of leadership when examining leader attributes.

Third, in contrast with previous studies examining the attributes of athlete leaders (Loughead & Hardy, 2005; Moran & Weiss, 2006; Rees & Segal, 1984; Tropp & Landers, 1979; Yukelson et al., 1983), the present study was not conducted in the United States or Canada, but instead in Belgium, using Dutch questionnaires. The fact that similar findings emerged as in previous American and Canadian studies supports the cross-cultural validity of our findings.

Fourth, a variety of characteristics was investigated, ranging from leaders' personal characteristics, over leaders' behaviors, to leaders' impact on teammates. Despite this variety in examined characteristics, it should be noted that we assessed only a limited number of possible leader characteristics. Further research should examine whether other attributes might be more characteristic for athlete leadership quality. In particular with regard to the team captain, it is possible that this formal leader has other qualities than the ones we studied. For instance, the captain's function might be characterized by other issues than leadership, such as being the confidant of the coach. Future research can clarify the exact function of the team captain by conducting interviews with coaches and players about the function of the team captain and the selection criteria used to assign this function.

Not all people can lead. Some are offered the position but are not equipped with the tools necessary to fulfill it and others may not be given the opportunity. From a practical perspective, coaches can rely on these findings to elect their team captain more consciously by taking leadership qualities into account, rather than team tenure. Identifying the informal leaders within the team can help coaches to guide these leaders and further develop their leadership capabilities. Our findings suggest that coaches should stimulate their athlete leaders to express their team confidence, to encourage their teammates, and to show their enthusiasm, even when their team is losing. As a result, this strengthened athlete leadership lays the foundations of optimal team functioning.

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## 6. Appendix A

Specific regression analyses for male and female teams, for each of the four leadership roles evaluating the association between the 27 tested characteristics and the perceived quality of the four different leaders. Only the relevant associations ( $\beta > .10$ ; p < .05) for each team gender, including their standardized regression coefficient, are shown.

Sport-specific characteristics	Task leader	Motivational leader	Social leader	External leader
Total sample	$(R^2 = .26)$	$(R^2 = .22)$	$(R^2 = .16)$	$(R^2 = .19)$
Most influence on the team confidence of his teammates	.16***	.16***	.17***	.17***
Socially best accepted by his teammates	.12***	$.14^{***}$	.16***	
Encourages his teammates strongly during the game	.11***	.15***		
Most enthusiastic when the team is performing poorly	.12***			.10**
Exerts most effort outside the field				.23***
Male teams	$(R^2 = .26)$	$(R^2 = .23)$	$(R^2 = .18)$	$(R^2 = .21)$
Most influence on the team confidence of his teammates	.17***	$.16^{***}$	.17***	.18***
Socially best accepted by his teammates	.11***	.15***	.19***	
Encourages his teammates strongly during the		.13***		
game Communicates the most when the team is performing poorly	.10**	.10**		.13*
Exerts most effort outside the field				.25***
Female teams	$(R^2 = .30)$	(R <sup>2</sup> =.21)	$(R^2 = .16)$	(R <sup>2</sup> =.18)
Most influence on the team confidence of his teammates	.13***	.14***	.15***	.14**
Socially best accepted by his teammates	.14***	.14**	.11**	
Encourages his teammates strongly during the game	.16***	.18***		
Most enthusiastic when the team is performing poorly	.15***			
Cheers the most	16***			
Most optimistic	.17***			
Exerts most effort on the field				12*
Exerts most effort outside the field		.11**		.23**
<i>Note.</i> $p < .001; p < .01; p < .01$				

# 7. Appendix B

Specific regression analyses for perceptions of players and coaches, for each of the four leadership roles evaluating the association between the 27 tested characteristics and the perceived quality of the four different leaders. Only the relevant associations ( $\beta > .10$ ; p < .05) for players and coaches, including their standardized regression coefficient, are shown.

Sport specific characteristics	Task	Motivational	Social	External
Sport-specific characteristics	leader	leader	leader	leader
Total sample	$(R^2 = .26)$	$(R^2 = .22)$	$(R^2 = .16)$	$(R^2 = .19)$
Most influence on the team confidence of his	.16***	$.16^{***}$	$.17^{***}$	$.17^{***}$
teammates				
Socially best accepted by his teammates	.12***	$.14^{***}$	.16***	
Encourages his teammates strongly during the	.11***	$.15^{***}$		
game				
Most enthusiastic when the team is performing	.12***			$.10^{**}$
poorly				
Exerts most effort outside the field				.23***
Players	$(R^2 = .27)$	$(R^2 = .23)$	$(R^2 = .16)$	$(R^2 = .19)$
Most influence on the team confidence of his	.20***	.22***	.17***	.19***
teammates				
Socially best accepted by his teammates	.13***	$.15^{***}$	$.17^{***}$	
Encourages his teammates strongly during the	.11***	.16***		
game				
Most enthusiastic when the team is performing	.13***			$.10^{**}$
poorly				
Facial expressions or body language most			$.10^{***}$	
clearly express positive emotions during the				
game				
Exerts most effort outside the field				.21***
Coaches	$(R^2 = .29)$	$(R^2 = .24)$	$(R^2 = .24)$	$(R^2 = .26)$
Most influence on the team confidence of his			.13***	
teammates				
Socially best accepted by his teammates		$.10^{*}$	.13**	
Encourages his teammates strongly during the			$.10^{*}$	
game				
Communicates the most when the team is	$.18^{***}$	$.19^{***}$		
performing poorly				
Most playing time			13*	
Played on the highest level			$.11^{*}$	
Exerts most effort outside the field		.11**	.17***	.32***
Age				.16 <sup>*</sup>
$N_{oto} \stackrel{***}{=} n < 0.01 \stackrel{**}{=} n < 0.1 \stackrel{*}{=} n < 0.1$				

*Note.* p < .001; p < .01; p < .01

# 8. Appendix C

Sport-specific regression analyses for each of the four leadership roles evaluating the association between the 27 tested characteristics and the perceived quality of the four different leaders. Only the relevant associations ( $\beta > .10$ ; p < .05) for each sport, including their standardized regression coefficient, are shown.

Sport-specific characteristics	Task	Motivational	Social	External
	leader	leader	leader	leader
Total sample	$(R^2 = .26)$	$(R^2 = .22)$	$(R^2 = .16)$	$(R^2 = .19)$
Most influence on the team confidence of his	.16***	.16***	.17***	.17***
teammates				
Socially best accepted by his teammates	.12***	$.14^{***}$	.16***	
Encourages his teammates strongly during the	$.11^{***}$	.15***		
game	***			**
Most enthusiastic when the team is performing	.12			.10
poorly				***
Exerts most effort outside the field				.23
Basketball	$(R^2 = .33)$	$(R^2 = .23)$	$(R^2 = .22)$	$(R^2 = .24)$
Most influence on the team confidence of his teammates	.19***	.19***	.19***	.24***
Socially best accepted by his teammates	.13***	$.14^{***}$	.15***	
Encourages his teammates strongly during the	.15***	$.14^{***}$	.12**	
game				
Most enthusiastic when the team is performing	.12**			.11*
poorly				
Communicates the most when the team is		$.10^{*}$		
performing poorly				
Facial expressions or body language most			.13***	
clearly express positive emotions during the				
game				
Exerts most effort outside the field			.13***	.29***
Handball	$(R^2 = .44)$	$(R^2 = .53)$	$(R^2 = .62)$	$(R^2 = .83)$
Most influence on the team confidence of his			.46*	
teammates				
Socially best accepted by his teammates	.44**			
Exerts most effort during practice		43*		
Most enthusiastic when this leader is		$.59^{*}$		
performing poorly himself				
Most years of experience			49*	
Most capable of creating a turnaround in			$.60^{*}$	
performance when the team is behind				

Hockey	$(R^2 = .51)$	$(R^2 = .50)$	$(R^2 = .30)$	$(R^2 = .60)$
Most enthusiastic when the team is performing	.43*			
poorly	**			
Best player	.38**	*		*
Radiates the most self-confidence on the field		55*		.57*
Ice hockey	$(R^2 = .66)$	$(R^2 = .75)$	$(R^2 = .88)$	$(R^2 = .92)$
Most influence on the team confidence of his teammates		$.70^{**}$		
Most enthusiastic when this leader is performing poorly himself		.94*		
Communicates the most when this leader is performing poorly himself		83*	.74 <sup>*</sup>	
Played on the highest level			.81**	
Most years of experience			77**	
Most expression of team confidence when the			65*	
team is in the lead				
Netball	$(R^2 = .70)$	$(R^2 = .66)$	$(R^2 = .60)$	$(R^2 = .81)$
Best player	.38*			
Socially best accepted by his teammates			$.40^{*}$	
Cheers the most			.53**	
Most optimistic			.35*	
Exerts most effort on the field			65**	
Rugby	$(R^2 = .56)$	$(R^2 = .70)$	$(R^2 = .63)$	$(R^2 = .54)$
Starter in the game	.32*			
Most years of experience		38*		
The oldest player			59*	
Soccer	$(R^2 = .24)$	$(R^2 = .21)$	$(R^2 = .18)$	$(R^2 = .27)$
Most influence on the team confidence of his	25***		18**	
teammates	.23		.10	
Socially best accepted by his teammates	.15*	$.14^{*}$	.17*	
Encourages his teammates strongly during the		.21***		
game				
Communicates the most when the team is performing poorly		.15*		
Exerts most effort during practice	$.11^{*}$			
Most enthusiastic when the team makes a point				23*

Volleyball	$(R^2 = .20)$	$(R^2 = .29)$	$(R^2 = .20)$	$(R^2 = .20)$
Most influence on the team confidence of his teammates		.19***	.13**	
Socially best accepted by his teammates	$.10^{*}$	.12**	.18***	.16**
Communicates the most when the team is	.11*			
performing poorly				
Most enthusiastic when the team is performing poorly	$.10^{*}$			
Most enthusiastic when this leader is	$.11^{*}$			
performing poorly himself				
Starter in the game	12*			
Most optimistic			$.10^{*}$	
For the longest time player in the team				.11*
Exerts most effort outside the field		.14**		.18***
Water polo	$(R^2 = .54)$	$(R^2 = .50)$	$(R^2 = .48)$	$(R^2 = .80)$
Most influence on the team confidence of his teammates	.34*			.55*
Most enthusiastic when the team is performing poorly	.42*			
Most conchla of creating a turneround in	63 <sup>**</sup>			
performance when the team is behind	.05			
performance when the team is behind Most expression of team confidence when the	45 <sup>*</sup>			
performance when the team is behind Most expression of team confidence when the team is in the lead	45 <sup>*</sup>			
Most capable of creating a turnaround in performance when the team is behind Most expression of team confidence when the team is in the lead Starter in the game	45 <sup>*</sup> 42 <sup>*</sup>			
Most capable of creating a turnaround in performance when the team is behind Most expression of team confidence when the team is in the lead Starter in the game Communicates the most when the team is	45* 42*	52*		

Note. p < .001; p < .01; p < .01; p < .01

# 9. Appendix D

The mean values for the characteristics of both the team captain and the four leadership roles, for male and female teams separately. The highest value for each characteristic is indicated in bold.

	Team captain	Task leader	Motivational leader	Social leader	External leader
Total sample					
Status (starter versus bench player) <sup>a</sup>	4.61	4.74	4.52	4.12	3.96
Average playing time <sup>a</sup>	4.44	4.58	4.37	3.99	3.84
Highest level ever played	1.00	1.37	.96	.76	.79
Sport competence	1.38	1.78	1.42	1.07	.91
Sport experience	1.54	1.69	1.26	1.17	1.43
Training effort	1.23	1.41	1.47	1.20	1.06
Age	1.14	1.04	.79	.91	1.30
Team tenure	1.23	.69	.63	.83	1.19
Male teams					
Status (starter versus bench player) <sup>a</sup>	4.60	4.72	4.50	4.15	3.84
Average playing time <sup>a</sup>	4.41	4.54	4.32	3.97	3.74
Highest level ever played	1.03	1.36	.97	.80	.85
Sport competence	1.42	1.80	1.44	1.13	.90
Sport experience	1.57	1.68	1.27	1.24	1.47
Training effort	1.28	1.42	1.53	1.22	1.08
Age	1.12	1.00	.80	.94	1.32
Team tenure	1.21	.70	.64	.85	1.23
Female teams					
Status (starter versus bench player) <sup>a</sup>	4.64	4.78	4.56	4.08	4.13
Average playing time <sup>a</sup>	4.51	4.65	4.44	4.01	4.01
Highest level ever played	.95	1.38	.94	.68	.71
Sport competence	1.30	1.75	1.39	.97	.92
Sport experience	1.48	1.73	1.25	1.04	1.37
Training effort	1.14	1.38	1.36	1.18	1.04
Age	1.16	1.10	.77	.87	1.26
Team tenure	1.27	.68	.62	.79	1.12

<sup>a</sup>These characteristics were assessed on a scale from 1 (*almost never*) to 5 (*almost always*), while the other characteristics were assessed on a scale from -3 (*the worst of my team*) to 3 (*the best of my team*).

# 10. Appendix E

The mean values for the characteristics of both the team captain and the four leadership roles, for the viewpoint of players and coaches separately. The highest value for each characteristic is indicated in bold.

	Team captain	Task leader	Motivational leader	Social leader	External leader
Total sample					
Status (starter versus bench player) <sup>a</sup>	4.61	4.74	4.52	4.12	3.96
Average playing time <sup>a</sup>	4.44	4.58	4.37	3.99	3.84
Highest level ever played	1.00	1.37	.96	.76	.79
Sport competence	1.38	1.78	1.42	1.07	.91
Sport experience	1.54	1.69	1.26	1.17	1.43
Training effort	1.23	1.41	1.47	1.20	1.06
Age	1.14	1.04	.79	.91	1.30
Team tenure	1.23	.69	.63	.83	1.19
Players					
Status (starter versus bench player) <sup>a</sup>	4.58	4.72	4.47	4.04	3.92
Average playing time <sup>a</sup>	4.42	4.57	4.33	3.93	3.82
Highest level ever played	1.03	1.46	1.02	.81	.79
Sport competence	1.31	1.74	1.37	1.00	.88
Sport experience	1.57	1.75	1.29	1.16	1.42
Training effort	1.11	1.27	1.33	1.07	1.00
Age	1.16	1.06	.78	.92	1.29
Team tenure	1.24	.68	.59	.82	1.18
Coaches					
Status (starter versus bench player) <sup>a</sup>	4.70	4.79	4.65	4.33	4.10
Average playing time <sup>a</sup>	4.51	4.60	4.45	4.14	3.95
Highest level ever played	.93	1.16	.80	.62	.78
Sport competence	1.55	1.89	1.53	1.25	1.04
Sport experience	1.45	1.56	1.19	1.19	1.46
Training effort	1.58	1.73	1.79	1.55	1.31
Age	1.05	.98	.81	.90	1.33
Team tenure	1.20	.74	.72	.85	1.23

<sup>a</sup>These characteristics were assessed on a scale from 1 (*almost never*) to 5 (*almost always*), while the other characteristics were assessed on a scale from -3 (*the worst of my team*) to 3 (*the best of my team*).

# 11. Appendix F

The mean values for the characteristics of both the team captain and the four leadership roles, for the nine different sports separately. The highest value for each characteristic is indicated in bold.

	Team	Task	Motivational	Social	External
	captain	leader	leader	leader	leader
Total sample					
Status (starter versus bench player) <sup>a</sup>	4.61	4.74	4.52	4.12	3.96
Average playing time <sup>a</sup>	4.44	4.58	4.37	3.99	3.84
Highest level ever played	1.00	1.37	.96	.76	.79
Sport competence	1.38	1.78	1.42	1.07	.91
Sport experience	1.54	1.69	1.26	1.17	1.43
Training effort	1.23	1.41	1.47	1.20	1.06
Age	1.14	1.04	.79	.91	1.30
Team tenure	1.23	.69	.63	.83	1.19
Basketball					
Status (starter versus bench player) <sup>a</sup>	4.40	4.63	4.27	3.98	3.81
Average playing time <sup>a</sup>	4.07	4.35	4.01	3.73	3.58
Highest level ever played	.99	1.35	.95	.74	.75
Sport competence	1.29	1.77	1.36	1.08	.88
Sport experience	1.58	1.70	1.29	1.20	1.36
Training effort	1.18	1.33	1.40	1.14	1.00
Age	1.23	.98	.84	.91	1.23
Team tenure	1.21	.56	.56	.80	1.10
Handball					
Status (starter versus bench player) <sup>a</sup>	4.33	4.76	4.77	4.22	3.98
Average playing time <sup>a</sup>	4.15	4.52	4.53	4.02	3.80
Highest level ever played	1.11	1.49	.96	.84	.65
Sport competence	1.15	1.88	1.66	1.20	.88
Sport experience	1.47	1.75	1.27	1.45	1.24
Training effort	1.10	1.15	1.53	1.23	1.12
Age	1.39	.94	.71	1.03	1.35
Team tenure	1.80	1.01	.76	1.04	1.35

Status (starter versus bench player) <sup>a</sup>	4.69	4.88	4.92	4.66	4.57	
Average playing time <sup>a</sup>	4.60	4.86	4.75	4.53	4.40	
Highest level ever played	1.02	1.76	1.36	.78	1.12	
Sport competence	1.23	1.85	1.44	.91	1.01	
Sport experience	1.30	1.70	1.30	.84	1.20	
Training effort	.95	1.18	1.11	1.16	.74	
Age	.90	.77	.91	.85	.75	
Team tenure	1.57	.69	.66	.93	.81	
Ice hockey						
Status (starter versus bench player) <sup>a</sup>	4.71	4.73	4.55	4.39	3.70	
Average playing time <sup>a</sup>	3.83	3.83	3.76	3.67	3.14	
Highest level ever played	1.36	2.03	1.45	1.00	.53	
Sport competence	1.87	2.07	1.87	1.32	.76	
Sport experience	1.69	2.10	1.39	1.10	1.03	
Training effort	1.71	1.85	1.68	1.56	1.67	
Age	.82	.84	.33	.58	1.21	
Team tenure	1.28	1.35	.59	.84	.97	
Netball						
Status (starter versus bench player) <sup>a</sup>	4.95	4.87	4.81	4.33	3.81	
Average playing time <sup>a</sup>	4.94	4.88	4.84	4.44	3.98	
Highest level ever played	1.33	1.49	1.25	1.10	1.25	
Sport competence	1.73	1.93	1.62	1.21	1.31	
Sport experience	1.42	1.67	1.20	1.05	1.55	
Training effort	1.56	1.77	1.57	1.45	1.55	
Age	1.02	1.02	.52	.90	1.38	
Team tenure	1.22	1.47	1.01	.95	.71	
Rugby						
Status (starter versus bench player) <sup>a</sup>	5.00	4.96	4.88	4.12	3.81	
Average playing time <sup>a</sup>	4.97	4.93	4.89	4.08	3.74	
Highest level ever played	1.08	1.52	1.58	1.25	1.16	
Sport competence	1.73	2.01	2.02	1.26	1.34	
Sport experience	1.69	2.07	1.92	1.68	1.98	

Training effort	1.66	1.72	1.83	1.64	1.20	
Age	.58	1.01	.94	1.15	1.70	
Team tenure	1.44	1.77	1.51	1.73	2.00	
Soccer						
Status (starter versus bench player) <sup>a</sup>	4.94	4.90	4.83	4.62	4.41	
Average playing time <sup>a</sup>	4.91	4.86	4.80	4.58	4.39	
Highest level ever played	.77	1.01	.76	.72	.67	
Sport competence	1.46	1.70	1.45	1.28	.90	
Sport experience	1.30	1.39	1.12	1.20	1.43	
Training effort	1.50	1.59	1.72	1.35	1.20	
Age	.99	.85	.69	.83	1.25	
Team tenure	1.14	.64	.68	.85	1.33	
Volleyball						
Status (starter versus bench player) <sup>a</sup>	4.72	4.78	4.62	4.02	3.99	
Average playing time <sup>a</sup>	4.70	4.74	4.59	4.03	3.99	
Highest level ever played	1.00	1.40	.88	.67	.77	
Sport competence	1.36	1.74	1.35	.91	.86	
Sport experience	1.54	1.73	1.19	1.07	1.49	
Training effort	1.10	1.38	1.41	1.16	1.03	
Age	1.14	1.24	.81	.94	1.37	
Team tenure	1.16	.63	.55	.70	1.22	
Water polo						
Status (starter versus bench player) <sup>a</sup>	4.73	4.72	4.85	4.00	3.53	
Average playing time <sup>a</sup>	4.70	4.72	4.64	3.96	3.61	
Highest level ever played	1.81	1.95	1.45	1.18	1.27	
Sport competence	1.99	2.21	1.83	1.37	1.18	
Sport experience	2.18	2.21	1.63	1.49	1.86	
Training effort	1.69	1.62	1.71	1.28	1.28	
Age	1.11	1.22	.68	1.16	1.81	
Team tenure	1.83	1.52	1.33	1.41	1.69	

<sup>a</sup>These characteristics were assessed on a scale from 1 (*almost never*) to 5 (*almost always*), while the other characteristics were assessed on a scale from -3 (*the worst of my team*) to 3 (*the best of my team*).

Leadership as Social Identity Management: Introducing the Identity Leadership Inventory (ILI) to Assess and Validate a Four-Dimensional Model

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*Note*: Although Dr. Nik Steffens and Prof. Alex Haslam took the lead in the development of the ILI and the writing out of the manuscript, we realized the data collection for Study 4, in which 421 athletes assessed their team captain on all dimensions of the ILI, thereby relating this identity based leadership style to outcomes such as team confidence and task cohesion.

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#### Abstract

Although nearly two decades of research has provided support for the social identity approach to leadership, most previous work has focused on leaders' identity prototypicality while neglecting the assessment of other equally important dimensions of social identity management. However, recent theoretical developments have argued that in order to mobilize and direct followers' energies, leaders need not only to 'be one of us' (identity prototypicality), but also to 'do it for us' (identity advancement), to 'craft a sense of us' (identity entrepreneurship), and to 'embed a sense of us' (identity impresarioship). In the present research we develop and validate an Identity Leadership Inventory (ILI) that assesses these dimensions in different contexts and with diverse samples from the US, China, and Belgium. Study 1 demonstrates that the scale has content validity such that the items meaningfully differentiate between the four dimensions. Studies 2, 3, and 4 provide evidence for the scale's construct validity (distinguishing between dimensions), discriminant validity (distinguishing identity leadership from authentic leadership, leaders' charisma, and perceived leader quality), and criterion validity (relating the ILI to key leadership outcomes). We conclude that by assessing multiple facets of leaders' social identity management the ILI has significant utility for both theory and practice.

*Keywords*: leadership, social identity, self-categorization, scale development, identity leadership

#### 1. Introduction

Questions of collective self and identity (e.g., "Who are we?", "What do we stand for?", "How will we progress?") are at the heart of collaborative human enterprise. Not least, this is because the answers to such questions are crucial to leaders' attempts to mobilize and shape the energies of potential followers. Nevertheless, despite the readily apparent relevance of these questions to issues of leadership and followership, relatively little leadership research has placed these issues center stage and attempted to build theory around them (Akerlof, 2011; Dinh et al., 2014; Gardner, Lowe, Moss, Mahoney, & Cogliser, 2010).

There are however, some notable exceptions to this observation. Most particularly, two theories that have placed issues of group process at the cornerstone of the analysis of leadership are social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner, 1991; Turner, Hogg, Oakes, Reicher & Wetherell, 1987; Turner, Oakes, Haslam & McGarty, 1994) — theories which, together, comprise the social identity approach (Haslam, 2004; Postmes & Branscombe, 2010; Reicher, Spears, & Haslam, 2010; Tyler & Blader, 2003). In answer to the question "who am I?", self-categorization theory suggests that a person's subjective sense of self can be defined at varying levels of abstraction (Turner, 1985). At one level, these definitions involve conceptions of the self as a unique individual (in terms of *personal identity* as 'I' and 'me'; Turner, 1982), but at another they involve more inclusive definitions based on shared group memberships (in terms of social identity as 'us' and 'we'). Importantly, self-categorization in terms of social identity (i.e., where the self is defined in terms of shared group membership) is argued to underpin behavior that is qualitatively distinct from that which is predicated on personal identity because it is shaped by, and oriented towards, the interests of the group as a whole. Indeed, more generally, selfcategorization theory asserts that it is individuals' internalized sense of shared identity (their sense of themselves as part of 'us') that "makes group behavior possible" (Turner, 1982, p. 21; see also Ashforth & Mael, 1989; Ellemers, 2012; Ellemers, Spears, & Doosje, 2002; Haslam, Postmes, & Ellemers, 2003; Hogg & Terry, 2001).

## 1.1 The Social Identity Approach to Leadership

The theoretical assertion that social identity makes possible all meaningful forms of group behavior provides the conceptual basis for a novel analysis of leadership. Indeed, building on the foregoing insights, the social identity approach asserts that leadership is a recursive, multi-dimensional process that centers on leaders' capacities to represent, advance, create, and embed a shared sense of social identity for group members (Haslam, Reicher, & Platow, 2011; Hogg, 2001; Reicher, Haslam & Hopkins, 2005; Turner & Haslam, 2001; van Knippenberg & Hogg, 2003; van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004). This is because it is by developing and directing a shared sense of 'us' that leaders are able to galvanize individuals' otherwise idiosyncratic motivations and to harness the transformative power of their coordinated energies (Ellemers, de Gilder, & Haslam, 2004; Reicher et al., 2005; Turner, 2005). Importantly, from this perspective, successful leadership is a process of social influence (something that does not reside in a position, a person, or a result) that involves making followers *want* to contribute to shared goals (see also House, Javidan, & Dorfman, 2001).

Yet despite the multi-faceted nature of this approach, previous empirical work that has been informed by this body of leadership theory has tended to be somewhat narrow in scope. In particular, research and theory have tended to focus on the importance of leaders being seen to be representative — or *prototypical* — of the groups they seek to lead such that they are seen to embody those attributes that characterize a particular ingroup and make it distinct from other groups<sup>1</sup> (after Rosch, 1978; Turner, 1985; for reviews see van Knippenberg, 2011; van Knippenberg & Hogg, 2003). The focus on this aspect of the leadership process reflects Turner's (1991) original insight that it is by being representative of shared group interests that individuals are able to exert *influence* over other group members. In line with this claim, recent comprehensive reviews by Haslam and colleagues (2011), van Knippenberg (2011), and Hogg, van Knippenberg, and Rast (2012) demonstrate that leader prototypicality contributes to a range of important leadership outcomes including (a) perceived leader fairness (De Cremer, van Dijke, & Mayer, 2010; Koivisto, Lipponen, & Platow, 2013; Platow, Hoar, Reid, Harley & Morrison, 1997), (b) endorsement of leaders (Ullrich, Christ, & van Dick, 2009), (c) trust in leaders (Giessner & van Knippenberg, 2008), and (d) perceived leader charisma (Platow, van Knippenberg, Haslam, van Knippenberg, & Spears, 2006; Steffens, Haslam, & Reicher, 2014). Nevertheless, it is apparent that, as well as representing shared social identity, leaders often first must create

this sense of commonality through acts of *identity entrepreneurship* (Reicher & Hopkins, 1996a; Reicher & Hopkins, 2001; Reicher et al., 2005) and then also have to work to *promote* the group through acts of *identity advancement* (Haslam & Platow, 2001). Finally, they also need to embed the group within members' lived experience through acts of *identity impresarioship* (Haslam et al., 2011). Thus, as we argue in more depth below, while clearly very important, prototypicality is certainly not the be-all and end-all of identity leadership.

At the same time, the social identity approach to leadership has also been hampered by two inter-related methodological weaknesses. The first of these relates to the fact that, to date, researchers have lacked a validated measurement tool to assess various aspects of identity leadership. This contrasts starkly to the predicament of those who work with other prominent leadership theories, for which a range of measurement tools are available, and where the development of reliable and valid measurement tools has facilitated theoretical and empirical progress (Schriesheim & Cogliser, 2009). This is true, for example, in the case of work on (a) transformational leadership (where researchers use the Transformational Leadership Inventory, *TLI*; Podsakoff, MacKenzie, Moorman, & Fetter, 1990; or the Multifactor Leadership Questionnaire, *MLQ*; Bass & Avolio, 2004), (b) leader–member exchange (where researchers use the Leader–Member–Exchange 7-Scale, *LMX-7*; Graen & Uhl-Bien, 1995; or the multidimensional LMX scale; Liden & Maslyn, 1998), and (c) authentic leadership (where researchers use the Authentic Leadership Inventory, *ALI*; Neider & Schriesheim, 2011; or the Authentic Leadership Questionnaire, *ALQ*; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008).

Second, there is also some confusion about the precise meaning of prototypicality that, in turn, has resulted in measurement inconsistencies. As several recent reviews (Bartel & Wiesenfeld, 2013; Hogg et al., 2012; van Knippenberg, 2011) have pointed out, it is a mistake to equate leader prototypicality simply with being maximally similar to other group members or with being an average group member. For rather than relating to the average-type, prototypicality relates more to the *ideal-type* of what is means to be 'one of us' (van Knippenberg, 2011, p. 1079; see also Steffens, Haslam, Kessler, & Ryan, 2013). Amongst other things this means that the prototypical position in the group shifts depending on features of the context at hand (e.g., who 'we' compare ourselves with, and what dimensions of comparison are salient, as specified by the meta-contrast ratio; Turner, 1985; see also Haslam, Turner, Oakes, McGarty, & Hayes, 1992). This means, for example, that

what it means to be a 'good' psychologist varies as a function of whether psychologists are being compared with philosophers or with physicists (van Rijswijk, Haslam, & Ellemers, 2006). Moreover, prototypicality can also diverge from a position of maximal similarity when we consider the way in which *time* and *spatial* dimensions shape prototypicality. This is because who 'we' are and what 'we' means is determined not only by who we are in the present but also by who we were in the past as well as who we want to become in the future (Reicher & Hopkins, 2003).

## 1.2 Specifying Multiple Dimensions of Identity Leadership

To address these various issues, and thereby, enhance the utility of the social identity approach to leadership, in the present paper we seek to develop and validate a new instrument — the *Identity Leadership Inventory* (the *ILI*) — with the aim of providing a more comprehensive and firmer basis for future investigations of the various dimensions of leadership as a social identity process. This centers on the assessment of the four dimensions of identity leadership — represented schematically in Figure 1 — that we have been discussing. However, before continuing, it is useful to clarify these in more detail.

**Figure 1.** A four-dimensional model of social identity management comprising identity prototypicality, advancement, entrepreneurship, and impresarioship.



## 1.2.1 Identity prototypicality: Being one of us

As observed above, the measures of prototypicality that have been deployed in previous research do not always map clearly onto the theoretical specifications of self-categorization theory (Turner, 1985), in part because the measures often speak to a leader's 'similarity' or 'averageness' rather than their 'specialness'. For instance, the (arguably most) widely used measures developed by Platow and van Knippenberg (2001) and van Knippenberg and van Knippenberg (2005) include several items that are ambiguous in this sense (e.g., "This leader is a good example of the kind of people that are members of [this group]"; "This leader has a lot in common with the members [of this group]"; "This leader stands for what people [in this group] have in common"; "This leader is very similar to most people [in this group]"). This is potentially problematic because, as well as contributing to measurement inaccuracy, such usage can promote a mistaken belief that a leader's prototypicality (or representativeness) is independent of, or indeed excludes, his or her capacity to be an *exemplary* group member (e.g., by embodying a shared vision; for discussions along these lines see Halevy, Berson, & Galinsky, 2011; Hogg et al., 2012).

In the present research we thus define — and will attempt to assess — prototypicality as follows:

Representing the unique qualities that define the group and what it means to be a member of this group. Embodying those core attributes of the group that make this group special as well as distinct from other groups. Being an exemplary and model member of the group.

#### 1.2.2 Identity advancement: Doing it for us

Although leaders will generally be more effective to the extent that they are seen to be 'one of us', they also need to 'do it for us' by promoting the shared interests of the group that they are leading (Haslam & Platow, 2001; Haslam et al., 2001; for a review see Haslam et al., 2011). In these terms, it has been argued and empirically demonstrated that leaders are more effective to the extent that they are seen to be acting as *ingroup champions*; that is, if they are seen to be acting in ways that serve their ingroup's interests, rather than their personal interests or those of other outgroups (e.g., Duck & Fielding, 2003; Giessner, van Knippenberg, van Ginkel, & Sleebos, 2013; Haslam et al., 2001; Jetten, Duck, Terry, & O'Brien, 2002; van Dick, Hirst, Grojean, & Wieseke, 2007; van Knippenberg & van Knippenberg, 2005). Here it is worth pointing out that behaving in ways that advance shared

group interests and ambitions is clearly not the same as being seen as prototypical of the ingroup (Halevy et al., 2011; van Vugt, Hogan, & Kaiser, 2008): a leader who is working to promote our collective interests and goals need not be a prototypical member of the group, just as a leader who is seen to be 'one of us' may not act in ways that promote core group interests (see also Hogg & van Knippenberg, 2003). Yet while this concept of leaders' identity advancement has received some research attention in the social identity tradition (albeit far less than prototypicality), research has typically focused on manipulating leaders' identity advancement rather than on assessing the extent to which leaders are actually seen to be 'doing it for us'.

In this context it is also worth noting that the importance of leaders' promotion of collective (rather than personalized) interests has been recognized to be important by other theoretical approaches to leadership (Bass & Riggio, 2006; Shamir, House, & Arthur, 1993). Yet, as a point of difference, these have tended to appraise leaders' actions with reference to generic higher-order entities (e.g., transcending 'self-interests' by promoting those of other individuals, humans as a whole) rather than with reference to the interests of a particular contextually salient ingroup. Moreover, and counteracting common misconceptions, it is important to note that advancing shared ingroup interests does not necessarily involve derogating outgroups or treating these unfairly. This is because, ultimately, the particular forms of group behavior that an ingroup values and encourages are shaped by the content of its shared identity and its relationship with other groups (e.g., as members of Red Cross, the more we advance our collective interests, the more we help people in need; Jetten, Spears, & Manstead, 1996). At the same time, leaders clearly fail to be seen as ingroup champions to the degree that they are seen to advance either (a) the interests of another group (e.g., when a national leader is seen to advance the interests of their party rather than those of the nation) or (b) their personal self-interest.

From a social identity perspective, identity advancement of a collective identity on the part of leaders is, therefore, an important dimension to assess in its own right, and based on the range of meanings discussed by Haslam et al. (2011), we can do this with reference to the following definition:

Advancing and promoting core interests of the group. Standing up for, and if threatened defending, group interests (and not personal interests or those of other groups). Championing concerns and ambitions that are key to the group as a whole. Contributing to the realization of group goals. Acting to prevent group failures and to overcome obstacles to the achievement of group objectives.

#### 1.2.3 Identity entrepreneurship: Crafting a sense of us

Whereas a leader's prototypicality for a particular group has often been treated as more or less given, research by Reicher, Hopkins, and colleagues has argued that the construction of shared identity and associated notions of prototypicality are both negotiable and actively constructed by leaders (Hopkins & Reicher, 1997; Reicher et al., 2005; Reicher & Hopkins, 1996a; 1996b; 2001; 2003). Amongst other things, then, leaders actively develop their own prototypicality as a function of their success in defining values, norms, and ideals that give a group shared meaning for its members. Along these lines, at the most basic level, it has been argued and shown that unless followers have a sense that they are part of a common ingroup, leaders' efforts to try to mobilize their collective energies are likely to fail (Haslam & Reicher, 2007). It thus follows, as Reicher and Hopkins (2001) argue, that leaders routinely need to act as *identity entrepreneurs* such that their words and deeds serve to craft a sense of shared identity among followers. More specifically, leaders need to work to create and maintain a coherent sense of 'we' and 'us' and also to define what 'us' means (and does not mean) for followers (Augoustinos & De Garis, 2012; Hogg & Giles, 2012; Klein & Licata, 2003; Seyranian & Bligh, 2008; Steffens & Haslam, 2013). Indeed, it has been argued that entrepreneurship involves different facets including leaders' efforts (a) to define the *boundaries* of an identity (who 'we' are, and are not) and thereby to make people feel part of the same group (or not) and (b) to define the *content* of an identity (what 'we' stand for, and do not), for example, by invoking particular contexts or comparisons in the present or past; Reicher et al.,  $2005)^2$ .

In line with recent discussions of this aspect of identity leadership (Haslam et al., 2011; Reicher et al., 2005), we thus define leaders' identity entrepreneurship as involving:

Bringing people together by creating a shared sense of 'we' and 'us' within the group. Making different people all feel that they are part of the same group and increasing cohesion and inclusiveness within the group. Clarifying people's understanding of what the group stands for (and what it does not stand for) by defining core values, norms, and ideals.

#### 1.2.4 Identity impresarioship: Making us matter

The previous three aspects of representing, advancing, and crafting shared social identities should all be important determinants of a leader's capacity to engage with group members. Ultimately, though, leaders also need to deliver concrete outcomes for the group and 'make us matter'. That is, they need to engage in activities and produce outcomes that allow group members to live out their group membership in meaningful ways. Refining insights from previous work which points to the importance of initiation of structure (Fleishman & Peters, 1962; see also Judge, Piccolo, & Ilies, 2004), this means that leaders need to create material realities that are consistent with, and serve to embed, a shared identity, thereby not just 'talking the talk' of 'us', but also 'walking the walk'.

As discussed in depth by Haslam and colleagues (2011), a critical way in which leaders achieve this is through acts of *identity impresarioship* (e.g., establishing structures, implementing practices, formalizing rituals, and organizing events) that serve to embed and naturalize a shared sense of 'us', thereby giving weight to the group's existence and making it matter in the world at large. Along these lines, impresarioship involves initiating group structures, practices, and activities that (a) are oriented to internal reality and allow group members to live out, and to derive meaning from, their group membership (e.g., a political meeting) and (b) are oriented to external reality and allow the group as a whole to be effective and successful and to have an impact on other groups and the world at large (e.g., a political demonstration).

Informed by these discussions, we can attempt to assess this fourth aspect of identity leadership as involving the following:

Developing structures, events, and activities that give weight to the group's existence and allow group members to live out their membership. Promoting structures that facilitate and embed shared understanding, coordination, and success (and not structures that divide or undermine the group). Providing a physical reality for the group by creating grouprelated material and delivering tangible group outcomes. Making the group matter by making it visible not only to group members but also to people outside the group.

#### **1.3 The Present Research**

To develop and validate the ILI, the present research centers on four studies. The first study involves the generation, refinement, and selection of scale items. The next three studies then seek to validate this instrument by examining its content, construct, and criterion validity in various contexts and with different groups. To keep the paper as short as possible, we provide only brief Introductions and Discussions for each study. However, we provide an integrated summary of the findings across all studies in the General Discussion. Our analysis concludes with a discussion of recommendations for the ILI's use and an outline of future research that might put this instrument to good use.

To enhance the ILI's content and construct validity, we followed guidelines prescribed by Gehlbach and Brinkworth (2011) for scale item creation and those laid out by Schriesheim and Cogliser (2009; see also Hinkin, 1998; Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993) as well as Kaplan and Saccuzzo (2009) for scale validation. The process of creating items involved a number of steps starting with a detailed review of the literature (along lines outlined above; see also Haslam et al., 2011). The research team then made suggestions for multiple items for each of the four dimensions before discussing and refining them further in several iterations. Afterwards, the items were presented to social and organizational psychologists to seek further feedback on their construct clarity and comprehensibility and refined further. Given that we placed particular emphasis on developing a clear theoretical foundation and followed commonly best practices in generating our items (Gehlbach & Brinkworth, 2011), we settled for 20 items that we sought to test with the aim of reducing these to no more than four items for each of the four sub-scales.

The 20 items that were examined in our initial study included four items for *prototypicality* (e.g., "This leader embodies what the group stands for"), six items for *advancement* (e.g., "This leader promotes the interests of members of the group"), five items for *entrepreneurship* (e.g., "This leader makes people feel as if they are part of the same group"), and five items for *impresarioship* (e.g., "This leader devises activities that bring the group together")<sup>3</sup>. For the sake of consistency, throughout the present paper we discuss these four dimensions and present corresponding results in this order. The full list of the final 15 ILI items that were ultimately shown to best represent the four dimensions are presented in Appendix A.

#### 2. Study 1: Item Generation and Content Validation

As indicated above, the first phase of ILI construction involved the research team generating 20 items to assess each of the four dimensions of identity leadership. The preliminary exploration of these involved asking a sample of non-expert participants to indicate the extent to which each item appeared to represent each dimension of identity leadership (following procedures recommended by Neider & Schriesheim, 2011; Schriesheim et al., 1993) and then using this feedback to refine the items further for use in subsequent phases of scale validation.

#### 2.1 Method

#### 2.1.1 Participants

Two-hundred-and-seventy-five participants from the US general population voluntarily took part in this online study for a small reimbursement after being recruited via AMAZON MTurk (Buhrmester, Kwang, & Gosling, 2011; Goodman, Cryder, & Cheema, 2013). Thirty-seven participants failed to respond appropriately to the two control questions (e.g., "This is a control question — please select 2") and were excluded from analysis, thereby reducing the final sample size to 238. Participants ranged in age from 18 to 72 years (M = 31.52, SD = 11.70) and 41% were female. Seventy-two percent were currently full-time employed and 17% had been employed in the last 12 months. Participants' average work experience was 11 years (SD = 9.22).

#### 2.1.2 Design and procedure

Participants were asked to carefully read the theoretical definitions for each of the four leadership dimensions of the social identity approach to leadership as specified above before assessing the extent to which each item was representative of the above definition of each of the four dimensions ("Please rate the extent to which each statement describes each dimension: 1. Being one of us; 2. Doing it for us; 3. Crafting a sense of us; and 4. Making us matter") using 7-point Likert scales ranging from 1 (*not at all representative*) to 7 (*completely representative*). To avoid order effects and to minimize inferences on the basis of the preceding items, items for each dimension were administered in alternating order (such that an entrepreneurship item was followed by a prototypicality item, then an advancement item, and then an impresarioship item; for a similar procedure, see Neider & Schriesheim, 2011).

## 2.1.3 Analysis

We first conducted one-way ANOVAs to examine whether (or not) participants rated a particular item as differentially representative of each the four dimensions. Significant results were subject to planned *t*-tests that examined whether a particular item was seen to be more representative of the theoretical dimension that it was designed for than of any alternative dimension (Hinkin & Schriesheim, 2008; Hinkin & Tracey, 1999). In this way, this procedure complements the theoretically guided item-creation phase with additional empirical scrutiny that assesses item dimensionality.

After this, we selected 16 items with the clearest item dimensionality to conduct an "extended data matrix" factor analysis (Schriesheim et al., 1993). For this analysis, the data were transformed into a matrix that represented the 16 ILI items in 16 columns while each participant's evaluations of the items in terms of the four leadership dimensions were represented in four separate rows (i.e., to evaluate all items in terms of prototypicality, advancement, entrepreneurship, impresarioship). As the sample included 238 participants, we thus ended up with a total of 952 rows (four rows per participant). The data was then analyzed by means of principal-axis factor analysis that examined unrotated and rotated factor solutions to test whether (or not), based on participants' judgments of the items' representativeness of each dimension, the items can be assigned to those underlying leadership dimensions that they were theoretically expected to load on (see Schriesheim et al., 1993).

#### 2.2 Results

Means, standard deviations, and results from one-way ANOVAs and planned *t*-tests are presented in Table 1. Analyses revealed that all items differed in the extent to which they captured the particular leadership dimensions (all F > 11, p < .001). More specifically, 16 of the 20 items matched the intended leadership dimension most strongly (i.e., more than any alternative dimension). The four remaining items also showed good correspondence with the intended dimensions. That is, planned *t*-test comparisons indicated that these four items mapped more clearly onto the theoretically intended dimension than two comparison dimensions but did not map more closely on the theoretically expected dimensions than one other dimension.

ILI Item and					One-way F-test	Planne	ed directi	onal <i>t</i> -
Scale	B Mean (SD)	D Mean (SD)	C Mean (SD)	M Mean (SD)	( <i>p</i> -value)	test	compari	sons
ILI 1 (B)	5.96 (1.29)	4.90 (1.69)	5.09 (1.54)	5.00 (1.69)	29.85 (.001)	B>D*	B>C*	B>M*
ILI 2 (D)	4.80 (1.58)	6.01 (1.29)	4.91 (1.63)	5.46 (1.52)	43.93 (.001)	D>B*	D>C*	D>M*
ILI 3 (C)	5.31 (1.58)	4.14 (1.79)	6.42 (0.77)	4.54 (1.80)	130.87 (.001)	C>B*	C>D*	C>M*
ILI 4 (M)	4.87 (1.68)	4.92 (1.64)	5.71 (1.50)	5.69 (1.45)	25.27 (.001)	$M > B^*$	M>D*	M>C
ILI 5 (B)	6.13 (1.25)	4.71 (1.69)	5.11 (1.49)	4.63 (1.73)	63.08 (.001)	B>D*	B>C*	B>M*
ILI 6 (D)	4.95 (1.58)	5.85 (1.37)	4.66 (1.64)	5.09 (1.66)	30.51 (.001)	D>B*	D>C*	D>M*
ILI 7 (C)	5.31 (1.58)	4.14 (1.79)	6.42 (0.77)	4.54 (1.80)	130.87 (.001)	C>B*	C>D*	C>M*
ILI 8 (M)	4.50 (1.58)	5.29 (1.51)	4.86 (1.57)	5.84 (1.36)	47.33 (.001)	$M > B^*$	$M > D^*$	$M>C^*$
ILI 9 (B)	6.23 (1.16)	4.74 (1.65)	5.02 (1.54)	4.45 (1.78)	90.09 (.001)	B>D*	B>C*	B>M*
ILI 10 (D)	5.25 (1.59)	6.33 (1.04)	4.92 (1.67)	5.19 (1.82)	56.81 (.001)	$D>B^*$	D>C*	B>M*
ILI 11 (C)	5.45 (1.55)	4.50 (1.70)	6.04 (1.25)	4.81 (1.70)	63.14 (.001)	C>B*	C>D*	C>M*
ILI 12 (M)	4.61 (1.59)	5.28 (1.59)	4.98 (1.70)	6.01 (1.25)	46.95 (.001)	$M > B^*$	$M > D^*$	M>C*
ILI 13 (B)	6.27 (1.22)	4.58 (1.71)	5.19 (1.70)	4.48 (1.68)	96.45 (.001)	B>D*	B>C*	B>M*
ILI 14 (D)	5.34 (1.47)	6.31 (1.13)	5.07 (1.63)	5.30 (1.61)	44.28 (.001)	$D>B^*$	D>C*	D>M*
ILI 15 (C)	4.94 (1.65)	4.71 (1.68)	5.68 (1.42)	4.77 (1.73)	27.76 (.001)	C>B*	C>D*	C>M*
ILI 16 (M)	5.08 (1.63)	5.94 (1.43)	5.29 (1.61)	6.03 (1.24)	35.17 (.001)	$M>B^*$	M>D	M>C*
ILI 17 (D)	5.00 (1.60)	6.03 (1.26)	4.94 (1.68)	5.43 (1.67)	34.45 (.001)	$D>B^*$	D>C*	D>M*
ILI 18 (C)	5.91 (1.40)	4.67 (1.63)	5.77 (1.30)	4.77 (1.66)	61.73 (.001)	C>B	$C>D^*$	C>M*
ILI 19 (M)	4.89 (1.56)	5.35 (1.57)	5.25 (1.62)	6.29 (1.17)	57.66 (.001)	$M > B^*$	M>D*	M>C*
ILI 20 (D)	5.01 (1.62)	5.64 (1.52)	5.41 (1.56)	5.60 (1.53)	11.48 (.001)	D>B*	D>C*	D>M

**Table 1.** Study 1: Results of ILI content validity ratings (showing mean ratings, ANOVAs, and planned directional t-test comparisons).

*Note.* p < .05. Ratings for all variables were indicated on Likert scales ranging from 1 (*not at all*) to 7 (*completely*). Abbreviations for the four dimensions are: Identity Prototypicality (B='Being one of us'); Identity Advancement (D='Doing it for us'); Identity Entrepreneurship (C='Crafting a sense of us'); Identity Impresarioship (M='Making us matter'). Items in bold match the theoretically intended dimension more clearly than all three other dimensions, whereas all remaining items match the theoretically intended dimension more clearly than two other dimensions.

In line with empirical evaluations, we then selected four items per dimension with the clearest item dimensionality (items with best item dimensionality are indicated in bold) and subjected these to an extended data matrix factor analysis (Schriesheim et al., 1993). First, this involved an examination of an unrotated principal-axis factor analysis of the 16 items to calculate the appropriate number of underlying dimensions. The eigenvalues (and explained variance) of the first eight factors were 5.78 (36.14%), 2.43 (15.12%), 1.77 (11.04%), .95 (5.95%), .70 (4.37%), .58 (3.62%), .55 (3.46%), and .45 (2.82%). Supporting the extraction of four dimensions, although the fourth factor had an eigenvalue of just less than one (i.e., .95), it explained more than 5% of the variance (i.e., 5.95%). Together, the first four factors explained 68.3% of the total variance.

To interpret the factor structure and item loadings, we then subjected these 16 items to a principal-axis factor analysis in which the four factors were orthogonally (varimax) rotated (as the four leadership dimensions are theoretically independent; see also Neider & Schriesheim, 2011; Schriesheim et al., 1993). Results are presented in Table 2. Findings indicate a clear factor structure such that the items that were theoretically expected to measure a particular dimension clearly loaded on the expected dimension (item communalities range between .34 and .75). All the item loadings on the theoretically consistent dimensions are above .46. Moreover, all item cross-loadings (on dimensions other than the principal dimension) are less than .40. In line with recommendations to use an item loading criterion of .40 (Ford, MacCallum, & Tait, 1986), the findings support the distinctiveness of the four leadership dimensions.

These findings provide evidence that on the whole participants were clearly able to assign items to the intended dimensions of identity leadership. Indeed, the factor structure and item loadings indicate a consistent pattern such that (a) items were assigned to dimensions with which they were theoretically consistent, (b) the four factors explained a significant amount (68%) of the variance, and (c) items loaded highly on the primary factor (all above .40) while showing negligible cross-loadings (all less than .40).

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ILI Item	Easter $1$ ( <b>D</b> )	Easter 2 (D)	Eastor 2 (M)	Easter $A(C)$	Item
and Scale	Factor I (B)	Factor 2 (D)	Factor 5 (IVI)	Factor 4 (C)	communality $(h^2)$
<i>ILI</i> 1 (B)	.64	.20	.05	.23	.51
<i>ILI</i> 2 (D)	.05	.64	.29	.05	.50
<i>ILI</i> 3 (C)	.22	.01	.01	.80	.68
ILI 4 (M)	.10	.09	.58	.35	.48
<i>ILI</i> 5 (B)	.69	.21	.06	.25	.59
<i>ILI</i> 6 (D)	.24	.67	.17	.09	.54
<i>ILI</i> 7 (C)	.21	.09	.19	.77	.68
<i>ILI</i> 8 (M)	.06	.29	.73	.07	.62
<i>ILI</i> 9 (B)	.83	.17	.06	.19	.75
<i>ILI</i> 10 (D)	.24	.76	.18	.03	.67
<i>ILI</i> 11 (C)	.36	.06	.23	.63	.58
<i>ILI</i> 12 (M)	.02	.21	.81	.07	.70
<i>ILI</i> 13 (B)	.76	.17	.08	.27	.68
<i>ILI</i> 14 (D)	.20	.71	.20	.07	.59
<i>ILI</i> 15 (C)	.31	.12	.18	.45	.34
<i>ILI</i> 16 (M)	.09	.23	.62	.12	.46
Eigenvalue	5 70	2.42	1 77	05	10.02
(% of variance	5.78	2.43	1.//	.95	10.93
explained)	(36.1%)	(15.1%)	(11%)	(5.9%)	(68.3%)

**Table 2.** Study 1: Results of ILI's content validity (showing rotated factors).

*Note*. Abbreviations for the four dimensions are: Identity Prototypicality (B='Being one of us'); Identity Advancement (D='Doing it for us'); Identity Entrepreneurship (C='Crafting a sense of us'); Identity Impresarioship (M='Making us matter'). Loadings > .40 are in bold.

### 2.3 Discussion

Study 1 tested the content validity of ILI items by assessing item dimensionality and factor structure. Results provide consistent support for the items' content validity in so far as the 16 selected items were understood to map clearly onto the four dimensions of identity leadership in anticipated ways. Furthermore, extended data matrix principal-axis factor analysis indicated that the four extracted factors were comprised of those four items that were expected to comprise a particular dimension (explaining more than two-thirds of the variance in ratings of construct representativeness). Item loadings also indicated that the four dimensions are distinct with high item loadings on the anticipated factor and low cross-loadings.
In sum, following the logic and recommendations presented by Gehlbach and Brinkworth (2011) as well as Schriesheim and colleagues (1993; Neider & Schriesheim, 2011), findings from this initial study provide empirical evidence for the ILI items' content validity and thereby a solid basis for further tests of the inventory's construct and criterion validity.

# 3. Study 2: Establishing Construct, Discriminant, and Criterion Validity

In our second study we sought to probe the ILI's validity further (Kaplan & Saccuzzo, 2009). The study had three key goals. The first of these was to establish construct validity by showing that the ILI has good factor structure, such that the four dimensions it identifies are meaningful and best treated as distinct. The second goal was to establish discriminant validity by showing that the ILI can be differentiated from authentic leadership — a theoretical tradition that places emphasis on leaders' understanding of their self and that has grown exponentially during the last few years (for a comprehensive review, see Gardner, Cogliser, Davis, & Dickens, 2011). With this in mind, we examined whether the ILI assesses a construct that is discriminant from that assessed by the ALQ — the current standard and most widely used measure of authentic leadership (Walumbwa et al., 2008). Beyond this, we aimed to establish whether the ILI can be differentiated from self-esteem (Robins, Hendin, & Trzesniewski, 2001), a core construct in psychology to which, theoretically, identity leadership should be unrelated (to examine whether the ILI is robust against general response bias). The third goal was to establish criterion validity by showing that the ILI nevertheless predicts relevant leadership outcomes (job satisfaction and social identification with the team).

Consistent with prior research that has found followers' job satisfaction to be associated with identity prototypicality (Pierro, Cicero, Bonaiuto, van Knippenberg, & Kruglanski, 2005), we expected our new and refined measurement of identity prototypicality to be related to job satisfaction. In addition, because followers respond more positively to their group's leader to the extent that they perceive her or him to be promoting shared group interests (Platow et al., 1997), we also expected followers to respond more positively to their own role and function within that group (in terms of job satisfaction) to the extent that their leader was seen to engage in identity advancement. At the same time, we expected that leaders' crafting of an identity would be most closely related to followers' social identification. This is because followers should come to internalize a group

membership to the extent that there is a shared appreciation of the group in the first place — and this in turn should be enhanced by leaders' efforts to bring group members together and to define the meaning and content of its identity (Reicher et al., 2005; Reicher & Hopkins, 2001; Smith, Amiot, Smith, Callan, & Terry, 2013). We would also note that although we had expectations about those dimensions that would play a pronounced role in particular outcomes (here and in further studies), we did not rule out the possibility that outcomes could also be related to dimensions other than those hypothesized. Yet, to keep the discussion of the results concerning the criterion validity as simple and short as possible (not least because our primary focus is on construct and discriminant validity; Schriesheim & Cogliser, 2009), we focus on discussing only those dimensions for which there was a strong theoretical basis.

## 3.1 Method

# 3.1.1 Participants

Six-hundred-and-ninety-nine participants with work experience were recruited online from the US general population to participate in this study for a small reimbursement (recruited via MTurk; Buhrmester et al., 2011; Goodman et al., 2013). Fifty-four participants who failed to answer the two control questions as instructed (e.g., "This is a control question — please tick 3") were excluded, reducing the total sample size to 645 (316 female, three missing data points). Participants ranged in age from 18 to 71 years (M =32.51; SD = 11.02), they had between one and 50 years of work experience (M = 12.90; SD= 10.05), and they had worked for up to 20 years with their current team leader (M = 3.22; SD = 2.95) in teams that ranged in size from two to 300 members (M = 11.84; SD = 20.67).

## 3.1.2 Design and procedure

Participants were asked to respond to questions relating to their workgroup or team as well as their job more generally. They responded to the 16 ILI items on 7-point Likert scales ranging from 1 (*not at all*) to 7 (*completely*). They also completed the 16 items of the *Authentic Leadership Questionnaire* (Walumbwa et al., 2008). These items assess subscales of (a) relational transparency (five items;  $\alpha = .87$ ), (b) internalized moral/ethical perspective (four items;  $\alpha = .89$ ), (c) balanced processing (three items;  $\alpha = .92$ ), and (d) selfawareness (four item;  $\alpha = .93$ ). Sample items include "My leader says exactly what he or she means" (transparency), "My leader makes difficult decisions based on high standards of ethical conduct" (internalized moral/ethical perspective), and "My leader knows when it is time to reevaluate his or her positions on important issues" (self-awareness). Item responses were made on scales ranging from 0 (*not at all*), 1 (*once in a while*), 2 (*sometimes*), 3 (*fairly often*), to 4 (*frequently, if not always*).

After this, participants responded on 7-point Likert scales ranging from 1 (*not at all*) to 7 (*completely*) to (a) the *Single-Item Self-Esteem Scale* (Robins et al., 2001, "I have high self-esteem"), (b) four items assessing *workgroup identification* ( $\alpha = .92$ ; based on Postmes, Haslam, & Jans, 2013; e.g., "I identify with this group"; "Being a member of this group is an important part of how I see myself"), and (c) four items assessing *job satisfaction* ( $\alpha = .87$ ; based on the *Job Satisfaction Survey*; Spector, 1985; e.g., "I like doing the things I do at work"; "My job is enjoyable").

#### 3.2 Results

# 3.2.1 Confirmatory factor analyses with ILI items

We conducted confirmatory factor analyses (CFAs) to assess the ILI's construct validity (as indicated by its internal item loadings and factor structure). An overview of the internal consistencies of the ILI's four dimensions and those for alternative leadership measures is presented in Table 3 (along with the results for Studies 3 and 4). At the same time, discriminant validity was assessed by examining the fit of a variety of competing models (differentiating identity from authentic leadership).

First, we subjected the ILI items to a CFA specifying (A) a 16-item one-factor model (which would suggest only one undifferentiated underlying identity leadership dimension), (B) a 16-item four-factor model with a second-order factor (which would suggest four distinct leadership dimensions loading on one superordinate 'identity' factor), and (C) a 16-item four-factor model (which would suggest four distinct identity leadership dimensions). Because inspection of the covariances and error terms of the ILI items indicated a high loading of item 16 ("This leader makes the group matter for its members") on identity entrepreneurship, we also tested the three analogous models omitting this item. We thus also specified (D) a 15-item one-factor model (which again would suggest only one undifferentiated underlying identity leadership dimension), (E) a 15-item four-factor model with a superordinate second-order factor (which would suggest four distinct leadership dimensions loading on one superordinate 'identity' factor), and (F) a 15-item four-factor model (which would suggest four distinct leadership dimensions).

	No. of items	Coe	efficient al	phas
Variable		Study 2	Study 3	Study 4
Identity Leadership Inventory				
Identity Prototypicality ('Being one of us')	4	.96	.96	.91
Identity Advancement ('Doing it for us')	4	.95	.94	.89
Identity Entrepreneurship ('Crafting a sense of us')	4	.95	.96	.88
Identity Impresarioship ('Making us matter')	3	.94	.94	.92
Authentic Leadership Questionnaire				
Self-Awareness	4	.93		
Relational Transparency	5	.87		
Internalized Moral Perspective	4	.89		
Balanced Processing	3	.92		
Idealized Influence	4		.95	
Perceived Quality of Leader	5			.83

**Table 3.** Internal consistency reliabilities of ILI dimensions and additional leadership constructsmeasured in Studies 2, 3, and 4.

Results are presented in Table 4. Because a model's fit cannot be determined by a single fit index but should be interpreted by inspecting a constellation of multiple fit indices (Cheung & Rensvold, 2002), we analyzed the following fit indices: standardized root mean square residuals (SRMR), root mean square error of approximation (RMSEA), comparative fit (CFI), and non-normed fit (NNFI). Moreover, we also employed chi-square difference tests to compare competing models by examining differences in chi-square per degree of freedom. We should also note that although allowing error terms to correlate enhances the fit indices for a particular model, this practice does not change the factor structure and thus in this and all subsequent studies we refrain from this practice in the interest of presenting clear and interpretable results.

a) ILI Items	A: 16-item one- factor model	B: 16-item four- factor model with second-order factor	C: 16-item four- factor model	D: 15-iten factor m	n one- E: 15-item four- odel factor model with second-order factor	F: 15-item four- factor model <sup>*</sup>
Degrees of freedom	104	100	98	90	86	84
Chi-square	1836.37	862.59	838.11	1686.	53 443.38	430.54
Std. RMR	.040	.040	.037	.041	.033	.033
RMSEA	.16	.11	.11	.11	.08	.08
RMSEA CIs	[.154, .167]	[.10, .12]	[.10, .12]	[.16, .1	[.07, .09]	[.07, .09]
CFI	.88	.95	.95	.88	.97	.97
NNFI	.87	.94	.94	.87	.97	.97
b) ILI and ALQ Items	G: 31-item one-facto model	or H: 31-item tw correlated-fac model (one fac each for ILI a ALQ)	tor I: 31-item tor model (or ctor ILI and f nd for A	five-factor he factor for our factors ALQ)	J: 31-item five-factor model (four factors for ILI and one factor for ALQ)	K: 31-item eight- correlated-factor model <sup>*</sup>
Degrees of freedom	434	433	4	-24	424	406
Chi-square	4044.87	3079.93	282	29.08	1815.83	1531.83
Std. RMR	.046	.035	.(	)34	.035	.034
RMSEA	.11	.10		09	.07	.07
RMSEA CIs	[.11, .12]	[.09, .10]	[.09	, .09]	[.07, .08]	[.06, .07]
CFI	.85	.89		90	.94	.95
NNFI	.83	.87		88	.93	.94

**Table 4.** Study 2: CFA results for item sets containing (a) ILI items and (b) ILI and ALQ items

*Note.* \*best-fitting model; none of the models specified correlated error terms.

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Overall, the fit indices yielded good fit to the data of Models E and F. Here, we should note that while some fit indices showed good fit, other indices showed marginal fit (i.e., chi-square and RMSEA). Because of the particular strengths and limitations of each fit index and in line with previous recommendations (Chen, Curran, Bollen, Kirby, & Paxton, 2008; Marsh, Hau, & Wen, 2004), we do not interpret global model fit with regard to an universal fixed cut-off value of a particular index but rather use such values as general rules of thumbs and interpret global model fit on the basis of the constellation of values associated with multiple indices (as well as by contrasting fit of alternative models). Altogether, overall model fit of model F was satisfactory and the chi-square difference test showed that Model F had a significantly better fit than Model E ( $\Delta \chi^2 / \Delta df = 12.84/2$ , p < .001). Moreover, testing Model E and F against the competing models indicated a significantly better fit to the data of these models than any other model (all  $\Delta \chi^2 / \Delta df$ , p < .001). In light of this empirical evidence, we therefore omitted item 16 from all further analyses.

Table 5 displays item loadings on the relevant factors for all items of Model F as well as intercorrelations between the factors. All items load highly on the specified factors, with correlations ranging from .84 to .96. At the same time, the intercorrelations between the four factors are relatively high (ranging from .78 to .88) and suggest that participants treated the different dimensions of their leaders as having significant overlap. Nevertheless, and aside from the fact that many multidimensional leadership inventories, such as the recently developed ALI, in which sub-dimensions generally show intercorrelations above .80 (Neider & Schriesheim, 2011), the CFA results provide stronger support for a four-factor model that discriminates between the four dimensions than for an undifferentiated one-factor model. In this way, these findings confirm the ILI's content validity and suggest that it is appropriate to treat the four leadership dimensions as distinct rather than as one undifferentiated conglomerate (along the lines of Neider & Schriesheim's, 2011, discussion of the ALI).

		a) Item lo	oadings	
Item	Factor 1	Factor 2	Factor 3	Factor 4
1 (B)	.96			
2 (B)	.95			
3 (B)	.89			
4 (B)	.92			
5 (D)		.94		
6 (D)		.91		
7 (D)		.89		
8 (D)		.92		
9 (C)			.84	
10 (C)			.93	
11 (C)			.94	
12 (C)			.89	
13 (M)				.88
14 (M)				.93
15 (M)				.93
		b) Factor inter	correlations	
Factor	1	2	3	4
1	1.00			
2	.88	1.00		
3	.87	.88	1.00	
4	.79	.78	.82	1.00

**Table 5.** Study 2: Standardized CFA results displaying (a) item loadings and (b) factor intercorrelations

*Note.* Abbreviations for the four dimensions are: Identity Prototypicality (B='Being one of us'); Identity Advancement (D='Doing it for us'); Identity Entrepreneurship (C='Crafting a sense of us'); Identity Impresarioship (M='Making us matter'). Loadings > .40 are in bold.

## 3.2.2 Confirmatory factor analyses with ILI and ALQ items

As a next step, we conducted further CFAs with these 15 ILI items and the 16 ALQ items to test whether (or not) the four ILI dimensions capture a construct that is distinct from those constructs measured by the four ALQ dimensions. We specified competing models that included (G) a 31-item one-factor model (which would suggest poor discriminant validity because all items would only measure one superordinate 'leadership' factor), (H) a 31-item two-correlated factor model with the 15 ILI items loading on one 'identity leadership factor' and the 16 ALQ items loading on one 'authentic leadership factor' (which would suggest poor content validity of both measures as only their superordinate factors would be supported), (I) a five-factor model with the 15 ILI items loading on one 'identity leadership factor' and the 16 ALQ items loading on the differentiated four dimensions of authentic leadership (which would suggest discriminant validity of the ILI from the ALQ but no internal differentiation of the four ILI dimensions), (J) a five-factor model with the 16 ALQ items loading on one 'authentic leadership factor' and the 15 ILI items loading on the four differentiated identity leadership dimensions (which would suggest discriminant validity of the ILI from the ALQ but no internal differentiation of the ALQ's four dimensions), and (K) an eight-correlated-factor model that includes the four ILI dimensions as well as the four ALQ dimensions (which would suggest discriminant validity of the ILI from the ALQ while differentiating each scale's four dimensions). Results of the competing models are presented in Table 4. The fit indices indicate good fit of the data to Models J and K. However, overall, Model K, which specified 4 sub-dimensions in each of the two inventories, fitted the data best. Moreover, a chi-square difference test indicated that this model had significantly better fit to the data than any competing model (all  $\Delta \chi^2 / \Delta df$ , p < .001).

#### 3.2.3 Bivariate correlations between ILI dimensions and dependent variables

To explore issues of discriminant validity further, next we examined the relationship between the four ILI dimensions and self-esteem. Intercorrelations between the four identity leadership dimensions, self-esteem, and the dependent variables are presented in Table 6. In line with expectations, these correlations indicated that the relationship between each identity leadership dimension and self-esteem was only weak (between r = .11 for prototypicality and r = .15 for impresarioship).

**Table 6.** Study 2: Results displaying (a) means, standard deviations, and intercorrelations between ILI dimensions and outcome variables and (b) multiple linear regression coefficients for ILI dimensions predicting dependent variables

a) Means, standard deviations and intercorrelations between ILI dimensions and outcome variables										
Variable	Mean	SD	1	2	3	4	5	6	7	
1. Identity Prototypicality	4.87	1.82	-							
2. Identity Advancement	4.76	1.82	.88	-						
3. Identity Entrepreneurship	4.73	1.68	.87	.88	-					
4. Identity Impresarioship	4.37	1.81	.79	.78	.82	-				
5. Self-esteem	4.60	1.60	.11	.14	.13	.15	-			
6. Job Satisfaction	4.80	1.53	.58	.58	.57	.52	.28	-		
7. Team Identification	4.93	1.49	.50	.47	.52	.48	.19	.66	-	

b) Multiple linear regression coefficients for ILI dimensions predicting dependent variables

ILI Dimension	В	<i>S.E</i> .	Beta	<i>t</i> -value							
<i>Job satisfaction</i> ( $R^2 = .37$ ; <i>F</i> [4,640] = 92.26, <i>p</i> < .001)											
Identity Prototypicality	.205	.063	.244	3.25**							
Identity Advancement	.204	.063	.243	3.25**							
Identity Entrepreneurship	.079	.071	.087	1.11							
Identity Impresarioship	.055	.049	.064	1.12							
Team identification ( $R^2 = .29$ ; $F[4$	4,640] = 63.90, p	<i>o</i> <.001)									
Identity Prototypicality	.152	.065	.186	$2.34^{*}$							
Identity Advancement	066	.065	080	-1.01							
Identity Entrepreneurship	.271	.073	.305	3.70***							
Identity Impresarioship	.123	.050	.149	$2.45^{*}$							

*Note.* All intercorrelations are statistically significant at p < .01; for linear regression results:  $p^* < .05$ .  $p^* < .01$ ; Ratings for all variables were indicated on Likert scales ranging from 1 (*not at all*) to 7 (*completely*).

# 3.2.4 Regression analyses examining criterion validity

In a final stage of analysis, we examined the relationship between the four ILI dimensions and the dependent variables. The correlations presented in Table 6 indicate that all four dimensions were positively correlated with job satisfaction and team identification. We then conducted linear regressions predicting each of the criteria, where discriminant validity as well as the usefulness of individual dimensions should be indicated by different patterns in 'predicting' each dependent variable (while controlling for each other; in line

with procedures followed by Neider & Schriesheim, 2011). Moreover, we refrain from contrasting the ILI with other measures (here ALQ) in predicting outcomes (consistent with Neider & Schriesheim, 2011) because our focus is on construct and discriminant (rather than incremental criterion) validity (Kaplan & Saccuzzo, 2009). Regression results are presented in the bottom half of Table 6. Supporting our hypotheses, team members showed greater job satisfaction as a function of increased leaders' identity prototypicality ( $\beta = .24, p$ < .001) and identity advancement ( $\beta = .24, p < .001$ ). However, job satisfaction was not predicted by identity entrepreneurship or identity impresarioship. Moreover, in support of our hypothesis, team members identified more strongly with the team to the extent that they perceived their leader to have engaged in the process of crafting a sense of shared identity ( $\beta = .31, p < .001$ ). At the same time, team identification was unrelated to identity advancement but positively related to identity prototypicality ( $\beta = .19, p = .02$ ) and identity impresarioship ( $\beta = .15, p = .02$ ). These relationships between ILI dimensions and criteria were unaffected when controlling for self-esteem, thereby providing support for the scale's concurrent validity.

# 3.3 Discussion

Study 2 examined the ILI's construct, discriminant, and criterion validity. Overall, CFA results indicated that the model with 15 items and four distinct factors had good fit to the data and significantly better fit than competing models. These patterns provide evidence of the ILI's construct validity and are consistent with findings from Study 1. Moreover, the inventory's discriminant validity was supported by CFA findings indicating (a) significantly better fit for an eight-factor model specifying all ILI and ALQ dimensions than any competing model with fewer factors and (b) a weak and negligible relationship of the four identity dimensions with self-esteem (which also did not affect relationships with outcomes). Finally, supporting hypotheses and providing evidence for criterion validity, the four identity leadership dimensions also differentially predicted relevant outcomes job satisfaction and team identification.

Given that the present participants were recruited online and largely from a single (Western) country, there was clearly value in seeking to confirm the instrument's construct and criterion validity within a different population. With this goal in mind, Study 3 was conducted with research participants from mainland China.

# 4. Study 3: Confirming Construct, Discriminant, and Criterion Validity

As in Study 2, we sought first to test further the ILI's construct validity by examining whether the ILI is best treated uniformly in terms of a single-construct or in terms of its four distinct identity leadership dimensions. Second, we aimed to provide a more expansive test of the scale's discriminant validity by testing whether the ILI is also distinguishable from leaders' *charisma* (as indicated in their idealized influence; Bass & Riggio, 2006), a construct which has inspired and continues to inform a great deal of contemporary leadership research in psychology, management, and the human sciences more broadly (DeRue, Nahrgang, Wellman, & Humphrey, 2011; Rees, 2012). Consistent with Study 2, to explore issues of discriminant validity further we also sought to investigate whether or not the scale correlates with self-esteem (Robins et al., 2001), a construct to which it should be theoretically unrelated.

Third, elaborating upon the ILI's criterion validity, we aimed to examine its relationship to perceived *team support* (see Eisenberger, Huntington, Hutchison, & Sowa, 1986; Jetten, Haslam, & Haslam, 2012). Here we anticipated that group members would feel more supported by their team to the extent that they perceived their leaders to engage in a process of identity entrepreneurship (i.e., creating a shared sense of 'us'; Reicher et al., 2005). This was for at least two reasons. On the one hand, we know that people are more likely to *provide* social support to others who they categorize as 'ingroup' rather than 'outgroup' members (Levine, Prosser, Evans, & Reicher, 2005). Following from this, leaders' efforts to create a sense of shared ingroup identity among followers should in turn encourage followers to provide more support within the group (Haslam, Reicher, & Levine, 2012). On the other hand, people also *receive* more support and feel more supported to the extent that any support is perceived to originate from an ingroup rather than an outgroup source (Platow, Voudouris et al., 2007; van Dick & Haslam, 2012). Again, though, this sense of shared identity typically has to be cultivated in the first place through acts of identity entrepreneurship.

As well as this, the present study aimed to examine followers' *work engagement* as a key indicator of their motivation and well-being in the workplace (Bakker, Schaufeli, Leiter, & Taris, 2008; Ellemers et al., 2004; Schaufeli, Bakker, & Salanova, 2006). Here previous evidence suggests that employees show greater work engagement to the extent that the team as a whole (that arguably includes team members as well as leaders) engages in job crafting

by actively shaping the work environment (Tims, Bakker, Derks, & van Rhenen, 2013). By the same token, we anticipated that to the extent that leaders craft followers' work environment by embedding structures related to shared group membership then those followers would in turn be more engaged at work (Haslam et al., 2011). In sum, the present study was designed to extend Study 2 by broadening (a) the sample, (b) construct comparisons, and (c) relevant outcomes.

## 4.1 Method

# 4.1.1 Participants

We recruited 338 employees who worked for a large organization in the Chinese solar industry to participate in this study. Participants' age ranged from 19 to 63 years (M = 33.90; SD = 7.65) and 72% were male (23 missing data points). On average, employees had 11 years of work experience (SD = 7.11) and had worked for three years with their current team leader (SD = 1.46). Team size ranged from two to 450 members (M = 26.91; SD = 55.39).

## 4.1.2 Design and procedure

Participants were invited to participate in the current study by responding to a series of questions relating to their team leaders. All items and scales were translated by experts to Mandarin and then back translated into English (Brislin, 1970). As in Study 2, participants responded on 7-point Likert scales ranging from 1 (*not at all*) to 7 (*completely*) to the 15 ILI items<sup>4</sup>. Moreover, they also responded to four items assessing *leaders' idealized influence* ( $\alpha = .95$ ; based on Platow et al., 2006, and the MLQ; e.g., "This leader increases others' optimism for the future", "This leader gives people a sense of overall purpose"). Participants then responded on the same 7-point scales to the single-item *self-esteem* measure that was used in Study 2 (Robins et al., 2001) as well as six items assessing *perceived team support* ( $\alpha = .89$ ; based on Eisenberger et al., 1986; e.g., "This team really cares about my well-being"; "This team is willing to help me when I need a special favor"). Finally, participants completed the short nine-item version of the *Utrecht Work Engagement Scale* on scales ranging from 0 (*never*) to 6 (*always/every day*;  $\alpha = .91$ ; based on Schaufeli et al., 2006; e.g., "At my work, I feel strong and vigorous"; "I feel happy when I am working intensely").

### 4.2 Results

# 4.2.1 Confirmatory factor analyses with ILI items

We conducted a CFA testing different competing models identical to those described in Study 2. As can be seen from Table 7, Models B and C showed the best fit to the data. While Model C had good fit in terms of some indices, it had marginal fit in terms of other indices (i.e., chi-square and RMSEA). The conglomeration of all fit indices indicates that Model C had an overall satisfactory fit to the data. Moreover, fit for Model B and C was significantly better than the fit for competing Model A ( $\Delta \chi^2 / \Delta df$ , p < .001). Nevertheless, Model C had a significantly better fit than Model B ( $\Delta \chi^2 / \Delta df$  = 10.22/2, p = .01).

**Table 7.** Study 3: CFA results for item sets containing (a) ILI items and (b) ILI and idealized influence items

a) ILI Items	A: 15-item one- factor model	B: 15-item four-factor model with second-order factor	C: 15-item four-factor model <sup>*</sup>
Degrees of freedom	90	86	84
Chi-square	1069.73	407.19	396.97
Std. RMR	.051	.033	.031
RMSEA	.19	.11	.109
RMSEA CIs	[.18, .20]	[.10, .12]	[.10, .12]
CFI	.84	.95	.95
NNFI	.83	.93	.94
b) ILI and idealized influence Items	D: 19-item one- factor model	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence)	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)*
<i>b) ILI and idealized influence Items</i>	D: 19-item one- factor model 152	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence) 151	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)* 142
b) ILI and idealized influence Items Degrees of freedom Chi-square	D: 19-item one- factor model 152 1844.70	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence) 151 1248.57	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)* 142 556.07
b) ILI and idealized influence Items Degrees of freedom Chi-square Std. RMR	D: 19-item one- factor model 152 1844.70 .070	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence) 151 1248.57 .049	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)* 142 556.07 .032
b) ILI and idealized influence Items Degrees of freedom Chi-square Std. RMR RMSEA	D: 19-item one- factor model 152 1844.70 .070 .19	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence) 151 1248.57 .049 .16	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)* 142 556.07 .032 .099
b) ILI and idealized influence Items Degrees of freedom Chi-square Std. RMR RMSEA RMSEA CIS	D: 19-item one- factor model 152 1844.70 .070 .19 [.19, .20]	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence) 151 1248.57 .049 .16 [.15, .17]	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)* 142 556.07 .032 .099 [.09, .11]
b) ILI and idealized influence Items Degrees of freedom Chi-square Std. RMR RMSEA RMSEA CIS CFI	D: 19-item one- factor model 152 1844.70 .070 .19 [.19, .20] .78	E: 19-item two- correlated-factor model (one factor each for ILI and idealized influence) 151 1248.57 .049 .16 [.15, .17] .86	F: 19-item five-factor model (four factors for ILI and one factor for idealized influence)* 142 556.07 .032 .099 [.09, .11] .95

*Note.* \*best-fitting model; none of the models specified correlated error terms.

# The Identity Leadership Inventory

The standardized item loadings on the respective factors for Model C are presented in Table 8, revealing that the items loaded highly on their specified factor, varying between .83 and .96. The intercorrelations between the four dimensions were also high and varied between .73 and .88 suggesting that these have significant overlap. On the whole, then, because these CFA results indicate a better fit for the differentiated four-factor model than for the one-factor model and are also highly consistent with findings of Study 2, it would appear that the four dimensions are better conceptualized as separate constructs than as a single generic construct.

	a) Items loadings							
Item	Factor 1	Factor 2	Factor 3	Factor 4				
1 (B)	.91							
2 (B)	.94							
3 (B)	.96							
4 (B)	.89							
5 (D)		.88						
6 (D)		.93						
7 (D)		.90						
8 (D)		.83						
9 (C)			.89					
10 (C)			.95					
11 (C)			.95					
12 (C)			.90					
13 (M)				.86				
14 (M)				.94				
15 (M)				.94				
		b) Factor inter	rcorrelations					
Factor	1	2	3	4				
1	1.00							
2	.86	1.00						
3	.88	.87	1.00					
4	.73	.79	.78	1.00				

**Table 8.** Study 3: Standardized CFA results displaying (a) item loadings and (b) factor

 intercorrelations

*Note.* Abbreviations for the four dimensions are: Identity Prototypicality (B='Being one of us'); Identity Advancement (D='Doing it for us'); Identity Entrepreneurship (C='Crafting a sense of us'); Identity Impresarioship (M='Making us matter'). Loadings > .40 are in bold.

#### 4.2.2 Confirmatory factor analyses with ILI and idealized influence items

We examined whether identity leadership can be distinguished from leaders' idealized influence by testing competing models including (D) a 19-item one-factor model (collapsing all items assessing identity leadership and idealized influence into a single factor), (E) a 19-item two-factor model (collapsing the four identity dimensions into a single factor and differentiating it from idealized influence) and (F) a 19-item five-factor model (differentiating the four identity leadership dimensions from idealized influence). The results are presented in Table 7. These indicate that Models D and E have poor fit while Model F has a good fit to the data. Moreover, a chi-square difference test indicated that Model F fitted the data significantly better than either Model D or Model E (all  $\Delta \chi^2 / \Delta df$ , p < .001). By indicating that the four dimensions can and should be differentiated from idealized influence, results thus underscore the ILI's discriminant validity.

# 4.2.3 Bivariate correlations between ILI dimensions and dependent variables

Intercorrelations between the four dimensions of identity leadership and dependent variables are presented in Table 9. Speaking to the ILI's discriminant validity, the four identity dimensions show weak or no relationships with the theoretically unrelated construct of self-esteem (with correlations ranging from r = .10 to r = .20 for advancement and entrepreneurship, respectively). Consistent with Study 2, this analysis therefore provides further evidence of the instrument's discriminant validity.

**Table 9.** Study 3: Results displaying (a) means, standard deviations, and intercorrelations between ILI dimensions and outcome variables and (b) and (b) multiple linear regression coefficients for ILI dimensions predicting dependent variables

a) Means, standard deviations and intercorrelations between ILI dimensions and outcome variables										
Variable	Mean	SD	1	2	3	4	5	6	7	
1. Identity Prototypicality	5.32	1.45	-							
2. Identity Advancement	5.24	1.47	.86**	-						
3. Identity Entrepreneurship	5.20	1.49	.88**	.87**	-					
4. Identity Impresarioship	4.85	1.54	.73**	.79**	$.78^{**}$	-				
5. Self-esteem	5.80	1.10	.16**	.10	.20***	.11	-			
6. Perceived Team Support	5.06	1.16	.58**	.57**	.65**	.55**	.31**	-		
7. Work Engagement	4.37	1.10	.46**	.44**	.49**	.46**	.28**	.47**	-	

ILI Dimension	В	S.E.	Beta	<i>t</i> -value						
Perceived Team Support ( $R^2 = .43$ ; $F[4,290] = 42.72$ , $p < .001$ )										
Identity Prototypicality	036	.084	044	43						
Identity Advancement	.036	.083	.044	.43						
Identity Entrepreneurship	.420	.084	.528	4.99**						
Identity Impresarioship	.119	.058	.157	$2.04^{*}$						
Work Engagement ( $R^2 = .26$ ; $F[$	4,290] = 24.63,	<i>p</i> <.001)								
Identity Prototypicality	.078	.091	.101	.86						
Identity Advancement	082	.094	109	88						
Identity Entrepreneurship	.205	.093	.272	$2.20^{*}$						
Identity Impresarioship	.194	.064	.273	3.05**						

b) Multiple linear regression coefficients for ILI dimensions predicting dependent variables

*Note.* p < .05. p < .05. p < .01. Ratings for all variables were indicated on Likert scales ranging from 1 (*not at all*) to 7 (*completely*) other than for work engagement which were indicated on scales ranging from 0 (*never*) to 6 (*always/every day*). Degrees of freedom are reduced due to missing data.

# 4.2.4 Regression analyses examining criterion validity

The results of linear regression analyses are presented in the bottom half of Table 9. Supporting our core hypotheses, when predicting perceived team support, this analysis pointed to the significant impact of leaders' perceived identity entrepreneurship ( $\beta = .53$ , p = .001), while there was no effect for their identity prototypicality or identity advancement (both  $\beta < .05$ , p > .05). At the same time, it also pointed to the significant impact of leaders' identity impresarioship ( $\beta = .16$ , p = .04; although this relationship was weaker than in the case of identity entrepreneurship).

When predicting respondents' work engagement, analysis also supported our hypotheses in pointing to the significant impact of leaders' identity impresarioship ( $\beta = .27$ , p = .003). Moreover, the effects of leaders' perceived identity prototypicality and identity advancement were both non-significant (both  $\beta < .11$ , p > .05), while the effect of identity entrepreneurship was significant ( $\beta = .27$ , p = .003). These results were largely unaffected when controlling for self-esteem (the only difference being that the impact of identity impresarioship on perceived team support became marginally significant). Overall, these findings thus provide further confirmation of the ILI's criterion validity.

### 4.3 Discussion

Beyond findings of Study 2, Study 3's main findings provide further support for the ILI's construct validity (CFA results indicate that the four specified dimensions should be conceptualized as distinct factors rather than as a single undifferentiated factor), discriminant validity (the four dimensions are distinct from idealized influence and are weakly related or unrelated to the theoretically unrelated construct self-esteem), and criterion validity (the sub-dimensions are as expected differentially related to team support and work engagement). Together, Studies 2 and 3 thus provide solid evidence of the ILI's psychometric properties for samples of workers in manufacturing and service industries drawn from both North America and Asia.

### 5. Study 4: Establishing Domain Generalizability

As a final stage in our empirical analysis, in Study 4 we aimed to provide further evidence of the ILI's construct, discriminant, and criterion validity (Kaplan & Saccuzzo, 2009) by examining its properties in a very different leadership context — the domain of sport. To cover a broad range of sports we recruited players from basketball, soccer (football), volleyball, and handball teams and in each case respondents provided ratings of their team captain. Finally, complementing previous studies that had involved participants from North America and Asia, in this study we recruited participants from a European country (Belgium).

Assessing issues of discriminant validity, in this study we examined whether the four identity leadership dimensions can be distinguished from perceived quality of the captain in their role as leader (Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014). Assessing the scale's criterion validity, consistent with research that has shown that ingroup leaders — and those who are particularly representative of that group — are particularly capable of influencing followers (Abrams, Randsley de Moura, Marques, & Hutchison, 2008; Subasic, Reynolds, Turner, Veenstra, & Haslam, 2011; van Knippenberg, Lossie, & Wilke, 1994), we expected team members to perceive athlete leaders to be more influential to the extent that they were seen to embody shared group membership (i.e., be identity prototypical). Moreover, we expected that team members would be more confident about the team's prospect of winning to the extent that they saw their athlete leaders to be engaging in identity advancement by standing up for, and actively promoting, shared group interests. At the same time, we expected that they would perceive greater cohesion around

their shared task to the extent that they perceived their athlete leaders to engage in acts of identity impresarioship that serve to structure group activities around shared activities — thereby serving to embed the group in shared experience. Finally, consistent with Study 2, we expected team identification to be predicted primarily by leaders' identity entrepreneurship.

## 5.1 Method

#### 5.1.1 Participants

We recruited 421 players from basketball (31%), soccer (football) (31%), volleyball (19%), and handball (19%) teams in Belgium. Participants' age ranged from 14 to 64 years (M = 24.46; SD = 7.18) and 44% were female. They had been playing for their current team for between one and 46 years (M = 6.34; SD = 6.34).

#### 5.1.2 Design and procedure

Participants indicated their perceptions of their team and its corresponding team captain. All items and scales were translated by experts to Dutch (the language in which the study was administered) before being back translated into English (Brislin, 1970). Participants responded on 7-point Likert scales ranging from 1 (not at all) to 7 (completely) to ILI items as well as to items assessing perceived quality of the captain in the role as *leader* ( $\alpha = .83$ ; five items after Fransen et al., 2014; "How well does the captain fulfill the role of team captain in general/task leader/motivational leader on the field/social leader off the field/external leader"). Moreover, they responded to items assessing (a) team *identification* ( $\alpha = .91$ ; five items based on Doosje, Ellemers, & Spears, 1995<sup>5</sup>; e.g., "I identify strongly with this team"; "I am very proud to be a member of this team"), (b) task cohesion ( $\alpha = .86$ ; five items based on Eys, Carron, Bray, & Brawley, 2007; e.g., "We all take responsibility for any loss or poor performance"; "Our team members communicate freely about each athlete's responsibilities during competition or practice"), (c) team *confidence* (two items; r = .84; "I believe that our team will succeed this season to achieve our goals"; "Our team believes that we will succeed this season in achieving our goals"), and (d) *perceived leader influence* (the single item "When the team captain clearly indicates during a game that he/she believes that our team will win, I also believe more strongly that our team will win"). Participants then provided demographic data and were debriefed.

# 5.2 Results

# 5.2.1 Confirmatory factor analyses with ILI items

We examined different competing models that were identical to those examined in previous studies. As presented in Table 10, CFA results indicate that Models B and C that distinguished between the four identity leadership dimensions (with or without a second-order factor, respectively) showed reasonably good fit to the data.

**Table 10.** Study 4: CFA results for item sets containing (a) ILI items and (b) ILI and perceived
 *leader quality items*

a) ILI Items	A: 15-item one- factor model	B: 15-item four-factor model with second-order	C: 15-item four-factor model <sup>*</sup>
		factor*	
Degrees of freedom	90	86	84
Chi-square	1098.53	368.86	363.89
Std. RMR	.073	.049	.048
RMSEA	.17	.09	.09
RMSEA CIs	[.16, .18]	[.08, .10]	[.08, .10]
CFI	.80	.94	.94
NNFI	.78	.93	.93
b) ILI and perceived	D: 20-item one-	E: 20-item two-correlated-	F: 20-item five-factor model
leader quality	factor model	factor model (one factor	(four factors for ILI and one
items		each for ILI and perceived	factor for perceived leader
		leader quality)	quality)*
Degrees of freedom	170	160	160
Chi-square	1437.44	1337.87	641.98
Std. RMR	.069	.065	.051
RMSEA	.14	.14	.09
RMSEA CIs	[.14, .15]	[.13, .14]	[.08, .10]
CFI	.77	.80	.90
NNFI	.76	.78	.92

*Note.*<sup>\*</sup> best-fitting models; none of the models specified correlated error terms.

Model C showed good fit to the data with regard to some indices, while it showed marginal-to-good fit with regard to others (i.e., chi-square, RMSEA, and CFI). On the whole, the constellation of values associated with all fit indices indicates that the overall fit of Model C was satisfactory. Moreover, a chi-square difference test indicated that Model C

that did not specify a higher-order factor did not have better fit than Model B that specified such a higher-order factor ( $\Delta \chi^2 / \Delta df = 4.97/2$ , p = .08). Moreover, both models had significantly better fit than any of the competing models (including a one-factor model with an undifferentiated superordinate 'identity' factor; all  $\Delta \chi^2 / \Delta df$ , p < .001). Altogether, the findings thus support the scale's construct validity.

Table 11 displays the standardized item loadings on the respective factors on the basis of Model C. These indicate that the items load highly on their respective factors, with loadings ranging from .71 to .94.

		a) Item l	oadings	
Item	Factor 1	Factor 2	Factor 3	Factor 4
1 (B)	.77			
2 (B)	.81			
3 (B)	.92			
4 (B)	.88			
5 (D)		.78		
6 (D)		.87		
7 (D)		.88		
8 (D)		.77		
9 (C)			.84	
10 (C)			.94	
11 (C)			.84	
12 (C)			.71	
13 (M)				.90
14 (M)				.92
15 (M)				.86
		b) Factor inte	rcorrelations	
Factor	1	2	3	4
1	1.00			
2	.76	1.00		
3	.78	.75	1.00	
4	.64	.57	.67	1.00

 Table 11. Study 4: Standardized CFA results displaying (a) item loadings and (b) factor

 intercorrelations

*Note.* Abbreviations for the four dimensions are: Identity Prototypicality (B='Being one of us'); Identity Advancement (D='Doing it for us'); Identity Entrepreneurship (C='Crafting a sense of us'); Identity Impresarioship (M='Making us matter'). Loadings > .40 are in bold.

Moreover, the intercorrelations between the four factors are moderate to strong (between .57 and .78) suggesting that compared to the leaders in the previous samples, leaders in the current sample were seen to vary to a greater extent on the four dimensions. Together with the CFA results, and findings from Studies 2 and 3, these results provide evidence of the scale's construct validity — indicating that the four identity leadership dimensions should be treated as four differentiated constructs rather than as one undifferentiated dimension.

# 5.2.2 Confirmatory factor analyses with ILI and perceived leader quality items

Results of CFAs that explored whether identity leadership and perceived leader quality can and should be distinguished are shown in Table 10. Results indicate that Model F that differentiates the four identity leadership dimensions from perceived leader quality has an overall fit to the data that is satisfactory. Moreover, Model F has the best fit of all alternative models. In particular, it has better fit than both Model D (in which all ILI and perceived leader quality items load together) and Model H (in which two factors differentiate a superordinate 'identity' factor from perceived quality of the leader; all  $\Delta \chi^2 / \Delta df$ , p < .001). Supporting the scale's discriminant validity, findings thus indicate that the four identity dimensions are different from perceived leader quality.

#### 5.2.3 Regression analyses examining criterion validity

Table 12 displays intercorrelations between the ILI's four dimensions and dependent variables (as well as their means and standard deviations) and Table 13 regression analyses related to criterion validity. Consistent with findings from Study 2, results indicate that (a) perceived leader influence was predicted by identity prototypicality ( $\beta = .24$ , p = .003) and also by identity entrepreneurship ( $\beta = .24$ , p = .002) but not by the remaining dimensions, (b) team confidence was predicted by identity advancement ( $\beta = .19$ , p = .02) and also by identity impresarioship ( $\beta = .16$ , p = .02) but not by the other two dimensions, (c) team identification was significantly predicted by leader identity entrepreneurship ( $\beta = .28$ , p = .001) but not by the remaining dimensions, and (d) task cohesion was significantly predicted by identity entrepreneurship ( $\beta = .24$ , p = .003) but not by the other two dimensions. Altogether, these results thus provide consistent support for the ILI's criterion validity.

Variable	Mean	SD	1	2	3	4	5	6	7	8
1. Identity Prototypicality	5.01	1.17	-							
2. Identity Advancement	5.37	1.12	.76**	-						
3. Identity Entrepreneurship	4.94	1.15	.78**	.75**	-					
4. Identity Impresarioship	4.36	1.52	.64**	.57**	.67**	-				
5. Identification with Team	1.90	1.00	.37**	.32**	.40**	.29**	-			
6. Task Cohesion	6.44	1.34	.47**	.45**	.52**	.45**	.58**	-		
7. Team Confidence	1.58	1.38	.35**	.36**	.33**	.33**	.39**	.48**	-	
8. Perceived Leader Influence	1.83	1.21	.48**	.44**	.48**	.33**	.40**	.38**	.29**	-

**Table 12.** Study 4: Results displaying means, standard deviations, and intercorrelations betweenILI dimensions and outcome variables

*Note.* p < .05. p < .05. p < .01. Ratings for ILI items were indicated on Likert scales ranging from 1 (*not at all*) to 7 (*completely*); identification with team, team confidence, and perceived leader influence were indicated on scales ranging from -3 to +3; social cohesion was indicated on scales ranging from 1 to 9.

**Table 13.** Study 4: Results displaying multiple linear regression coefficients for ILI dimensionspredicting dependent variables

ILI Dimension	В	S.E.	Beta	<i>t</i> -value			
Perceived Leader Influence ( $R^2 = .26$ ; $F[4,380] = 33.08$ , $p < .001$ )							
Identity Prototypicality	.248	.085	.237	$2.97^{**}$			
Identity Advancement	.118	.083	.108	1.45			
Identity Entrepreneurship	.253	.275	.239	$2.99^{**}$			
Identity Impresarioship	035	.081	044	71			
<i>Team Confidence</i> ( $R^2 = .16$ ; $F[4,389] = 17.63$ , $p < .001$ )							
Identity Prototypicality	.106	.100	.090	1.06			
Identity Advancement	.229	.097	.186	$2.38^{*}$			
Identity Entrepreneurship	.021	.103	.017	.20			
Identity Impresarioship	.143	.059	.157	$2.41^{*}$			
Identification with Team ( $R^2 = .17$ ; F[4,389] = 19.34, p < .001)							
Identity Prototypicality	.121	.072	.141	1.68			
Identity Advancement	005	.069	006	07			
Identity Entrepreneurship	.243	.074	.280	3.29**			
Identity Impresarioship	.012	.042	.018	.29			

Task Cohesion ( $R^2 =$ .	30; F[4, 385] = 40.58	8, p <.001)			
Identity Prototypicality	.082	.089	.072	.93	
Identity Advancement	.087	.086	.072	1.01	
Identity Entrepreneurship	.346	.091	.297	3.79**	
Identity Impresarioship	.149	.052	.169	2.85**	

*Note.*  ${}^{*}p < .05$ .  ${}^{**}p < .01$ . Degrees of freedom vary due to missing data.

#### 5.3 Discussion

Augmenting the findings of the previous three studies, Study 4 provided additional tests of the ILI's validity in a different leadership context — namely, athlete leaders of sporting teams in Belgium. Together, the findings underline the inventory's construct validity (by indicating that the data fit best to a model that differentiates between the four identity leadership dimensions) and discriminant validity (by indicating that the four dimensions are distinct from perceived quality of the leader). Finally, the findings also support its criterion validity (by demonstrating the distinct relevance of different aspects of leaders' identity management to particular leadership outcomes). In this, the data encourage a differentiated appreciation (and assessment) of the different types of identity work that leaders perform (Haslam et al., 2011) — an appreciation that has been largely absent from the social identity research that has been conducted to date.

# 6. General Discussion

The present paper presented findings from four studies (Ns = 1730) conducted with samples from the United States, China, and Belgium that altogether provide consistent support for the ILI's content, construct, and criterion validity (Kaplan & Saccuzzo, 2009). Across the four studies, the instrument's content and construct validity is confirmed (a) by evidence of item and factor dimensionality indicating that the items reliably capture four distinct dimensions (in line with the theoretical definitions; Study 1; Schriesheim et al., 1993) and (b) by evidence of the internal consistency of each dimension (as signaled by high internal reliabilities in Studies 2, 3, and 4). Similarly, confirmatory factor analyses reveal that the four-factor model has satisfactory-to-good fit to the data and significantly better fit than a grand single-factor model that does not differentiate between the four dimensions (Studies 2, 3, and 4). Providing evidence of the scale's discriminant validity, we have also shown that identity leadership is distinguishable from (a) authentic leadership (Study 2; Gardner et al., 2011; Walumbwa et al., 2008), (b) leaders' idealized influence (Study 3; Bass & Riggio, 2006; Platow et al., 2006), and (c) perceived leader quality (Study 4; Fransen et al., 2014). Moreover, the four dimensions show weak or no relationships with the theoretically unrelated variable self-esteem (Studies 2 and 3), indicating that the scale's measurement is robust against general response bias.

Findings across Studies 2, 3, and 4 also speak to the criterion validity of the inventory by demonstrating that (a) leaders' identity prototypicality predicted team identification and job satisfaction (Study 2) as well as perceived leader influence (Study 4), (b) leaders' identity advancement predicted job satisfaction (Study 2) and team confidence (Study 4), (c) leaders' identity entrepreneurship predicted team members' team identification (Study 2 and 4), perceived team support, and work engagement (Study 3), as well as task cohesion and perceived leader influence (Study 4), while (d) leaders' identity impresarioship predicted team identification (Study 2), perceived team support, and work engagement (Study 3), as well as task cohesion and perceived team confidence (Study 4). In indicating that specific outcomes are predicted by different dimensions of identity leadership, these findings are consistent with theoretical predictions derived from recent theoretical analysis (e.g., as presented by Haslam et al., 2011). At the same time, it is apparent that some outcomes were related to more than one dimension (e.g., social identification was related to identity entrepreneurship and identity impresarioship) and that there were nuanced variations in the relationships across samples and contexts (e.g., social identification was not related to identity impresarioship in Study 4 with athlete leaders in sports). The reasons for this variation were not the central focus of the present research but they point to important contextual sensitivities that future research should explore programmatically.

#### 6.1 Theoretical and Practical Usefulness and Implications

The present research advances our theoretical and practical understanding of identity leadership in at least three important ways. First, prior theorizing on this topic had focused primarily on leader prototypicality while placing less emphasis on other equally important aspects of the social identity approach to leadership. Moreover, some of the research on leader prototypicality had relied on measures that were problematic to the extent that they assessed prototypicality simply in terms of 'being average' or 'similar' to other group members. Although in some circumstances this may be important, research suggests that rather than capturing averageness or maximal similarity to other group members, prototypicality is more likely to capture the ideal-type of what it means to be 'one of us' (Hogg et al., 2012; Steffens et al., 2013; van Knippenberg, 2011). This issue was addressed in the current scale by ensuring that items avoided reference to any suggestion that being prototypical is simply a question of being average, and instead focused on prototypicality as a matter of being exemplary (see also Bartel & Wiesenfeld, 2013; Turner, 1985). This is not to say, however, that we should ignore (or re-conduct) the wealth of previous work that has been conducted on leaders' identity prototypicality (because its measurement might have been more precise or because it examines only one of the four dimensions that we have identified). On the contrary, this prior work has enabled us to gain valuable and informative insights into the leadership process. Nevertheless, going beyond this, we believe that the present studies suggest that there is much more to learn about leadership from future research which moves beyond any sense that identity leadership is simply about identity prototypicality (e.g., see Halevy et al., 2011).

Second, the current inventory was developed to afford assessment of additional, more novel, aspects of leaders' identity work — specifically focusing on the degree to which leaders not only represent but also advance, craft, and embed a sense of shared social identity among followers (Haslam et al., 2011). By developing and validating scales that quantify group members' perceptions of leaders' achievements in these domains, the present research lays the foundations for new methodological and theoretical advancements. This is particularly important considering that previously researchers (a) have lacked refined measurements that might tap into leaders' embedding of identity-structure and their active advancement of shared ingroup interests (Haslam & Platow, 2001; Haslam et al., 2011; van Knippenberg & van Knippenberg, 2005), and (b) have tended to employ more or less exclusively qualitative methods in the assessment of leaders' identity entrepreneurship (Augoustinos & de Garis, 2012; Reicher & Hopkins, 2001, 2003; Reicher et al., 2005). This has meant that while qualitative analyses support claims that, beyond prototypicality, identity leadership involves additional elements of active mobilization and identity shaping (Elsbach & Kramer, 1996) these aspects had not entered mainstream leadership theory and research. On the basis of the present contribution it should be easier for researchers to map this landscape quantitatively in the process of uncovering when, why, and how these additional dimensions of identity leadership augment leaders' capacity to motivate followers to contribute to the achievement of group goals.

Third, the social identity approach to leadership originated out of a strong theoretical and experimental tradition (Haslam et al., 2011; Hogg et al., 2012; van Knippenberg, 2011) and to date the translation of this approach into practice — including the development, delivery, and testing of leadership training or interventions has been rather piecemeal (for a review see Avolio, Reichard, Hannah, Walumbwa, & Chan, 2009; but see Peters, Haslam, Ryan, & Steffens, 2014). A significant factor that has hampered efforts to use these insights for practical ends has been precisely our limited capacity to assess — and therefore provide 'hard' evidence for — the usefulness of the different dimensions of leaders' social identity management. This instrumentation void contrasts not only with the various scales that have been developed on the basis of other leadership theories and that have (to varying degrees) been provided with empirical validation but also with the various tools (e.g., Myers-Briggs type measurements) that have failed such tests. By allowing for the measurement of identity leadership not only as a representational issue (in terms of perceived identity prototypicality), but also as a rhetorical, practical, and structural issue (in terms of identity entrepreneurship, advancement, and impresarioship), the present inventory can be used to advance theory and practice that strives for a more comprehensive examination of the science and art of leaders' identity labor.

## 6.2 Limitations and Future Research

As we have seen, the full ILI scale (as set out in Appendix A) encompasses 15 items that distinguish between four different identity dimensions. Although future research may find these dimensions to be correlated with each other, we contend that this will not necessarily be the case. Instead the interrelationship between dimensions should be expected to vary (meaningfully) with context (e.g., interrelationships might be weaker in teams in which leaders' official roles are tied closely to particular tasks that map onto particular identity leadership dimensions). We therefore strongly recommend using the scale to examine separate dimensions of identity leadership rather than bundling these together in one global measure (consistent with CFA results from Studies 2 to 4). This practice will be more fruitful not only (a) from an empirical perspective (as the present findings suggest that even when the dimensions are correlated, the scale fits the data better when distinguishing between the dimensions rather than treating all dimensions in terms of a single

superordinate 'identity leadership' factor) but also (b) from a theoretical perspective by allowing more refined conclusions in terms of the role that these different elements play in the leadership process and in predicting relevant outcomes.

Here we should note too that some of the theoretically consistent models we tested showed good fit in terms of some fit indices while showing marginal fit in terms of others (having said this, they showed better fit than any alternative models). In any case, future research should further refine the ILI in order to enhance psychometric properties by developing, in particular, a fourth item stem for the measure of impresarioship (as scales with four rather than three items tend to show greater statistical support for separate factors and enhanced model fit; Hinkin & Tracey, 1999) as well as additional tools that can be useful in assessing these four dimensions (research that is currently underway; Steffens, Haslam, & Peters, 2014).

Moreover, to gain a better and more nuanced understanding of the relevance of the each of the four leadership dimensions, much more research is needed to assess the role that social and organization context plays in determining the importance of each dimension. For example, the need for identity advancement and identity entrepreneurship may vary as a function of both the type of group that is being led (e.g., political vs. recreational), and the particular point in time at which it is encountered (e.g., before or after an election). Similarly, it is possible that in particular intragroup and intergroup contexts, the various identity leadership dimensions may not only exert additive but also interactive effects in influencing particular outcomes (e.g., in some cases, identity entrepreneurship and prototypicality may be particularly effective if they go hand in hand). Such issues can only be explored through work with a far broader range groups, contexts, and leadership outcomes than the present work encompasses (Yukl, 2012).

We also recognize, though, that in some research endeavors, it will not be feasible or desirable to assess leadership using a tool that comprises 15 items (e.g., due to time restrictions or the nature of the issues that are being investigated; see Postmes et al., 2013). In such circumstances, we recommend using those four items listed in Appendix B that — across the studies here — typically showed the highest loadings on their respective factor (while ensuring high internal consistencies — with  $\alpha$ s in Study 2, 3 and 4 of .93, .92, and .85, respectively).

#### The Identity Leadership Inventory

Here it is also important to discuss when (and for which purposes) this inventory should *not* be used. In particular, although it may be tempting to imagine that engaging in these four aspects of identity leadership is a recipe for success, this is not necessarily the case. Instead, there are a range of necessary and sufficient conditions that modulate the effectiveness of any of these dimensions — not the least of which is some detailed appreciation of the group whose identity is to be crafted, advanced, represented and embedded (see Haslam, Eggins, & Reynolds, 2003; Haslam et al., 2011). In short, we would discourage potential users from seeing the four dimensions presented here as some kind of 'shopping list' that leaders simply need to evince in order to guarantee success. Most particularly, this is the case because we construe leadership as a dynamic, social-psychological process rather than as a matter of personal skills, traits, and attributes in the abstract.

Instead, researchers and practitioners intending to use the scale would be well advised to make themselves familiar with the broader context in which the scale is administered because this will contribute not only to its productive use but also to correct interpretation of its findings. For instance, in some organizational contexts it might be useful to be aware of, and first identify, those precise group memberships that matter to people in order to map the assessment of identity leadership onto those entities that are most relevant (e.g., by going through the process of Ascertaining Identity Resources (AIRing); Haslam et al., 2003). Appreciation of the wider social context should also be informative because the degree to which a leader is seen to engage in effective social identity management (i.e., motivating followers to contribute to group goals) is not set in stone but fluid and context-dependent (e.g., see Turner & Haslam, 2001). Thus, amongst other things, it is likely to depend on (a) the relationship of the leader with the group and with specific group members (e.g., high and low identifiers; Platow & van Knippenberg, 2001; van Dijke & De Cremer, 2008), (b) the comparative context (e.g., intragroup vs. intergroup; Platow, Grace, Wilson, Burton, & Wilson, 2008), and (c) the way in which identities are framed by other relevant organizational variables (e.g., gender; Eagly & Karau, 2002; Ryan, Haslam, Hersby, & Bongiorno, 2011). Indeed, we suggest that future research should investigate precisely these developmental and dynamic aspects of identity leadership (e.g., as argued by Haslam et al., 2011; Reicher et al., 2005), and in this regard, the utility of the ILI should derive precisely from its capacity to prove helpful in this endeavor.

Finally, in the present studies we relied on self-report data because this was necessary in the process of validating the scale in terms of its ability to meaningfully distinguish between followers' *perceptions* of the various facets of social identity management (and other measures). In order to develop a theoretically well-defined and accurate tool, construct and discriminant validity have been the focus here (Schriesheim & Cogliser, 2009). In this sense, common method bias may actually have provided a more conservative test of our ability to distinguish between the four dimensions of identity leadership. However, in order to enhance to the ILL's criterion validity, we see clear value in further research that would employ a multitude of methods (e.g., longitudinal design, self-other ratings, objective or behavioral outcomes) to refine and extend the observed relationships between the ILL's dimensions and relevant leadership outcomes.

## 6.3 Conclusion

The social identity approach to leadership has stimulated an important and exciting surge of research interest in recent years. Yet while this has served to advance a credible theory of leadership, to date the contribution of this work has been somewhat peripheral to the field as a whole. In part, this had been due to an overemphasis on leader prototypicality at the expense of other aspects of leaders' identity management. To address this lacuna, the present paper has expanded upon prior research and theory by developing and validating a novel instrument — the Identity Leadership Inventory (ILI) — that assesses the extent to which leaders not only represent but also create, advance, and embed a shared sense of 'us' (i.e., a shared social identity).

In this way, the ILI allows researchers and practitioners alike to assess and chart more richly the various ways in which leaders achieve influence by engaging with followers in ways that transform a psychology of 'you' and 'I' into a psychology of 'we' and 'us'. Going forward, we are excited about the prospect of empirical and theoretical projects that will employ this tool to furnish the field with a better, more detailed, and integrative understanding of these various facets of identity leadership as they are made manifest in leaders' and followers' efforts to work together to build the organizations and communities of the future.

# 7. Notes

1. Importantly, the present concept of leaders' identity prototypicality differs from leader prototypicality (or stereotypicality) developed within leader categorization theory (e.g., Lord & Brown, 2004; Lord, Foti, & de Vader, 1984) that refers to the extent to which a leader is seen to be representative of *leaders* in general (i.e., of the category of a leader rather than the particular group that a leader is leading).

2. Here, we would like to note that Reicher and colleagues (2005) have pointed out that leaders' identity entrepreneurship has implications for, and can also be used to enhance, their prototypicality. While this may be true in some cases, in the present definition of identity entrepreneurship, we merely focus on crafting and changing an identity without making any claims about the inferences that this has for the relationship between the leader to the group.

3. In order to enhance the clarity of the identity impresarioship dimension, these items relate primarily to the internal (rather than the external) process of allowing group members to live out their shared identity.

4. Participants in Study 3 as well as in Study 4 also responded to the item that was shown to have relatively poor properties in Study 2. Again, consistent with Study 2, inspection of the modification indices indicated that this item had a large error term and covariance with identity entrepreneurship in both studies. In the interests of parsimony, we thus focus on describing in detail only those results that relate to models that omit this item (as one would expect, all models that include this item showed poorer fit to the data).

5. We selected the present identification measure in Study 4 (and not the one we used in Study 2) because it was most likely to fit the current (sports) context and has been used successfully in previous studies in this setting. The present scale had a satisfactory internal consistency of above .90.

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## 9. Appendix A

## Identity Leadership Inventory (ILI) #

Identity Prototypicality: 'Being one of us'

- 1. This leader embodies what [the group] stands for.
- 2. This leader is representative of members of [the group].
- 3. \* This leader is a model member of [the group].
- 4. This leader exemplifies what it means to be a member of [the group].

Identity Advancement: 'Doing it for us'

- 5. This leader promotes the interests of members of [the group].
- 6. \* This leader acts as a champion for [the group].
- 7. This leader stands up for [the group].
- 8. When this leader acts, he or she has [the group's] interests at heart.

Identity Entrepreneurship: 'Crafting a sense of us'

- 9. This leader makes people feel as if they are part of the same group.
- 10. \* This leader creates a sense of cohesion within [the group].
- 11. This leader develops an understanding of what it means to be a member of [the group].
- 12. This leader shapes members' perceptions of [the group's] values and ideals.

Identity Impresarioship: 'Making us matter'

- 13. This leader devises activities that bring [the group] together.
- 14. This leader arranges events that help [the group] function effectively.
- 15. \* This leader creates structures that are useful for [group members].
- *Note*: <sup>#</sup> The Identity Leadership Inventory is copyright © 2013 by Niklas K. Steffens, S. Alexander Haslam, and Stephen D. Reicher. All rights reserved. The ILI is freely available for use in academic research. Contact one of the first two authors for further information about using the instrument for commercial and other purposes.

## 10. Appendix B

## Identity Leadership Inventory – Short Form (ILI–SF)<sup>†#</sup>

- 1. This leader is a model member of [the group].
- 2. This leader acts as a champion for [the group].
- 3. This leader creates a sense of cohesion within [the group].
- 4. This leader creates structures that are useful for [group members].
- *Note*: <sup>†</sup> This includes the item from each of the four dimensions of identity leadership that across the studies typically showed the highest factor loading on the respective dimension (marked with \* above) while also ensuring high internal consistencies.

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## Part 2

# Social Network Analysis as Pioneering Tool to Examine Athlete Leadership

"Trying to understand leadership without looking at the context is like trying to comprehend 'love' abstracted from the people who feel and enact it. You may be able to capture a trace of it, but it is virtually impossible to really appreciate its full impact and significance as a detached observer."

~ Donna Ladkin, 2010 ~

Who takes the lead? Social Network Analysis as pioneering tool to investigate

shared leadership within sports teams

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#### Abstract

Leaders do not operate in social vacuums, but are imbedded in a web of interpersonal relationships with their teammates and coach. The present manuscript is the first to use social network analysis to provide more insight in the leadership structure within sports teams. Two studies were conducted, including respectively 25 teams (N = 308) and 21 teams (N = 267). The reliability of a fourfold athlete leadership categorization (task, motivational, social, external leader) was established by analyzing leadership networks, which mapped the complete leadership structure within a team. The study findings highlight the existence of shared leadership in sports teams. More specifically, athlete leaders were perceived as better motivational and social leaders than their coach. Furthermore, both the team captain and informal athlete leaders shared the lead on the different leadership roles. Social network analysis was found to be a pioneering but valuable tool for obtaining a deeper insight in the leadership structure within sports teams.

*Keywords*: athlete leadership, informal leadership, team captain, peer leaders, leadership roles, coaching

#### 1. Introduction

High-quality leadership has been considered as a decisive factor in the successes of governments, political movements, educational institutions, business enterprises, and sports teams (Chelladurai, 2012). The majority of the research on team leadership has focused narrowly on the influence and behavior of one single team leader (usually a manager external to the team), and has largely ignored the leadership provided by team members. Only since the last decade, the concept of shared leadership was introduced in organizational settings and has been defined as "leadership that emanates from the members of teams and not simply from the appointed team leader" (Pearce & Sims, 2002, p. 172). The idea that "shared leadership is a more useful predictor of team effectiveness than vertical leadership" (Pearce & Sims, 2002, p. 183) seems to be at the heart of the growing interest in shared forms of organizational leadership (Pearce & Conger, 2003).

The structure of a sports team is similar to the structure of a business team. Both teams are characterized by a hierarchical structure in which there is one person formally appointed as *the* leader of the team (i.e., respectively the manager or the coach). Furthermore, both types of teams strive for visible performance outcomes, for instance, taking the form of sale increases or a sports victory. Therefore, it should not be surprising that there are also similarities between the leadership styles of business managers and sport coaches (Weinberg & McDermott, 2002). In line with leadership research in organizations, most sport studies have concentrated on the coach (see Chelladurai, 1994; Chelladurai & Riemer, 1998 for reviews). This is not surprising given that the coach is responsible for many aspects of the team's functioning (Loughead & Hardy, 2005). In this regard, it has been shown that the coach has an impact on athletes' identification with their team, their collective efficacy, and the team's cohesion (De Backer et al., 2011; Felton & Jowett, 2013; Hampson & Jowett, 2012; Price & Weiss, 2013).

While coaches are vital to their teams, another source of leadership within teams has recently garnered some research attention; namely athlete leadership. This construct is defined as an athlete occupying a formal or informal leadership role influencing team members towards a common goal (Loughead, Hardy, & Eys, 2006). Contained within this definition are two types of leadership roles that athletes can occupy. Athletes who are formally appointed to be a leader, such as the team captain, are termed formal leaders. Informal leaders on the other hand are not formally recognized as a leader but acquire their

leadership role through group member interactions. Previous studies on athlete leadership have mainly focused on the team captain as formal leader (e.g., Dupuis, Bloom, & Loughead, 2006; Grandzol, Perlis, & Draina, 2010; Kent & Todd, 2004; Voelker, Gould, & Crawford, 2011). Nevertheless, several researchers have argued that, besides the team captain as formal leader of the team, informal leadership should also be taken into consideration (Cope, Eys, Beauchamp, Schinke, & Bosselut, 2011). For example, Loughead et al. (2006) revealed that, although most athlete leaders occupy a formal leadership position (i.e., captain or assistant captain), also other players within the team are perceived as leaders by their teammates. In a different study, the majority of athletes (65.1%) pointed out that both the team captain and other players occupied a leadership function in their team (Loughead & Hardy, 2005). Furthermore, a positive relationship was demonstrated between the presence of athlete leaders and team outcomes, such as athletes' satisfaction, athletes' team confidence, the team's cohesion, and the team's performance (Crozier, Loughead, & Munroe-Chandler, 2013; Fransen et al., 2012; Price & Weiss, 2011; Vincer & Loughead, 2010). These findings highlight the crucial role of having high-quality athlete leaders and necessitate further research efforts to obtain a deeper insight in athlete leadership.

In addition to the formal-informal leadership distinction, Fransen, Vanbeselaere, et al. (2014) recently identified the presence of four different athlete leadership roles. This new athlete leadership categorization encompasses two on-field leadership roles (task and motivational leader) and two off-field leadership roles (social and external leader). A detailed description of these four different leadership roles, as outlined in previous research (Fransen, Vanbeselaere, et al., 2014), can be found in Table 1.

Using this new categorization of athlete leadership roles, Fransen, Vanbeselaere, et al. (2014) focused on the players who were perceived as *the* best leader in respect to these four leadership roles. Interestingly, the results indicated that there was an overlap between the task and motivational leadership role. More specifically, 18.8% of the best task leaders were also perceived as the best motivational leaders in their team. Furthermore, 11.5% of the best motivational leaders were also seen as the best social leaders. However, these overlapping percentages were relatively low, supporting the fact that the four leadership roles are clearly distinct and, more importantly, showing that different players within the team are perceived as best leader on the four leadership roles.

Leadership role	Definition
Task leader	A task leader is in charge on the field; this person helps the team to focus on our goals and helps in tactical decision-making. Furthermore the task leader gives his/her teammates tactical advice during the game and adjusts them if necessary.
Motivational leader	The motivational leader is the biggest motivator on the field; this person can encourage his/her teammates to go to any extreme; this leader also puts fresh heart into players who are discouraged. In short, this leader steers all the emotions on the field in the right direction in order to perform optimally as a team.
Social leader	The social leader has a leading role besides the field; this person promotes good relations within the team and cares for a good team atmosphere, e.g. in the dressing room, in the cafeteria or on social team activities. Furthermore, this leader helps to deal with conflicts between teammates besides the field. He/she is a good listener and is trusted by his/her teammates.
External leader	The external leader is the link between our team and the people outside; this leader is the representative of our team towards the club management. If communication is needed with media or sponsors, this person will take the lead. This leader will also communicate the guidelines of the club management to the team regarding club activities for sponsoring.

**Table 1.** The definitions of the four leadership roles, as outlined by Fransen et al. (2014).

Furthermore, Fransen, Vanbeselaere, et al. (2014) examined the formal and informal athlete leaders with respect to the four leadership roles (i.e., task, motivational, social, and external) within nine different team sports in Flanders (N = 4451). The results demonstrated that only 1% of the participants perceived their team captain (i.e., a formal leader) as the best leader in all four roles. Even more remarkable was that almost half of the participants (44%) did not perceive their captain as the best leader on any of the four roles, neither on the field, nor off the field. On average over the four leadership roles, 29.5% of the participants indicated their captain as the best leader on a specific leadership role, whereas 70.5% of the participants indicated an informal leader. These results show that athlete leadership is a shared phenomenon within sports teams and therefore contradicts the general notion of players and coaches that the team captain is *the* best leader of the team. As a consequence, there is a clear need for a better understanding how widespread athlete leadership is within teams.

One limitation emerging from Fransen, Vanbeselaere, et al. (2014) was that participants were only asked to evaluate the *best* leader on their team. As such, the authors obtained important information concerning the *best* leader on the team, concerning the overlap between the *best* leaders in the different leadership roles, and concerning whether

the team captain is perceived as *best* leader. However, information on the leadership provided by other team members, who may not be the best but still influential leaders, is missing. Furthermore, because perceived leadership of the coach was not measured, it was not possible to compare the athlete leaders and the coach in this respect. As such, the leadership structure within the complete team remains concealed. Consequently, it cannot be ruled out that the captain, not often perceived as the best leader in the Fransen, Vanbeselaere, et al. (2014) study, was neither perceived as second or third best leader. Likewise, it could be that, although the captain was not perceived as best leader in any of the given roles, he/she might have been perceived as best all-round leader (i.e., scoring second or third best on all four leadership roles).

In order to gain a deeper insight into the leadership structure of sports teams, the present study will measure the leadership quality of the coach and every player on the team with respect to the four different leadership roles. Moreover, it is important to realize that athlete leaders do not lead in a social vacuum, but instead, are imbedded in a web of interpersonal relationships with their teammates and coach. Nevertheless, previous research has typically focused on individual perceptions when examining athlete leadership, thereby ignoring the surrounding team context. The present study will extend previous research by using social network analysis to obtain a greater insight in the complete leadership structure within sports teams.

#### **1.1 Social Network Analysis**

Social network analysis (SNA) is a set of methodological tools for understanding the relationships and structures of a network. This approach views social relationships in terms of network theory, consisting of nodes, representing the individual actors within the network, and ties, representing the relationships between the individuals (Wasserman & Faust, 1994). Over the past decade, the theory of networks yielded explanations for social phenomena in a wide variety of areas, ranging from organizational networks and information sharing, over the use of social media, to politics and terrorist networks (Borgatti, Mehra, Brass, & Labianca, 2009).

Recently, social network analysis has also been established as a well-suited technique to study leadership in organizational settings for three reasons: (1) because it can model patterns of relationships among interconnected individuals; (2) it can represent how leadership is distributed among group members; and (3) it can identify the emergence of

multiple leaders (Emery, Calvard, & Pierce, 2013). In this regard, Emery et al. (2013) used social network analysis to investigate the emergence of leaders in a newly-formed leaderless group. Also Hoppe and Reinelt (2010) postulated different leadership networks as a useful framework to identify important outcomes such as collaboration and information sharing. It is important to note that the ties in such an organizational leadership network are often informal and exist outside the formal organizational structure, such as when an employee seeks advice from a colleague other than the manager to solve a problem more quickly. This informal leadership closely aligns with the informal athlete leadership in sport settings.

Although social network analysis has emerged as a useful technique in other research disciplines, this network approach has hardly found its way into sports research (Lusher, Robins, & Kremer, 2010). That is unfortunate because, as Lusher (2010) noted, sports teams are ideally suited for a social network investigation because they are composed of a well-defined group of interdependent individuals (or stated in social network terms 'a full network'). Furthermore, a sports team has clear and measurable performance outcomes, and the effectiveness of the relationships between the players has a direct impact on those outcomes.

Although Nixon (1993) argued that social network analysis could provide important insights in the leadership structure of sports teams, the few studies that used social network analysis in sport settings only focused on the cognitive or actual interaction between the players during the game (Bourbousson, Poizat, Saury, & Seve, 2010; Cotta, Mora, Merelo, & Merelo-Molina, 2013; Passos et al., 2011). To our knowledge, there is only one study that took a first step in the direction proposed by Nixon. More specifically, Lusher et al. (2010) constructed an influence network of an Australian football team by asking each of the players which teammate they considered as influential. Unfortunately, the network used in this study did not provide any information on the strength of these influence perceptions. The results simply revealed that most players rated the best players in their team as influential, but these findings did not reveal any information on the degree of influence these players were perceived to have.

#### **1.2 The Present Study**

The present manuscript, which includes two studies, aims to extend the current athlete leadership literature in two ways. First, we aim to demonstrate that social network analysis is a useful tool to examine leadership in sports teams. Therefore, the present studies used networks of leadership perceptions in which the nodes represent the team members and the ties are determined by the leadership perceptions. This network approach constitutes a novel approach to examine leadership in sports teams. Although social network analysis has already been used to study leadership in education and work team settings (Emery et al., 2013; Mehra, Smith, Dixon, & Robertson, 2006), the specific network approach that is used in the current manuscript extends these studies in two ways. First, the present research does not use binary networks (relations represented by 0 'no leader' or 1 'a leader'), but instead valued networks, in which the strength of the ties represents the athlete leadership quality, ranging from 0 (very bad leader) to 4 (very good leader). As such, leaders can be identified as the persons who receive the strongest ties. In addition, we do not only examine the general athlete leadership of team members (Study 1), as was the case in previous research. Instead, Study 2 goes more in depth and investigates the leadership structure within each team for the four different roles (i.e., task, motivational, social, and external leadership role). This role-based leadership approach is suggested to provide a more comprehensive view on the complete leadership network.

By using this type of social network approach, the existence of shared leadership in sports teams can be examined, which constitutes the second aim of the present manuscript. Previous research only focused on a part of the leadership structure in a sports team, for example, on the difference between the coach and athlete leaders (e.g., Loughead & Hardy, 2005; Price & Weiss, 2013), on the difference between the team captain as formal leader and the informal athlete leaders (e.g., Fransen, Vanbeselaere, et al., 2014; Holmes, McNeil, & Adorna, 2010), or on the different types of informal athlete leaders (e.g., Eys, Loughead, & Hardy, 2007; Fransen, Vanbeselaere, et al., 2014; Loughead et al., 2006). By using social network analysis, more insight can be gained on how the leadership positions of the captain, the informal leaders, and the coach are interrelated.

To compare the leadership roles of these different team members, we rely on the leadership classification developed by Fransen, Vanbeselaere, et al. (2014). As we noted above, this classification was based on perceptions of the *best* leader on each leadership role. Because social network analysis takes into account the leadership structure of all

players in the team, we should establish in a first step whether the previous classification still holds for the leadership network structure. In a second step, the main purpose of the study can then be established, namely using social network analysis as a novel approach to better understand the leadership structure in sports teams. These two steps will now be elaborated, thereby highlighting the added value of using social network analysis.

### 1.2.1 The reliability of the fourfold athlete leadership categorization for networks

Social network analysis allows us to examine the correlations between all four leadership networks for all players within the team. In other words, not only the *best* leaders will be compared, as was the case in the study of Fransen, Vanbeselaere, et al. (2014), but also the moderate leaders and the players that do not occupy a leadership function at all. With a network approach, it can then be established whether a person with high or low athlete leadership quality on one leadership role, also scores respectively high or low on another leadership role. Only in this way, we can examine whether the four roles are really distinct leadership roles or whether leadership qualities can be generalized over different roles. In line with previous research, we expect only moderate correlations between the different leadership networks, indicating that the roles are clearly distinct roles and mainly fulfilled by different players within the team.

#### 1.2.2 Comparing coach leadership with formal and informal athlete leadership

Social network analysis will allow us to compare the leadership quality of the coach with the leadership quality of both formal and informal athlete leaders within the team. In line with previous studies (Fransen, Vanbeselaere, et al., 2014; Loughead & Hardy, 2005; Loughead et al., 2006), we expect that in at least half of the teams, the team captains will not be perceived as best athlete leaders. As such, we expect that the average captains' leadership quality, as rated by their teammates, will be lower than the perceived quality of the best athlete leader in the team (H1a). Nevertheless, even though the team captain might not be perceived as the best leader, we do expect that the leadership quality of the team captain will be rated higher on all four different leadership roles than the average leadership qualities of all the players in the team (H1b).

Furthermore, this network approach allows us to compare the leadership quality of athlete leaders and coaches. Because most coaches have completed a coach education program, and given the hierarchical structure in sports teams characterized by the coach as

formal leader, we expect that the coaches will be perceived as the best leaders in the team (H2a). With regard to the different roles, previous research that compared coach and athlete leadership in sports teams showed that athlete leadership was more strongly related to social cohesion than coach leadership (Price & Weiss, 2013). Moreover, both coach and athlete leadership were found to be equally important for task cohesion. Furthermore, coaches displayed behaviors aimed at training and instruction more frequently than athlete leaders (i.e., characteristic behavior for task leaders). By contrast, athlete leaders exhibited more positive feedback and social support than their coaches, which are characteristic behaviors for motivational and social leaders (Loughead & Hardy, 2005). Therefore, we expect that the coach will be perceived as a better leader than athlete leaders on the task leadership role (H2b). On the other hand, we expect that athlete leaders will outperform the coach on the motivational and social leadership roles (H2c).

#### 2. Method

### 2.1 Procedure

In total, 71 coaches were invited via email to participate in our study. The 59 coaches that agreed to participate (yielding a response rate of 83%), were asked to send us the player list for the current season. We adopted a stratified sampling technique with respect to sport, gender, and playing level to constitute our sample in both studies. As such, an equal number of teams of the different sports were selected (i.e., soccer, volleyball, basketball, and handball in Study 1; soccer, volleyball, and basketball in Study 2). Within each sport, an equal number of male and female teams participated. Moreover, within each subgroup, half of the teams played at high level (i.e., national level) and half of the teams played at low level (i.e., provincial or regional level).

At the end of a training session, a research assistant was present to inform the players about the nature of the study and to answer any questions participants may have had during the completion of the questionnaire. The APA ethical standards were followed in the conduct of the study and players could withhold their participation at any time. Informed consent was obtained from all participants and confidentiality was guaranteed. No rewards were given for participation in the study.

## 2.2 Participants

## 2.2.1 Study 1

In total, 35 sports teams participated in Study 1 (eight teams of volleyball, soccer, and basketball, and 11 handball teams). To conduct reliable social network analyses, a high response rate within each participating team is required (Sparrowe, Liden, Wayne, & Kraimer, 2001; Wasserman & Faust, 1994). In 10 teams several players did not attend the training session in which this research study was conducted, and as a consequence, the minimum required response rate of 75% was not attained in these teams (Smith & Moody, 2013). Therefore, these 10 teams were removed from our dataset. More detailed information on the participants of the 25 remaining teams can be found in Table 2.

Sport	Number of participants	M <sub>TeamSize</sub>	Team gender	Level	M <sub>Age</sub> (years)	M <sub>Experience</sub> (years)	M <sub>TeamTenure</sub> (years)
Study 1							
Soccer	6 teams ( <i>n</i> = 100)	16.7	$\begin{array}{l} 3 \bigcirc (n = 55) \\ 3 \oplus (n = 45) \end{array}$	3 HL ( <i>n</i> = 58) 3 LL ( <i>n</i> = 42)	23.7 (± 4.8)	15.9 (± 6.5)	4.4 (± 5.2)
Volleyball	7 teams ( <i>n</i> = 75)	10.7	$4 \stackrel{\checkmark}{\bigcirc} (n = 43)$ $3 \stackrel{\bigcirc}{\subsetneq} (n = 32)$	4 HL ( <i>n</i> = 45) 3 LL ( <i>n</i> = 30)	28.5 (± 11.7)	17.2 (±9.4)	7.2 (± 10.2)
Basketball	6 teams ( <i>n</i> = 63)	10.5	$4 \stackrel{\wedge}{\bigcirc} (n = 43)$ $2 \stackrel{\bigcirc}{\subsetneq} (n = 20)$	3 HL ( <i>n</i> = 30) 3 LL ( <i>n</i> = 33)	24.4 (± 5.8)	15.7 (± 6.4)	6.7 (± 6.0)
Handball	6 teams ( <i>n</i> = 70)	11.7	$4 \stackrel{\wedge}{_{\odot}} (n = 47)$ $2 \stackrel{\bigcirc}{_{\odot}} (n = 23)$	3 HL ( <i>n</i> = 42) 3 LL ( <i>n</i> = 28)	23.2 (± 4.8)	14.0 (±4.8)	8.7 (± 6.1)
Total	25 teams ( <i>n</i> = 308)	12.3	$15^{-1}_{0}(n = 188)$ $10^{-1}_{0}(n = 120)$	13 HL ( <i>n</i> = 175) 12 LL ( <i>n</i> = 133)	24.9 (± 7.5)	15.7 (± 7.0)	6.5 (± 7.2)
Study 2							
Soccer	7 teams ( <i>n</i> = 97)	13.9	4 $ \bigcirc^{n}$ ( <i>n</i> = 53) 3 $ \bigcirc^{n}$ ( <i>n</i> = 44)	4 HL ( <i>n</i> = 51) 3 LL ( <i>n</i> = 46)	24.6 (± 4.4)	16.1 (± 6.7)	2.8 (± 2.3)
Volleyball	8 teams ( <i>n</i> = 93)	11.6	$4 \stackrel{?}{\bigcirc} (n = 50)$ $4 \stackrel{\bigcirc}{\bigcirc} (n = 43)$	4 HL ( <i>n</i> = 48) 4 LL ( <i>n</i> = 45)	25.6 (± 5.5)	14.4 (± 5.2)	3.4 (± 2.8)
Basketball	6 teams $(n = 77)$	12.8	$3 \stackrel{\frown}{\bigcirc} (n = 37)$ $3 \stackrel{\bigcirc}{\bigcirc} (n = 40)$	4 HL $(n = 50)$ 2 LL $(n = 27)$	22.7 (± 4.2)	13.9 (± 4.9)	5.1 (± 4.5)
Total	21 teams $(n = 267)$	12.7	$11^{\circ} (n = 140)$ $10^{\circ} (n = 127)$	12 HL ( <i>n</i> = 149) 9 LL ( <i>n</i> = 118)	24.3 (± 4.9)	14.9 (± 5.8)	3.7 (± 3.4)

**Table 2.** Sample characteristics for Study 1 and Study 2.

Note. The standard deviation of age and experience is presented between parentheses.

 $\bigcirc$  = male team;  $\bigcirc$  = female team; HL = high level; LL = low level

## 2.2.2 Study 2

In total, 24 sports teams participated in Study 2 (eight soccer teams, eight volleyball teams, and eight basketball teams). There was no overlap between the samples of Study 1 and Study 2. Based on the cut-off of 75% for the response rate per team, three teams were removed from our dataset. More detailed information on the participants of the 21 remaining teams is presented in Table 2.

### 2.3 Measurements

#### 2.3.1 Study 1 – General leadership quality

Each participant had to indicate "to what extent they considered each player as having good general leadership qualities" on a 5-point Likert scale, ranging from 0 (very bad leader) to 4 (very good leader). Based on the player list, all the names of the players on the team were listed in advance, as was suggested by Lusher et al. (2010). For each team, this resulted in an NxN adjacency matrix (with N being the number of team members). The first row indicates the outgoing ties of the first team member (i.e., the leadership quality of all team members as perceived by the first team member), while the second row indicates the second team member's leadership quality perceptions, and so on. The columns reflect the incoming ties to team members, with the first column being the ratings of all team members with regard to the leadership quality of the first player. This means that the AB entry not necessarily equals the BA entry. In other words, person A can perceive person B as a good leader, but person B does not necessarily perceive person A as a good leader. This adjacency matrix thus refers to a non-symmetric, finite NxN social network with directed relations that refer to the rating of general leadership quality that team members gave each other. By convention, the diagonal entries are forced to be missing values, representing that players do not rate their own leadership quality. In addition, each player rated the general leadership quality of their coach, also on a 5-point Likert scale, ranging from 0 (very bad *leader*) to 4 (very good leader).

#### 2.3.2 Study 2 – Role-specific leadership quality

To construct role-specific leadership quality networks, each of the participants had to rate the leadership quality of each of their teammates and their coach on four different leadership roles: task leader, motivational leader, social leader, and external leader.

#### Task leadership quality network

The same procedure was used as to construct the general leadership network in Study 1. For the present network, a definition of a task leader, as outlined in Table 1, was presented to the participants. Subsequently, each participant had to rate the quality of the task leadership of each of his/her teammates, whose names were listed in advance. Players had to indicate for each of their teammates "how well they perceived their teammates' task leadership qualities" on a 5-point Likert scale, ranging from 0 (*very bad task leader*) to 4 (*very good task leader*). This procedure resulted in a finite *NxN* task leadership quality network for each team. This network had directed relations, referring to the rating of task leadership quality that team members gave each other. In addition, each player rated the task leadership quality of their coach on the same response scale.

#### Motivational leadership quality network

To construct this network, a definition of a motivational leader (as outlined in Table 1) was presented to the participants. Players rated the motivational leadership quality of each teammate and their coach on a 5-point Likert scale, ranging from 0 (*very bad motivational leader*) to 4 (*very good motivational leader*). This procedure resulted in a finite *NxN* motivational leadership quality network for each team. This network had directed relations, referring to the rating of motivational leadership quality that team members gave each other.

#### Social leadership quality network

Each participant was provided with a definition of a social leader (see Table 1) and the same procedure as outlined above resulted in a finite NxN social leadership quality network for each team. In this network, the directed relations referred to the rating of social leadership quality that team members gave each other.

#### External leadership quality network

We applied the same procedures as for the leadership networks above, but now with regard to the external leader (see Table 1). As a consequence, a finite NxN external leadership quality network was constructed for each team, in which the directed relations referred to the rating of external leadership that team members gave each other.

#### 2.4 Data Analysis

Degree centrality is an often used social network measure to study leadership in teams (Carson, Tesluk, & Marrone, 2007). In our study, we used a valued network approach, in which the ratings vary within a given range (in our study between '0' and '4'). The degree centrality thereby refers to the strength of a node's ties. In directed networks, like the networks in our study, centrality can be further differentiated into indegree centrality (i.e., the strength of the incoming ties) and outdegree centrality (i.e., the strength of the examination of leadership networks, it has been recommended to use indegree centrality: an athlete's leadership quality as perceived by his/her teammates. This measure assesses a leader's importance in the network and his/her influence on the other team members (Freeman, 1979; Hoppe & Reinelt, 2010; Sutanto, Tan, Battistini, & Phang, 2011). In our leadership networks, a node with a high indegree centrality refers to a player that is, on average, seen as a good leader by his/her teammates.

To examine the relation between the different types of networks, we performed the social network-specific Quadratic Assignment Procedure (QAP) hypothesis tests (Krackhardt, 1988). The autocorrelated structure of network data (Wasserman & Faust, 1994) can lead to severe biases when classical hypothesis tests are performed (Krackhardt, 1987). Therefore, QAP-tests use restricted permutation tests, which makes them robust against the problem of autocorrelation (Dekker, Krackhardt, & Snijders, 2007). More specifically, QAP-correlations were calculated between the different leadership quality networks for each team separately. The goal of this analysis was to examine the degree in which the ties in the different leadership quality networks are related with each other. For example, a high QAP-correlation between the task leadership quality network and the motivational leadership quality network in a certain team means that the athletes who are perceived as high-quality task leaders are also perceived as high-quality motivational leaders.

## 3. Results

#### 3.1 The Different Leadership Networks

To test the reliability of the existing athlete leadership classification (Fransen, Vanbeselaere, et al., 2014) for the use of network analysis, we created a separate leadership quality network for each of the four leadership roles (task, motivational, social, and external leadership role). As an illustration, Figure 1 presents the task leadership quality network of one of the participating teams: a male volleyball team. Figure 2 presents the social leadership quality network within the same team.

**Figure 1.** Task leadership quality network of a participating team. A directed line from Player A to Player B means that Player A perceives Player B as a very good task leader (i.e., score of 4). The other scores are not visualized. The node size corresponds to the indegree centrality: the higher a player's task leadership quality as perceived by the other team members, the larger the corresponding node, and the more central the player is positioned in the figure. The nodes of the formal leaders and the informal task leader are filled.



**Figure 2.** Social leadership quality network of a participating team. A directed line from Player A to Player B means that Player A perceives Player B as a very good social leader (i.e., score of 4). The other scores are not visualized. The node size corresponds to the indegree centrality: the higher a player's social leadership quality as perceived by the other team members, the larger the corresponding node, and the more central the player is positioned in the figure. The nodes of the formal leaders and the two informal social leaders are filled.



To maintain clarity of the figures, we decided to visualize only the strongest leadership perceptions or, in other words, the perceptions of very good leadership (i.e., score of 4). The size of each node corresponds to the player's leadership quality in fulfilling that particular leadership role (i.e., the player's indegree centrality). The node size does take into account all the arrows, also the ones with scores lower than 4 that are not visualized in the picture. The more a player is perceived as a good leader by his/her teammates, the larger the corresponding node size, and the more central the node is positioned in the network. Because we did not ask the coach to rate the players' leadership quality, there are no out-going arrows from the coach's node.

For instance, Figure 1 reveals that in this particular volleyball team, player 7 is an informal leader who is perceived as the best task leader. Both coach and team captain are also perceived as relatively important task leaders, indicated by their central position in the

network and their relatively large node size. In Figure 2, both player 4 and player 11 have the same indegree centrality scores and thus share the lead as the two individuals who provide the highest quality of social leadership. In this figure, the formal leaders (i.e., the coach and the team captain) are both positioned on the outside of the network, meaning that the social leadership role is clearly fulfilled by informal leaders on this team.

Figure 3 represents the all-round leadership quality network of the same team as in Figure 1 and Figure 2. The perceived all-round leadership quality is the average of the perceived leadership quality scores on the four leadership roles (task, motivational, social, and external).

**Figure 3.** All-round leadership quality network of a participating team. A directed line from Player A to Player B means that averaged over all four leadership roles Player A rated Player B as a good leader (i.e., average score of 3 or higher). The other scores are not visualized. The node size corresponds to the average indegree centrality of the four roles: the higher a player's all-round leadership quality as perceived by the other team members, the larger the corresponding node, and the more central the player is positioned in the figure. The nodes of the formal and informal leaders on each leadership role are filled.



The visualization in Figure 3 only includes the arrows indicating an average score of 3 or higher (i.e., perception of a good or very good all-round leader). In this network, the node size (and the position centrality in the network) corresponds to players' indegree centrality of all-round leadership quality. The nodes of both formal and informal leaders are filled. In this team, the informal leaders (player 7 and player 11) are positioned most central in the network, and thus are perceived as the best all-round leaders. However, it should be noted that the coach and team captain also occupy relatively central positions.

#### **3.2** The Reliability of the Athlete Leadership Categorization for Networks

First, we aimed to test the reliability of the leadership categorization (i.e., task, motivational, social and external leadership role) with respect to our network approach, because the categorization was originally developed based on perceptions of only the best leader in each role (Fransen, Vanbeselaere, et al., 2014). We thus examined the overlap between the different networks to establish whether the roles are also distinct if we included the complete leadership structure in the team, instead of only the best leader. To determine this network overlap, QAP-correlations between the different leadership networks were calculated for each team. This SNA measure determines the correlation between two networks, thereby examining whether a player, scoring high (or low) on one leadership network (e.g., task leadership), also scores high (or low) on another leadership network (e.g., motivational leadership). In Table 3, the QAP-correlations, averaged over all teams, are indicated.

**Table 3.** The QAP-correlations between the different leadership quality networks, averaged overall teams.

	1.	2.	3.	4.
1. Task leadership quality	1			
2. Motivational leadership quality	.67	1		
3. Social leadership quality	.53	.60	1	
4. External leadership quality	.44	.46	.43	1

The results revealed only moderate correlations, suggesting that the four different leadership roles, although correlated, are clearly distinct leadership roles. Furthermore, the highest correlation was found between the two on-field leadership networks, namely the task and the motivational leadership quality networks. This finding holds for both male and female teams, in all sports, regardless of the competition level. In other words, team

members who perceive a player as a good task leader were more likely to perceive this player also as a good motivational leader. In addition, the second highest correlation was found between the motivational and the social leadership quality network.

One-way Anova's revealed no significant differences between the strength of the correlations between all four networks with regard to sport, team gender, and level. The only difference that was (marginally) significant was the correlation between task and external leader as a function of playing level (F = 4.55; p = .046). More specifically, the task leadership quality network correlated significantly more strongly with the external leadership quality network in high level teams (r = .51) than in low level teams (r = .34).

These findings confirmed the reliability of the existing leadership categorization when taking into account the complete leadership structure within the team. As a result, we can proceed to the main purpose of the present study: examining the complete leadership structure within teams, thereby comparing the leadership quality of the coach and the athlete leaders, in general, and with respect to the four different leadership roles.

## **3.3 Comparing Coach Leadership with Formal and Informal Athlete Leadership**

We calculated the indegree centrality as a measure of the average leadership rating received from all other players in the team (see Table 4). The node size and the position centrality of the players in the networks in Figures 1, 2 and 3 are based on the players' indegree centrality. Table 4 presents the indegree centrality scores for the coach and the players, averaged over all teams. Furthermore, we examined the captain, as formal leader of the team, and the actual 'athlete leader' on each role. This athlete leader refers to the player that was perceived as best leader on that specific role. This person can be the team captain, but can also be an informal leader scoring the highest on leadership quality.

To obtain more insight in the leadership status of the team captain, we computed a ranking for all players in the team, based on their indegree centrality scores. This ranking thus ranged from 1 (*player who is perceived as best leader by the other team members*) to *n* (*player who is perceived as worst athlete leader by the other team members*), with *n* being the total number of players in the team. The averaged ranking of the team captain over all teams, as presented in Table 4, reveals whether formal or informal leaders are perceived as providing the highest-quality leadership on a specific role. If the team captain is not the

highest ranked, this means that in most teams informal leaders are perceived as better leaders on that role than the captain.

**Table 4.** The average indegree centrality scores for the players and more specifically for theteam captain and the best athlete leader, as well as for the coach for both Study 1(generalleadership quality) and Study 2 (specific leadership quality).

	All players	Team captain	Athlete leader <sup>c</sup>	Coach
General leadership quality <sup>a</sup>	$1.92 \pm .22$	3.11 ± .49 (2.3)	$3.37 \pm .34$	$2.99\pm.74$
Task leadership quality <sup>b</sup>	$2.12\pm.38$	3.11 ± .67 (2.3)	$3.41 \pm .46$	$3.52\pm.29$
Motivational leadership quality <sup>b</sup>	$2.34\pm.28$	3.12 ± .58 (2.7)	$3.45 \pm .34$	$3.21 \pm .45$
Social leadership quality <sup>b</sup>	$2.44\pm.22$	$2.97 \pm .60$ (3.6)	$3.50 \pm .22$	$2.54\pm.87$
External leadership quality <sup>b</sup>	$1.80\pm.53$	2.70 ±.88 (2.4)	$3.00 \pm .76$	$3.09 \pm .47$
All-round leadership quality <sup>b</sup>	$2.16\pm.28$	$2.97 \pm .61$ (2.4)	$3.22 \pm .41$	$3.09\pm.41$

*Note.* For the team captain, the average athlete leadership rank is presented in parentheses.

<sup>a</sup>These analyses are based on Study 1. <sup>b</sup>These analyses are based on Study 2.<sup>c</sup>The athlete leader is defined as the player who is perceived on average as best leader by his/her teammates on the specific leadership role.

For both studies we utilized the same approach to present the results. First, we investigated athlete leadership within the team by comparing the team captain with (H1a) the best athlete leader and (H1b) with the average of all players in the team. Next, we compared the leadership quality of the coach with the leadership quality of the best athlete leader, in general (H2a), and on the different leadership roles (H2b and H2c).

In Study 1, the team captain had an average rank of 2.3 regarding his/her general leadership qualities. The general leadership quality of the team captain (i.e., indegree centrality) was, on average, perceived as significantly lower than the general leadership quality of the best athlete leader (t = 4.37; p < .001). More specifically, in 14 of the 25 teams, other players than the team captain were perceived as better leaders. The finding that the formal leader is not always the best leader in the team confirms H1a. However, it should be noted that the team captain is still perceived as a relatively important leader. In fact, in 21 of the 25 teams, the captain was placed in the top 3 ranking of general leadership quality. Furthermore, the team captain is perceived as a significantly better leader than the average player in the team (t = 11.22; p < .001), which is in line with H1b. In contrast with H2a, findings revealed that the best athlete leader was perceived as a significantly better leader than the coach (t = 2.41; p = .02). More specifically, in only 8 of the 25 teams, the coach was perceived as a better leader.

One-way Anova's did not reveal any significant differences with regard to the average athlete leadership quality (i.e., indegree centrality on team level) between high and low level teams (p = .21), male and female teams (p = .17), or between the different sports (p = .97). Furthermore, independent-samples Kruskal-Wallis tests revealed no significant differences in the leadership ranking of the team captain between high and low level teams (p = .86), male and female teams (p = .75), or between the different sports (p = .54).

In Study 2, we compared the leadership qualities of the best athlete leader with the leadership quality of the team captain and the coach on each of the four leadership roles. First, looking at the leadership within the team, the results revealed that the best athlete leaders on each role are perceived as significant better leaders than the team captain (t = 2.90; p = .009 for task leadership; t = 3.00; p = .007 for motivational leadership; t = 4.43; p < .001 for social leadership; t = 2.18; p = .04 for external leadership; t = 2.52; p = .02 for all-round leadership). More specifically, in respectively 9, 12, 15, and 6 teams of the 21 teams, other leaders than the captain take the lead on the task, motivational, social, and external leadership roles. In addition, the best athlete leader was perceived as a significant better all-round leader than the captain (t = 2.52; p = .02), thereby confirming H1a.

However, in line with Study 1, Study 2 corroborated that the team captain is not only a formal leader, but that he/she does indeed occupy an important leadership role. More specifically, in respectively 12, 6, 9, and 15 teams of the 21 teams, the team captain is perceived as best leader on the task, motivational, social, and external leadership roles. Furthermore, in half of the teams (12 teams) the captain was perceived as the best all-round leader, and in five teams the captain was still perceived as second or third best all-round leader. Independent-samples Kruskal-Wallis tests revealed no significant differences for the leadership ranking of the captain with respect to each of the four roles between high and low level teams, between male and female teams, or between the different sports. One exception did emerge; the captain was ranked significantly higher on social leadership in soccer and basketball teams than in volleyball teams (p < .05).

In addition, the perceived athlete leadership quality of the team captain was significantly higher than the team's average on respectively task leadership (t = 7.33; p < .001), motivational leadership (t = 5.72; p < .001), social leadership (t = 3.95; p = .001), external leadership (t = 5.69; p < .001), and all-round leadership (t = 6.08; p < .001). It can therefore be concluded that, although the team captain is not always perceived as the most

important leader, he/she does occupy an important leadership function, thereby confirming H1b.

Finally, we compared the leadership quality of the coach and the best athlete leader in the team. No significant difference emerged between the all-round leadership quality of the coach and the best athlete leader (t = 1.24; p = .23), which contradicts H2a. Also with regard to the task and external leadership role, no significant difference was observed between the leadership quality of the coach and the leadership quality of the best athlete leader (respectively t = .96; p = .35 and t = .56; p = .58), which contradicts H2b. More specifically, the coach was perceived as best task leader in 11 of the 21 teams, and as best external leader in 13 of the 21 teams. For the motivational and social leadership quality, a significant difference emerged in line with H2c: the athlete leader is perceived as a significant better leader than the coach on both motivational (t = 2.31; p = .03) and social leadership (t = 5.28; p < .001). More specifically, in only 6 and 2 teams of the 21 teams, the coach was perceived as best motivational and social leader respectively.

## 4. Discussion

Athletes are imbedded in webs of interpersonal relationships with their teammates and coach. Nevertheless, most sport psychology research has typically relied on individuallevel measures to assess team-level constructs such as leadership. Brass and Krackhardt (1999, p. 181) highlighted this research gap by stating: "largely ignored in leadership research is an approach that focuses on the structure of interpersonal relationships: a social network theory of leadership." The present study was, to our knowledge, the first to use social network analysis to obtain a greater insight in the leadership structure within sports teams. In contrast to previous studies, we did not restrict the analysis to the best leader or to the formally appointed leaders, but instead, we covered the full range of leadership relations within the team, thereby providing evidence for shared leadership. This network approach allowed us to compare the leadership quality (as perceived by all team members) of the coach, the team captain, and the informal athlete leaders within the team.

We first verified the reliability of the existing athlete leadership categorization, including the roles of task, motivational, social, and external leader, when using leadership networks. Very similar findings emerged as in the original manuscript that developed this classification based on only the best leader in each of the four leadership roles (Fransen, Vanbeselaere, et al., 2014). In particular, moderate positive correlations were observed

between the different leadership networks. To a certain degree, general leadership capacities are thus transferable between the different roles; a good leader in one leadership role is more likely to be perceived as a good leader in another leadership role. However, the fact that only moderate correlations emerged, corroborates previous research, concluding that the four roles are clearly distinct leadership roles, which necessitate specific leadership qualities (Fransen, Vanbeselaere, et al., 2014).

Our results revealed the highest correlation between the task and the motivational leadership quality network. This finding extends previous research that observed the highest overlap between the best task leader and the best motivational leader (Fransen, Vanbeselaere, et al., 2014). Three possible explanations may explain this relationship. First, playing time was demonstrated to be an attribute of both high-quality task and high-quality motivational leaders (Fransen, Van Puyenbroeck, et al., 2014). In other words, the field players, rather than the bench players, were perceived as good task and motivational leaders by their teammates, which may have caused the relatively high overlap between these two on-field leadership quality networks. Second, the tactical advice that is provided by the task leader might also serve as a good strategy to cope with competition-specific stressors (Anshel, Williams, & Williams, 2000). For example, for a stressed or discouraged player, it may be beneficial to focus on the task at hand, rather than on his/her own negative emotions. Therefore, the tactical advice provided by the task leader might help to steer the emotions in the right direction, thereby motivating the player. Third, Fransen et al. (2012) established tactical communication as one of the indicators of players' confidence in their team. By giving tactical advice, the task leader is perceived as being confident in his/her team. Because expressing confidence by the leader has a motivational impact on the other players (Fransen, Haslam, et al., 2014; Fransen et al., 2012; Moll, Jordet, & Pepping, 2010), it can be inferred that the task leader quality of a player is positively correlated with his/her motivational leader quality.

The second highest overlap was found between the motivational and social leadership quality network. Because these leadership roles refer to interpersonal relations, respectively on and off the field, it can be assumed that interpersonal leadership qualities are characteristic for both roles. Our data thus demonstrate that previous findings on the correlations between the different leadership roles, which only took into account the best leader (Fransen, Vanbeselaere, et al., 2014), can be transferred to complete leadership networks.

After establishing the reliability of our theoretical framework including the four leadership roles, we proceeded to the main aim of our study, namely to provide a deeper understanding in the leadership structure within sports teams, thereby comparing the perceived leadership quality of coach and both formal and informal athlete leaders. Three major conclusions can be drawn in this regard.

First, with regard to athlete leadership, both Study 1 and Study 2 revealed that in half of the teams, an informal leader, rather than the team captain, was perceived as the best allround leader. Furthermore, Study 2 added that especially on the motivational and social leadership role mainly informal leaders were perceived as best leaders. These findings corroborate earlier research (Loughead & Hardy, 2005; Loughead et al., 2006) that besides the team captain, other players (i.e., informal leaders) take the lead within sports teams, thereby confirming H1a.

Second, it should be noted that, although the team captain is not always perceived as best leader, he/she does fulfill an important leadership function in most teams. More specifically, in 83% of the investigated teams, the captain is seen as one of the top three leaders (i.e., with respect to general or all-round leadership), which confirms H1b. Study 2 provided more insight in the role-specific leadership function of the captain and revealed that captains were often rated higher by their teammates on external leadership quality, followed by task leadership quality. With respect to the motivational and social role, other players than the captain were generally perceived as best leader. These results align with the findings of Loughead et al. (2006) who observed that the majority of external leaders (79%) occupied a formal leadership position in their team (i.e., captain or assistant-captain), followed by task leaders (65%) and social leaders (57%). These findings temper previous research stating that in 44% of the teams the captain was not perceived as best leader on any of the four leadership roles (Fransen, Vanbeselaere, et al., 2014). It should be noted though that the present study included only 575 participants and was administered in the presence of the other teammates, whereas the study of Fransen, Vanbeselaere, et al. (2014) included 4,451 participants and was administered on-line.

Third, we compared the leadership quality of the coach with the leadership quality of the best athlete leader in the team. With regard to the general leadership quality (Study 1) and the all-round leadership quality (Study 2), the results revealed that, in contrast to H2a, the coach was perceived as best leader in only 35% of the teams. Although most coaches have followed a coach education program, it is the athlete leader that is perceived as best

all-round leader in most teams. Study 2 provided more detail with respect to the different leadership roles. Regarding the task and external leadership roles, no significant differences were observed between the leadership quality of coaches and athlete leaders. In contrast to H2b, coaches were not always perceived as best leaders, but instead, coaches and athlete leaders shared the lead on these roles. This finding contradicts previous research demonstrating that coaches exhibited more task-oriented behavior than athlete leaders (Loughead & Hardy, 2005). However, the results do align with a previous study demonstrating that both coach and athlete leadership were equally important for task cohesion (Price & Weiss, 2013). Finally, in line with H2c, the athlete leaders were perceived as significantly better leaders than their coach on the motivational and social leadership role. This finding corroborates earlier research, demonstrating that athlete leaders exhibit the behaviors of positive feedback and social support (i.e., characteristic behaviors for the motivational and social leader) to a greater extent than their coaches (Loughead & Hardy, 2005). Moreover, Price and Weiss (2013) also found that athlete leadership was more strongly related to social cohesion than coach leadership.

#### 4.1 Strengths, Limitations, and Further Research Avenues

A major strength of this study was the large number of participating teams, including male and female athletes across diverse team sports and levels of competition. To date, most social network studies in sports settings have included only a small number of teams. For instance, the sports studies described in the present manuscript examined one to three sports teams (Bourbousson et al., 2010; Cotta et al., 2013; Lusher et al., 2010; Passos et al., 2011; Warner, Bowers, & Dixon, 2012). The present study is, to our knowledge, the first in sports settings that encompasses data of more than 40 teams (including 575 players) in its social network analyses.

Moreover, the stratified sampling technique, used to select the participating teams, allowed for comparison between the different sports, and between male and female teams, playing at high and low level. Leaving a few marginally significant differences aside, we can conclude that the consistency in the relations demonstrated for both male and female teams, for high and low competition level, and for the different sports testifies to the reliability of the study's findings.

In addressing the limitations of the present research, several opportunities for future research emerge. In terms of the design, a cross-sectional approach was adopted, limiting

#### Social Network Analysis to examine athlete leadership

our ability to examine the stability of the different leadership structures within the team. Hoppe and Reinelt (2010, p. 600) stated that "Understanding the nature of networks and changes in them is an increasingly important aspect of leadership development evaluation." Related to this point, Emery et al. (2013) assessed emerging leadership perceptions at three times in a newly formed student group. Given the observed variations in leadership perceptions, future research should adopt a longitudinal design that allows for the examination concerning the evolution and the stability of the different leadership networks over the course of a season.

Warner et al. (2012) adopted such a longitudinal approach in a sports setting and assessed an efficacy network of two basketball teams at four points during the season. The results revealed that the head coach moved from a central network position during the off-season to a more decentralized location at the end of the season. A longitudinal design would enable researchers to verify whether this in-season shift of the coach (or team captain) from a central position to a more decentralized position can also be observed in the different leadership networks.

Moreover, future research could investigate the antecedents and outcomes of shared leadership. In this regard, it would be interesting to examine the impact of the coaching style of the coach on the emergence of high-quality athlete leaders within the team. Two major coaching approaches can be distinguished: an autocratic, controlling style and an autonomy supportive style. Mageau and Vallerand (2003) proposed seven autonomy supportive coaching behaviors, among which for example allowing athletes to work independently and to have input into solutions for solving problems. It can be assumed that such a coaching style, in which athletes are given autonomy, rather than being controlled, nurtures the development of athletes' leadership abilities. Furthermore, future research could examine the importance of shared leadership among the coach, the team captain, and the informal leaders in order to obtain optimal team functioning.

Finally, a fruitful line for further inquiry is to replicate the current study in other cultures. It is indeed possible that the leader status of the formal leader, and the attached emotional significance, is culture-specific. For example, in Flanders, where the current study was conducted, the team captain wears a specific armband or the captain's shirt number is underlined. These observable signs increase the public visibility, thereby often increasing the emotional value for the player and/or the importance attached to this function
by the fans. Future research should verify whether the same findings are also found in different cultures, in which less importance is assigned to visible signs of formal leadership.

### 4.2 Implications for Theoretical Knowledge

The present study extends current literature on athlete leadership by providing a deeper insight in the complete leadership structure of sports teams. First, the reliability of the athlete leadership categorization, developed by Fransen, Vanbeselaere, et al. (2014), was established for the analysis of leadership networks. As such, not only with respect to the best leader in the team, but also when taking into account the complete leadership structure within the team, the four leadership roles emerged as clearly distinct roles. This categorization thus forms a reliable theoretical framework for further athlete leadership research.

Second, the network approach made it possible to compare coach and athlete leadership, thereby including both formal and informal leadership. The present manuscript demonstrated that coach, captain, and informal leaders shared the lead on the different leadership roles. The study findings are thus in line with recent theorizing in the organizational leadership literature on shared leadership. The integrative model of Locke (2003) constitutes a good theoretical framework to underpin our findings. This integrative model combines three different leadership approaches: (1) the top-down model, (2) the bottom-up model, and (3) the model of shared leadership.

Our findings provide support for each of the three models. More specifically, in more than half of the teams, the coach took the lead on the task and external leadership role, which supports the top-down influence of the coach. Second, on the motivational and social leadership role, the athletes within the team were clearly perceived as being better leaders than their coach, thereby supporting the bottom-up model. Finally, the results provided evidence that the captain together with the informal athlete leaders shared the lead on the different leadership roles, providing support for the model of shared leadership.

## **4.3 Implications for Coaching Practice**

High school coaches have listed a lack of leadership skills as the sixth most frequently cited problem among adolescent athletes today (Gould, Chung, Smith, & White, 2006). Furthermore, semi-structured interviews with 13 former high school captains reported that not one of these captains was trained or prepared by their coaches for their

leadership role (Voelker et al., 2011). These are only a few examples of research studies emphasizing a clear need for leadership development in young people (Gould & Voelker, 2010). The findings from the present study demonstrated that social network analysis is a viable diagnostic tool to identify leadership abilities of all players within a team, which constitutes the first step in a leadership development program. We thereby distinguish between the contribution to coaching practice of (1) a team-specific leadership network analysis and (2) the general results as presented in the current manuscript, including the 46 tested teams.

First, network analysis of the different leadership networks for a specific team (such as presented in Figure 1, Figure 2, and Figure 3) provides a viable diagnostic tool to identify the key leaders on the different leadership roles within the team. Such a network approach does not only reveal the athletes who are perceived as best leader by their teammates, but also provides insight in the remaining leadership structure of the team (e.g., the presence of cliques). For example, this approach distinguishes between the situation in which two players are perceived as best task leaders by all of their teammates and the situation in which half of the team nominated one task leader and the other half of the team assigned another task leader. Especially in the latter situation, it might be beneficial for the team to formally appoint both leaders as task leader to impact the whole team. This network approach provides leadership information that is very specific to the team, thereby allowing us to map the evolution of these leadership structures over time.

As Bailey (2001, p. 187) stated: "the man who correctly understands how a particular structure works, can make it work differently with much less effort than a man who does not know these things". With regard to sports teams, equipping a coach with knowledge of the leadership structure within the team, should yield similar benefits (Warner et al., 2012). That is, a coach with knowledge of the key relational structures within the team can more effectively lead the team to success, and using social network analysis might be an important tool to reach this aim.

Second, the results of the present manuscript lead to several general practical implications that should be considered by coaches, sport psychology consultants, and sports teams. More specifically, our findings support previous research that not only formal leaders, but also informal leaders take the lead on the different leadership roles (Fransen, Vanbeselaere, et al., 2014; Loughead et al., 2006). Therefore, coaches should not solely focus on the team captain, but spend time and effort to identify the other athlete leaders on

the different leadership roles within their team. It is conceivable that identifying the athlete leaders within the team will enhance players' role clarity and, as such, also the effectiveness of their role fulfillment (Crozier et al., 2013; Martens, 1987). In other words, if players realize that teammates perceive them as a leader, this recognition will strengthen their sense of responsibility, thereby motivating them to fulfill their leadership role even better.

However, coaches and sport psychology consultants should not only *identify* the key leaders, but also invest time and energy to *improve* the leadership qualities of these athlete leaders with respect to the different leadership roles. In this regard, leadership development programs that focus on how athlete leaders can optimally fulfill the different roles would support coaches and sport psychology consultants to strengthen the athlete leadership quality within their team.

To conclude, the study findings demonstrated that the era of one sole leader (i.e., the coach as leader) has come to an end. Instead, sports teams are complex social systems characterized by shared leadership. Leadership is spread throughout the team: the coach, the team captain, and the informal athlete leaders lead their team together.

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The art of athlete leadership: Identifying high-quality leadership at the individual and team level through Social Network Analysis

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## Abstract

Given the positive impact of athlete leaders on team members' identification, confidence and performance, the quest for the perfect athlete leader has intruded sport research. The present manuscript uses social network analysis as novel technique in sports contexts to (1) determine the characteristic attributes of high-quality athlete leaders (i.e., analyzing leadership at the individual level), and (2) to investigate the attributes of teams with high-quality athlete leadership (i.e., analyzing leadership at the team level). Two studies were conducted. Study 1 included 25 sports teams (N = 308) and focused on athletes' leadership quality in general. Study 2 included 21 sports teams (N = 267) and focused on athletes' specific leadership quality as task, motivational, social, and external leader. The findings revealed that the followers, rather than the leader, hold the key for effective leadership. More specifically, process-based attributes such as social connectedness with team members, rather than trait-based attributes such as age or team tenure, proved to be most predictive for an athlete's perceived leadership quality. Furthermore, teams with higher athlete leadership quality demonstrated higher levels of team identification and were more strongly connected. It can be concluded that social network analysis is a valuable tool to provide more insight in the attributes of high quality leadership at the individual and at the team level.

*Keywords*: informal leadership, peer leaders, leader characteristics, leadership roles, shared leadership

### 1. Introduction

## **1.1 In Search of the Perfect Leader**

The quest for the perfect leader resembles the quest for the Holy Grail. If it could be captured, distilled, and replicated, it would lead to guaranteed success for any government, military organization, academic institution, and/or business organization that is in possession of it (Medina, 2011). The same could be said for sports teams where leadership is seen as a key factor for an optimal team functioning. Leadership is not restricted to coaches, but it has been found that also athletes can fulfill important leadership roles (Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014). Although most research has focused on the quest for the perfect coach, recently the investigation of the leadership attributes of athlete leaders has also gained attention.

Athlete leaders have been shown to positively impact their teammates' satisfaction, their team confidence, the role clarity in the team, the team communication, the team's task and social cohesion, and ultimately the team's performance (Crozier, Loughead, & Munroe-Chandler, 2013; Fransen et al., 2012; Price & Weiss, 2011; Vincer & Loughead, 2010). Given all these benefits, the quest for high-quality athlete leaders has intruded into sport research. The present study attempts to move athlete leadership research forward by using social network analysis as a novel tool to (1) determine the characteristic attributes of high-quality athlete leaders (i.e., analyzing leadership at the individual level), and (2) investigate the attributes of teams with high-quality athlete leadership (i.e., analyzing leadership at the individual level). More specifically, at the individual level, we will investigate each athlete's leadership quality as perceived by all other team members. At the team level, we will assess the average athlete leadership qualities in each team (i.e., aggregated leadership quality perceptions of all athletes in the team)

## **1.2 Leadership Theories Underlying the Perfect Leader Quest**

Historically, two main approaches of leadership have been used to examine this phenomenon: trait leadership and process leadership. The trait perspective to leadership, also termed 'the Great Man approach', suggests that certain individuals have special innate or inborn characteristics that make them leaders, and that it is these characteristics that differentiate them from non-leaders (Northouse, 2010). The range of leader-specific characteristics is widespread, and includes, among others, characteristics such as charisma,

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wisdom, intelligence, dominance, and an extraverted personality (e.g., Locke, 1997). In this approach, leadership is restricted to those people who have special, usually inborn talents. Several criticisms have been proposed against this theory, for example with regard to its inability to incorporate the situational context (see e.g., Stogdill, 1948), thereby paving the way for a new leadership approach.

In contrast, the process approach states that leadership is not restricted to certain individuals, but instead is available to everyone since leadership behaviors can be learned. From this perspective, leadership is defined as "a phenomenon that resides in the context of interactions between leaders and followers" (Northouse, 2010, p. 8). In this regard, leadership is not a linear, one-way event, but rather an interactive event: a leader affects and is affected by followers. This process approach to leadership has laid the foundation for the development of other leadership approaches such as transformational, transactional, authentic, and servant leadership theories.

Up to now, leadership research in organizational settings has been predominantly leader-centered (for a review see Judge, Piccolo, & Kosalka, 2009). By focusing on the leader, researchers have traditionally neglected the important role of followers' perceptions in mediating and moderating the effect of leadership behavior on followers' behavior (Thomas, Martin, & Riggio, 2013). Because leadership effectiveness is determined in large part by others' perceptions of the leader, leadership is thus to a certain degree a socially constructed phenomenon. The idea that followers are critical to effective leadership introduced new research approaches, which puts the followers at the centre of attention (Emery, Calvard, & Pierce, 2013; Haslam et al., 2001).

One of these new approaches or theories embracing this principle is the Social Identity Approach to Leadership (Haslam, Reicher, & Platow, 2011). The Social Identity Approach asserts that the behavior of team members is shaped by their capacity to think, feel, and behave, not only as individuals (as 'I' and 'me' in terms of a personal identity), but also, and often more importantly, as group members (as 'we' and 'us' in terms of a shared social identity). The recent application of this approach to leadership argues that leaders' effectiveness depends on the extent that leaders are able to manage—that is create, embody, advance, and embed—a shared identity within a group (Haslam et al., 2011; Reicher, Haslam, & Hopkins, 2005; Steffens, Haslam, & Reicher, 2014; Steffens, Haslam, Reicher, et al., 2014). In other words, effective leaders cause their followers to think, feel, and behave in terms of 'we' (as a group), rather than 'I' (as individuals). The famous speech of

football coach Al Pacino in the movie Any Given Sunday (Stone, 1999) illustrates this type of leadership style: "That's a team, gentlemen. And either we heal now, as a team, or we will die as individuals."

### **1.3** The Quest for the Perfect Athlete Leader

In order to identify the athlete leaders within the team and to optimize leadership development programs, the key question remains: What are the attributes of high quality athlete leaders? To date, the research on athlete leadership has been predominantly leader-centered, driven by the search for the characteristics of what constitutes a good athlete leader (Glenn & Horn, 1993; Holmes, McNeil, & Adorna, 2010; Price & Weiss, 2011; Todd & Kent, 2004).

The majority of previous studies focused on traits that differentiate the athlete leaders from the other players. In this regard, athlete leaders have been shown to demonstrate higher levels of competitiveness, responsibility, dominance, and ambition (Klonsky, 1991). Moreover, Glenn and Horn (1993) validated a shortened version of the Sport Leadership Behavior Inventory, which included the following athlete leaders' characteristics: determined, positive, motivated, consistent, organized, responsible, skilled, confident, honest, leader, and respected. In addition, an often studied attribute of athlete leaders has been sport competence, also operationalized as athletes' playing time or their starting status (Loughead, Hardy, & Eys, 2006; Moran & Weiss, 2006; Price & Weiss, 2011; Rees & Segal, 1984). Team tenure also emerged as an essential characteristic for athlete leaders (Rees & Segal, 1984; Tropp & Landers, 1979; Yukelson, Weinberg, Richardson, & Jackson, 1983). Loughead et al. (2006) provided support for these findings among varsity student-athletes with four or five years of playing eligibility, by demonstrating that the majority of the athlete leaders were third- or fourth-year players.

More recently, in organizational settings, there is a trend towards process-based leadership (e.g., Chase, 2010). As a consequence, attributes associated with the relation between leader and followers have become more prominent. For example, friendship quality, which has also been termed 'peer acceptance' or 'social connectedness', was demonstrated to be an important attribute of good athlete leaders (Moran & Weiss, 2006; Price & Weiss, 2011; Tropp & Landers, 1979). Similarly, Yukelson et al. (1983) found that strong off-field friendship was associated with higher leadership ratings among college baseball and soccer players. However, when examining student-athletes' perceptions of

formal and informal team leaders, likeability was not seen as a necessary attribute for good leadership (Holmes et al., 2010). In this study, both men and women reported that they could play for and respect a leader, even when the leader was not popular or liked by other teammates.

The notion of putting the follower, instead of the leader, as a central figure in relation to leadership effectiveness has recently entered the sport literature. In this regard, the Social Identity Approach to Leadership was used as theoretical framework to underpin the demonstrated positive relation between the perceived quality of the athlete leaders and players' identification with the team (Fransen, Coffee, et al., 2014). More specifically, athlete leaders were seen as better leaders to the extent in which they were able to create stronger team identification among team members. Furthermore, Steffens et al. (2014) demonstrated that leaders who adopted such an identity-oriented leadership style made their teammates more confident in the abilities of their team and strengthened the team's task cohesion.

## 1.4 Team-Level Attributes of Teams with High Athlete Leadership Quality

Having discussed the individual level—which attributes are characteristic of a highquality athlete leader—, the question remains: What are the attributes of teams with highquality leadership? In organizational settings, a number of studies have linked leadership perceptions to individual-level outcomes, such as pay-raises and job-promotions (Hoppe & Reinelt, 2010). However, these authors also acknowledge that the contribution of leadership perceptions to organization-level outcomes remains unclear. Hogan and Kaiser (2005) argued for a radical departure from the conventional wisdom where research focused on the individual 'leader'. Although so far only few studies have used indices of group effectiveness as the criterion for leadership, Hogan and Kaiser (2005) believe that this should become 'the gold standard' to define and evaluate leadership.

In sports settings, research on the attributes of an individual leader is also much more prominent than research linking the average leadership qualities in the whole team to teamlevel characteristics. However, a recent qualitative study demonstrated that the presence of athlete leaders in the team positively impacted a variety of group dynamic constructs at the team level, such as enhanced role clarity within the team, stronger cohesion, better team communication, and ultimately a better team performance (Crozier et al., 2013). Nevertheless, to our knowledge, until now only one study has investigated the attributes of teams with effective athlete leadership in a quantitative way. More specifically, Price and Weiss (2011) stated that effective athlete leadership was associated with higher levels of collective efficacy and a stronger task and social cohesion. However, when looking more closely to their methodology, the authors actually examined the correlations at an individual level, namely the correlations between a player's leadership skills and the player's perceptions of collective efficacy and team cohesion. In order to study team-level attributes, it is necessary to gain insight in all leadership perceptions within the team. Such a team-level approach to leadership has not yet been adopted in a sports setting.

## **1.5 Social Network Analysis**

Social Network Analysis (SNA) is a novel but promising tool to obtain a full insight in the leadership relations within a team. A social network approach views groups in terms of networks, consisting of nodes (representing the individual actors) and ties (representing the relationships between the actors) (Wasserman & Faust, 1994). Over the past decade, the use of this network approach has grown exponentially in a wide variety of areas, ranging from sociology, over politics and terrorism networks, to organizational research (Borgatti, Mehra, Brass, & Labianca, 2009).

Only recently, organizational leadership research has included this network approach. The few existing studies can be categorized in accordance with the described evolutions in leadership research. Emery et al. (2013) for example focused on group members' personality traits (e.g., extraversion, openness to experience, and conscientiousness) to predict the emergence of leaders in newly formed groups. Hoppe and Reinelt (2010) used a more process-based leadership approach and revealed that leadership networks were characterized by attributes such as collaboration and information sharing. Considering that the Social Identity Approach to Leadership puts the follower in the centre of the leadership process, it is unfortunate that this network approach has not yet regularly been used to further test follower-focused theories on leadership. After all, SNA includes the whole team, thereby measuring an individual's leadership status based upon the perceptions of all the followers.

Although Nixon (1993) stated that SNA could be a valuable tool to analyze leadership structures in sports teams, to our knowledge, so far no study has heeded Nixon's suggestion. Also Lusher (2010) noted that sports teams are the ideal object of investigation for social network analysis because they are a well-defined group of interdependent

individuals, or in social network terms, a full network. Furthermore, the relations between the different athletes have a direct impact on measurable performance outcomes.

The few preliminary studies that did use social network measures in sports teams mainly focused on the relations between the players with regard to their interactive play (Cotta, Mora, Merelo, & Merelo-Molina, 2013; Kyoung-Jin & Yilmaz, 2010; Passos et al., 2011). In these networks, the players were considered as the nodes and the passes between teammates were viewed as relationships. We found only two studies that used SNA to examine the psychological interrelations between the members of a sports team. The first study (Lusher et al., 2010) examined one football team, thereby constructing a friendship network (based on the question "Who do you consider as a friend?") and an influence network (based on the question "Who do you consider as influential?"). The relations with players' ability revealed that ability was not related with being nominated as a friend but it did correlate positively with being seen as influential by the teammates. The second study (Lusher, Kremer, & Robins, 2013) constructed trust networks for three sports teams, thereby mapping the extent to which team members trusted each other. Their findings demonstrated that the trust-generating structures were found in the team with the highest overall team performance. A considerable limitation of both studies is that they used binary networks (i.e., relying on the only possible answers being 'yes' or 'no'), which did not provide any information on the strength of these relations.

## **1.6 The Present Study**

The present study extends previous research on the attributes of high quality leadership in four different ways, using specific SNA measures. First, we did not categorically distinguish between leaders and non-leaders, but instead measured leadership using a 5-point scale to examine the quality of the leadership of all athletes within a sports team. Second, we did not only investigate the characteristic attributes for leaders in general, but also with respect to the specific role a leader fulfils in the team. Third, we examined not only trait characteristics (e.g., sport competence), but also more process-based attributes (e.g., social acceptance by others). Fourth, the social network approach allows us to examine the team-level attributes of teams with high-quality athlete leadership. We will now shortly elaborate on each of these contributions to the current literature, thereby including the corresponding hypotheses.

## 1.6.1 Contribution 1—Towards Valued Leadership Quality Perceptions

The present study will extend previous research findings that examined the characteristic attributes of athlete leaders by investigating which of these characteristics is most decisive for athletes' leadership quality. In other words, we will not assess what is required for a player to be a leader, but more importantly, what is required for players to be perceived as a *good* leader by their teammates. Furthermore, in contrast with all the previous network studies in sport, the present study will not use a binary network (relations represented by 0 '*no leader*' or 1 '*a leader*'), but instead a valued network, in which the strength of the ties represented the athlete leadership quality, ranging from 0 (*very weak leader*) to 4 (*very good leader*). Previous research only examined the characteristics of thé leader. Because leadership is a process and can be learned, we chose to take into account all the players of the team, and thus as a consequence, different degrees of leadership quality.

## 1.6.2 Contribution 2—General and role-specific leader attributes

Recently, four different athlete leadership roles have been distinguished (Fransen, Vanbeselaere, et al., 2014): (1) the task leader, who gives his/her teammates tactical advice and adjusts them when necessary; (2) the motivational leader, who encourages his/her teammates on the field to perform at their best; (3) the social leader, who cares for a good atmosphere in the team besides the field, and (4) the external leader, who handles the communication with club management, media, and sponsors.

The present manuscript includes two studies: while Study 1 focuses on the attributes of athlete leaders' leadership quality in general, Study 2 goes more in depth and investigates the attributes of athlete leadership quality within the four different leadership roles (i.e., task, motivational, social, and external leadership role). This approach will inform us not only on the attributes that are characteristic for leadership quality in general, but also on the attributes that are characteristic for high-quality athlete leadership for each of the four specific leadership roles (task, motivational, social, external leader).

Previous research, distinguishing between different leadership roles, demonstrated that all of the perceived task leaders were starters, whereas the perceived social leaders were equally divided between starters and non-starters (Rees & Segal, 1984). In contrast, Loughead et al. (2006) indicated that the majority of task, social, and external leaders were starters. Also with regard to age and team tenure, differences between the different

leadership roles emerged: whereas the social leaders were mostly seniors, the task leaders were spread out amongst juniors and seniors (Rees & Segal, 1984).

Given the clearly distinct role content of the four leadership roles that are investigated in the present study, we assume that different leader attributes will be predictive in determining the leadership quality in a given role (H1). More specifically, we expect that the quality of social leaders is characterized by the social acceptance by the team members (H1a). Furthermore, because Mosher (1979) noted that one of the key tasks of a captain is to represent the team at receptions, meetings, and press conferences, we expect that captaincy is the most characteristic attribute for external leadership quality (H1b). Finally, we hypothesize that playing time will be the most characteristic attribute for the perceived quality of the on-field leaders (i.e., task and motivational leader) (H1c).

## 1.6.3 Contribution 3—Trait- and process-based attributes of the leader combined

In the present study, we included both trait-based attributes (e.g., age, competence) and process-based attributes (e.g., connectedness with others) to examine which of these attributes are most characteristic for high-quality athlete leaders. Following the historical evolution in leadership research towards a more process-based approach, we expect the process-based attributes to be more predictive than the trait-based attributes (H2).

# 1.6.4 Contribution 4—Team-level attributes of teams with high-quality athlete leadership

In the present study, we moved beyond the individual level and examined the extent to which high average leadership quality within the team is connected with two important team-level attributes, namely team identification (i.e., the extent to which players identify with their team) and the team's social connectedness (i.e., the extent to which players feel connected with each other).

First, the present study will use social network analysis to examine the relationship between perceived leadership quality with respect to each of the four different leadership roles in the team (i.e., task, motivational, social, and external leadership) and team identification. This analysis aims to provide a better view on the applicability of the Social Identity Approach to Leadership (Haslam et al., 2011) in sports settings. Our study therefore encompasses not only the trait- and process-based approaches, but also the identity-based approach to leadership. In line with previous findings, we expect that at the team level, the average quality of athlete leadership in a team, in the eyes of the followers, is positively associated with players' identification with their team (H3).

Second, it has been suggested that social network analysis is a useful methodology to explore the social relations between team members (Lusher et al., 2010). Therefore, we will use social network analysis not only to construct the leadership networks, but also to construct a social connectedness network in which each player indicates how connected he/she feels with the other team members. A previous study with sales teams demonstrated that the position of the leader in a social connectedness network (i.e., the friendship ties with the others) was related with more favourable leadership ratings by subordinates, peers, and supervisors (Mehra, Dixon, Brass, & Robertson, 2006). Warner et al. (2012) constructed such a social connectedness network for two sports teams, but they did not relate it to leadership structures within the team. Moreover, these former studies used binary ratings to construct the networks, thereby neglecting all information on the strength of these relationships.

The present study will extend previous research by using a valued instead of a binary social connectedness network, with the degree of connectedness ranging from 0 (*not connected*) to 4 (*very connected*). In addition, we will examine the extent to which the leadership quality networks for each specific leadership role (task, motivational, social, and external) are related with the team's social connectedness network. In line with previous findings (Mehra et al., 2006), we expect that at the team level, higher athlete leadership quality will be related with a higher social connectedness within the team (H4a). With regard to the specific roles, we keep in mind that the specific role description of the social leader focuses on the social relations with the other team members, thereby fostering a good atmosphere within the team. Therefore, we expect that the social leadership quality network will be most strongly related with the social connectedness network (H4b).

### 2. Method

### 2.1 Procedure

For both studies contained in this manuscript, we adopted a stratified sampling technique. As a consequence, we selected an equal number of teams with respect to sport, gender, and playing level. With regard to the playing level, we differentiated between high-level teams (i.e., national level) and low-level teams (i.e., provincial or regional level). In

total, 71 coaches were invited via email to participate in our study, resulting in 59 positive reactions (i.e., a response rate of 83%). Next, we asked the participating coaches for a complete player list of the current season.

Data collection took place after a training session under the guidance of a research assistant who provided information to the teams. First, informed consent was obtained from all participants and anonymity was guaranteed. Furthermore, we stated that the players could withhold their participation at any time. Subsequently, all players completed the questionnaire individually. The research assistant was present to answer possible questions. The APA ethical standards were followed in the conduct of the study and no rewards were given for participation in the study. Data from this sample have been used in two other manuscripts (Fransen, Van Puyenbroeck, et al., 2014; Loughead, Fransen, Van Puyenbroeck, Hoffmann, & Boen, 2014), examining other research questions and using different variables of interest.

## 2.2 Participants

## 2.2.1 Study 1

In total, 35 sports teams participated in Study 1. Given that missing data in social networks can lead to biased results, we used a minimum response rate of 75% of the players for each team as inclusion criteria (Smith & Moody, 2013; Sparrowe, Liden, Wayne, & Kraimer, 2001; Wasserman & Faust, 1994). As a consequence, 10 teams (N = 100) were removed from our dataset. The average response rate of these 10 deleted teams was 64%. The 25 remaining teams included 308 athletes, playing in six soccer teams, seven volleyball teams, six basketball teams, and six handball teams. Fifteen male teams and 10 female teams participated, of which 13 teams played at high level (i.e., national level) and 12 teams played at low level (i.e., provincial or regional level). The players were on average 24.9 years old (SD = 7.5), had 15.7 years of experience in their sport (SD = 7.0), and played for 6.5 years in their current team (SD = 7.2).

One-way Anova's revealed no significant differences between the different sports with respect to level (p = .42), team gender (p = .22), or years of experience (p = .06). However, significant differences emerged with regard to age (p < .001) and team tenure (p = .001). Post hoc test revealed that volleyball players were on average older than soccer, basketball, and handball players (all p's < .01). With respect to team tenure, the only significant difference was between handball and soccer (p = .001), namely that handball players had played on average longer in their current team.

## 2.2.2 Study 2

In total, 24 sports teams participated in Study 2. There was no overlap in the samples of Study 1 and Study 2. Based on the cut-off of 75% for the response rate per team, three teams (N = 20) were removed from our dataset. The average response rate of these three deleted teams was 58%. The 21 remaining teams (267 athletes) included seven soccer teams, eight volleyball teams, and six basketball teams. Furthermore, the sample included 11 male teams and 10 female teams of which 12 teams played at high level and 9 teams played at low level. The players were on average 24.3 years old (SD = 4.9), had 14.9 years of experience (SD = 5.8), and played for 3.7 years in their current team (SD = 3.4).

One-way Anova's revealed no significant differences between the different sports regarding level (p = .16) and team gender (p = .66). With regard to age, years of experience, and team tenure, post hoc analyses revealed that volleyball players were older than basketball players (p < .001), that soccer players had more experience than basketball players (p = .03), and that basketball players played longer for the team than both volleyball players (p = .003) and soccer players (p < .001).

### 2.3 Measurements

## 2.3.1 Descriptive information

In addition to several demographic characteristics (e.g., age, sex, years of experience, team tenure), we also assessed other characteristics that might be related to a player's leadership quality. In this regard, players indicated their average playing time on a 5-point Likert scale, ranging from 1 (*almost nothing; 0-25%*), over 3 (50%), to 5 (*almost the whole game; 76-100%*). Furthermore, participants indicated to what extent leadership qualities were important in their job or in their free time (e.g., as a leader in youth movement) on a 7-point Likert scale, ranging from 1 (*not at all important*) to 7 (*very important*). Finally, players had to indicate whether they occupied the function of team captain.

# 2.3.2 Leadership quality networks

To create a leadership network for a sports team, each player on the team rated each teammate with respect to their leadership quality on a 5-point Likert scale, ranging from 0 (*very bad leader*) to 4 (*very good leader*). Based on the roster list, all the names of the players in the team were listed in advance on the questionnaire. For each team, this procedure resulted in a non-symmetric, directed *NxN* leadership quality network (with *N* being the number of team members). The rows referred to the outgoing ties of the team members (i.e., how players perceived other players' leadership quality), whereas the columns referred to the incoming ties of team members (i.e., how players are perceived by other players with regard to their leadership quality). By convention, the diagonal entries were forced to be missing values, meaning that players do not rate their own leadership quality. This approach resulted in a directed, valued network, meaning that (1) how player A perceives player A's leadership qualities, and (2) players rated their teammates on a 5-point Likert scale in contrast with the binary approach (i.e., 'leader' or 'no leader') used in previous studies (e.g., Lusher et al., 2010).

Study 1 included networks with respect to the perceived quality of leadership in general, based on the question "To what extent do you consider each teammate as having good leadership qualities in general?" Study 2 constructed a specific leadership quality network for each of the four leadership roles. As an example of these role-specific leadership quality networks, we will outline the procedure for the task leadership quality network. First, the definition of a task leader, as postulated in previous research (Fransen, Vanbeselaere, et al., 2014), was presented to the participants: "A task leader is in charge on the field; this person helps the team to focus on the team goals and helps in tactical decision-making. Furthermore, the task leader gives his/her teammates tactical advice during the game and adjusts them if necessary." Subsequently, each participant had to rate the quality of the task leadership of each of his/her teammates, whose names were listed in advance. Players had to indicate for each of their teammates "how well they perceived their teammates' task leadership qualities" on a 5-point Likert scale, ranging from 0 (very bad task leader) to 4 (very good task leader). Afterwards, the same procedure as outlined above was followed, which resulted in a non-symmetric NxN task leadership quality network for each team with directed, valued relations.

Figure 1 presents the task leadership quality network for one of the participating teams: a male basketball team. To maintain the clarity of this figure, we decided to visualize only the strongest leadership perceptions, in other words the perceptions of very good task leadership (i.e., score of 4). The size of each node in the network corresponds to the player's task leadership quality, as perceived by all other players in the team (i.e., the player's indegree centrality). The node size thus does take into account all the arrows, also the ones with scores lower than 4, which are not visualized in the picture. The higher a player's task leadership quality as perceived by all teammates, the larger the node, and the more central we positioned the player in the figure. The best task leader, whose node is filled in Figure 1, thus has the largest node size and is positioned most central in the figure.

**Figure 1.** Task leadership quality network of one specific participating basketball team. A directed line from Player A to Player B means that Player A perceives Player B as a very good task leader (i.e., score of 4). The other scores were not visualized. The node size corresponds to the indegree centrality: the higher a player's task leadership quality as perceived by all teammates, the larger the node, and the more central the player is positioned in the figure. The node of the best task leader is filled.



Player 6

## Attributes of high-quality athlete leadership

The same procedure was adopted to create a motivational leadership quality network, thereby using the following definition for motivational leader: "The motivational leader is the biggest motivator on the field; this person can encourage his/her teammates to go to any extreme; this leader also puts fresh heart into players who are discouraged. In short, this leader steers all the emotions on the field in the right direction in order to perform optimally as a team." To create a social leadership quality network, we used the following definition: "The social leader has a leading role besides the field; this person promotes good relations within the team and cares for a good team atmosphere, e.g. in the dressing room, in the cafeteria or on social team activities. Furthermore, this leader helps to deal with conflicts between teammates besides the field. He/she is a good listener and is trusted by his/her teammates." Finally, to create an external leadership quality network, the following definition was used: "The external leader is the link between our team and the people outside; this leader is the representative of our team towards the club management. If communication is needed with media or sponsors, this person will take the lead. This leader will also communicate the guidelines of the club management to the team regarding club activities for sponsoring."

The data of Study 2 thus resulted in four role-specific leadership quality networks for each team. By using the average of an athlete's perceived leadership quality on the four different roles, a score of all-round leadership was created for each athlete. Based on these perceptions of all-round leadership, we created an all-round leadership quality network, presented in Figure 2. This network is based on the same team as was used for the network in Figure 1. The node size and the position centrality of all athletes were based on the calculated perceptions of their all-round leadership quality. In other words, the higher a player's scores on the average perceived leadership on all four leadership roles, the larger the node size, and the more central the player is positioned in the network. The nodes of the appointed leaders in every specific role are filled. In the pictured team, player 3 is thus perceived as the best all-round leader and champions the roles of task and external leader. **Figure 2.** All-round leadership quality network of the same basketball team as was used in Figure 1. The node size and the position centrality of the node correspond to the average indegree centrality of the four roles: the higher a player's all-round leadership quality as perceived by all his teammates, the larger the node, and the more central the player is positioned in the figure. The nodes of the best leaders on each leadership role are filled. The lines do not represent perceptions of leadership, but instead perceptions of social connectedness. A directed line from Player A to Player B means that Player A feels very connected to Player B (i.e., score of 4). The other scores were not visualized.



## 2.3.3 Social connectedness network

In order to construct a social connectedness network, participants had to indicate for each teammate, whose names were listed in advance, "to what extent they felt connected to this person". Players rated their feeling of social connectedness on a 5-point Likert scale, ranging from 0 (not connected) to 4 (very connected). This procedure resulted in a non-symmetric, directed NxN connectedness network for each team, in which the AB entry referred to the extent player A felt connected with player B. Also in this network, the diagonal entries are forced to be missing values, representing that players do not rate the connectedness with themselves. Although Figure 2 presents the all-round leadership

network, with the node size and position centrality of the node referring to a player's allround leadership perceptions, the ties are referring to the perceived social connectedness. More specifically, we only visualized the ties of the strongest connectedness perceptions (i.e., score of 4). In other words, a directed arrow from player A to player B means that player A felt very connected to player B.

### 2.3.4 Team identification

Based on previous research (Doosje, Ellemers, & Spears, 1995; Fransen, Coffee, et al., 2014) team identification was assessed with five items (i.e., 'Being a member of this team is very important to me', 'I am very proud to be a member of this team', 'I identify myself strongly with this team', 'I feel strongly connected with this team', 'I am very happy to be part of this team'). Participants assessed these items on a 7-point scale anchored by -3 (*strongly disagree*) and 3 (*strongly agree*). As in previous research, these items formed a highly reliable scale in both studies, demonstrated by the high Cronbach's  $\alpha$ 's ( $\alpha$  = .91 for Study 1;  $\alpha$  = .88 for Study 2). In addition, confirmatory factor analysis confirmed the structure of the present scale in both studies, thereby allowing two covariances between two error terms (Study 1;  $\chi^2$  = 1.99; df = 3; p = .57; CFI = 1.00; TLI = 1.00; SRMR = .006; Study 2;  $\chi^2$  = 5.90; df = 3; p = .12; CFI = 1.00; TLI = .99; SRMR = .015).

## 2.4 Data Analysis

### 2.4.1 Social network measures

Density and degree centrality are often used measures to quantify leadership in teams when using SNA (Carson, Tesluk, & Marrone, 2007). First, the network density is a teamlevel measure that was computed for each team with regard to the four leadership quality networks, using the same procedure for valued networks as described by Sparrowe, Liden, Wayne, and Kraimer (2001). More specifically, the density for each network was computed by summing the values of all relations and dividing this result by the number of all possible relations. As a result, high density scores refer to teams with on average high-quality athlete leadership, whereas low density scores characterize teams with on average low-quality athlete leaders.

Second, degree centrality is a node-specific measure that refers to the strength of a node's ties. In directed networks, centrality can be further differentiated into indegree centrality (i.e., the strength of the incoming ties) and outdegree centrality (i.e., the strength

of the outgoing ties). For the leadership networks, we will only use the indegree centrality of a player, which is operationalized as a measure of the leader's importance in the team and the extent in which the leader can influence other team members (Freeman, 1979; Hoppe & Reinelt, 2010; Sutanto, Tan, Battistini, & Phang, 2011). With regard to the social connectedness network, both indegree and outdegree centrality will be used. A high indegree centrality characterizes the players to which other team members feel strongly connected. A high outdegree centrality on the other hand characterizes the players who feel strongly connected to their teammates.

## 2.4.2 Social Network Analyses

When correlating or regressing different networks, the autocorrelated structure of network data (Wasserman & Faust, 1994) would lead to severe biases when using the classical statistical tests (Krackhardt, 1987). In the present study, we therefore used Quadratic Assignment Procedure (QAP) hypothesis tests for each team separately to examine the relations between the different leadership networks and the connectedness network. Because QAP-tests use restricted permutation tests, these tests are robust against the problem of autocorrelation (Dekker, Krackhardt, & Snijders, 2007).

First, QAP-correlations were calculated between the different leadership quality networks and the social connectedness network for each team separately. The goal of this analysis was to examine whether the ties in the leadership quality networks are related to the ties in the social connectedness network.

Second, multiple regression quadratic assignment procedures (MR-QAP) were performed. In Study 2, MR-QAP was used to model the ties in the social connectedness network (i.e., the dependent variable), using multiple independent variables (i.e., the ties in the different leadership quality networks) (Krackhardt, 1987). This analysis was performed for each team separately to determine which leadership quality ties (task, motivational, social, or external) are most predictive for social connectedness ties.

### 3. **Results**

Because Study 1 and Study 2 investigated the same hypotheses (i.e., Study 1 with respect to leadership quality *in general* and Study 2 with respect to leadership quality *on the four leadership roles*), we will present the results according to the sequence of our hypotheses (i.e., results of both Study 1 and Study 2, pertaining to the same hypothesis, presented together), rather than presenting the results of Study 1 and Study 2 separately.

## 3.1 Leader Attributes Related to Perceived Athlete Leadership Quality

First, we identified which attributes determined athletes' leadership quality. Table 1 presents the linear regression analyses with the indegree centrality of the different leadership networks as the criterion variable (i.e., general leadership quality network for Study 1, role-specific leadership quality networks for Study 2). This leadership quality measure refers to the degree to which the other team members perceive a particular player as a good task, motivational, social, or external leader. The demographic characteristics and two measures of the social connectedness network, namely the indegree and outdegree centrality of a player in the social connectedness network, served as predictor variables. The indegree centrality is a measure for the extent to which other team members feel connected with the particular player (termed "social connectedness from others"), whereas the outdegree centrality refers to the extent in which a particular player him/herself feels connected to the other team members (termed "social connectedness toward others"). Because not all the predictors are networks, we could not use the social network specific QAP-regression. Instead, normal linear regressions were used, including the node-specific social network measures of degree centrality for the included networks.

The correlations between the different predictor variables did not exceed .50, neither in Study 1 (leadership quality *in general*), nor in Study 2 (leadership quality *on the four roles*), except for the correlation between age and years of experience (r = .82 in Study 1; r= .74 in Study 2). To exclude any possible bias due to multicollinearity, we calculated the VIF scores for each predictor in all six regressions. All VIF scores appeared to be smaller than 3.7, which is clearly below the limit of 10 above which concern for bias is warranted (Bowerman & O'Conell, 1990; Myers, 1990). Furthermore, all tolerance scores clearly exceeded the recommended 0.2 threshold (Menard, 1995).

	Leadership	Task	Task Motivational Social		External	All-round
	quality in	leadership	leadership	leadership	leadership	leadership
	general <sup>1</sup>	quality <sup>2</sup>	quality <sup>2</sup>	quality <sup>2</sup>	quality <sup>2</sup>	quality <sup>2</sup>
Age	.23**	.10	.20**	.22**	.10	.17**
Leadership outside sport	.11**	$.10^{*}$	.09*	$.10^{*}$	.06	.10*
Years of experience	.19**	.01	15*	20**	$.17^{*}$	03
Team tenure	13**	06	06	03	12*	08
Captaincy <sup>3</sup>	.25***	.18***	.15**	.08	.23***	.18***
Playing time	.29***	.25***	.13*	.07	.18**	.18***
Team identification	.02	.07	.08	.07	.06	.08
Social connectedness from others <sup>4</sup>	.34***	.48***	.61***	.68***	.29***	.57***
Social connectedness towards others <sup>5</sup>	04	07	09	04	09	08
R <sup>2</sup>	.59	.60	.59	.59	.42	.65

**Table 1.** The standardized regression coefficients ( $\beta$ ) of the regression analyses with players' indegree centrality within each of the leadership quality networks as dependent variable.

 $p^* < .05; p^* < .01; p^* < .001$ 

<sup>1</sup>These analyses are based on Study 1. <sup>2</sup>These analyses are based on Study 2. <sup>3</sup>Captaincy is a dichotomous variable indicating whether the player is a captain or not. <sup>4</sup>Social connectedness from others refers to the player's indegree centrality within the social connectedness network. <sup>5</sup>Social connectedness towards others refers to the player's outdegree centrality within the social connectedness network.

First of all, it should be noted that some beta values are negative, suggesting a negative relation with leaders' perceived quality. However, further analyses in both studies pointed out that when entering a single predictor variable in the regression, the relation with the perceived leadership quality in each of the roles was positive for each predictor. In other words, the negative direction of the relation is caused by the inclusion of other predictors. Because some predictors are related with each other, the standard errors are misleadingly inflated as a result of which the positive significance of some predictors turns into non-significance or even into negative significance. More specifically, when years of experience was entered in the regression as only predictor, all beta values were positive and significant (p < .001). Also for the years played in the team, the same procedure resulted in all positive significant beta values (p < .05), with only one exception: team tenure was not a significant predictor for external leadership quality. Finally, for social connectedness towards others, all beta values were positive, but significance only emerged for the perceived quality of task leadership, social leadership, and all-round leadership (p < .05).

The results in Table 1 point to social connectedness from others as the most important characteristic of an athlete's social leadership quality (i.e., revealed by the highest  $\beta$  compared to the other attributes), thereby confirming H1a. Moreover, not only for the social leader, but also for the task, motivational, and external leader, social connectedness seems to be the key attribute determining an athlete's perceived leadership quality. In other words, the stronger teammates felt connected to a specific player, the higher they rated this player's leadership quality. This finding holds for Study 1 (i.e., leadership quality in general), as well as for Study 2 (i.e., leadership quality with respect to each of the four different leadership roles). Considering that social connectedness is the most processoriented attribute compared with the other included attributes in the current study, the superiority of social connectedness supports H2, which stated that process-based attributes.

Moreover, further analyses revealed that, within both studies and for all the different leadership networks, the superiority of social connectedness holds for all the different sports ( $\beta$ 's ranging from .21 to .80, all p's < .05), for both male and female teams ( $\beta$ 's ranging from .46 to .78, all p's < .001), and for teams playing on high and on low level ( $\beta$ 's ranging from .33 to .80, all p's < .01). Only one exception emerged in Study 2; connectedness from others was not seen as a significant predictor of the external leadership quality in male teams. Our findings partially contradict H1: social connectedness emerged as key attribute for all leadership roles but, with respect to the other attributes, differences did emerge between the four roles.

More specifically, in Study 1, captaincy emerged as a significant predictor of general athlete leadership quality in all four sports, regardless of the team gender or level. With regard to Study 2, captaincy emerged again an important predictor of leadership quality on all domains, except for the domain of social leader. However, further analyses revealed some differences as a function of sport, level, or team gender. For example, captaincy was not perceived as a significant predictor of task leadership quality in basketball. For motivational leadership quality, captaincy was not a significant predictor in volleyball or in low level teams. Although the results for the total sample did not reveal a significant relation between captaincy and social leadership quality, captaincy did emerge as a significant predictor of social leadership quality in high level teams. Finally, with regard to external leadership quality, no significance for captaincy was observed in soccer teams, neither in low level teams, nor in female teams. These findings partially support H1b:

although in general captaincy emerged as most predictive attribute for external leadership quality after social connectedness, the non-significance for soccer teams, low level teams, and female teams temper the generalizability of our findings. Taking into account the four different leadership roles together (i.e., with regard to all-round leadership quality), captaincy was a significant characteristic for all different sports, for both male and female teams, but only for high level teams.

Age also emerged as an important predictor; the older the players, the better they were perceived as leaders in general (Study 1), and in particular with respect to the motivational and social leadership role (Study 2). However, there are some other differences that should be highlighted. More specifically, in Study 1, age was only seen as a significant attribute of leadership quality in general in soccer teams and in female teams. Similarly, in Study 2, with regard to motivational leadership quality, age was only a significant attribute for high-quality leaders in male teams. However, in both male and female teams, age was a significant attribute of social leadership quality.

In line with H1c, playing time was a significant attribute of the leadership quality of task and motivational leaders (Study 2). For task leadership quality, playing time was even the second most predictive attribute after social connectedness. Leadership experience outside the sport context was also seen as a significant predictor of the perceived leadership quality for the task leader, for the motivational leader, and for the social leader, but not for the external leader. However, this leadership experience was only a characteristic attribute of high-quality leaders in high competition level teams, not in low competition level teams.

Both team identification and the social connectedness towards others (i.e., the extent to which a player feels connected with the other team members) failed to emerge as significant predictors for high-quality leaders, neither for athlete leadership quality in general (Study 1), nor for leadership quality on any of the four roles (Study 2). Nevertheless, we decided to compare the contribution of these variables in the different sports, for higher and lower levels of competition, and for male and female teams. No significant differences emerged, with exception for team identification. A player's identification with the team was a significant predictor of basketball players' all-round leadership quality ( $\beta = .17$ ; p < .05), and for their motivational ( $\beta = .28$ ; p < .01) and social leadership quality ( $\beta = .21$ ; p < .02) in particular. Furthermore, soccer players who identified more with the team were perceived as significantly better task leaders ( $\beta = .19$ ; p < .05).

## 3.1.1 The relation between social connectedness and athlete leadership quality

Social connectedness from others emerged as the most important characteristic of an athlete's leadership status, regardless of the sport, team gender, or competition level on which teams played. However, the cross-sectional nature of our data does not allow us to determine the causality of this relationship: is it the more players feel connected to a teammate, the higher they rate this teammate's leadership quality, or the other way around: the more players perceive a teammate as good leader, the more connected the players feel to him/her. Because social connectedness was measured with a network structure, we can use specific social network measures to further investigate the link between the social connectedness network and the different leadership networks.

In Study 1 (i.e., examining general leadership quality), we used QAP-correlations to examine the link between the general leadership quality network and the social connectedness networks for each team separately. Findings revealed that in 23 of the 25 teams the general leadership quality network was significantly and positively correlated with the social connectedness network (average *QAP-correlation* = .40; average *p*-value = .02). In other words, the findings outlined above (based on indegree centrality as average measure) can be extended to all relations within the whole network; the more connected player A felt to player B, the more player A perceived player B as a good leader in general.

In Study 2 (i.e., examining leadership quality on each of the four roles), multiple QAP-regressions were conducted to determine the extent in which each of the four leadership quality networks explained the variance in the social connectedness network. In these regressions, the four different leadership quality networks functioned as predictor variables, whereas the social connectedness network functioned as criterion variable. The standardized regression weights of the multiple QAP-regressions for each team separately can be found in Table 2.

The highest average regression weight over all teams was found for social leadership quality (average  $\beta = .34$ ), which is in line with H1a. In 16 of the 21 teams, this regression coefficient was significant. In other words, high social leader quality within the team was most closely related with high social connectedness within the team. Motivational leader quality was seen as second most predictive for social connectedness in the team, indicated by a significant regression coefficient in 13 of the 21 teams (average  $\beta = .23$ ). The contributions of task and external leadership quality in explaining the variance in the social

connectedness network were very small (average  $\beta = .07$  and -.01 respectively). Only in a small minority of the teams (respectively 4 and 2 teams of the 21 teams) the networks of task and external leadership quality significantly predicted the social connectedness network.

**Table 2.** The standardized regression coefficients of the QAP-regressions with the socialconnectedness network as dependent variable and the four specific leadership quality networksas independent variables.

Teem	$\mathbf{p}^2$	Task leader	Motivational leader Social leader		External leader
Team K		quality ( $\beta$ )	quality ( $\beta$ )	quality ( $\beta$ )	quality ( $\beta$ )
1	.35	.01	.21*	.44***	05
2	.13	.20	03	.18	.07
3	.09	.04	.03	.25**	.07
4	.36	17	.35*	.36***	.12
5	.20	.01	.30*	.06	.11
6	.18	14	.34	.33*	15
7	.29	.01	02	.54***	.02
8	.54	.10	.36***	.44***	08
9	.36	.19	$.21^{*}$	.24**	.04
10	.49	.09	$.18^{*}$	$.50^{***}$	.10
11	.39	14	.44***	.43***	11
12	.31	05	$.26^{*}$	.44***	.11
13	.42	$.20^{*}$	.11	.34***	.10
14	.39	.08	.36**	.41***	34**
15	.48	.11	.51**	.22	06
16	.37	.45***	.04	$.28^{**}$	05
17	.09	.11	.13	.17	22
18	.57	10	.35***	$.58^{***}$	13*
19	.24	.04	.07	.28	.15
20	.46	$.16^{*}$	.23**	.39***	.13
21	.35	.16*	.31***	.25**	09
Average β	.34	.07	.23	.34	01
Weighted av	verage β	.06	.22	.22	01

 $p^* < .05; p^* < .01; p^* < .001$ 

## 3.2 Team Characteristics Related to Teams' Athlete Leadership Quality

To establish a measure for leadership quality on team level, we used the density values of the different leadership quality networks, which represent the average value of the athletes' leadership qualities within the team on that specific role. These density values range between 0 and 4; a high density network has on average stronger ties (i.e., stronger

leadership perceptions) than a low density network. Table 3 presents the densities of the different leadership networks with the associated standard deviations and their intercorrelations, all averaged over the analyzed teams. Table 3 includes the results of both Study 1 (i.e., general leadership quality) and Study 2 (i.e., leadership quality on the four leadership roles).

	М	SD	3.	4.	5.	Social connectedness network density	Team-level team identification
1. Density of the general leadership quality network <sup>1</sup>	1.92	.22				.57**	.57**
2. Density of task leadership quality network <sup>2</sup>	2.18	.24	.86**	.76**	.42	.60**	$.48^{*}$
3. Density of motivational leadership quality network <sup>2</sup>	2.34	.28		.84**	.31	.48*	.44*
4. Density of social leadership quality network <sup>2</sup>	2.43	.22			.45*	.61**	.43
5. Density of external leadership quality network <sup>2</sup>	1.80	.53				.39	.23

**Table 3.** Means, standard deviations and intercorrelations of the densities of the different
 leadership networks, as well as their correlations with team level characteristics.

 $p^* < .05; p^* < .01; p^* < .001$ 

<sup>1</sup>These analyses are based on Study 1. <sup>2</sup>These analyses are based on Study 2.

In both Study 1 and Study 2, one-way Anova's revealed no significant differences for the densities of the different leadership networks with respect to team level and team gender. In other words, both male and female teams, playing at a high and low level, perceived the average leadership quality on the different roles within their team similarly. With regard to the three different sports tested in Study 2, soccer teams rated both task, motivational, and external leadership quality in their team higher than basketball teams (respectively p = .02, p = .03, and p = .01). With regard to the all-round leadership quality (i.e., average leadership quality over the four roles included in Study 2), both soccer teams and volleyball teams scored higher than basketball teams (respectively p = .001 and p = .02). However, in Study 1 (i.e., leadership quality in general) no such differences between the different sports emerged.
The second main aim of the present manuscript was to determine the extent in which a team's average athlete leadership quality was related with team characteristics such as team identification and social connectedness. In contrast to the previous research aim, we now examined attributes at the team level instead of at the individual level. To examine the relation between the densities of the leadership networks and the team attributes, we calculated the average value of all players' identification with their team, and we used the density of the social connectedness network as a measure for the average social connectedness perceptions in the team. Table 3 presents the correlations between the densities of the different networks and both team identification and the density of the social connectedness network.

The results in Table 3 revealed that the leadership quality in general (Study 1), and the task and motivational leadership quality in particular (Study 2), were significantly related with the team's team identification, which confirms H3. To compare the different correlations with each other, we used the Hotelling-Williams test as was described by Steiger (1980):

$$t_{(N-3)} = (r_{xy} - r_{xz}) \sqrt{\frac{(N-1)(1+r_{yz})}{2(\frac{N-1}{N-3})|R| + \bar{r}^2(1-r_{yz})^3}},$$

with  $|R| = 1 - r_{xy}^2 - r_{xz}^2 - r_{yz}^2 + 2(r_{xy})(r_{xz})(r_{yz})$ ,  $\bar{r} = \frac{(r_{xy} + r_{xz})}{2}$ , N being the sample size (i.e., 267), X being the average team value for team identification, and Y and Z being the densities of the leadership networks. The results revealed that the correlation between team identification and external leadership quality (r = .23) was significantly lower than the correlation between team identification and task leadership quality (r = .48; t = 4.26; p < .001), motivational leadership quality (r = .44; t = 3.21; p < .01), and social leadership quality (r = .43; t = 3.41; p < .001).

With regard to social connectedness, the results in Table 3 revealed that the perceived quality of leadership in general (Study 1) was significantly related with the density of the connectedness network, which confirms H4a. With respect to the different roles (Study 2), the perceived quality of task, motivational, and social leaders was significantly correlated with perceptions of social connectedness within the team. In line with H4b, the density of the social leadership quality network was most strongly correlated with the density of the social connectedness network.

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To examine the differences between the different correlations, we replaced the Y variable in the above formula by the density of the connectedness network. The results revealed that the correlation between the social leadership quality network and the connectedness network (r = .61) significantly exceeded the correlations between both motivational and external leadership quality and social connectedness (respectively r = .48; t = 4.72; p < .001 and r = .39; t = 4.27; p < .001). Furthermore, the correlation between the task leadership quality network and the connectedness network (r = .60) was significantly higher than the correlation between both motivational and external leadership quality and social connectedness (respectively r = .48; t = 4.62; p < .001 and r = .39; t = 3.94; p < .001).

## 4. Discussion

To date, leadership research in organizational settings has been predominantly leader-centered (for a review see Judge et al., 2009). Thomas et al. (2013, p. 5) pointed at a research gap stating that "by taking a leader-centric approach to leadership, leadership researchers have traditionally neglected the important role of followers' social cognition in mediating and moderating the effect of leadership behavior on followers' judgments and behavior". Although it has been acknowledged that leadership is to a certain degree a socially constructed reality and that the followers seem to hold the key for effective leadership (Haslam et al., 2011), research on leadership as a team-level construct is very rare in sports settings. Instead of investigating isolated athletes, we focused on the athletes imbedded in social webs of interrelationships with their teammates. By using social network analysis for the first time to examine the attributes of high-quality athlete leadership, the present study contributed to the current athlete leadership literature in two ways.

### 4.1 Individual-Level Attributes of High-Quality Athlete Leaders

As a first contribution, we identified the most important attributes of an athlete's leadership quality as perceived by the other team members. We distinguished between four different leadership roles that a player can occupy. The results revealed that the degree in which athletes felt connected with their leader was most strongly related to athletes' perceptions of that leader's quality. This finding holds both for leadership quality in general and for the quality of the four specific leadership roles. These results corroborate earlier social network research in organizational settings, revealing that good social relations between group leaders and both peers and followers led to more secure favourable

leadership perceptions (Mehra et al., 2006). Furthermore, the results align with previous sport research, demonstrating that teammates' perceptions of connectedness are characteristic for athlete leaders (Moran & Weiss, 2006; Price & Weiss, 2011; Tropp & Landers, 1979). However, our findings clearly contradict the widespread perception that the leadership quality of an athlete is not related with his/her popularity within the team (Holmes et al., 2010).

Given the cross-sectional nature of the study, we cannot determine the direction of this relationship. It could be that the more players' feel connected to their leader, the better they rate his/her leadership qualities. However, it could also be the other way around: the more players perceive their leader as a good leader, the more they feel connected to him? It seems likely that the relation between connectedness and perceived leadership quality is reciprocal (i.e., both constructs influencing each other). Therefore, future experimental research using experimental designs should try to determine the relative strength of this bidirectional association.

Our finding that social connectedness is the key to effective leadership for every leadership role contradicts H1, which stated that different attributes would be most decisive for the quality on the different leadership roles. However, at the same time, differences between the four leadership roles did emerge for the other attributes that were measured. For example, in line with H1c, playing time was demonstrated to be an important attribute for the leadership quality of task, motivational, and external leaders, but not for social leaders, thereby confirming previous findings (Rees & Segal, 1984).

Being a captain was also perceived as an important predictor for the perceived quality of task, motivational, and external leaders (in line with H1b), but not for the perceived quality of social leaders. This finding adds to the literature that the formal recognition of being a team captain is more strongly linked with athletes' perceived leadership quality than characteristics such as age, years of experience, and team tenure.

Finally, age was seen as an important characteristic for high-quality motivational and social leaders, thereby confirming previous research that social leaders were mostly seniors, whereas task leaders were spread amongst juniors and seniors (Rees & Segal, 1984). Age, as an indicator of accumulated relevant life experiences, can facilitate abilities such as solving interpersonal conflicts or steering someone's on-field emotions in the right direction (Grossmann et al., 2010; Staudinger & Baltes, 1996). Older players may have acquired more

control over their own emotions, which could make it easier to focus on others' emotions and on the interpersonal relations within the team.

It can be concluded that, in line with our expectations (H2), the process-based attributes, such as social connectedness, were more decisive in determining an athlete's leadership quality than the more trait-like attributes, such as age, sport competence, and team tenure. Furthermore, the study findings further support the idea that followers hold the key to effective leadership. The most predictive characteristic for the leader's perceived quality was not the degree to which the leader felt connected with the other team members, but instead, the degree to which the others felt connected to the leader.

## 4.2 Team-Level Attributes of Teams with High Athlete Leadership Quality

As a second contribution, we provided more information at the team level, and more specifically, on how the average athlete leadership quality in a team is related to important team characteristics, such as team identification and the team's social connectedness. With regard to team identification, it was found that a higher average athlete leadership quality in the team positively correlated with higher levels of team identification within the team, thereby confirming H3. The present findings further support the Social Identity Perspective on Leadership (Haslam et al., 2011), holding that high-quality team leadership strengthens members' identification with their team. Our results highlight the potential value of this social identity approach for gaining a better understanding of leadership processes in sport settings.

With regard to social connectedness, our study demonstrated that this construct is not only an attribute of the perceived leadership quality at the individual level, as outlined above, but also a team-level attribute for teams with high-quality athlete leadership (H4a). Also in line with our expectations (H4b), the average social leadership quality in the team was the most predictive for high levels of social connectedness within the team. These findings are similar with previous studies that have demonstrated the positive impact of leaders on the team's cohesion, both of coaches (Callow, Smith, Hardy, Arthur, & Hardy, 2009; De Backer et al., 2011) and of athlete leaders (Crozier et al., 2013; Vincer & Loughead, 2010).

It is noteworthy that, when looking back at the individual level of analysis and more specifically to the regression analyses presented in Table 2, no significant relation emerged between a player's perceptions of task leadership quality and his/her perceptions of connectedness. Although, for the motivational and social leader, feeling closely connected with the leader was positively related to the perceptions of the leader's quality, these social connectedness perceptions did not matter when rating a player's task leadership quality.

At the team level by contrast, the team's task leadership quality was strongly related with the team's connectedness. In fact, the correlation between the team's connectedness and task leadership quality almost equaled the correlation with social leadership quality, and significantly exceeded the correlations with the other leadership roles. In other words, higher task leadership qualities in the team go hand in hand with higher social connectedness among the members. A possible explanation is that higher task leadership qualities within the team foster a higher task-oriented climate. In this regard, the observed findings align with previous studies demonstrating the beneficial nature of a task-involving motivational team climate in sports teams for the formation and development of not only task cohesion, but also of social cohesion (Boyd, Kim, Ensari, & Yin, 2014; Eys et al., 2013). Although social connectedness may not impact perceptions of task leadership quality at the individual level, having high-quality task leaders in the team is important for having a strongly connected team. As Boyd et al. (2014, p. 120) noted, "collective effort to improve group performance where each player fulfils a distinctive role on the team, may serve to break down social barriers subsequently generating player interdependence and team camaraderie on and perhaps off the field."

### 4.3 Strengths, Limitations, and Further Research Avenues

When interpreting the findings from the present study, some strengths and weaknesses of our methodology approach should be acknowledged. A major strength of this study is the relatively large number of participating teams. Previous studies using social network analysis in a sports setting tested one to three sports teams (Cotta et al., 2013; Kyoung-Jin & Yilmaz, 2010; Lusher et al., 2013; Lusher et al., 2010; Passos et al., 2011; Warner et al., 2012). By including the data of 46 teams, containing 575 players in total, the present study by far exceeds the sample size of the previous network studies, which enhances the reliability and generalizability of our results.

A second strength of this study is that in order to allow for the comparison between genders, competition levels, and sports, the present study opted for a stratified sampling technique, which resulted in a variety of male and female participating athletes, playing at low and high competition levels in four different sports. Previous researchers have

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suggested that it is important to examine issues such as gender and playing level when studying leadership in sport (Price & Weiss, 2011). Nevertheless, most studies on athlete leadership had only examined either male or female teams at a specific competition level, limiting comparisons on these aspects. The only exception with respect to team gender is the study by Moran and Weiss (2006), in which both male and female players were examined. These authors identified gender differences in that the perceptions of male athlete leader's quality, as rated by teammates, included both psychological and social qualities (e.g., friendship quality), whereas for females, perceptions of athlete leadership quality were only related to higher sport competence.

Taken together, the current manuscript showed a high degree of equivalence between male and female teams, between high and low competition level teams, and between the different sports. For instance, within all these groups, the perceptions of social connectedness emerged as key attribute for high-quality leadership. In contrast, also significant differences between these groups emerged, for instance with regard to the other leader attributes we included. Future research should take into account that findings on athlete leadership cannot automatically be generalized, regardless of team gender, competition level, or sport.

In addressing the limitations of the present research, several opportunities for future research emerge. In terms of the study design, we explored for only a limited selection of attributes whether or not they are characteristic for high-quality athlete leaders and for teams having high athlete leadership quality. Therefore, caution is warranted when interpreting the results concerning the discussion about trait- and process-based attributes. Although social connectedness as process-oriented attribute was most predictive of the leadership quality perceptions of the different leadership roles, several trait-like characteristics also emerged as significant predictors (e.g., age, years of experience, captaincy). This finding infers that, despite leadership being a process, and athletes can learn how to become good leaders, it should not be disregarded that certain athletes are more suitable to occupy a leadership function than others.

In addition, it should be noted that some of the measured attributes that we considered as traits (e.g., age, years of experience) have a process-oriented connotation. Although these characteristics are stable on a given moment and cannot be changed by leadership development programs, it is plausible that the process-oriented nature of leadership underlies the significance of these predictors. In other words, the fact that older

and more experienced athletes are seen as better athlete leaders might reflect that leadership is learned throughout practice. A longitudinal study examining the leadership development over athletes' sporting careers would provide more insight in this regard. Furthermore, future research should include pure personality traits, such as dominance and extraversion, to establish the relative impact compared with more process-based attributes. In doing so, the social network approach, as presented in the current manuscript, constitutes a novel and pioneering tool to study leadership attributes in sports settings.

In addition, leadership is dependent on the specific surrounding context. There is no single 'best' leadership style: the most successful leaders are the ones who are able to adapt their leadership style to the group that they are leading and to the specific task at hand. This context-specificity is advocated not only by the Situational Leadership Theory (Hersey, 1984), but also by the recently developed Social Identity Approach to Leadership (Haslam et al., 2011), which holds that good leadership is grounded upon the specific social identity existing within the team. In this regard, the most effective leaders are seen as conforming the in-group prototypes, thereby embodying the differences between the specific in-group and other out-groups (Haslam et al., 2011). Furthermore, the theory on shared leadership (Pearce & Conger, 2003, p. 111) argues that the leadership structure in a team should be flexible, thereby allowing the specificity of the situation to determine which persons will fulfill a leadership function.

The present findings demonstrated that leaders' characteristics differ for the various leadership roles athletes can occupy. Future research should establish whether these attributes differ depending on the specific situation. For example, a motivational leader aims to steer all players' emotions in the right direction in order to perform optimally. In order to get each player in the optimal zone, different leadership behaviors might be the most effective: while some players need a hard-handing approach, others need more emotional support. Some players need to be calmed down, while others need to be aroused. It can thus be assumed that effective leaders not only adapt their leadership style to the team they lead, but even to each individual member in the team, depending on the situation.

Another fruitful line for further research is the search for an effective athlete leadership development program. The present study demonstrated the importance of highquality athlete leadership for team identification and social connectedness. In addition, previous research emphasized several other positive outcomes of high quality athlete leaders, such as team resilience, team cohesion, athletes' satisfaction, team confidence, and team identification (Fransen, Coffee, et al., 2014; Fransen et al., 2012; Morgan, Fletcher, & Sarkar, 2013; Price & Weiss, 2011; Vincer & Loughead, 2010). Therefore, future research should further clarify the processes through which effective leadership skills can be developed. In doing so, the effectiveness of leadership development programs should be evaluated within different sports and at different levels.

### 4.4 Contribution to Theoretical Knowledge

The present manuscript combines three different approaches to leadership, namely a trait-based approach, a process-based approach, and an approach that gives a central position to the followers in the leadership process. First, it can be concluded that, in line with the historical evolution in leadership research, the process-based attributes (e.g., social connectedness) were more decisive in determining an athlete's leadership quality than the trait-based attributes. Second, it was shown that higher perceived athlete leadership quality within the team was positively related with higher levels of team identification. This finding provides support for the applicability of the Social Identity Approach to Leadership in sport settings. Because, social connectedness from others, rather than social connectedness toward others emerged as the key attribute of high-quality athlete leaders, it can be concluded that the followers, rather than the leader, hold the key to effective leadership.

One important research challenge for social psychologists, following from previous research (e.g., Haslam et al., 2011; Thomas et al., 2013), was to demonstrate that the group processes associated with leadership have more explanatory power than the more leader-centric approaches to leadership. Social network analysis was demonstrated to be a novel and valuable tool for obtaining a deeper insight in athlete leadership within teams, thereby taking into account the surrounding team context. By including also a team-level perspective on athlete leadership, we counterbalanced the leader-centered approach that has dominated athlete leadership research.

## 4.5 Implications for Coaching Practice

There are a number of practical implications that could be considered by coaches, sport psychologists, and other sport professionals. First of all, social network analysis seems to be a novel and valuable tool to identify the leadership structures in a sport team. Identifying the key leaders in the team for each of the four leadership roles is a first step in a leadership development program. The findings of the present study can then be used to develop a specific program for each of the leaders in order to obtain role-specific highquality athlete leadership. Moreover, the technique of social network analysis can also be used to map the social connectedness relations within a team. The visualization of such a network provides additional insights by revealing potential cliques within the team. As such, social network analysis forms the key to obtaining a full insight in the relational structures within the team.

With regard to the discussion about trait- or process-based leadership, Chase (2010) argued for the importance of a player's mindset. Two different mindsets can thereby be distinguished (Dweck, 2006): a person with a fixed mindset would view leadership as an innate quality, or believe that people are born leaders. A person with a growth mindset would believe that leadership abilities can be learned and acquired through effort and experience. Chase (2010) demonstrated that a growing leadership mindset is essential for the effectiveness and success as a leader. Therefore, we suggest that athlete leadership development programs should guide athletes in obtaining a growth mindset about their abilities, as opposed to focusing on how to be a great leader. The perfect leader cannot be found, nor can a perfect follower be found. But it seems that in the pursuit of perfection, by walking the talk of the group, leaders develop their leadership skills to lead their team to success.

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An examination of the relationship between athlete leadership and cohesion using

Social Network Analysis

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*Note*: Although Prof. Todd Loughead took the lead in the writing out of the introduction and discussion of the manuscript, it should be noted that we completed the data collection, conducted the analyses, and provided a first draft of the method section and the result section.

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## Abstract

Two studies were conducted to examine the structure of different athlete leadership networks and its relation to cohesion using Social Network Analysis. In Study 1, we examined the relation between a general leadership network and measures of task and social cohesion using the Group Environment Questionnaire (GEQ; Carron et al., 1985). In Study 2, we investigated the leadership networks for four different athlete leader roles (i.e., task, motivational, social, and external) and their association with task and social cohesion. Using a total of 25 teams in Study 1 and 21 teams in Study 2, participants included male and female athletes competing at the national, provincial, and regional levels in the region of Flanders, Belgium. In Study 1, the results showed that the general leadership quality network was positively related to task and social cohesion as measured by the GEQ. In other words, when athletes observed higher amounts of athlete leadership within their teams, they perceived greater unity and closeness regarding the attainment of group goals and the maintenance of social interactions. The results from Study 2 indicated positive correlations between the four leadership networks and both task and social cohesion networks. Further, the motivational leadership network was found to be the strongest predictor of the task cohesion network; while the social leadership network emerged as the strongest predictor of the social cohesion network. Overall, the results complement a growing body of research indicating that athlete leadership has a positive association with perceptions of team cohesion.

Keywords: athlete leadership, cohesion, Social Network Analysis

#### 1. Introduction

Cohesion is defined as "a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives, and/or for the satisfaction of member affective needs" (Carron, Brawley, & Widmeyer, 1998, p. 213). Inherent in this definition is the notion that cohesion is a key variable in terms of group formation, maintenance, and productivity, which led some researchers to consider cohesion as the most important small group variable (Golembiewski, 1962; Lott & Lott, 1965). The importance of cohesion in the study of sport teams has long been recognized by group dynamics researchers (e.g., Brawley, Carron, & Widmeyer, 1987).

Given its importance and to help guide research in the area, Carron (1982) advanced a conceptual model for the study of cohesion in sport. The model is a linear framework comprised of inputs, throughputs, and consequences. The inputs are viewed as the antecedents of the cohesion and are comprised of four categories. The first antecedent is labeled environmental factors, which consists of both contractual responsibilities (e.g., eligibility and contract demands) as well as organizational orientations (e.g., the goals of the organization). The second antecedent is labeled *personal factors*, which includes factors such as individual motivation (e.g., task, affiliation, and self-motivation), individual satisfaction, and individual differences (e.g., race). The third antecedent influencing cohesion is *team factors* and consists of such variables as group orientation, group productivity norm, team stability, and desire for group success. The last antecedent impacting the development of cohesion is *leadership factors*, which refers to the behaviors, characteristics, attitudes, and cognitions of leaders. While not a focus of the current study, the conceptual model also highlights the importance of the consequences related to cohesion. Carron noted that the consequences of cohesion could be related to individual outcomes such as personal satisfaction, role clarity, individual performance, and conformity. Conversely, team outcomes could also be examined that include but are not limited to aspects such as team performance, team stability, team satisfaction, and collective efficacy.

The central component of this conceptual model is the throughput of cohesion. The definition of cohesion presented at the beginning of this article highlights the multidimensionality of cohesion. Carron, Widmeyer, and Brawley (1985) noted that cohesion's multidimensionality can be examined from the individual-group and task-social

perspectives. The individual-group distinction assumes that each team member has thoughts about both the cohesiveness of the team as a whole, as well as their own individual perceptions of their team. The task-social distinction reflects the notion that team members can be interested in the achievement of the goals of the team and/or in the development and maintenance of social relationships within the group.

While it could be argued that all of the antecedents (i.e., environmental, personal, team, and leadership) are important in terms of influencing cohesion, the present study focused on the association between leadership and cohesion. Leadership was selected since it is a variable closely related to group effectiveness (Carron & Eys, 2012). Similarly, a survey of U.S. Olympic coaches revealed that two of the most important team-related variables influencing athlete performance were cohesion and strong team leadership (Gould, Guinan, Greenleaf, & Chung, 2002). There are different sources of team leadership within sport teams with coaches being one of the most obvious. However, athletes are also an essential and critical source of leadership within teams (Price & Weiss, 2013).

While athlete leadership research is in its infancy, the research that has been conducted highlights its importance to effective team functioning. Athlete leadership is defined as an athlete occupying a formal or informal role within a team, who influences group members to achieve a common goal or objective (Loughead, Hardy, & Eys, 2006). Contained within this definition are two types of athlete leaders based on their status within the team. First, there are formal athlete leaders who are formally designated as leaders by the team, such as team captains and assistant captains. The second type refers to informal athlete leaders by interacting with other team members.

To date, research examining athlete leadership can be classified into three main categories— the characteristics and attributes of athlete leaders, the quantity of athlete leaders within teams, and the behaviors exhibited by athlete leaders. Research examining the characteristics and attributes of athlete leaders has been sparse and sporadic in the last three decades (Loughead, Mawn, Hardy, & Munroe-Chandler, 2014). In essence, athlete leadership is fulfilled by both formal and informal leaders (Loughead et al., 2006), who are viewed as high in ability (Yukelson, Weinberg, Richardson, & Jackson, 1983), play in central positions within their teams (Glenn & Horn, 1993), possess certain personality characteristics such as being assertive, confident, friendly, nurturing, organized, and responsible (Glenn & Horn, 1993), and are liked by their teammates (Tropp & Landers, 1979).

The present study used Fransen, Vanbeselaere, De Cuyper, Vande Broek, and Boen's (2014) classification concerning the leadership roles of athletes. Specifically, this athlete leadership categorization encompasses two on-field leadership roles (i.e., task and motivational leader) and two off-field leadership roles (i.e., social and external leader). The task athlete leader is an individual who takes charge on the field, helps the team to focus on its goals, and provides tactical guidance during games. The motivational athlete leader encourages teammates during competition, and lifts the spirits of teammates who are discouraged. The social athlete leader promotes good relationships between teammates, promotes a good team atmosphere off the field, and is trusted by teammates. The external athlete leader serves as a liaison between the team and the external environment where the individual represents the team at functions such as meetings, press conferences, community events, and team receptions.

As for the quantity of athlete leaders on a team, research findings are fairly consistent that there are numerous athletes fulfilling leadership roles. For instance, Loughead and Hardy (2005) had intercollegiate athletes indicate teammates who provided leadership to them. Two-thirds of the participants listed both formal and informal athlete leaders as providers of leadership, whereas the other third of the participants indicated the team captain as the only source of leadership. Further, Eys, Loughead, and Hardy (2007) examined the relationship between the number of athlete leaders across various leadership roles (i.e., task, social, and external) and satisfaction. The results indicated that those who perceived an equal representation of all three leadership roles were more satisfied with their teams' performance. The majority of research investigating athlete leadership has examined the leadership behaviors exhibited by formal and/or informal leaders in relation to various constructs. In particular, research has shown that an increase in athlete leadership behaviors has been positively associated to an increase in team cohesion (Paradis & Loughead, 2012; Vincer & Loughead, 2010), satisfaction (Paradis & Loughead, 2012), intrateam communication (Smith, Arthur, Hardy, Callow, & Williams, 2013), enjoyment, intrinsic motivation (Price & Weiss, 2013), and collective efficacy and team identification (Fransen, Coffee, Vanbeselaere, Slater, De Cuyper, & Boen, in press).

Taken together research examining athlete leadership and its relationship to various correlates (e.g., cohesion, satisfaction) has typically used questionnaires that focus on the attitudes of team members about the team as a whole. However, researchers should equally be concerned about dyadic relations between team members (Lusher, Robins, & Kremer,

2010). In order to do so, it is important to utilize alternative measurement tools that provide a different perspective and an innovative method to evaluate team dynamics variables such as cohesion and leadership (Warner, Bowers, & Dixon, 2012). One such tool is Social Network Analysis (SNA) that provides insight into the structure (e.g., cohesion) and hierarchies among players (e.g., athlete leadership), in particular dyadic relationships between athletes. That is, SNA is a technique that focuses on the relations (ties) between entities (nodes) in a specific network (Wasserman & Faust, 1994). In the case of sport, SNA would utilize a roster-based adjacency matrix in which the (ij) cell refers to the presence or the strength of the relation between node i (e.g., Athlete A) and node j (Athlete B). The term relation does not necessarily refer to a social relation but could be widely interpreted and depends on the context. For example, in a sport context it can refer to leadership evaluation (e.g., a rating of leadership quality that Athlete A gives to Athlete B). It is important to note that these networks can be symmetric (e.g., being a member of a sport team), in which the relation between Athlete A and Athlete B is always equal to the relation between B and A. In contrast, networks can also be directed (e.g., leadership), in which the relation between Athlete A and B (e.g., the extent to which Athlete A is viewed as providing leadership by Athlete B) is not necessarily equal to the relation between Athlete B and A (e.g., the extent to which Athlete B is viewed as providing leadership by Athlete A). The latter type of network relation was utilized in the present study.

The purpose of the present study was to examine the structure of different athlete leadership networks and its relation to cohesion. This purpose will be accomplished using two studies. In Study 1, we examined the relation between a general leadership network and measures of task and social cohesion using the Group Environment Questionnaire (GEQ; Carron et al., 1985). In this first study, it was hypothesized that there would be significant positive correlations between the general leadership network and the measures for task cohesion (H1a) and social cohesion (H1b). In other words, the greater the perceived athlete leadership within each team, the stronger the task and social cohesion would be in the team. In Study 2, we investigated the leadership networks for the four different athlete leader roles (i.e., task, motivational, social, and external) and their association with task and social cohesion using specific SNA measures. Similarly, it was expected that there would be positive correlations between the four leadership networks and the two cohesion networks (H2a). Further, we expect that the task leadership network is the most important predictor of the task cohesion network (H2b). In other words, if an athlete perceives one of his/her

teammates as a good task leader, than this player will also feel strongly cohesive with this person with regard to achieving the team's goals and objectives. Furthermore, we expect the social leadership network to be the strongest predictor of the social cohesion network (H2c). In other words, if a player perceives one of his/her teammates as a good social leader, we expect this player also to feel cohesive with this person with regard to maintaining good social relationships within the team.

## 2. Methods – Study 1

#### 2.1 Participants

A total of 35 sport teams participated in the first study (eight volleyball, soccer, and basketball teams, and 11 handball teams) from Flanders, Belgium competing at the regional, provincial, or national level. To conduct network analysis, it is required to have high response rates (Kossinets, 2006). For 10 of the teams sampled in the current study we had a response rate of less than 75% of the team's roster (i.e., some players did not attend the training session at the time when the questionnaires were completed). When there was less than 75% completion rate, we removed these teams from our dataset. The 25 remaining teams included six soccer teams (three male teams, three female teams), seven volleyball teams (four male teams, three female teams), six basketball teams (five male teams, one female team), and six handball teams (four male teams and two female teams). In total, there were 308 players that participated in this study with an average age of 24.9 years (*SD* = 7.5), on average 15.7 years of experience in their sport (*SD* = 7.0) of which 6.5 years (*SD* = 7.2) with their current team, and 2.3 years (*SD* = 2.5) with their current coach.

## 2.2 Measures

### 2.2.1 General leadership

Each participant was asked to rate the general leadership quality of each teammate on a 5-point Likert scale, ranging from 0 (*very bad leader*) to 4 (*very good leader*). For each team, this resulted in an NxN adjacency matrix, in which the ij<sup>th</sup> entry referred to the leadership rating of member j, rated by member i. In other words, Athlete A can perceive Athlete B as a good leader, but Athlete B does not necessarily perceive Athlete A as a good leader. In turn, this adjacency matrix referred to a finite NxN social network with directed relations that referred to the rating of general leadership that team members gave each other.

### 2.2.2 Cohesion

Cohesion was measured using the GEQ (Carron et al., 1985), an 18-item questionnaire that measures task and social cohesion in sport teams. Task cohesion was assessed using nine items that refer to team members' feelings about the group's tasks, goals, and productivity (e.g., "I'm happy with how much my team wants to win"). Social cohesion was measured using nine items that refer to team members' feelings about acceptance and social interaction within the group (e.g., "Some of my best friends are on this team"). All items were scored on a 9-point Likert scale, ranging from 1 (*strongly disagree*) to 9 (*strongly agree*).

## 3. Methods – Study 2

#### 3.1 Participants

A total of 24 sport teams different than those in the first study participated in the second study (eight soccer teams, eight volleyball teams, and eight basketball teams) from Flanders, Belgium competing at the regional, provincial, or national level. Based on the cut-off criteria of 75% for the response rate per team, three teams were removed from our dataset. The 21 remaining teams included seven soccer teams, eight volleyball teams, and six basketball teams. There was a gender balance within the different sports (with exception of soccer in which four male teams and three female teams participated). This resulted in a total of 267 athletes participating in this study who had an average age of 24.3 years (SD = 4.9), 14.9 years of experience in their sports (SD = 5.8) of which 3.7 years (SD = 3.4) with their current team, and 2.1 years (SD = 1.7) with their current coach.

#### 3.2 Measures

#### 3.2.1 Task leadership

The same procedure was used as in Study 1where each participant rated the quality of leadership provided by each teammate (whose names were provided to each participant). Prior to rating each teammate, the participants read the following definition from Fransen et al. (2014) to describe a task leader: "A task leader is in charge on the field; this person helps the team to focus on the goals and helps in tactical decision making. Furthermore, the task leader gives teammates tactical advice during the game and helps to adjust them if necessary." Players had to rate each teammates' task leadership quality on a 5-point Likert

scale, ranging from 0 (*very bad task leader*) to 4 (*very good task leader*). This procedure resulted in a finite NxN task leadership network for each team. This network had directed relations, which referred to the rating of task leadership that team members gave each other.

#### 3.2.2 Motivational leadership.

From Fransen et al. (2014), a motivational leader was defined as follows: "The motivational leader is an individual on the field who encourages his teammates to go to any extreme; this leader also supports teammates who are discouraged. In short, this type of leader steers all the emotions on the field in the right direction in order to perform optimally as a team." Players rated the quality of motivational leadership of each teammate on a 5-point Likert scale, ranging from 0 (*very bad motivational leader*) to 4 (*very good motivational leader*). This procedure resulted in a finite NxN motivational leadership network for each team. This network had directed relations, which referred to the rating of motivational leadership that team members gave each other.

#### 3.2.3 Social leadership

From Fransen et al. (2014), a social leader was defined as follows: "The social leader has a leading role off the field; this person promotes good relations within the team and helps to establish a good team atmosphere, e.g., in the dressing room, in the cafeteria or during social team activities. Furthermore, this leader helps with conflicts between teammates off the field. This type of leader is a good listener and is trusted by his/her teammates." Players rated the quality of social leadership of each teammate on a 5-point Likert scale, ranging from 0 (*very bad social leader*) to 4 (*very good social leader*). The same procedure as outlined above resulted in a finite NxN social leadership network for each team, with directed relations referring to the rating of social leadership that team members gave each other.

## 3.2.4 External leadership

From Fransen et al. (2014), the role of external leader was described by the following definition: "The external leader is the link between our team and the people outside of our team; this leader is the liaison between our team and club management. If communication is needed with media or sponsors, this person will represent our team. This leader will also communicate the guidelines of the club management to the team regarding club activities for sponsoring, club events, etc." Players rated the quality of external

leadership of each teammate on a 5-point Likert scale, ranging from 0 (*very bad external leader*) to 4 (*very good external leader*). Using the same procedures as for the leadership networks above, a finite NxN external leadership network was constructed for each team in which the directed relations referred to the rating of external leadership that team members gave each other.

### 3.2.5 Task cohesion

In order to construct a task cohesion network, participants indicated for each teammate the extent that they felt cohesive with him/her with regard to achieving the team's goals and objectives based on Carron et al.'s (1985) conceptualization of task cohesion. Players rated their feelings of task cohesion on a 5-point Likert scale, ranging from 0 (*not task cohesive*) to 4 (*strongly task cohesive*). This resulted in a finite NxN directed task cohesion network for each team, in which the ij<sup>th</sup> entry referred to the extent i felt cohesive with team member j to reach the team's goals and objectives.

### 3.2.6 Social cohesion

Participants rated the extent they felt cohesive with each of their teammates with regard to maintaining good social relationships based on Carron et al.'s (1985) conceptualization of social cohesion. Players rated each teammate on a 5-point Likert scale, ranging from 0 (*not socially cohesive*) to 4 (*strongly socially cohesive*). This resulted in a finite NxN directed social cohesion network for each team, in which the ij<sup>th</sup> entry referred to the extent player i felt cohesive with team member j in order to maintain good social relations within the team.

### 3.3 Procedure

We adopted a stratified sampling technique with respect to sport, gender, and playing level to constitute our sample in both studies. More specifically, in both studies, we included an equal number of teams from the most important team sports in Flanders, Belgium (i.e., soccer, volleyball, and basketball, and in Study 1 handball was added as fourth sport), an equal number of male and female teams, and an equal number of teams playing at the regional, provincial, and national levels.

The coaches were emailed to request their athletes' participation in the study. Once the coaches agreed to let their teams participate, we obtained from the coaches a roster list for the current season. Based on this roster list, the names of all players were filled out in the different networks prior to data collection.

Data collection occurred at the end of a training session where a research assistant was present to provide a description of the study. The players were sitting apart to complete the questionnaire and the research assistant was present to answer any questions. The APA ethical standards were followed throughout this study and players could withhold their participation at any time. The completion of the survey took approximately 25 minutes. Participation in the study was completely voluntary. Informed consent was obtained from all participants and confidentiality was assured. It should be noted that the findings are from a larger research project examining athlete leadership.

### 3.4 Data Analysis

All of the analyses involving social networks were conducted using UCINET software (Borgatti, Everett, & Freeman, 2002). Density is often used to study leadership in teams (Carson, Tesluk, & Marrone, 2007). More specifically, the density of each network was computed by summing the values of all relations and dividing the result by the number of all possible relations (Sparrowe, Liden, Wayne, & Kraimer, 2001). The density scores of teams with greater athlete leadership will be higher than the density scores of teams with poorer athlete leadership. For each team, the network density was computed for the general leadership network (Study 1) and the four leadership networks (Study 2).

Quadratic Assignment Procedure (QAP) hypothesis tests were performed to examine the relation between the different types of networks (i.e., general, task, motivational, social, external, task cohesion, social cohesion) within each team (Krackhardt, 1988). Due to the autocorrelated structure of network data (Wasserman & Faust, 1994), severe biases occur when classical hypothesis tests are conducted (Krackhardt, 1987). As a result, QAP-tests use restricted permutation tests, making them robust against autocorrelation (Dekker, Krackhardt, & Snijders, 2007). QAP-correlations were first calculated between the different leadership networks and the cohesion networks, for each team separately. The goal of this analysis was to examine whether the ties in the leadership networks are related to the ties in the cohesion networks. For example, a high QAP-correlation between the task leadership quality network and the task cohesion network indicates that team members who perceive each other as good task leaders will also feel highly cohesive to each other concerning the team's goals and objectives. Second, multiple regression quadratic assignment procedures (MR-QAP) were also computed. Specifically, dependent variable networks (i.e., task and social cohesion) were regressed onto the four independent variable networks (i.e., task, motivational, social, and external leadership) (Krackhardt, 1987). The MR-QAP assesses whether the R-square and regression coefficients are significant.

### 4. **Results – Study 1**

Means, standard deviations, correlations, and Cronbach's  $\alpha$ 's for the examined variables are provided in Table 1. The results showed that, overall, players perceived their teams as highly cohesive as measured by the GEQ. Specifically, task cohesion had a mean of 6.35 (SD = .76), while social cohesion had a mean of 6.39 (SD = .69) on a scale from 1 to 9.

**Table 1.** Means, standard deviations, correlations, and Cronbach's  $\alpha$ 's for Study 1.

Variable	М	SD	1.	2.
1. Task cohesion	6.39	1.31	(.86)	
2. Social cohesion	6.35	1.39	.63*	(.88)
3. Density of general leadership quality network	1.92	.22	.58*	.60*

\*p < .01.

The density value for the network can be seen as an average value of the leadership attributed to the different players, and as such, vary in range between 0 and 4; a high density network has stronger ties (i.e., stronger leadership perceptions) than a low density network. In the present research, the density scores varied between 1.49 and 2.27, with an average density of 1.92 (SD = .22) across all teams. The present findings showed a positive moderate correlation between the density of the general leadership network and the team's task cohesion (r = .58; p = .002), thereby confirming H1a. In line with H1b, a positive moderate correlation was found between the leadership network and the team's social cohesion (r = .60; p = .002). In other words, the greater the athlete leadership, the more athletes perceived their team as highly cohesive, both with respect to task and social cohesion.

#### 5. Results – Study 2

#### 5.1 QAP-correlations

First, we calculated the mean density values for the four leadership networks and the two cohesion networks. Specifically, for task leadership, the density score ranged between 1.77 and 2.64, with a mean of 2.18 (SD = .24). For motivational leadership, the density score ranged between 1.77 and 2.86, with a mean of 2.34 (SD = .28). For social leadership, the density score ranged between 2.07 and 2.85, with a mean of 2.43 (SD = .22). For external leadership, the density score ranged between .83 and 2.69, with a mean of 1.80 (SD = .53). As for task cohesion, the density score ranged between 2.20 and 3.28, with a mean of 2.83 (SD = .28). And for social cohesion, the density score ranged between 2.22 and 3.27, with a mean of 2.72 (SD = .29). Next, we determined the QAP-correlations between the two cohesion networks and the four leadership networks (H2a) for each team.

An examination of the correlations in Table 2 shows that the majority of relationships between the task cohesion network and the four leadership networks were significant for each team in the current study. Consequently, when we averaged the QAP-correlations over all teams, the results indicated moderate positive correlations between the task cohesion network and the task leadership network (r = .43), the motivational leadership network (r = .44), the social leadership network (r = .44), and the external leadership network (r = .31) (see Table 2 for results by team). Similarly, the correlations in Table 3 demonstrate that the majority of relationships between the social cohesion network and the task leadership network to the social cohesion network, moderate positive correlations emerged in relation to the task leadership network (r = .42), the motivational leadership network (r = .48), the social leadership network (r = .42), the motivational leadership network (r = .48), the social cohesion network, moderate positive correlations emerged in relation to the task leadership network (r = .42), the motivational leadership network (r = .48), the social leadership network (r = .42), the motivational leadership network (r = .48), the social leadership network (r = .53), and the external leadership network (r = .35). These findings confirm hypothesis H2a.

	Task leader	Motivational leader	Social leader	External leader
Team	quality (r)	quality ( <i>r</i> )	quality (r)	quality (r)
1	.52***	.52***	.53***	.32**
2	.42**	.44**	.39**	.55***
3	.08	.15	.06	.20*
4	.48***	.56***	.46***	.44***
5	.22*	.35**	.31**	.22*
6	.31**	.48***	.48***	.38**
7	.51***	.54***	.62***	.37**
8	.47**	.49**	.27*	.33*
9	.57***	.55***	.47***	.57***
10	.48***	.55***	.64***	.32**
11	.50***	.47***	.32**	.27*
12	.43**	.55***	.48***	.09
13	.63***	.62***	.55***	.40**
14	.50***	.65***	.64***	.34*
15	.26	.50**	.39*	.23
16	.34*	.18	.33**	.19
17	.29**	.35***	.23*	.26*
18	.57***	.58***	.63***	.37**
19	.51***	.52***	.41**	.34*
20	.49***	.54***	.53***	.19
21	.52***	.59***	.46***	.16*
Average r	.43	.48	.44	.31

**Table 2.** The QAP correlations between the task cohesion network and the leadership qualitynetworks

p < .05 p < .01 p < .001

	Task leader	Motivational leader	Social leader	External leader
Team	quality (r)	quality (r)	quality (r)	quality ( <i>r</i> )
1	.54***	.60***	.67***	.33**
2	.32**	.38***	.27**	.30**
3	.21*	.26**	.28**	.13
4	.52***	.59***	.63***	.44***
5	.37**	.44**	.47***	.45**
6	.42***	.52***	.47***	.38**
7	.38***	.51***	.72***	.48***
8	.40**	.65***	.75***	.53***
9	.70***	.61***	.55***	.60***
10	.48***	.49***	.52***	.24*
11	.47***	.49***	.62***	.33**
12	.24*	.32**	.40**	.07
13	.54***	.54***	.60***	.53***
14	.40***	.50***	.60***	.27*
15	.28*	.70***	.56**	.38*
16	.37*	.23	.44***	.41**
17	.33**	.44***	.34**	.30**
18	.52***	.52***	.81***	.26**
19	.39**	.42***	.45***	.42***
20	.49***	.40***	.56***	.13
21	.41***	.45***	.47***	.28**
Average r	.42	.48	.53	.35

**Table 3.** *The QAP correlations between the social cohesion network and the leadership quality networks* 

p < .05 p < .01 p < .001

## 5.2 QAP-regressions

To determine the extent to which each of the leadership networks explained the variance in the cohesion networks, multiple QAP-regressions were conducted both for the task cohesion network (Table 4) and the social cohesion network (Table 5). In all of the QAP-regressions, the four different leadership networks functioned as independent variables while task and social cohesion networks were the dependent variables. In Table 4 and Table 5, the standardized regression weights of the multiple QAP regressions are reported for each team. In addition, the average regression coefficient over all teams is reported (i.e., average  $\beta$ ), as well as the weighted regression coefficient (i.e.,  $\beta \times$  number of players), averaged over all teams.

**Table 4.** The standardized regression coefficients of the multiple QAP regressions with the task cohesion network as the dependent variable and the leadership quality networks as independent variables

Teem	$\mathbf{P}^2$	Task leader	Motivational leader	Social leader	External leader
Team K		quality (β)	quality (β)	quality $(\beta)$	quality (β)
1	.31***	.22	.17	.27*	04
2	.33**	.15	.06	.03	.42**
3	.04**	01	.16*	01	$.20^{*}$
4	.33***	18	.53**	.10	$.19^{*}$
5	.15***	54**	.56**	.31*	.01
6	.25***	11	.36*	.33*	08
7	.47***	.27***	.08	.46***	001
8	.28***	$.22^{*}$	.35**	08	.12
9	.39***	.16	.16	.12	.30**
10	.49***	.05	.25**	$.49^{***}$	.11
11	.23***	.34*	.21	.01	05
12	.41***	.11	$.40^{***}$	.33***	.18
13	.44***	.34***	.26**	.12	.03
14	.49***	.07	.37**	$.42^{**}$	11
15	.21**	.05	.41**	.18	11
16	.16***	.36*	15	.27**	.01
17	$.11^{***}$	.07	.25	.04	.07
18	.44***	$.20^{*}$	.10	.37***	.14
19	.23***	.32*	.14	.12	03
20	.41***	.23**	.31***	.27**	.04
21	.41***	.24***	.37***	.12*	.12*
Average $\beta$		.12	.25	.20	.07
Weighted av	verage β	.12	.25	.21	.08

 $p^* < .05 p^{**} < .01 p^{***} < .001$ 

In contrast to H2b, the results in Table 4 indicated that the motivational leadership network was the strongest predictor of the team's task cohesion network. In other words, if an athlete perceived a teammate as a good motivational leader, this athlete was more task cohesive with this teammate. It should be noted that in half of the teams, the task leadership network emerged as a significant predictor of the team's task cohesion network.

**Table 5.** The standardized regression coefficients of the multiple QAP regressions with the social cohesion network as the dependent variable and the leadership networks as independent variables

Teem	$\mathbf{D}^2$	Task leader	Motivational leader	Social leader	External leader
Teani K		quality ( $\beta$ )	quality (β)	quality ( $\beta$ )	quality (β)
1	.46***	.10	.22*	.49***	10
2	.16**	.11	$.29^{*}$	05	.09
3	$.10^{**}$	.06	.19*	.19*	.09
4	.43***	15	.31*	.44***	$.14^{*}$
5	$.26^{***}$	46*	.37*	.36**	.27
6	.27***	.08	.37*	.21	10
7	$.55^{***}$	.09	08	.63***	$.20^{*}$
8	.62***	09	.37***	.54***	.04
9	.53***	.43***	.05	$.17^{*}$	$.18^{*}$
10	.35***	.19*	$.20^{*}$	.34***	.01
11	$.38^{***}$	.11	.10	.51***	05
12	.19***	.01	.21	.35**	.15
13	.43***	.19*	.08	$.29^{**}$	.23*
14	.37***	.07	.16	.54***	13
15	.47***	06	$.60^{***}$	.22	05
16	.27***	.04	02	.36***	.31**
17	.19***	.01	.32**	.14	.07
18	.65***	09	.13	.76***	.02
19	.22***	.05	.19	.14	.20
20	.37***	$.27^{***}$	.11	.38***	002
21	.33***	$.22^{**}$	$.18^{*}$	.24**	.23**
Average β		.06	.21	.34	.09
Weighted a	verage β	.06	.20	.35	.09

 $p^* < .05 p^* < .01 p^* < .001$ 

With regard to the social cohesion network, the results confirmed H2c by demonstrating that the perceived social leadership of a teammate was the main predictor of social cohesiveness with that person. In other words, if an athlete perceived a teammate as a strong social leader, this athlete felt more cohesive with their teammate and wanted to maintain good social relationships with him/her.

#### 6. Discussion

The general purpose of the present study was to investigate the structure of different leadership networks and its relationship to cohesion by conducting two separate studies. In Study 1 the relationship between a general leadership quality network, measured using SNA, and task and social cohesion as measured by the GEQ (Carron et al., 1985), was examined. The results supported our predictions showing significant positive moderate correlations between the general leadership network and both task (H1a) and social (H1b) cohesion. The purpose of Study 2 was to examine the leadership quality networks for four different athlete leadership roles (i.e., task, motivational, social, and external leader) and to examine their relation to task and social cohesion networks. The first hypothesis from Study 2 (H2a) was confirmed, with results showing positive correlations between the four leadership quality networks and both task and social cohesion networks. Further, the findings partially supported the following two hypotheses (H2b and H2c). On the one hand, the motivational leadership network was found to be the strongest predictor of the task cohesion network, even though we had predicted the task leadership network to be most strongly related to this cohesion network (H2b). On the other hand, the results supported our hypothesis (H2c) that the social leadership network would be the strongest predictor of the social cohesion network. Overall, the results complement a growing body of research indicating that athlete leadership has a positive influence on perceptions of team cohesion (Callow, Smith, Hardy, Arthur, & Hardy, 2009; Crozier, Loughead, & Munroe-Chandler, 2013; Dupuis, Bloom, & Loughead, 2006; Price & Weiss, 2011, 2013; Vincer & Loughead, 2010).

In terms of Study 1, the results showed that the general leadership quality network was positively related to task and social cohesion. In other words, athletes perceived greater unity and closeness regarding the attainment of group goals and maintenance of social interactions when they observed higher amounts of athlete leadership within their teams. This outcome is similar to past research operationalizing cohesion using the GEQ (Carron et al., 1985), which has shown positive relationships between athlete leadership behaviors and the task and social dimensions of cohesion (e.g., Callow et al., 2009; Price & Weiss, 2013; Vincer & Loughead, 2010). In particular, these previous studies examined how the frequency of various leadership behaviors assessed by questionnaires such as the Leadership Scale for Sports (LSS; Chelladurai & Saleh, 1980) and Differentiated Transformational Leadership Inventory (DTLI; Callow et al., 2009) were related to cohesion. In the present

study, we addressed a gap in the literature by considering how the density of a general leadership network (i.e., leadership ties between athletes) was associated with cohesion as assessed by the GEQ (Carron et al., 1985). Since greater leadership quality was found to be positively associated to task and social cohesion, the results suggest that the more effective the leadership amongst athletes, the better. In fact, Crozier et al. (2013) recently found that ideally 85% of athletes should provide leadership within their teams. Further, the Crozier et al. results showed that having the ideal number of athlete leaders on teams enhanced perceptions of cohesion. Given the results of the current study and the findings of Crozier et al., it is reasonable to conclude that cohesion is enhanced when there is a high quality of athlete leadership spread across the team.

The results of Study 2 expanded upon the findings of Study 1 by considering leadership networks for four athlete leader roles (i.e., task, motivational, social, and external) and their relationship to task and social cohesion as operationalized using SNA methodologies. The results revealed positive moderate correlations amongst the four leadership quality networks and both task and social cohesion networks. In practical terms, this suggests that athletes who reported greater leadership quality for any of the four athlete leader roles also experienced greater cohesion in terms of achieving the team's performance objectives and maintaining social relationships.

With the exception of the Eys et al. (2007) and Fransen et al. (2014) studies, no known research has investigated the relationship between the athlete leader roles and group dynamics variables. Eys et al. found that athletes were most satisfied with their team's performance and the integration of team members when they perceived the task, social, and external athlete leader roles to be represented to the same degree within their teams. More recently, Fransen et al. showed that as the number of leadership roles that were fulfilled by the athletes increased, so did the collective efficacy beliefs of athletes and coaches on those teams. Given the scarcity of research examining athlete leader roles and their association to various outcomes, the results of the present study extend the knowledge base by showing that the four leadership roles of an athlete are positively related to perceptions of cohesion. Taken together, the results confirm the importance and classification of the athlete leader roles examined in previous research (Eys et al., 2007; Loughead et al., 2006; Fransen et al., 2014) and their impact on team functioning.

Another objective of Study 2 was to determine which of the four athlete leadership networks most strongly predicted the task and social cohesion networks. The results diverged from our hypothesis that the task leadership network would be the most strongly related to the task cohesion network. Rather, the results revealed that the motivational leadership network was the strongest predictor of the task cohesion network. This outcome highlights the significance of the motivational leadership role identified by Fransen et al. (2014) and supports previous research (e.g., Dupuis et al., 2006; Holmes, McNeil, & Adorna, 2010) indicating the importance of enthusiastic and motivational athlete leaders as it relates to effective leadership on sport teams. Further, given the definition used in the present study to describe the role of motivational leader, the finding that the motivational leadership network most strongly predicted task cohesion is not surprising. Specifically, the role of motivational leader is inherently task-oriented due to its emphasis on the leader motivating and encouraging teammates *on* as opposed to *off* the field. Therefore, if the goal is to enhance perceptions of unity in terms of accomplishing the team's task objectives, then athlete leaders should focus on guiding teammates' emotions towards performing optimally.

In regards to the strongest predictor of the social cohesion network, the results supported our hypothesis and showed that the social leadership network was most strongly related to the social cohesion network. This particular finding was expected given the theoretical link between these two constructs. As the role of social athlete leader is concerned with promoting harmony and good social relations among teammates (Loughead et al., 2006), it is therefore likely to relate to team members perceiving an increase in bonding with a desire to maintain social connections within the group (Carron et al., 1985). Further, this finding supports research conducted by Vincer and Loughead (2010) that examined the relationship between athlete leadership behaviors (measured using the LSS; Chelladurai & Saleh, 1980) and cohesion (assessed using the GEQ; Carron et al., 1985). Specifically, the authors found a positive association between the leadership behavior of social support (i.e., satisfying teammates' interpersonal needs) and social cohesiontherefore providing similar evidence for the relation between social leadership and social cohesion as found in the present study. Beyond the specific findings highlighted in the above paragraphs, the results from both studies provide unique contributions to the athlete leadership-cohesion literature due to the method in which these constructs were measured (i.e., SNA). Insofar as athlete leadership is concerned, previous quantitative research has typically examined this construct by asking athletes to rate the frequency of leadership behaviors exhibited by one (e.g., Callow et al., 2009; Price & Weiss, 2013) or several teammates (e.g., Paradis & Loughead, 2012; Vincer & Loughead, 2010; Zacharatos,
Barling, & Kelloway, 2000). While this approach offers valuable information concerning the leadership provided by one or more athlete leaders, it clearly does not take into account the intra-team relations among *all* team members. Conversely, by calculating the strength of the relations (i.e., degree of perceived leadership quality) between athletes on teams using SNA, we were able to generate a density score more reflective of the overall leadership provided within sport teams. Therefore, the results of Studies 1 and 2 extend athlete leadership research by considering the degree to which all team members provide quality leadership to one another. Similarly, the study of cohesion in sport has traditionally examined athletes' perceptions of the team environment using the GEQ (Carron et., 1985). However, as noted by Warner et al. (2012), "nonnetwork measurements such as Carron et al.'s (1985) GEQ are unable to test theoretical propositions related to structural properties" (p. 55). Lusher et al. (2010) advocated using SNA to explore the structural interdependencies between individuals on sport teams. With the exception of Warner et al. (2012) who found that a higher performing women's collegiate basketball team had a denser (i.e., more cohesive) network compared to a lower performing women's collegiate basketball team, it appears that SNA as a method of investigating cohesion has yet to garner interest in the field of sport psychology. Thus, by analyzing task and social cohesion networks, the findings of Study 2 supplement previous research which has found a positive relationship between athlete leadership behaviors and cohesion as measured by the GEQ (e.g., Callow et al., 2009; Price & Weiss, 2013; Vincer & Loughead, 2010).

From an applied perspective, the results suggest that higher levels of athlete leadership quality are associated with increases in cohesion from both a task and social standpoint. Thus, consistent with the findings of Crozier et al. (2013) it would appear that more athletes on sport teams, rather than a select few, should provide effective leadership to their teammates. In order to increase the quality of leadership exhibited amongst athletes, sport organizations should develop effective athlete leaders that encompass the four athlete leader roles using an educational approach. This type of an approach would insure that all athletes on teams are given the opportunity to enhance their leadership skills (Loughead, Munroe-Chandler, Hoffmann, & Duguay, 2014). Although research on athlete leadership development training is in its infancy (Loughead et al., 2014), there is some evidence to suggest that leadership development programs for athletes are beneficial (e.g., Blanton, Sturges, Gould, 2014; Gould & Voelker, 2010). Therefore, practitioners (e.g., coaches, sport psychology consultants) are encouraged to make concerted efforts to provide some form of

leadership training to their athletes. In particular, given the results of the present study, practitioners should educate athletes about the importance of providing tactical advice to teammates (i.e., task leader), motivating group members (i.e., motivational leader), promoting harmony and social relationships within the team (i.e., social leader), and representing the team in the community (i.e., external leader). Similarly, practitioners should inform athletes that team unity is enhanced when athletes provide quality leadership amongst each other.

Although the present study enhances our knowledge of the relationship between athlete leadership and cohesion by examining these constructs using a unique and underutilized approach (i.e., SNA), there are a few limitations that should be noted. First, the results are correlational in nature. Therefore, the findings do not lead to the suggestion that athlete leadership causes cohesion or vice versa. Second, while the large sample size and diversity of sports included in the present study increased the generalizability of the results, the cross-sectional nature of the data did not permit the examination of team member relations over the course of the season. As Carron et al. (1985) noted cohesion is a dynamic construct that changes over time. It would be interesting to examine how individual team member perceptions of cohesion change over the course of a season in relation to the four leadership roles (task, motivational, social, and external). Similarly, Loughead et al. (2006) suggested that athlete leadership is a dynamic process that may change over the course of time. In this regard, it would be worthwhile examining how leadership quality changes over the course of a season or multiple seasons.

In addition to future research examining the relationship between athlete leadership and cohesion networks, sport psychology researchers could also explore how athlete leadership networks relate to other group dynamics constructs such as athlete satisfaction, collective efficacy, and performance. Taken together, the results of these two studies indicate a positive association between athlete leadership and cohesion. It is hoped that these results will encourage researchers to examine the effect of athlete leadership and cohesion using SNA methodologies. Further, given the paucity of research examining cohesion in sport from a structural standpoint, SNA may prove to be a useful and alternative method to examine what Dion (2000) considered an "unquestionably" important factor in sport groups.

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#### 8. Appendix

#### Shared leadership

In this Appendix, we determined whether shared leadership is beneficial for a stronger cohesion within the team (i.e., both with regard to task and social goals). In line with the procedure for valued networks from Sparrowe, Liden, Wayne and Kraimer (2001), we used the density of the cohesion networks as single score for the task and social cohesion of each team. To determine the number of leaders on a specific leadership role, we defined a leader as a player who was rated as very good leader on that leadership role (i.e., given the maximum score of 4) by at least half of the team members.

We examined shared leadership within each team on two levels; first, within a specific leadership role (e.g., do more cohesive teams have several task leaders?) and second, between the different leadership roles (e.g., do more cohesive teams have one player championing all leadership roles or several players championing each another leadership role?). It is important to note that, for the latter level, we only examined whether the best leader on a specific leadership role is the same person as the best leader on the other leadership roles. The mean values of the density scores of the task and social cohesion network for both levels of shared leadership (i.e., within and between the four leadership roles) are presented in Table 1.

First, the results demonstrated that the task cohesion within the team was higher for teams with two task leaders (M = 3.02), compared to teams with one task leader (M = 2.81) or no task leaders (M = 2.74). Although ANOVA's demonstrated that these differences were not significant, which can be attributed to the small power of the sample, they supported the hypothesized trend, namely that shared leadership within the task leadership network is associated with higher task cohesion within the team. Furthermore, our findings provide support for the fact that teams with two social leaders perceive their teams as more socially connected (M = 2.82) than teams with one social leader (M = 2.80) or teams with no social leaders (M = 2.57). In other words, shared leadership within the social leadership network is associated with higher social cohesion within the team. This positive relation between the number of leaders in a specific role and the team's task and social cohesion can be found for all four leadership roles (with only one exception for the link between task leadership and the team's social cohesion). Our findings thus suggest that the more leaders within a

specific leadership role are identified within a team, the higher the team's task and social cohesion.

Second, to examine shared leadership at a higher level, we determined the task and social cohesion with regard to the number of different players championing the four leadership roles within the team. In other words, is it better, in terms of cohesion, to have one leader who occupies all four leadership roles? Or can it be preferred to have four different players fulfilling the four leadership roles? The results revealed inconsistent results with regard to shared leadership between the different roles. Both for task and social cohesion a U-curve emerged, indicating that teams with one person fulfilling all leadership roles or teams with four different persons occupying the different leadership roles demonstrated the highest levels of task and social cohesion.

**Table 1.** The average density of the task and social cohesion network for each level of sharedleadership.

	Density task			Density social		
	cohesi	ion netwo	ork	cohesi	on netwo	rk
	Number of teams	М	SD	Number of teams	М	SD
Number of task leaders	or tourns			or tourns		
0	6	2.74	.18	6	2.76	.37
1	11	2.81	.34	11	2.66	.28
2	4	3.02	.17	4	2.81	.21
Number of motivational leaders						
0	6	2.56	.26	6	2.50	.32
1	9	2.87	.24	9	2.78	.27
2	5	3.02	.16	5	2.80	.18
3	1	3.11	/	1	3.08	/
Number of social leaders						
0	8	2.70	.35	8	2.57	.31
1	7	2.84	.27	7	2.80	.31
2	6	2.99	.09	6	2.82	.16
Number of external leaders						
0	12	2.72	.29	12	2.64	.29
1	7	2.97	.24	7	2.80	.29
2	2	2.98	.19	2	2.89	.28
Number of different persons						
occupying the leadership roles						
1	7	2.97	.23	7	2.87	.22
2	7	2.76	.29	7	2.59	.27
3	6	2.71	.30	6	2.69	.36
4	1	3.06	/	1	2.84	/

# Part 3 Team Confidence

"When a team outgrows individual performance and learns team confidence, excellence becomes a reality"

~ Joe Paterno, American football coach ~

Collective efficacy or team outcome confidence? Development and validation of the Observational Collective Efficacy Scale for Sports (OCESS)

Fransen, K., Kleinert, J., Dithurbide, L., Vanbeselaere, N., & Boen, F. (2014) International Journal of Sport Psychology, 45, 121-137. doi: 10.7352/IJSP 2014.45.121

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#### Abstract

Although collective efficacy has been demonstrated to be an important precursor of team performance, there remains some ambiguity concerning its assessment. Therefore, the main aim of the present study was to test the validity of previous collective efficacy measures. An online survey was completed by 4,451 Flemish players and coaches from nine different team sports. The results revealed two distinct and reliable scales; process-oriented collective efficacy (i.e., the confidence in the team's skills to accomplish processes that could lead to successes) and outcome-oriented team confidence (i.e., the confidence in the team's ability to obtain a goal or win a game). Furthermore, we established the validity of a 5-item Observational Collective Efficacy Scale for Sports (OCESS) as short measure of process-oriented collective efficacy. Because the OCESS only includes observable behaviors, this scale has the potential to be a starting point for the development of a continuous in-game measure of collective efficacy.

*Keywords*: instrument development, team confidence, continuous measure, team sports, dynamic measurements, in-game variation

#### 1. Introduction

The performance of athletes can vary strongly during a sports game. Players' confidence in the team's capabilities is often mentioned as one of the factors that characterize these performance variations throughout the game. For example, a sudden collapse in team performance is often attributed to a drop in the team's confidence. Conversely, team confidence is assumed to be a prerequisite for fighting back when the team is lagging behind. Arsenal coach Arsene Wenger adds that "confidence is the easiest thing to lose in football and the most difficult to win back" (Mangan, 2013). Bandura (1997, p. 477) termed this confidence 'collective efficacy', defined as "the group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment."

#### **1.1 Collective Efficacy as a Dynamic Construct**

Bandura (1997) stated that collective efficacy has an effect on what a team chooses to do, how much effort is instilled into a task, and how persistent the team is. These claims have been supported in research showing that teams with strong collective efficacy beliefs tend to set more challenging goals (Silver & Bufanio, 1996), exert more effort, and persist longer in the face of adversity (Greenlees, Graydon, & Maynard, 1999). As a result, a positive relationship has been revealed between collective efficacy and sport performance; the more the players believe in the team's capacities, the better they perform and vice versa (Dithurbide, Sullivan, & Chow, 2009; Hodges & Carron, 1992; Keshtan, Ramzaninezhad, Kordshooli, & Panahi, 2010; Myers, Feltz, & Short, 2004; Myers, Payment, & Feltz, 2004).

It is important to emphasize that collective efficacy is not a fixed trait, but a dynamic construct (Myers & Feltz, 2007). In other words, the individual's beliefs in the capabilities of his or her team may change in the course of weeks, days, or even during a game. Especially these changes in the course of a competition seem often responsible for winning or losing. To investigate this close link between collective efficacy and performance, Bandura (1997, p. 67) stated that "the relationship between efficacy beliefs and action is revealed most accurately when they are measured in close temporal proximity." Myers and colleagues (2007) added that only research designs allowing for simultaneous measures of both efficacy and performance would provide maximal information about their dynamic relationship during a competition. However, in contrast with these guidelines and collective efficacy's dynamic nature, the concept has traditionally been measured as a trait concept or

at best before or after a game, but not during a game. The only exception is a study by Edmonds, Tenenbaum, Kamata, and Johnson (2009), who attempted to measure collective efficacy beliefs of adventure racing teams at three time points during the race. Their results supported the dynamic nature of collective efficacy; as the collective efficacy of the more successful teams increased throughout the race, subsequent performance improved, and vice versa for the less successful teams.

#### 1.2 How to Measure Collective Efficacy? Resolving the Ambiguity

According to the definition of Bandura (1997), efficacy beliefs are future-oriented judgments about capabilities to organize and execute the courses of action. In other words, efficacy measures have to address the skills, properties, or other descriptions of (inter-) personal conditions that assist in successful performance. However, the existing collective efficacy research is characterized by inconsistencies in the manner in which collective efficacy is conceptualized, operationalized, and measured (Shearer, Holmes, & Mellalieu, 2009). For instance, current measures of collective efficacy vary with respect to the extent in which they correspond to the original definition of efficacy by Bandura (1997). In line with previous research (Collins & Parker, 2010), we can distinguish two types of measures.

The first type evaluates the athletes' confidence in their team's skills to accomplish the processes that can lead to success (i.e., process-oriented, e.g., "I believe that the players in my team will encourage each other during the game"). Because this type of measure addresses the belief in the team's abilities to optimize the process (e.g., items measuring motivational and communication skills that help a team to be successful), it conforms to Bandura's original definition of collective efficacy. We will term this measure "collective efficacy" (in the proper process-oriented sense). Collective efficacy thus focuses on athletes' confidence in the process of their own team, rather than comparing their own abilities with those of the opposing team.

In contrast, the second type of measure focuses on outperforming the opponent and refers to athletes' confidence in the abilities of their team to obtain a certain outcome (i.e., outcome-oriented, e.g., "I believe that my team will outplay the opposing team and win this game"). This measure refers to the confidence in the outcome rather than the confidence in the process and focuses on the comparison with the other team, rather than on the own team. Therefore, this measure is not congruent with Bandura's original definition of collective efficacy. We will therefore term this outcome-oriented measure "outcome-oriented team

confidence", shortened as "team outcome confidence". Despite the fact that this outcomeoriented team confidence does not measure collective efficacy as originally defined, a number of studies used these measures to allegedly assess collective efficacy (e.g., Chen et al., 2002; Fransen et al., 2012; Spink, 1990; Tasa, Taggar, & Seijts, 2007; Vargas-Tonsing & Bartholomew, 2006). Although previous research (Myers & Feltz, 2007) already recommended against single-item performance measures, typically, the one-item measures used in these studies are outcome-oriented rather than process-oriented, and as such, they measure team outcome confidence rather than collective efficacy (e.g., "What placing do you expect to attain?" or "To what extent do you believe that the team can finish in at least the top 10 teams?"). For example, Edmonds and colleagues (2009) attempted to measure the dynamic evolution of collective efficacy in an adventure race by using the one-item measure "How confident are you in the team's ability in executing the mountain biking portion of the race in order to secure a top-place finish?" Because this item is more outcome-oriented than process-oriented, the authors actually assessed the dynamic variation in team outcome confidence rather than the variation in collective efficacy.

Nevertheless, several studies did assess collective efficacy in accordance with the original process-oriented definition of Bandura (1997). An example of a widely used measure of collective efficacy is Short, Sullivan, and Feltz's Collective Efficacy Questionnaire for Sport (CEQS; 2005). The CEQS represents collective efficacy as a multidimensional construct based on Bandura's (1997) argument that efficacy beliefs include beliefs in the physical tasks but also beliefs in the capability to manage thoughts, actions, emotions, and motivation (Dithurbide & Feltz, 2012, p. 260). The CEQS (2005) comprises a five-factor structure (i.e., five subscales) measured with four items each. These five subscales include: Ability (e.g., "to outplay the opposing team"), Effort (e.g., "to play to its capabilities"), Persistence (e.g., "to persist when obstacles are present"), Preparation (e.g., "to devise a successful strategy"), and Unity (e.g., "to be united").

Given the ambiguity in the current literature concerning the assessment of collective efficacy, the main aim of the present study is to investigate the validity of the measures used to assess collective efficacy. As mentioned above, the one-item measures used to assess collective efficacy often focus on the outcome (i.e., performing better than the opponent), and as such assess outcome-oriented team confidence rather than process-oriented collective efficacy. Consequently, these outcome-oriented one-item measures cannot be used as reference measurement of collective efficacy in team sports. In line with this argument, the validation study by Short and colleagues (2005) revealed a lower correlation between the Ability subscale and the other subscales (.59 - .78) than the correlation among the other subscales (.76 - .94). Looking more closely at the factors and items of the CEQS (Short, et al., 2005), it can be inferred that the items of the Ability subscale are outcome-oriented, rather than process-oriented (e.g., "Rate your team's confidence, in terms of the upcoming game or competition, that your team has the ability to outplay the opposing team"). Despite the evidence found for the internal consistency of each subscale of the CEQS, the conceptual unity of these different subscales can be questioned. Once clarity is obtained about the reliability of the different collective efficacy measures, the second aim of our study can be realized; the validation of a new and short five-item scale of collective efficacy (Observational Collective Efficacy Scale for Sports; OCESS) that can be used as a starting point for more dynamic measures of collective efficacy.

#### 1.3 Dynamic Measurements Through Observations: The OCESS

While striving toward a more dynamic measurement of collective efficacy, researchers have experienced a practical barrier; in team sports it is not possible to interrupt a player repeatedly during a game to measure his or her collective efficacy beliefs (Myers, Paiement, & Feltz, 2007). Therefore, Edmonds and colleagues (2009) only considered a few time points during a contest. However, in order to advance the knowledge of the dynamic character of collective efficacy, one should strive for more frequent measurements throughout the game. Because working with questionnaires appears to be a major barrier for realizing a continuous measurement of collective efficacy during a contest, observations could provide a viable alternative.

A first step toward an observational measure of collective efficacy was taken by Fransen and colleagues (2012). These authors surveyed 33 top-level volleyball coaches on what they believed to be the most important sources of team outcome confidence (i.e., "I believe that my team will win the game") in their sport. Subsequently, 2365 volleyball coaches and athletes evaluated the extent to which these sources had the power to predict team outcome confidence. The data revealed five sources that were perceived as very important by both coaches and athletes: a) reacting enthusiastically when making a point; b) having leader figures in the team who believe that their team will win this game and express this on the court; c) having both players in the game and on the bench who cheer enthusiastically; d) encouraging each other during the game; and e) communicating tactically during the game. All these behaviors are clearly process-oriented. Having confidence that the own team has the qualities to succeed in these five behaviors could therefore represent process-oriented collective efficacy.

In the present study we develop a new scale based on these five sources, named the Observational Collective Efficacy Scale for Sports (OCESS). The aim of the present study is to assess whether this short scale constitutes a valid measure of process-oriented collective efficacy in different team sports. If it does, the 5-item OCESS would offer a valid alternative to the 20-item CEQS for assessing collective efficacy in sport whenever time available for administering long questionnaires is limited. Furthermore, because all five items represent observable behaviors, the OCESS would allow future assessment of the evolution of players' collective efficacy beliefs throughout a contest by observations rather than questionnaires. Such a measure could highlight the dynamic nature of collective efficacy during a game and provide more insight into how to attain and maintain high collective efficacy.

#### **1.4 Hypotheses**

Given the ambiguity in the existing literature concerning the assessment of collective efficacy, the main purpose of the present study is to investigate the validity of the measures currently used to assess collective efficacy in sports teams. In line with our conceptual reasoning above, we hypothesize that the Ability subscale assesses outcome-oriented team confidence (analogous to the outcome-oriented one-item measures), rather than process-oriented collective efficacy. By contrast, we expect the other four subscales of the CEQS to form a valid and reliable reference measurement of process-oriented collective efficacy as defined by Bandura (1997).

Once a reliable reference measurement of collective efficacy is obtained, a second aim of our study can be realized: the validation of our newly developed five-item scale of collective efficacy (Observational Collective Efficacy Scale for Sports; OCESS) within different team sports. Two hypotheses can be formulated with regard to this aim. First, we hypothesize that the OCESS and the CEQS (subscales 2-5) are strongly correlated (i.e., r >.70), attesting that the OCESS measures process-oriented collective efficacy instead of outcome-oriented team confidence. Second, the convergent and divergent validity of the OCESS is examined by comparing the influence of demographic characteristics respectively with the first subscale and the last four subscales of the CEQS. If supported, this OCESS, which includes only observable behaviors, offers a starting point for the design of a continuous measure of players' collective efficacy beliefs during the game through observation instead of through the use of traditional questionnaires.

### 2. Method

#### 2.1 Procedure

The database of the Flemish Trainer School (i.e., organization responsible for sportspecific schooling of coaches in Flanders) was used to invite 5,535 qualified coaches out of nine different team sports to participate in our study. These coaches were asked to complete a web-based questionnaire and to motivate their players to complete the player-specific version of the questionnaire. In order to assure variability within our sample, we also contacted non-qualified coaches and their teams through the different Flemish sport federations. The coaches and players who did not respond were sent a reminder two weeks later. Informed consent was obtained from all participants. No rewards were given for participation in our study and all participants were guaranteed full confidentiality.

## 2.2 Participants

In total, 4,451 participants (3,193 players and 1,258 coaches) completed our questionnaire. This corresponds to an approximate response rate of 27%. These participants played or coached in 2,366 different teams. More detailed information on the participants can be found in Table 1.

	Participants	$M_{Age}$ (years)	$M_{Experience}$ (years)	Team gender	Level
Coaches	1,258 (28%)	41.94	13.97	905 ♂ (72%) 353 ♀ (28%)	90 E (7%) 268 N (21%)
					613 P (49%) 102 RG (8%) 22 RC (2%)
Players	3,193 (72%)	23.92	14.21	1,915 ♂ (60%) 1,278 ♀ (40%)	163 Y (13%) 177 E (6%) 836 N (26%) 1,733 P (54%) 209 RG (7%)
					122 RC (4%) 116 Y (4%)

 Table 1. Sample characteristics

Total sample	4,451	29.01	14.14	2,820 💍 (63%)	267	E	(6%)
				1,631 ♀ (37%)	1,104	Ν	(25%)
					2,346	Р	(53%)
					311	RG	(7%)
					144	RC	(3%)
					279	Y	(6%)

*Note.*  $\bigcirc$  = male;  $\bigcirc$  = female; E = elite level; N = national level; P = provincial level; RG = regional level; RC = recreational level; Y = youth teams.

The sample included participants from nine team sports in Flanders; basketball, handball, hockey, ice hockey, netball, rugby, soccer, volleyball, and water polo. Table 2 contains the descriptive characteristics for the respondents of each of the nine team sports. Data from this sample have been used in another research study (Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014), but examined different variables and research questions.

 Table 2. Sport specific sample characteristics

	Participants	<i>M</i> <sub>age</sub> (years)	M <sub>Experience</sub> (years)	Male team $(\Im) /$ Female team $(\Im)$	Function Players (P) / Coaches (C)
Basketball	1,959 (44%)	27.40	14.67	1,332 ♂ (68%) 627 ♀ (32%)	1,551 P (79%) 408 C (21%)
Volleyball	1,287 (29%)	29.77	14.35	521 ♂ (41%) 766 ♀ (59%)	919 P (71%) 368 C (29%)
Soccer	589 (13%)	33.88	13.05	541 ♂ (92%) 48 ♀ (8%)	249 P (42%) 340 C (58%)
Hockey	127 (3%)	27.39	13.65	68 ♂ (53%) 59 ♀ (47%)	110 P (87%) 17 C (13%)
Netball	118 (3%)	27.53	15.27	64 ♂ (54%) 54 ♀ (46%)	85 P (72%) 33 C (28%)
Handball	116 (3%)	29.64	13.67	80 ♂ (69%) 36 ♀ (31%)	76 P (65%) 40 C (35%)
Water polo	99 (2%)	26.93	13.40	84 ♂ (85%) 15 ♀ (15%)	84 P (85%) 15 C (15%)
Rugby	84 (2%)	28.10	7.59	67 ♂ (80%) 17 ♀ (20%)	60 P (71%) 24 C (29%)
Ice hockey	72 (2%)	27.76	13.37	63 ♂ (87%) 9 ♀ (13%)	59 P (82%) 13 C (18%)
Total sample	e 4,451	29.01	14.14	2,820 ♂ (63%) 1,631 ♀ (37%)	3,193 P (72%) 1,258 C (28%)

#### 2.3 Measures

#### 2.3.1 Collective efficacy

Two measures of collective efficacy were included in our questionnaire. First, the Collective Efficacy Questionnaire for Sports (CEQS; Short, et al., 2005), including five subscales, each consisting of four items. In line with the suggestions of Myers and Feltz (2007), each of the items begins with the stem: "Rate your confidence, in terms of the upcoming game or competition, that your team has the ability to..." Participants assessed the items on a 7-point scale anchored by 1 (*not at all confident*) and 7 (*extremely confident*).

The second collective efficacy measure included in our study was our newly developed five-item Observational Collective Efficacy Scale for Sports (OCESS), including the most important sources of team outcome confidence (Fransen, et al., 2012). It is important to note that, although the items of the OCESS are intended to be used as an observational measurement instrument in the future, in the current study, the scale is still in a self-evaluative questionnaire form. The items included in the OCESS are "react enthusiastically when making a point," "have leader figures in the team who believe that we will win this game and express this on the court," "have both players in the game and on the bench who cheer enthusiastically," "encourage each other during the game," and "communicate a lot tactically during the game." In analogy with the CEQS, each of the items was assessed on a 7-point scale ranging from 1 (*not at all confident*) to 7 (*extremely confident*) and each item began with the stem: "Rate your confidence, in terms of the upcoming game or competition, that your team has the ability to…"

#### 2.3.2 Team outcome confidence

Outcome-oriented team confidence was measured using five one-item measures that assess the confidence that the team will win the game, lose the game, or realize its goals. These items are a general representation of the measures mainly used in previous research studies (Myers & Feltz, 2007, for a review). To determine the difference between an individual stem (i.e., "*I* believe that our team...") and the team-focused stem (i.e., "*Our team* believes that we..."), we included items with both stems for the confidence in winning or losing the upcoming game.

#### 2.3.3 Other measures

Besides several background characteristics (e.g., sex, age, years of experience), we assessed some performance related measures as well, such as position of the team in the ranking of the ongoing season and the score and quality of the play during the last game.

#### 3. Results

In order to validate our new OCESS scale as a measure of collective efficacy in sports teams, we first investigated the validity of the measures currently used to assess collective efficacy for the Flemish context.

# **3.1 Investigation of the Validity of the Flemish Version of the Collective Efficacy Questionnaire for Sports (CEQS)**

## 3.1.1 Factor analyses

A Confirmatory Factor Analysis (CFA) conducted on the 20-item CEQS questionnaire, including the five subscales, for all 4,451 players and coaches, revealed an inadequate fit with the data ( $\gamma^2 = 5620$ ; df = 165; p < .001; GFI = .87; AGFI = .84; RMSEA = .09). We therefore conducted an Exploratory Factor Analysis on the whole sample (4,451) players and coaches within all sports) to identify the structure underneath the 20 items of the CEQS scale. It has been established that the scree plot is a reliable criterion for component selection with samples of more than two hundred participants (Stevens, 2002). The scree plot suggested that two independent factors should be extracted which explained 61% of variance. An item was retained to construct a factor when it had a minimum loading of .40, without having a cross loading higher than .40 on another factor. This resulted in the deletion of three items from different subscales; the items "Be ready" and "Devise a successful strategy" were deleted from the subscale Preparation, the item "Perform under pressure" was deleted from the subscale "Persistence". The first component, accounting for 52% of the variance in participants' responses, consisted of 13 items from the subscales of Effort, Persistence, Preparation, and Unity. The second component included the four items of the CEQS subscale of Ability.

#### 3.1.2 Intercorrelations between the subscales of the CEQS

In order to provide a better insight into the underlying structure of the five subscales of the original CEQS, Table 3 presents the correlation matrix of all subscales of the CEQS

scale. Cronbach's  $\alpha$  coefficients are provided in parentheses on the diagonal as estimates of internal consistency.

	Subscale 1	Subscale 2	Subscale 3	Subscale 4	Subscale 5
	Ability	Effort	Persistence	Preparation	Unity
Subscale 1 Ability	(.93)				
Subscale 2 Effort	.51**	(.83)			
Subscale 3 Persistence	.56**	$.79^{**}$	(.83)		
Subscale 4 Preparation	.59**	$.75^{**}$	.69**	(.84)	
Subscale 5 Unity	.52**	$.80^{**}$	$.79^{**}$	.73**	(.84)

**Table 3.** Intercorrelations between different subscales of the CEQS (Short et al., 2005). The Cronbach's  $\alpha$  coefficient of each subscale can be found on the diagonal in parentheses.

p < .01

The internal consistency of all five subscales was high (all Cronbach's  $\alpha$ 's > .83). As can be seen in Table 3, subscales 2, 3, 4, and 5 are strongly correlated (all r > .69). However, the Ability subscale is only moderately correlated (i.e., r < .60) with the other subscales. This confirms the previous EFA that this subscale measures something different than the other subscales.

# 3.1.3 The relation between CEQS and outcome-oriented team confidence

To investigate the internal validity of the different subscales of the CEQS we explore the relationship with five one-item measures of outcome-oriented team confidence. Table 4 presents all correlations between these five one-item measures and the five subscales of the CEQS (Short, et al., 2005).

Subscale 5 Subscale 1 Subscale 2 Subscale 3 Subscale 4 Ability Effort Persistence Preparation Unity .40\*\* .44\*\* .77\*\* .37\*\* .38\*\* I believe that our team will win the upcoming game -.34\*\* -.41\*\* -,35\*\* I believe that our team will lose -.73\*\* -.37\*\* the upcoming game .59\*\* .48\*\* .49\*\* .49\*\* .47\*\* I believe that our team will obtain its goal in the upcoming game .75\*\* .48\*\*  $.40^{**}$ .44\*\* .41\*\* Our team believes that we will win the upcoming game -.35\*\* -.39\*\* -.36\* Our team believes that we will -.69\*\* -.43\*\* lose the upcoming game

**Table 4.** Correlations between the subscales of the CEQS and five one-item measures ofoutcome-oriented team confidence

p < .01

The outcome-oriented beliefs (i.e., winning/losing the game) correlate strongly with the Ability subscale. Also, the item assessing the belief in obtaining a goal correlates more strongly with the Ability subscale than with the other four subscales. The subscales Effort, Persistence, Preparation, and Unity correlate only moderately with outcome-oriented team confidence (all r < .49). The internal consistency of this newly constructed scale (subscales 2-5 of the CEQS) is very high (Cronbach's  $\alpha = .95$ ). Additional analyses revealed high correlation between the items: "I believe that our team will win the game" and "Our team believes that we will win the game" (r = .80; p < 0.01).

### **3.2** The Observational Collective Efficacy Scale for Sports (OCESS)

The findings above make clear that the subscales Effort, Persistence, Preparation, and Unity of the CEQS form a reliable measure of process-oriented collective efficacy. This brings us to the second purpose of our study, namely to determine whether our newly developed five-item OCESS can be considered as an adequate measure for process-oriented collective efficacy. The Cronbach's  $\alpha$  of the 5-item OCESS is .85, indicating a high internal consistency.

#### 3.2.1 Correlation with CEQS

Table 5 shows the correlations between the OCESS and the CEQS, including correlations with the full scale as well as correlations with the different subscales. In addition, the correlation with the process-oriented part of the CEQS (subscales 2-5) is reported. The results reveal high correlations between the OCESS and CEQS subscales 2, 3, 4, and 5, which together represent the process-oriented part of the CEQS (r = .79). In contrast, only a moderate correlation with the CEQS Ability subscale emerged.

#### 3.2.2 Relation with demographic variables

In order to further test the validity of the OCESS as measure of collective efficacy, we explored both convergent and discriminant validity by comparing the influence of demographic variables on different scales. With regard to the convergent validity, we tested whether the OCESS and the process-oriented part of the CEQS (subscales 2-5) are similarly related with the demographic variables. To examine the discriminant validity, we tested whether the OCESS and the first subscale of the CEQS (as measure of the outcome-oriented team confidence) are related with the predictors in a different way.

#### Table 5

*The correlations between the five-item OCESS (both full scale and individual items) and the CEQS (Short et al., 2005)* 

	Full CEOS	S1 Ability	S2 Effort	S3 Persistence	S4 Preparation	S5 Unity	S2-5
Full OCESS	.78 <sup>**</sup>	.51**	.75**	.68**	.68**	.75**	.79**
1. React enthusiastically when making a point	.51**	.27**	.55**	.45**	.46**	.50**	.54**
2. Have leader figures in the team who believe that we will win this game and express this on the court	.62**	.51**	.56**	.52**	.52**	.55**	.59**
3. Have both players in the game and on the bench who cheer enthusiastically	.61**	.37**	.62**	.56**	.51**	.60**	.63**
4. Encourage each other during the game	.64**	.36**	.64**	.57**	.53**	.65**	.66**
5. Communicate a lot tactically during the game	.66**	.45**	.57**	.57**	.64**	.63**	.67**

p < .01

We conducted three regression analyses with the different demographic variables as predictors (see Table 6). The Ability subscale of the CEQS (presumably a measure of team outcome confidence), the process-oriented part of the CEQS (subscales 2-5), and the newly developed OCESS served as criterion variables. Because the large sample size (N = 4450) goes along with an extremely high statistical power, we will consider only the significant relationships with a  $\beta$ -value above .20 (explaining at least 4% of the variance). The regression analyses in Table 6 reveal that the different demographic characteristics have a very similar relation with the two criteria that we consider as measures of collective efficacy (i.e., subscales 2-5 of the CEQS and the OCESS). Both the place in ranking of the own team and the playing level of the own team in the game of last weekend are significantly, and in the same direction, related with the two collective efficacy scales, which supports the convergent validity of our OCESS scale. By contrast, two different demographic variables, namely the place in the ranking of the next game's opponent and the score of the first game against that opponent, were significantly related to outcome-oriented team confidence. This differential impact of demographic variables supports the discriminant validity of the OCESS scale.

	CEQS	CEQS	OCESS
	Subscale 1	Subscale 2-5	
	Team outcome	Collective efficacy	Collective efficacy
	confidence		
Predictors	$R^2 = .391$	$R^2 = .180$	$R^2 = .130$
-	β	β	β
Player/Coach	.06*	.13***	.04
Sex	.03	06	<b>10</b> ***
Male/Female team	.01	.04	.05
Age	04	.02	.03
Years of experience	.01	.01	02
Team level	04**	<b>10</b> ***	05***
Team tenure	.02	.05**	.06**
Place in ranking of own team	<b>18</b> <sup>***</sup>	<b>25</b> ***	25***
Place in ranking of opponent	<b>33</b> ***	07**	02
Score of first game against same	.20***	00	.00
opponent	0.2	0.1	
Score of game last weekend	.03	01	00
Ranking opponent of game last weekend	.04*	02	.00
Playing level own team game last	10***	73***	20***
weekend	.10	.43	.20

**Table 6.** Regression analyses with background characteristics as predictors and CEQS andOCESS as dependent variables. The significant beta values are marked in bold.

 $p^* < .05 p^* < .01 p^* < .001$ 

#### 4. Discussion

The results of the present study question the internal validity of the measures currently used to assess collective efficacy. Two types of measures could be distinguished: process-oriented collective efficacy (i.e., the confidence in the team's skills to accomplish the processes that could lead to successes) and outcome-oriented team confidence (i.e., the confidence in the team's ability to obtain a goal or win a game). Furthermore, our findings provide support for our contention that the developed five-item OCESS can be used as a valid measure of process-oriented collective efficacy.

First, the results of this study demonstrated that the internal consistency of each of the five subscales of the Collective Efficacy Questionnaire for Sports (Short, et al., 2005), as well as the internal consistency of the full scale, was high. On the other hand, the originally proposed five-factor structure showed only a moderate fit to the data. The Ability

subscale emerged as a separate factor with relatively lower correlations with the other subscales, and with different relations with the demographic variables. This Ability subscale was found to assess outcome-oriented team confidence, rather than process-related collective efficacy, given its high correlations with the outcome-oriented one-item measures. The combined subscales Effort, Persistence, Preparation, and Unity seem to constitute a measure for process-related collective efficacy. Both findings are in line with our hypothesis.

Second, the present findings suggest that the OCESS is a valid measure of processoriented collective efficacy in different team sports. First, the OCESS scale has a high internal consistency. Second, high correlations have been established with the four subscales of the CEQS that assess process-oriented collective efficacy (r > .68). In contrast, only a moderate correlation emerged with the Ability subscale. This indicates that the OCESS is a measure of process-oriented collective efficacy rather than a measure of outcome-oriented team confidence. The convergent validity of the OCESS was further supported by the similar relations between demographic characteristics and both the OCESS scale and the process-oriented part of the CEQS. In contrast, these demographic characteristics had different relations with the Ability subscale, supporting the discriminant validity, and providing further evidence that the Ability subscale of the CEQS does not measure process-oriented collective efficacy beliefs that are congruent with Bandura's (1997) definition of the construct.

In addition, in this original definition, Bandura (1997) referred to collective efficacy as "a group's shared belief". Nevertheless, previous research argued that the best way to capture efficacy beliefs in questionnaires is by assessing the individual's perception of the team's capabilities (Bandura, 1997; Myers & Feltz, 2007; Shearer, Holmes, & Mellalieu, 2009). It should be noted that the OCESS contains items that express interaction or interpersonal behavior (e.g., communicating tactically, encouraging each other). These behaviors can be interpreted as "shared" behavior, and therefore align more closely with the original definition of Bandura (1997).

Because all the items in the OCESS refer to behaviors that can be observed, this scale offers a starting point for the development of a continuous observational instrument of collective efficacy during a competitive game. Because this new measure of collective efficacy can be completed by observers, it has the potential to overcome the limitations of traditional questionnaires that have to be completed by the players themselves. Moreover,

such observations allow assessing the dynamical changes of collective efficacy (e.g., in critical periods during a game).

Our study includes strengths and limitations, so the results should be interpreted accordingly. A particular strength of the study is the large sample size of both coaches and athletes, as well as the diversity of sport and competition level. Having such a large and diverse sample increases the applicability of the results to various sport settings. In addition, the five-item OCESS offers a valid alternative to one-item measures for assessing collective efficacy in sport whenever time available for administering long questionnaires is limited.

A potential limitation associated with our study is the use of an online survey to gather the data, which resulted in participation of individual players and coaches rather than complete teams. Because the 4,451 participants were active in 2,366 different teams, it was not possible to establish whether these collective efficacy beliefs are shared within the team. Collective efficacy is a group-level construct that is typically measured at the individual level and then, when appropriate, aggregated to the group or team level for subsequent analysis. This study only measured collective efficacy beliefs at the individual level of analysis. Further research is required to explore whether a similar pattern will be obtained at the group-level of analysis.

A second limitation regards to the design of our study. Given our cross-sectional study design, we are not able to give evidence for the amount of stability or instability of the OCESS over time. Because the OCESS (in an observational form) should be able to capture changes in collective efficacy (e.g., during a game or between subsequent games), the measurement has to be sensitive for variations. On the other hand, given the stability of external and internal circumstances, we expect high test-retest-reliability. More clarity should be obtained with further studies.

Another suggestion for future research refers to the validation of the OCESS as observational measure of collective efficacy. The present manuscript provides the first necessary step in this validation process by demonstrating that the *self-reported* efficacy behaviors (i.e., the OCESS) are highly correlated with collective efficacy, as measured by the process-oriented part of the CEQS. Future work is required to complete the final step in this validation process, namely to establish a high correlation between the *self-reported* efficacy behaviors and the *observer-reported* efficacy behaviors in a real game setting (both assessed by the OCESS). To obtain a high inter-observer reliability, it will be essential to

define and standardize the observation of the five behaviors for each specific sport, as well as to train the observers in this behavioral assessment.

The findings of the present study contribute both to theoretical knowledge and to coaching practice. First, the results provide clear insight into the conceptual distinction between process-oriented collective efficacy and outcome-oriented team outcome confidence. Hopefully, these findings result in more conceptual clarity in future collective efficacy research. Furthermore, these findings have the potential to provide the basis for the development of a dynamic collective efficacy measurement based on observations guided by the OCESS. Such a measure could provide a better insight in the dynamic nature of collective efficacy during a game and its relation with performance.

Second, this continuous measure would constitute an added value for the coaching practice by providing coaches with more insights into how to attain and maintain high collective efficacy standards within their teams. In addition to technical and tactical scouting, this mental scouting of players can become an essential tool to make important decisions in the course of a game.

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"Yes, we can!": Perceptions of collective efficacy sources in volleyball

Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., Ceux, T., De Backer, M., & Boen, F. (2012)

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*Note*: It should be noted that in the original manuscript of this paper, we used the term 'collective efficacy' for athletes' confidence in winning the game. Although most previous research used the same conceptualization, according to our recent conceptualization presented in Paper 7, we acknowledge that 'team outcome confidence' would have been the appropriate term for the construct that was investigated in this paper.

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#### Abstract

Collective efficacy can be defined as a group's shared confidence that they will successfully achieve their goal. We examined which behaviours and events are perceived as sources of collective efficacy beliefs in a volleyball context. In Study 1, volleyball coaches from the highest volleyball leagues (n = 33) in Belgium indicated the most important sources of collective efficacy. This list was then adapted based on the literature and on feedback given by an expert focus group, resulting in a 40-item questionnaire. In Study 2, coaches and players from all levels of volleyball in Belgium (n = 2,365) rated each of these sources on their predictive value for collective efficacy. A principal component analysis revealed that the 40 sources could be divided into eight internally consistent factors. Positive supportive communication (e.g., enthusiasm after making a point) was identified as the factor most predictive for positive collective efficacy beliefs. The factor referring to the negative emotional reactions of players (e.g., discouraged body language) was the most predictive for negative collective efficacy beliefs. These findings offer a starting point for the design of continuous measurements of collective efficacy through observation.

Keywords: team confidence, group performance, instrument development, sports, coaching
# 1. Introduction

"You have to believe that you can make it!" Coaches, players and other sport enthusiasts routinely talk about the importance of self confidence. Psychologists refer to this concept as self-efficacy, defined as "the beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Researchers have revealed that self-efficacy strongly influences how much effort people put forth and how persistent they are when facing obstacles (Pajares, 2006; Trevelyan, 2011). Consequently, self-efficacy has been proposed as a strong predictor of athletic performance (Bandura, 1977; Ness & Patton, 1979; Feltz, 1988; Weiss, Wiese, & Klint, 1989; Miller, 1993).

Although the majority of research on efficacy examined individual efficacy beliefs, people do not live in social isolation. Many human activities require interaction among people working in groups. For instance, in team sports, the resulting performance is not simply the sum of individual efforts, but a more complex interaction of the efforts of all team members. Bandura (1982) extended his theory with the concept of "collective" efficacy to explain group choices, coordinated team efforts, group motivation and team performance.

Collective efficacy refers to a "group's shared belief in its conjoint capability to organise and execute the courses of action required to produce given levels of attainment" (Bandura, 1997, p. 477). Whereas self-efficacy refers to perceptions of "how well can I do it", collective efficacy refers to perceptions of "how well can we do it". In sport, it has also been labelled as team confidence or team efficacy: "We have to believe that we can make it as a team".

Although collective efficacy is a relatively new construct in sport psychology, it has already been linked to several favourable outcomes. Teams with a strong sense of collective efficacy set more challenging goals (Silver & Bufanio, 1996), exert more effort, persist longer when facing difficulties or defeat (Greenlees, Graydon, & Maynard, 1999), and are ultimately more likely to succeed (Bandura, 2000). Furthermore, a positive relationship between collective efficacy and team cohesion was observed in sports such as rugby and basketball (e.g., Kozub & Mc Donnel, 2000; Parrow, 2002), and this relationship was confirmed in volleyball (Ramzaninezhad, Keshtan, Shahamat, & Kordshooli, 2009).

#### Perceived sources of team confidence in volleyball

A positive relationship between collective efficacy and performance has been observed in football teams (Myers, Feltz, & Short, 2004), ice hockey teams (Feltz & Lirgg, 1998; Myers, Payment, & Feltz, 2004), basketball teams (Watson, Chemers, & Preiser, 2001), softball teams (Chou, Yu, & Chi, 2010), and in volleyball teams (Dithurbide, Sullivan, & Chow, 2009; Keshtan, Ramzaninezhad, Kordshooli, & Panahi, 2010).

Regardless, little is known about the sources contributing to the development of collective efficacy. Bandura (1997) suggested that the four sources of self-efficacy may serve as sources of collective efficacy, namely, past performance, vicarious experience (or social comparison), verbal persuasion, and physiological/emotional states (e.g., arousal, fatigue or stress). However, the development of efficacy beliefs may differ between an individual and a team. This difference is supported by research in elite female netball that reveals that team level effects are more important than individual level effects in predicting collective efficacy. More specifically these team level predictors accounted for approximately 73% of the variance in collective efficacy at team level (Wilkinson, Fletcher, & Sachsenweger, 2011). These findings are supported by the existence of additional sources of collective efficacy in a team sport context such as past performance in practice or training sessions, preparation effort, and confident leadership (Chase, Lirgg, & Feltz, 1997; Watson et al., 2001; Chase, Feltz, & Lirgg, 2003).

Although past performance is generally thought to be the strongest source of efficacy beliefs (Bandura, 1997), only limited research has been conducted to explore other sources of collective efficacy beliefs in a sport setting. Until now researchers have focused only on the collective efficacy sources before the game, not during the game. However, these ingame sources might play an important part in predicting collective efficacy as well. Furthermore, no distinction has been made between sources of positive efficacy beliefs and sources of negative efficacy beliefs; which is unfortunate given the detrimental influence these negative efficacy beliefs can have on the team performance.

In the present study we extend previous research by investigating which information players and coaches use during the game to determine their in-game confidence in the abilities of their team to reach a certain goal (e.g., winning the game). Therefore, the general purpose of the current research was to identify the sources of positive and negative collective efficacy in volleyball, as perceived by players and coaches, not only before the game, but also during the game. A volleyball setting was chosen because this team sport requires continuous interaction between the players (Carron & Chelladurai, 1981), making it difficult to separate one's own functioning from that of the rest of the team (Lindsley, Brass, & Thomas, 1995). As a result, volleyball offers an interesting sport context for exploring the sources of collective efficacy.

Two studies were designed to realise our goals. Study 1 aimed to detect which information coaches use to assess the positive and negative collective efficacy beliefs of their volleyball players. Study 2 built on the results of Study 1 by asking volleyball coaches and players to indicate to what extent these sources do have predictive power for collective efficacy. Using principal component analysis, we examined whether the sources could be combined into distinct and meaningful components. Subsequently, we explored which of these factors are considered as the most predictive for collective efficacy.

# 2. Study 1

Our first study explored which information volleyball coaches use to assess the collective efficacy beliefs of their players. Based on previous literature, we expect that coaches will mention both general sources of efficacy, such as past performance (Bandura, 1997), as well as sources specific for the team context, such as team cohesion and confident leadership (Watson et al., 2001; Wilkinson et al., 2011).

# 2.1 Method

#### **Participants**

Participants were 33 coaches of the highest leagues in volleyball in Belgium, including 20 coaches of female teams and 13 coaches of male teams. Their mean age was 41 years (s=7.5) and they had on average 17.6 years of coaching experience (s=7.1). Twenty coaches worked with a team in one of the two highest levels out of 10, six coaches had a team on the third or fourth level, and six coaches trained a youth selection team. The majority of the coaches (88%) were the head coach of their team. Comparison between responders and non-responders revealed no significant differences in terms of gender, age, and experience, suggesting that the sample was representative for the invited population on these background characteristics.

#### Measures

An open-ended questionnaire was used to ask the coaches what they considered the most important sources that affect collective efficacy within volleyball. Participants were encouraged to identify any possible source that came to mind, with the intent to create a relatively complete list of volleyball specific sources of collective efficacy.

## **Procedure**

All coaches of the highest leagues in volleyball in Belgium (n=75) were electronically invited in the first half of season 2010-2011 to participate. Non-responders were sent a reminder two weeks later, which resulted in a 44% response rate. A detailed breakdown of the response rate for each level resulted in a response rate of respectively 47% for the coaches on the two highest levels, 21% for the coaches of a team on the third and fourth level, and 56% for the coaches of a youth selection team.

This original pool of collective efficacy sources obtained from coaches was extended with sources from a literature review (Bandura, 1986, 1997). Afterwards a focus group met, including three professional researchers in the area of sport psychology, one applied sport psychologist who has worked with elite volleyball teams, the head coach of the Belgium women's national volleyball team, and five players, active on different levels, ranging from national to regional level. They provided feedback with respect to item clarity and applicability in volleyball. As a result, the total number of sources was reduced considerably. An example of this adaptation process is that coaches mentioned twelve different, yet highly similar indicators of negative body language (e.g., shaking one's head, hanging one's head, shrugging or hanging one's shoulders, a dull gaze, averting one's eyes). All these sources were gathered into one source: "One or more players express a discouraged body language".

Finally, this list was adapted to both the perspective of the coach and the players; one version was formulated from the viewpoint of the coach (e.g., "As a coach I prepared the players tactically well for the game"), while a second version was formulated from the players' viewpoint (e.g., "Our coach prepared our team tactically well for the game").

#### 2.2 Results

In total, the coaches provided a list of 58 possible sources of collective efficacy. The most frequently mentioned source was decreased communication between the players (16 coaches), followed by enthusiasm after winning a point (11 coaches), and negative body language (10 coaches). A literature review provided additional sources such as the enthusiastic cheering of both field and bench players, and the expression of collective efficacy beliefs by the opposing team (Ronglan, 2007).

Adaptations based on advice from the focus group of experts resulted in 40 collective efficacy sources (see Appendix). This final list contained pre-game sources (e.g., "My team won the last game against the same opponent"), sources during the warming-up (e.g., "The players warm up concentrated before the game"), as well as sources during the game (e.g., "The team comes together enthusiastically after making a point"). This wide variety of behaviours, body language and other sources, all mentioned by experts as affecting a players' collective efficacy, served as a starting point for Study 2.

#### 3. Study 2

In the present study, coaches and players from all 10 Belgian volleyball levels rated to what extent the 40 previously obtained sources have the power to predict collective efficacy. Based on previous qualitative research on sources of collective efficacy during the game (Ronglan, 2007), we expect that enthusiasm on the field and efficacy expressed by the leaders will be scored as the most important sources of positive collective efficacy. Furthermore we assume that negative body language will be indicated as predictive for negative efficacy beliefs.

#### 3.1 Method

#### 3.1.1 Participants

The sample contained 2,365 participants including 603 coaches, 1,083 players, and 679 participants who combined both functions, not necessarily within the same team. Table 1 contains detailed information on the participants. Although the sample contained both male and female participants, most of the participants were males. This gender imbalance was also found in the total population of invited coaches (79% male coaches). This sample was thus representative for the dominance of male volleyball coaches in Flanders.

	Participants	Mean age (years)	Average experience (years)	Gender Men (♂) / Women (♀)	Team gender
Coaches	603 (25%)	42.24	16.89	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	199 ♂ 338 ♀ 66 ♂+♀
Players	1083 (46%)	23.69	13.04	414 ♂ (38%) 669 ♀ (62%)	414 ♂ 669 ♀
Player- coaches	679 (29%)	32.31	18.01	435 ♂ (64%) 244 ♀ (36%)	231 ♂ 236 ♀ 212 ♂+♀
Total sample	2365	31.42	15.61	1366 ♂ (58%) 999 ♀ (42%)	844 ♂ 1243 ♀ 278 ♂+♀

 Table 1. Sample characteristics

#### 3.1.2 Measures

Recently, researchers have focused on four main approaches to measure collective efficacy in sports teams. The first method aggregates the self-efficacy perceptions of all individuals in a group. However, because group members rely on one another for performance, the concept of collective efficacy differs from self-efficacy (Bandura, 1982, p. 143). The second method uses a group discussion to obtain a single, group-level measure of collective efficacy. Although this method resembles the original definition of Bandura (1997), the validity of this method is questionable (Bandura, 1997; Paskevich, Brawley, Dorsch, & Widmeyer, 1999). Social persuasion and conformity pressures may bias the results towards the beliefs of the dominant characters within the team. The third method aggregates individuals' perceptions of their own collective efficacy, for instance: "I believe that my team will win this game." In contrast, the fourth method aggregates individuals' perception of the team's collective efficacy, for example: "My team believes that we will win this game."

Although collective efficacy is defined as a group's shared belief, it still reflects individuals' perceptions of the team's capabilities (Bandura, 1997). In line with this, previous research indicated that both the third and the fourth method are equally suited to assess collective efficacy in sports teams (Bandura, 1997; Shearer, Thomson, Mellalieu, & Shearer, 2007).

However, it should be emphasised that the aim of the present study is not to measure collective efficacy but to examine which sources predict collective efficacy beliefs. In order to determine the predictive value of the 40 sources obtained in Study 1, participants assessed the items on a 7-point scale anchored by "When this item occurs I am totally convinced that my team will lose the game" (Score 1) and "When this item occurs I am totally convinced that my team will win the game" (Score 7). The neutral score of 4 indicated that no link was present between the source mentioned and the collective efficacy beliefs.

# 3.1.3 Procedure

The Flemish volleyball federation's database was used to contact 1,999 licensed volleyball coaches in Flanders (Belgium) in the middle of season 2010-2011 and to invite them to complete the questionnaire. They were also asked to motivate their players to participate by referring them to the player-specific version of the questionnaire. In addition, 342 volleyball players known by the principal researcher were personally contacted. No incentives were given for participation in our study and participants were guaranteed full confidentiality.

Participants were referred to a web-based questionnaire, containing demographic questions and the 40 item-list containing the sources of collective efficacy. Non-responders were sent a reminder two weeks later, which resulted in a 64% response rate for the contacted coaches and a 69% response rate for the contacted players, which is high compared to the average response rate of 34% of an online web-based survey as reported in a meta-analysis (Shih & Fan, 2008).

#### 3.1.4 Statistical analyses

We conducted a principal component analysis with Varimax rotation on the total sample. The Kaiser eigenvalue-greater-than-one rule was used to extract the components (Kaiser, 1960). An item was retained to construct a factor based on the component when it had a minimum loading of .40, without having a cross-loading higher than .40 on any other component. Cronbach's alpha coefficients were calculated to assess the internal consistency of each factor (Cronbach, 1951).

Finally, regression analyses were conducted to establish the impact of background characteristics on the perceived predictability of the factors. Each constructed collective

efficacy factor was used as the criterion variable. The included predictor variables were age, gender, male/female team, years of experience, competition level, and function of the participant (player, coach or player-coach) as dummy variable. Because our large sample resulted in extreme statistical power, only significant relations with a  $\beta$ -value above .20 will be discussed (i.e., explaining at least 4% of the variance in perceived predictability of the team result).

#### 3.2 Results

# 3.2.1 Construction of collective efficacy factors for players and coaches

The principal component analysis resulted in nine principal components with eigenvalues greater than 1, accounting for 56% of the variance. In order to construct a meaningful overarching structure of collective efficacy factors some adaptations were needed.

The internal consistency of the initial factor 9, represented by the Cronbach's alpha coefficient, was .53 and thus unacceptable (Gronlund, 1981). Because the content of factor 8 and factor 9 overlapped (they both referred to the negative emotional reactions of the players), we combined these factors, which resulted in an acceptable alpha value of .66.

The principal component analysis thus resulted in eight collective efficacy factors. These factors were labelled as follows: (1) Positive supportive communication, 7 items; (2) Positive indications before the game, 6 items; (3) The own team is in the lead of the game, 7 items; (4) Interventions of the coach, 4 items; (5) Positive emotional actions of the players, 3 items; (6) The own team is behind in the game, 4 items; (7) Faults of the own team, 4 items; and (8) Negative emotional reactions of the players, 5 items. Detailed information about the content of these factors can be found in Appendix.

The correlation matrix of these factors is shown in Table 2. Cronbach's alpha coefficients are provided in parentheses on the diagonal as estimates of internal consistency. The internal consistency of all factors was acceptable given that all Cronbach's alphas exceed .60 (Gronlund, 1981). As can be seen in Table 2, all correlations between the positive (1-5) as well as between the negative collective efficacy factors (6-8) were moderate to high correlations.

	Variable	1	2	3	4	5	6	7	8
1.	Positive supportive communication	(.83)							
2.	Positive indications before the game	.40**	(.81)						
3.	The own team is in the lead of the game	.57**	.51**	(.77)					
4.	Interventions of the coach	.50**	.40**	.45**	(.69)				
5.	Positive emotional actions of the players	.32**	.28**	.35**	.27**	(.64)			
6.	The own team is behind in the game	.27**	.11**	.26**	.20**	.08**	(.79)		
7.	Faults of the own team	.12**	.10**	.21**	.15**	.04*	.54**	(.74)	
8.	Negative emotional reactions of the	.05*	.10**	.15**	.13**	.11**	.43**	.57**	(.66)
	players								

**Table 2.** Correlations and Cronbach's alphas for the eight collective efficacy factors.

\*p < .05, \*\*p < .01

# 3.2.2 Predictive power for collective efficacy

Table 3 presents the factors, ranked from most predictive for positive collective efficacy to most predictive for negative collective efficacy. A score of 4 represented a neutral answer meaning that no predictive power for collective efficacy was perceived.

**Table 3.** Means at factor level for players, player-coaches, and coaches (7-point scale). The respective ranking of the factors is provided in parentheses. Standard deviations for the total population are included.

	All data	Players	Player- Coaches	Coaches
1. Positive supportive communication	$5.54 \pm .64$	5.46 (1)	5.55 (1)	5.66 (1)
2. Positive indications before the game	$5.28 \pm .90$	5.29 (2)	5.29 (2)	5.24 (2)
3. The own team is in the lead of the game	$5.13 \pm .62$	5.15 (3)	5.14 (3)	5.09 (4)
4. Interventions of the coach	$5.06 \pm .77$	4.99 (4)	5.07 (4)	5.18 (3)
5. Positive emotional actions of the players	$4.62 \pm .97$	4.66 (5)	4.66 (5)	4.49 (5)
6. The own team is behind in the game	3.66±.93	3.69 (6)	3.64 (6)	3.63 (6)
7. Faults of own team	$3.43 \pm .76$	3.45 (7)	3.40 (7)	3.44 (7)
8. Negative emotional reactions of the players	3.11±.75	3.09 (8)	3.02 (8)	3.24 (8)

Positive supportive communication was considered as the factor most predictive for positive collective efficacy. On the negative side of the scale, the factor referring to the negative emotional reactions of the players (e.g., discouraged body language) was considered as the most predictive for negative collective efficacy beliefs.

The perceptions of players and coaches were very similar. The same ranking emerged, with only one exception: coaches perceived their own interventions as more predictive for positive collective efficacy beliefs than players did. Separate linear regression analyses revealed that the relationships between the different background characteristics (age, gender, experience, and competition level) and perceived predictability of the factors did not exceed our criterion ( $\beta$ >.20). In other words, the predictability of the collective efficacy factors did not really differ between males and females, young and old, low and high level, and experienced and not experienced respondents. This conclusion holds for coaches and players.

In order to investigate these results in more detail, we examined the predictability for collective efficacy at item level as well. Table 4 presents the mean scores of the four sources perceived as most predictive for positive collective efficacy beliefs and the four sources perceived as most predictive for negative collective efficacy beliefs.

The four sources perceived as most predictive for positive collective efficacy beliefs of the 40-item list were identical for coaches, player-coaches and players. All these sources belonged to the factor of positive supportive communication. Also on the negative side of the scale the coaches and the players agreed to a large extent. All these sources belonged to the factor of negative emotional reactions of players.

The same linear regression analyses at factor level were conducted on each of these sources. Again, no significant differences regarding the background characteristics ( $\beta$ >.20) emerged, neither for coaches nor for players or player-coaches. These findings imply that the background characteristics do not influence the predictability of the perceived sources for collective efficacy.

**Table 4.** Means of the four sources perceived as most predictive for positive (1-4) and negative collective efficacy beliefs (37-40), out of the 40-item list, as a function of the respondents (coaches, player-coaches, and players). The respective ranking of the items is provided in parentheses.

		All data	Coaches	Player- Coaches	Players
1.	The team comes together enthusiastically after making a point.	5.82 (1)	5.87 (2)	5.77 (1)	5.82 (1)
2.	Athlete leaders within the team believe they will win the game and express this on the field.	5.70 (2)	5.93 (1)	5.72 (2)	5.56 (3)
3.	Enthusiastic cheering of both field players and bench players between the rallies.	5.67 (3)	5.74 (3)	5.63 (4)	5.66 (2)
4.	The players communicate a lot between the rallies (encouraging communication).	5.62 (4)	5.72 (4)	5.46 (3)	5.55 (4)
37.	A player ignores a player who made a fault, instead of encouraging him/her.	3.13 (37)	3.56 (32)	3.01 (37)	2.95 (39)
38.	A player does not dare to take difficult options.	3.04 (38)	3.06 (38)	3.01 (38)	3.05 (37)
39.	One or more players express a discouraged body language.	2.90 (39)	2.84 (40)	2.79 (40)	3.01 (38)
40.	A player reacts angrily and frustrated when one of his/her teammates makes a fault.	2.88 (40)	3.18 (35)	2.80 (39)	2.77 (40)

# 4. Discussion

We examined the sources most predictive for collective efficacy in volleyball. The variety in the collective efficacy sources obtained in Study 1 revealed additional sources beyond the four efficacy sources originally proposed by Bandura (1997). In line with our expectations, coaches mentioned both general sources of efficacy, such as past performance, as well as sources specific for the team context. In contrast to previous studies not only pregame sources of collective efficacy were mentioned, but also sources during the warmingup and during the game.

Next, Study 2 determined the importance of these sources in predicting the collective efficacy of players and coaches during the game. Results revealed that the factor referring to positive supportive communication is perceived as most predictive for positive collective efficacy beliefs, both by coaches, players, and player-coaches. This factor contains sources related to enthusiasm on the court, as well as sources related to communication.

Consistent with our expectations, further analyses at item level indicated that the most decisive source for this factor was the enthusiasm after making a point. The importance of enthusiasm was supported by the high ratings of the item referring to the cheering by bench and field players. These enthusiasm-related sources are rather volleyball specific given the relatively high amount of scored points in volleyball and the short break after every point, which makes it possible to come together and share the enthusiasm with teammates. Nevertheless, they can be linked with research findings in other sport settings. Ronglan (2007) for instance revealed that in handball cheering and making joy on the court are also very important in order to attain high collective efficacy standards within the team.

The expression of collective efficacy by the team leaders was perceived as the second most predictive factor of collective efficacy during the game. Moreover, for the coaches this factor heads the list. These findings are in line with our expectations and support other studies showing that leaders' high levels of collective efficacy may lead to higher collective efficacy among group members (Bandura, 1997; Watson et al., 2001; Hoyt, Murphy, Halverson, & Watson, 2003; Ronglan, 2007).

Communication between the players completed the top four. To our knowledge, no research has been conducted on the relationship between players' communication and collective efficacy. Nevertheless, communication has been found to positively influence sport performance. For example, LeCouteur and Feo (2011) found that intense communication during play is crucial for a successful performance. On the other hand, less frequent and negative communication has been suggested as being a predictor of a collective collapse (Apitzsch, 2009). Further research is needed to explore whether collective efficacy can be seen as the mediator of these relationships.

Although previous research findings indicated that past performance is the strongest source of efficacy beliefs (Bandura, 1997; Chase et al., 2003), the present study reveals that positive supportive communication was rated as even more predictive for collective efficacy. This in-game source is thus even more important in predicting collective efficacy than sources before the game.

Furthermore, it is noteworthy that positive supportive communication was rated as more predictive for collective efficacy than the in-game performance sources (e.g., the own team in the lead/behind in the game). In other words, if a team comes together enthusiastically, players and coaches are more confident in the team's ability to win the game than if the team is only performing well. Although many authors revealed a strong relation between performance and collective efficacy in volleyball teams (Dithurbide et al., 2009; Keshtan et al., 2010), positive supportive communication might even be more predictive for collective efficacy.

On the opposite side of the scale, the factor referring to negative emotional reactions of the players was perceived as the most predictive for negative collective efficacy beliefs. Although some authors mentioned the negative consequences of showing negative efficacy beliefs, for instance by motivating the opponent (Ronglan, 2007), they have not yet clarified which behaviours exemplify those negative efficacy beliefs. Analysis at item level provides a better understanding. The four most predictive sources, all belonging to the factor referring to the negative emotional reactions of players, were an irritated reaction on a teammate's fault, discouraged body language, not taking difficult options, and ignoring a player who made a fault. When these behaviours emerged, players and coaches lost their confidence in the abilities of their team and perceived the situation as leading to a defeat.

Another aim of this study was to test whether collective efficacy perceptions would differ as a function of the various background characteristics. At factor level players and coaches ranked the factors similarly. Even at item level both players, coaches and playercoaches listed the same four sources out of the list of 40 items as most important sources of collective efficacy. Also, on the negative side of the scale, strong agreement emerged. Regression analyses revealed only small effects for gender, age, experience and level. We can therefore conclude that players and coaches, regardless of their age, gender, experience, and level on which they play or coach, share very similar perceptions about the sources predicting collective efficacy. As a result, the findings of this study can be considered as very stable and applicable to many volleyball teams.

The present study extends previous research by examining the in-game sources of both positive and negative collective efficacy as perceived by players and coaches. Until now, research has only focused on collective efficacy before or after the game, but not during the game. The only exception so far is a study about adventure racing teams in which the authors measured collective efficacy on three separate points in a race (Edmonds, Tenenbaum, Kamata, & Johnson, 2009). However, more continuous measurements during the game would allow variations in collective efficacy to be related to variations in game circumstances and with changing interactions among the players and their coach.

One of the reasons for this research lacuna is the fact that in most team sports it is not possible to interrupt a player repeatedly during a game to measure his or her collective efficacy beliefs. Observational data might provide a viable alternative for these self report measures. As a consequence, there is a clear need in sports sciences to establish observable indicators that clearly reflect a player's collective efficacy beliefs.

It is therefore noteworthy that in the present study the collective efficacy sources most predictive for positive collective efficacy (i.e., 'positive supportive communication') and those most predictive for negative collective efficacy (i.e., 'negative emotional reactions of players') are clearly observable in-game behaviours. These sources may thus offer a starting point for the design of a continuous measurement of players' collective efficacy beliefs through observation. Such measurement would highlight the dynamic nature of collective efficacy, even within a single game, and provide more insight in how to attain and maintain high levels of collective efficacy.

The strengths of this study include the large sample size and the broad variety of players and coaches, active in all the different levels, ranging from youth to recreational players to professionals. The sample included both men and women of different ages and experience levels. This variety allowed us to examine whether these characteristics influenced the perception of collective efficacy sources. The large sample size and the correspondence between the perceptions of coaches, player-coaches and players assured the reliability of our findings.

The study also had some limitations. First, because only volleyball athletes and volleyball coaches participated, the findings are volleyball specific and it remains to be tested whether they apply to other sports.

Second, the results were based on the perceptions of players and coaches instead of on objective characteristics of the situation. On the other hand, Shaver (1975) suggested that an individual's perception of a situation is more important than the objective situation in determining one's feelings and actions. Consequently, we assume that the perceptions of players and coaches will be decisive for their collective efficacy beliefs. Nevertheless, in the future researchers should investigate whether there is a link between collective efficacy sources and collective efficacy beliefs in an official game.

Furthermore, researchers should attempt to experimentally determine the causal link between collective efficacy and its most important sources: enthusiasm, collective efficacy of team leaders, communication, and discouraged body language. For instance, future research could focus on how leaders' high collective efficacy is communicated to their followers and how, as a consequence, the collective efficacy beliefs spread throughout the entire team.

In order to facilitate optimal team performance, coaches should pursue high collective efficacy standards within their team. For this to happen, our findings suggest that coaches should stress the importance of enthusiasm and communication and train their athletes to continue communicating, even when the team is losing. In addition, the coaches should encourage the captain or other leaders within the team to take their responsibility by expressing their collective efficacy beliefs and contribute in this way to a better performance.

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# 6. Appendix

Detailed statistics: Factor loadings, means on factor and item level (7-point scale), and standard deviations.

	Collective efficacy factors and associated items	Factor loading	mean	S
1.	Positive supportive communication		5.54	.64
	1. The players communicate a lot between the rallies (encouraging communication).	.78	5.62	0.85
	2. The players communicate a lot before and during the rallies (tactical communication).	.72	5.40	0.93
	3. My team comes together enthusiastically after making a point.	.67	5.82	0.84
	4. The players listen carefully during a time-out.	.67	5.19	0.94
	5. Enthusiastic cheering of both field players and bench players between the rallies.	.62	5.67	0.89
	6. Athlete leaders within the team believe they will win the game and express this on the court.	.56	5.70	0.92
	7. The players warm up concentrated before the game.	.50	5.38	1.00
2.	Positive indications before the game		5.28	.90
	8. My team won the two last games.	.79	5.27	1.32
	9. My team is higher ranked than the opponent.	.75	5.20	1.29
	10. Last weekend we won our game.	.73	5.05	1.33
	11. My team won the last game against the same opponent.	.66	5.53	1.27
	12. My team played well during the last game.	.54	5.36	1.06
	13. My team is fit. No player is injured.	.43	5.25	1.24
3.	The own team is in the lead of the game		5.13	.62
	14. My team is in the lead at the technical time-out of 16 points.	.67	5.28	0.93
	15. My team is in the lead at the technical time-out of 8 points.	.64	4.74	0.92
	16. Spectacular powerful attacks of the own team.	.59	5.42	0.98
	17. My team wins a long rally.	.57	5.38	0.84
	18. During the first 10 points of the game my team played really well.	.53	5.37	1.02
	19. The coach of the opponent takes time-outs or substitutes players.	.53	5.02	1.06
	20. The players gather quickly at a time-out or after changing sides.	.41	4.68	0.89
4.	Interventions of the coach		5.06	.77
	21. The coach gave the team a motivational pep talk before the game.	.65	5.08	1.07
	22. The coach prepared the team tactically well for the game.	.63	5.24	1.09
	23. Last week my team trained well.	.62	5.21	1.00
	24. The coach let the players think along in determining the game	.57	4.72	1.12
	strategy.			

5.	Positive emotional actions of the players		4.62	.97
	25. A player starts to intimidate or challenge the opponent.	.73	4.33	1.26
	26. A player reacts forceful after scoring a point.	.66	4.56	1.36
	27. A player starts to play the audience and motivate them to cheer.	.60	4.97	1.17
6.	The own team is behind in the game		3.66	.86
	28. The own team is 5 points behind after the second technical time-out	.79	3.18	1.16
	(16 points).			
	29. The own team is 5 points behind during the first half of a set.	.77	3.96	1.00
	30. The own team is 5 points behind during the game.	.75	3.50	1.06
	31. The players of the opposing team clearly demonstrate their	.51	4.01	1.17
	conviction that they will win the game.			
7.	Faults of the own team		3.43	.76
	32. Within the same rotation a team loses three or more consecutive	.72	3.16	1.08
	points by errors in reception.			
	33. Within the same rotation a team loses two or more consecutive	.69	3.90	1.00
	points by errors in reception.			
	34. A player misses a serve after a serving error of a teammate.	.68	3.54	0.95
	35. One or more players fail to fulfil the tactical agreements.	.55	3.13	1.01
8.	Negative emotional reactions of the players		3.11	.75
	36. A player ignores a player who made a fault, instead of encouraging	.75	3.13	1.20
	him/her.			
	37. A player reacts angrily and frustrated when one of his/her teammates	.63	2.88	1.09
	makes a fault.			
	38. A player reacts frustrated on dubious decisions of the referee.	.62	3.58	1.13
	39. A player does not dare to take difficult options.	.56	3.04	1.18
	40. One or more players express a discouraged body language.	.54	2.90	1.16

On traffic-jams, speed bumps, and gas stations along the road to team confidence: Perceived sources of team confidence in soccer and basketball.

Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). Manuscript submitted for publication

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#### Abstract

Although it is generally accepted that team confidence is beneficial for optimal team functioning and performance, little is known about the predictors of team confidence. The present study aims to shed light on the precursors of both high and low team confidence in two different sports. A distinction is made between sources of process-oriented team confidence (i.e., collective efficacy) and sources of outcome-oriented team confidence (i.e., team outcome confidence), which have often been confounded in previous research. In a first step, two qualitative studies were conducted to identify as many sources of team confidence in soccer (N = 1028) and in basketball (N = 867), and the sources of collective efficacy in basketball (N = 825). The results revealed that positive coaching, high-quality performance, and team enthusiasm were the most important determinants of high levels of team confidence. In contrast, negative communication and expressions by players and the coach were perceived as the most decisive predictors of low levels of team confidence. Athlete leaders emerged as key triggers of both upward and downward spirals of team confidence.

*Keywords*: collective efficacy, team outcome confidence, athlete leadership, sport psychology, coaching

#### 1. Introduction

Joe Paterno, an American football coach, once stated: "When a team outgrows individual performance and learns team confidence, excellence becomes a reality" (Benson, 2008, p. 199). Having confidence in the abilities of the own team, in particular when facing difficulties, has been found to be an essential factor in the success of sports teams (Morgan, Fletcher, & Sarkar, 2013; Myers, Feltz, & Short, 2004). Especially in tight games, where the stakes are high and the mental pressure peaks, team confidence can make the difference between winning and losing.

The importance of team confidence was illustrated in the recent soccer final of the Europa League, in which FC Sevilla triumphed over Benfica in the penalty shoot-outs. After the game, Jorge Jesus, the losing coach of Benfica, acknowledged the importance of team confidence: "At the end of the game we were the better team. We created opportunities, but they did not work out. The team that was most confident in the penalties was Sevilla. With regard to the play, the best team did not win the Europa League" (Sporza, 2014). This quote illustrates that sometimes team confidence can even outweigh the performance.

### **1.1 Collective Efficacy and Team Outcome Confidence**

Recently, two types of team confidence have been distinguished (Collins & Parker, 2010; Fransen, Kleinert, Dithurbide, Vanbeselaere, & Boen, 2014; Myers & Feltz, 2007). The first type of team confidence is termed '*collective efficacy*' and was originally defined by Bandura (1997, p. 477) as: "a group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment". This type of team confidence thus captures team members' confidence in the team's abilities to successfully accomplish the requested processes (e.g., following the tactical game plan, communicating well, encouraging each other, etc.).

The second type of team confidence is termed '*team outcome confidence*' and captures team members' confidence in the team's abilities to obtain a goal or to win a game. Collins and Parker (2010) termed this type of confidence 'team outcome efficacy', whereas Myers and Feltz (2007) used the term 'competitive or comparative efficacy'. Fransen et al. (2014) made the appropriate remark that this outcome-oriented measure does not capture the process-oriented nature of efficacy beliefs as described by Bandura (1997). Consequently, the 'efficacy' label that has often been used appears inappropriate. We will therefore adopt

the conceptualization proposed by Fransen et al. (2014) and use the label of 'team outcome confidence'. Both constructs (i.e., collective efficacy and team outcome confidence) will be assembled under the umbrella term 'team confidence'.

While collective efficacy is oriented towards the process, team outcome confidence focuses on the outcome. Furthermore, collective efficacy is about the confidence in the own team and is therefore more controllable than team outcome confidence, which is rooted in the comparison with the opponent team. The different focus of both constructs is reflected in their different relations with background characteristics (Fransen, Kleinert, et al., 2014). More specifically, collective efficacy was significantly predicted by the place in the ranking of the *own team* and the playing level of the *own team* in the game of last weekend, whereas team outcome confidence was significantly predicted by the *opponent*'s place in the ranking and by the score of the first game against the same *opponent*.

# **1.2 Outcomes of Team Confidence**

Bandura (1997) postulated that team confidence influences what a team chooses to do, how much effort is instilled into a task, and how persistent the team is. Furthermore, quantitative research has demonstrated that athletes who are more confident in the abilities of their team set more challenging goals (Silver & Bufanio, 1996), exert more effort, and demonstrate more resilience when facing adversities (Greenlees, Graydon, & Maynard, 1999; Morgan et al., 2013). In addition, teams with high levels of team confidence were shown to be more cohesive (Kozub & Mc Donnel, 2000; Parrow, 2002; Ramzaninezhad, Keshtan, Shahamat, & Kordshooli, 2009). Furthermore, numerous studies revealed a positive relation between the strength of team confidence and the team performance (Chou, Yu, & Chi, 2010; Dithurbide, Sullivan, & Chow, 2009; Edmonds, Tenenbaum, Kamata, & Johnson, 2009; Feltz & Lirgg, 1998; Keshtan, Ramzaninezhad, Kordshooli, & Panahi, 2010; Myers, Feltz, et al., 2004; Myers, Paiement, & Feltz, 2004; Stajkovic, Lee, & Nyberg, 2009; Watson, Chemers, & Preiser, 2001). In short, it is beyond dispute that team confidence can be considered as a crucial factor for the team's optimal functioning and, as a consequence, for the team's success.

When examining the outcomes of team confidence, most previous studies have disregarded the conceptual distinction between the two types of team confidence. Two exceptions can be noted that investigated the relation between both types of team confidence and performance (Collins & Parker, 2010; Fransen, Decroos, et al., 2014).

Although differences emerged with regard to the strength of the relation between each construct and performance, both studies revealed a positive relation between team confidence (i.e., both collective efficacy and team outcome confidence) and the subsequent team performance.

## **1.3 Sources of Team Confidence**

Given the impact of players' team confidence on their performance, it is important to identify the factors that shape and influence this team confidence. In contrast with the abundant knowledge on the outcomes of team confidence, only limited research attention has been devoted to the sources of team confidence. The sparse research on confidence sources was inspired by Bandura (1997), who identified four important sources for one's situation-specific self-confidence (i.e., self-efficacy): (1) mastery experiences or past performance (i.e., previous success boosts one's self-efficacy, whereas previous failure undermines it), (2) vicarious experiences (i.e., seeing similar people succeed/fail after persistent efforts can strengthen/undermine one's self-efficacy), (3) social persuasion (e.g., verbal persuasion by others that one has the requested abilities to perform a task), and (4) physiological and emotional states (e.g., stress or arousal could influence the confidence in the own abilities). Because of the specificity of a sports context, additional sources of athletes' self-confidence have been proposed, such as the received social support, confidence, and coaches' leadership (Chase, Feltz, & Lirgg, 2003; Hays, Maynard, Thomas, & Bawden, 2007; Vealey, Hayashi, Garner-Holman, & Giacobbi, 1998).

Bandura (1997) suggested that the four sources of self-confidence would also predict team confidence. However, just as the performance of a team is more complex than simply the sum of the individual performances, team confidence is also more complex than the sum of each individual player's experienced self-confidence. Previous research supported this assumption by demonstrating that there are team-specific sources of team confidence, such as preparation effort, past performance in practice or training sessions, and confident leadership (Chase et al., 2003; Chase, Lirgg, & Feltz, 1997; Watson et al., 2001).

### **1.4 Research Lacuna in the Current Knowledge**

Three major limitations can be noted with regard to previous research on the sources of team confidence. First, it should be highlighted that team confidence is a dynamic construct, rather than a trait-like characteristic with a strong cross-temporal stability (Myers & Feltz, 2007). More specifically, athletes' confidence may vary in the course of weeks, days, or even within a single game. In contrast with this dynamic nature of team confidence, previous research predominantly focused on sources of team confidence before the game (e.g., past performance, preparation effort) instead of sources during the game (e.g., being behind or in the lead, confidence expressed by teammates).

Second, previous research focused on the factors that stimulate team members' confidence in their team (i.e., the gas stations along the road to team confidence). However, in doing so, previous research has disregarded the obstacles that negatively impact upon players' confidence in their team (i.e., the speed bumps and traffic-jams along the road to team confidence). Moreover, it could well be that these sources of low team confidence differ from their positive counterparts. Therefore, a thorough knowledge of the sources of both high and low team confidence would benefit coaches and sport psychologists to build high levels of team confidence within their team and prevent downward spirals, in which negative team confidence and poor performance amplify each other (Lindsley, Brass, & Thomas, 1995; Salanova, Llorens, & Schaufeli, 2011).

Finally, previous research has disregarded the difference between sources of collective efficacy and sources of team outcome confidence. Given their different focus on respectively the process of the own team and the outcome against the opponent, it could be that both types of team confidence are predicted by different sources. Because both constructs have a different impact on outcome variables (e.g., see Fransen, Coffee, et al., 2014), it is important to know how to influence each of these team confidence types.

To our knowledge, only one study has so far tackled the first two limitations (Fransen et al., 2012). These authors conducted a qualitative study in which they asked expert coaches to list all possible sources of athletes' confidence in winning the game (i.e., sources of team outcome confidence, although the authors allegedly used the term collective efficacy). Together with a literature review and feedback from an expert focus group, a comprehensive list of 40 sources of team confidence in a volleyball context was obtained. This approach made it possible to move beyond the sources of self-confidence and investigate the sources that are specific for a team context. Next, a larger group of participants (N = 2365) rated these sources on their predictive power for team outcome confidence on a 7-point scale, anchored by "When this item occurs I am totally convinced that my team will lose the game" (i.e., very predictive for low team outcome confidence) and "When this item occurs I am totally convinced that my team will win the game" (i.e.,

very predictive for high team outcome confidence). As such, the perceived sources of both high and low team outcome confidence could be identified.

Three important results can be highlighted. First, participants rated the scale 'positive supportive communication' as most predictive for high team outcome confidence. This scale contained items with respect to the enthusiasm and the communication on the court during the game. In contrast with previous research that had identified the past performance as the most decisive source of team confidence (Bandura, 1997; Chase et al., 2003), Fransen et al. (2012) revealed that in-game sources were more predictive for team outcome confidence.

Second, in-game positive supportive communication was not only considered as more important than *past* performance, but also outscored *in-game* performance sources (e.g., own team being in the lead or behind in the game). Although numerous studies have revealed a strong relationship between performance and team confidence (Fransen, Decroos, et al., 2014; Stajkovic et al., 2009), the results of Fransen et al. (2012) seem to indicate that factors such as communication, enthusiasm, and encouragement might be more important predictors of team confidence than the score at a particular moment during the game.

Third, at the item level (i.e., when looking at the individual sources instead of at the overarching scales), the expression of team confidence by the athlete leaders emerged as the most important source of athletes' and coaches' team outcome confidence. These findings corroborate previous research indicating the important role of athlete leaders in affecting teammates' team confidence (Apitzsch, 2009; Fransen, Coffee, et al., 2014; Ronglan, 2007; Watson et al., 2001).

Despite the pioneering work of Fransen et al. (2012) in the quest for the sources of team confidence, two major limitations of their study should be highlighted. First, the sample only included volleyball players and volleyball coaches. As such, it has to be established whether the observed findings also apply to other sports. For example, the source that emerged as most predictive for team outcome confidence was the enthusiasm when coming together after making a point. Coming together after making a point is a typical normative behavior of volleyball teams. In other team sports such as basketball, in which the game continues and there is no time to celebrate a point, it is possible that this source would not be as predictive for athletes' team outcome confidence as was the case in volleyball. Another limitation that is inherent to the study of Fransen et al. (2012) is that, similar to previous research, they disregarded the distinction between team outcome

confidence and collective efficacy. As such, the sources of collective efficacy remain concealed, even though they allegedly used the term 'collective efficacy' to refer to team outcome confidence. Given the difference between the two constructs, it still has to be established whether the observed sources of team outcome confidence also serve as sources for collective efficacy.

### **1.5 The Present Manuscript**

The present manuscript includes five different studies to complement and extend previous knowledge on the sources of team confidence in two ways. First, in order to establish the sport-specificity of the sources observed by Fransen et al. (2012), we examined the sources of team outcome confidence in two other sports, namely soccer and basketball. To ensure the relevance of the sources, we first conducted a qualitative study in each sport by asking soccer and basketball coaches to list all possible sources of team outcome confidence in their sport. We expected both similarities and differences between the observed sources in the different sports (Hypothesis 1). More specifically, on the one hand we hypothesized that also in soccer and basketball the in-game sources would be more predictive for team confidence than the sources before the game (Hypothesis 1a). On the other hand, we also expected that different sources would emerge, dependent on the specific sport environment (Hypothesis 1b).

Second, in order to establish the differences between the sources of both types of team confidence (i.e., team outcome confidence and collective efficacy), we did not only examine the sources of team outcome confidence in basketball, but also the sources of collective efficacy in basketball. Given that team outcome confidence focuses on the outcome, whereas collective efficacy focuses on the process, we expected that this difference would be reflected in the sources of both constructs. In other words, we expected that outcome-oriented sources (e.g., performance-related sources) would be more predictive for team outcome confidence, whereas process-oriented sources (e.g., communication, encouragement) would be more predictive for collective efficacy (Hypothesis 2).

To summarize, five different studies were conducted to verify our hypotheses. In line with the study approach of Fransen et al. (2012), we started within each sport with a qualitative study in order to obtain a list with all possible sources of team confidence within that specific sport. Subsequently, we conducted a quantitative study, in which we asked a

larger group of participants to rate the listed sources on their predictive power for team outcome confidence or collective efficacy.

Study 1: Qualitative study in soccer on the sources of team outcome confidenceStudy 2: Quantitative study in soccer on the sources of team outcome confidenceStudy 3: Qualitative study in basketball on the sources of team outcome confidenceStudy 4: Quantitative study in basketball on the sources of team outcome confidenceStudy 5: Quantitative study in basketball on the sources of collective efficacy

### 2. Methods

# 2.1 Study 1 – Qualitative Study in Soccer

Forty-three soccer coaches identified for their sport which factors would strengthen athletes' confidence in obtaining the team's goal (e.g., winning the game). The coaches were on average 40 years old (SD = 10.3) and had 12.9 years experience as a soccer coach (SD = 8.5). The 43 coaches were active at national level (n = 18), at provincial level (n = 25), and at youth level (n = 8). In total, the coaches provided a list of 105 possible sources of team outcome confidence.

A focus group, including three professional researchers in the area of sport psychology and one applied sport psychologist, provided feedback with respect to the clarity of the items and their applicability in soccer. Furthermore, sources that were considered as similar sources were combined into one source. For example, sources like "hanging one's shoulders", "shaking one's head", and "hanging one's head" were combined into the source "the players express discouraged body language". These adaptations resulted in a final list of 72 possible sources of team outcome confidence in soccer.

The final list contained sources referring to the pre-game period (e.g., "last week my team trained well"), sources that occurred during the warming up (e.g., "the players warm up in a concentrated way before the game"), as well as sources during the game (e.g., "both field and bench players cheer enthusiastically during the game") and sources during half-time (e.g., "the players listen carefully to the coach during the break). The coach-related sources of team confidence were formulated both from the viewpoint of the coach (e.g., "as a coach, I motivate my players during the game") and from the viewpoint from the player (e.g., "our coach motivates his/her players during the game").

# 2.2 Study 2 – Quantitative Study on the Sources of Team Outcome Confidence in Soccer

# 2.2.1 Participants

The attendance list of a soccer clinic for coaches, organized by TopSportsLab, was used to contact 152 coaches via e-mail, thereby asking them for the contact information of other soccer players and coaches. In total, 1,866 coaches and players were invited to complete a web-based questionnaire. Coaches and players who did not respond received a reminder two weeks later, and a second and final reminder was sent two weeks later if they had not yet responded.

In total, 1028 participants completed the questionnaire, resulting in a total response rate of 55.1%, which clearly exceeds the average response rate of web-based questionnaires (Shih & Fan, 2008). No rewards were given and full confidentiality was guaranteed. Our sample contained both male and female participants, but the overwhelming majority of the participants were males (98%). This gender imbalance reflects the dominance of male soccer players and coaches in Flanders (i.e., 94% male members of the Belgian Football Federation; Scheerder, Thibaut, Pauwels, Vandermeerschen, & Vos, 2011). More detailed information on the participants can be found in Table 1.

Study	Team gender	Level	Function	Mage	M <sub>experience</sub> <sup>a</sup>
(sport)				(years)	(years)
Study 2	999 👌 (97%)	230 N (22%)	506 players	22.4 (6.6)	16.1 (6.6)
(soccer)	28 ♀ (3%)	413 P (40%)	(49%)		
		20 R (2%)			
		361 Y (35%)	522 coaches	39.9 (10.6)	11.1 (7.8)
			(51%)		
Study 4	<b>609</b> ♂ (70%)	186 N (22%)	637 players	21.0 (7.4)	11.6 (7.4)
(basketball)	258 ♀ (30%)	487 P (56%)	(73%)		
		19 R (2%)			
		175 Y (20%)	230 coaches	39.6 (14.6)	13.8 (10.8)
			(27%)		
Study 5	596 👌 (72%)	193 N (23%)	605 players	21.0 (7.8)	12.0 (7.8)
(basketball)	229 ♀ (28%)	466 P (57%)	(73%)		
		13 R (2%)			
		153 Y (19%)	220 coaches	40.6 (14.0)	14.2 (11.0)
			(27%)		

**Table 1.** Sample characteristics for all quantitative studies. For the age and the years of experience, the standard deviation is presented in parentheses.

*Note.* <sup>a</sup>The years of experience refers to the playing experience for players and the coaching experience for the coaches.  $\bigcirc$  = male team;  $\bigcirc$  = female team; N = national level; P = provincial level; R = recreational level; Y = youth level.

#### 2.2.2 Measures

In line with the study of Fransen and colleagues (2012), participants rated the 72 sources, obtained in Study 1, on their predictive power for participants' own team outcome confidence (i.e., participants' confidence that their team will win the game). More specifically, participants rated the items on a 7-point scale anchored by -3 (*if this item occurs, I am totally convinced that my team will lose the game*) and 3 (*if this item occurs, I am totally convinced that my team will win the game*). The neutral score of 0 indicated that no link was present between the mentioned source and participants' team outcome confidence.

#### 2.3 Study 3 – Qualitative Study in Basketball

Thirty coaches listed the possible factors that influenced athletes' team outcome confidence in basketball. The majority of these coaches were males (n = 29) and they were active in male teams (n = 20). Five coaches were active in female teams and five coaches had coaching experience with both male and female teams. The coaches were on average 44.4 years old (SD = 13.6) and had 18.2 years of coaching experience within basketball (SD = 12.8).

The same procedure was adopted as in the qualitative study in soccer. Participants' answers resulted in a list of 150 possible sources of team outcome confidence. Again, a focus group (including three professional researchers in the area of sport psychology, one applied sport psychologist, and one professional basketball coach) discussed the sources regarding their clarity and applicability in a basketball context. A similar adaptation process as in the soccer study resulted in a final list of 96 possible sources of team outcome confidence, including sources before the game, during the warming up, and during the game.

Similarly to Study 1 in soccer, the final list of sources was formulated both from the viewpoint of the coach and from the viewpoint from the players. In Study 4 and Study 5, a larger group of basketball players and coaches rated these sources on their predictive power for respectively team outcome confidence in Study 4 and collective efficacy in Study 5.

# 2.4 Study 4 – Quantitative Study on the Sources of Team Outcome Confidence in Basketball

#### 2.4.1 Participants

To contact basketball players and coaches in Flanders (Belgium), we cooperated with the Flemish Basketball Federation. We adopted a stratified sampling technique on the database including all members of the Flemish Basketball Federation with respect to gender and function to create our database for Study 4 and Study 5. More specifically, the mailing list for both studies included the same number of males and females (i.e., equal number in both studies, which reflects the male dominance of the total sample in both studies), and an equal number of players, qualified coaches, and non-qualified coaches.

In total, 3,983 coaches and players were invited to complete a web-based questionnaire. Coaches and players who did not respond received a reminder two weeks later. In total, 168 persons answered that they could not participate in our study; 80 coaches and 69 players were no longer active, and 19 persons could not participate because of other valid reasons such as mentally handicapped or not knowing the Dutch language. In total, 867 participants (637 players and 230 coaches) completed the questionnaire, resulting in a total response rate of 22.7%. No rewards were given and full confidentiality was guaranteed. More detailed information on the participants can be found in Table 1. The majority of male participants in the present study (i.e., 73%) reflects the gender imbalance in the membership file of the Flemish Basketball Federation (i.e., 75% males and 25% females). The mean age of all participants was 25.7 years, which almost equals the average age of 26 years of all members of the Flemish Basketball Federation (Scheerder et al., 2011; Van Bocxstaele, 2014).

#### 2.4.2 Measures

In line with the procedure in Study 2 and in the study of Fransen and colleagues (2012), participants rated the 96 sources, obtained in Study 3, on their predictive power for team outcome confidence on a 7-point scale anchored by -3 (*if this item occurs, I am totally convinced that my team will lose the game*) and 3 (*if this item occurs, I am totally convinced that my team will win the game*). The neutral score of 0 indicated that no link was present between the mentioned source and participants' team outcome confidence.

# 2.5 Study 5 – Quantitative Study on the Sources of Collective efficacy in Basketball

# 2.5.1 Participants

We invited 4,012 coaches and players to complete a web-based questionnaire. No overlap existed between the coaches and players invited for Study 5 and the ones invited for Study 4. Coaches and players who did not respond received a reminder two weeks later. In total, 86 persons answered that they could not participate in our study; 25 coaches and 48 players were no longer active, and 13 persons could not participate because of other valid reasons such as mentally handicapped or not mastering the Dutch language. In total, 825 participants (605 players and 220 coaches) completed the questionnaire, resulting in a total response rate of 21.0%. No rewards were given and full confidentiality was guaranteed. More detailed information on the participants can be found in Table 1. The majority of male participants (74% males; 26% females) and the average age of our participants (26.3 years) closely resemble the characteristics for the membership file of the whole Flemish Basketball Federation (namely 75% males and a mean age of 26 years) (Van Bocxstaele, 2014), which supports the representativeness of our sample with regard to sex and age.

#### 2.5.2 Measures

Participants rated the same 96 sources as in Study 4, but now with regard to their predictive power for the process-oriented collective efficacy instead of the outcome-oriented team outcome confidence. More specifically, participants rated the sources on a 7-point scale anchored by -3 (*if this item occurs, I am totally convinced that my team will not function efficiently during the game*) and 3 (*if this item occurs, I am totally convinced that my team will not function efficiently during the game*). The neutral score of 0 indicated that no link was present between the mentioned source and participants' collective efficacy.

## 3. Results

### 3.1 Study 2 – Sources of Team Outcome Confidence in Soccer

#### 3.1.1 Component construction

We conducted a principal component analysis with Varimax rotation on the total soccer sample, including both players and coaches. To determine the number of components, we used the method of Cattell (1966) in which the components are plotted at the X-axis and the corresponding eigenvalues at the Y-axis, also termed the scree plot (Raykov & Marcoulides, 2008). Cattell (1966) recommended that the number of components should equal the point in the curve were the decline ceases and the curve makes a twist toward less steep decline. For sample sizes larger than 200, this scree plot has been demonstrated to be a reliable criterion for component selection (Stevens, 2002).

Analysis of the scree plot resulted in eight components for the present study, explaining 50.2% of the variance. An item was retained to construct a scale based on the component when it had a minimum loading of 0.40, without having a cross-loading higher than 0.40 on any other component. One of the scales included 17 items, but based on content analysis of this scale, two subcomponents could be distinguished. A principal component analysis on this component confirmed this observation and resulted in two subcomponents. These two subcomponents will be treated as separate scales in the remainder of this study. Because items were omitted when they had a cross-loading higher than .40 on another component, 15 items were excluded in the final scale structure.

The principal component analysis thus resulted in nine scales of which detailed content information can be found in Appendix A. The scales were labeled as follows: (1) positive coaching, 5 items; (2) team superiority, 5 items; (3) athletes' positive communication and confident body language, 10 items; (4) game preparation by the coach, 5 items; (5) recent team success, 5 items; (6) special starting circumstances, 6 items; (7) stimulating game circumstances, 5 items; (8) team inferiority, 5 items; and (9) negative communication and expression, 11 items. Cronbach's  $\alpha$ 's varied between .69 and .88, demonstrating a high internal consistency of each scale (Table 2).
	Scale	1	2	3	4	5	6	7	8	9
1.	Positive coaching	(.88)								
2.	Team superiority	.45**	(.78)							
3.	Athletes' positive communication and confident body language	.64**	.60**	(.87)						
4.	Game preparation by the coach	.58**	.36**	.52**	(.78)					
5.	Recent team success	.30**	.51**	.43**	.32**	(.81)				
6.	Special starting circumstances	.48**	.36**	.49**	.45**	.23**	(.71)			
7.	Stimulating game circumstances	.15**	.38**	.28**	.22**	.40**	.18**	(.69)		
8.	Team inferiority	.25**	.14**	.27**	.30**	.19**	.39**	.27**	(.80)	
9.	Negative communication and expression	.01	.02	08*	.08**	.11**	.24**	.21**	.47**	(.88)
*	o = **									

**Table 2.** Correlations between the nine team outcome confidence scales in soccer. The Cronbach's  $\alpha$ 's for each scale are presented between parentheses on the diagonal.

<sup>\*</sup>*p* < .05; <sup>\*\*</sup>*p* < .01

### 3.1.2 Predictive power for team outcome confidence

Table 3 presents the scales, ranked from most predictive for high team outcome confidence (extreme score of +3) to most predictive for low team outcome confidence (extreme score of -3). The neutral score of 0 indicates that the scale had no predictive power for team outcome confidence (neither in positive, nor in negative direction). The mean values, including their standard deviations are presented for the total sample, as well as for players and coaches separately. Athletes perceived the scale 'team superiority' (e.g., 'the own team is in the lead during the game') as the most predictive scale for their confidence in winning the game. In contrast, coaches perceived their own 'positive coaching' as most predictive for their team outcome confidence, followed by 'athletes' positive communication and confident body language'. In line with Hypothesis 1a, the results revealed that, for both players and coaches, *in-game* sources (i.e., scale 1 'positive coaching', scale 2 'team superiority', and scale 3 'athletes' positive communication and confident body language' as more predictive for team outcome confidence than sources *before the game* (i.e., scale 4 'game preparation by the coach', scale 5 'recent team success', and scale 6 'special starting circumstances').

**Table 3.** Means at scale level, including their standard deviations for the total sample, and for players and coaches separately. The respective ranking of the scales is provided between parentheses.

	Scale	Total sample	Players	Coaches
1.	Positive coaching	$1.54 \pm .79$ (1)	1.41 ± .76 (2)	$1.67 \pm .81$ (1)
2.	Team superiority	$1.38 \pm .77$ (2)	$1.48 \pm .72$ (1)	$1.30 \pm .80$ (3)
3.	Athletes' positive communication and confident body language	1.36 ± .67 (3)	1.32 ± .64 (3)	1.40 ± .70 (2)
4.	Game preparation by the coach	$1.13 \pm .83$ (4)	$.98 \pm .86$ (5)	$1.29 \pm .78$ (4)
5.	Recent team success	$1.03 \pm 1.07$ (5)	$1.19 \pm .97$ (4)	.88 ± 1.13 (5)
6.	Special starting circumstances	$.57 \pm .77$ (6)	.55 ± .74 (7)	$.60 \pm .80$ (6)
7.	Stimulating game circumstances	$.49 \pm .91$ (7)	$.63 \pm .87$ (6)	$.36 \pm .93$ (7)
8.	Team inferiority	$43 \pm .88$ (8)	54 ± .87 (8)	32 ± .88 (8)
9.	Negative communication and expression	91 ± .81 (9)	82 ± .80 (9)	99 ± .80 (9)

At the negative side of the scale, 'negative communication and expression' was perceived by both players and coaches as the most predictive for low levels of team confidence, followed by 'team inferiority'. As such, it seems that negative communication, emotions, and body language (i.e., scale 9) are perceived as more decisive for low team outcome confidence than negative performance indicators (i.e., scale 8).

#### 3.1.3 Background characteristics

Separate linear regression analyses were conducted for players and coaches separately to establish the relation between the different background characteristics (i.e., age, gender, team gender, experience, and competition level) and the perceived predictive power of the different scales. Each team outcome confidence scale was used as dependent variable. Because our sample size exceeds 1,000 participants and thus results in extreme statistical power, only significant relations with a  $\beta$ -value above 0.20 will be discussed (i.e., explaining at least 4% of the variance in perceived predictive power of the scales). The linear regression analyses for both coaches and players, and for all nine scales, revealed only one significant effect with a  $\beta$  > .20; years of experience significantly predicted players' perception of the scale 'team inferiority' ( $\beta$  = -.32; p = .01). In other words, the older the players, the more negative this scale was rated and thus the more predictive for low team outcome confidence. The predictive power of the eight other scales for team outcome confidence did not differ between young and old participants, males and females, male and female teams, more and less experienced responders, on low and high level. This

conclusion holds for both players and coaches. These findings emphasize the generalizability of our findings.

## 3.1.4 Analyses at item level

To provide a deeper insight in these results, we examined the predictive power for team outcome confidence at item level as well. Table 4 presents the mean scores of the six sources most predictive for high team outcome confidence and the six sources most predictive for low team outcome confidence. The expressed team confidence by coaches and athlete leaders in the team emerged as key factors to foster higher levels of team outcome confidence within the team. On the negative side of the scale, athletes' discouraged body language, selfish play, and negative communication appeared to be the most important obstacles along the road to team outcome confidence.

**Table 4.** Means of the six sources perceived as most predictive for high team outcome confidence (1-5) and low team outcome confidence (68-72) out of the 72-item list, based on the total sample. The respective ranking of the items within each subsample (players and coaches) is provided between parentheses.

		All data	Players	Coaches
1.	The coach believes that our team will win the match	1.69 (1)	1.60 (3)	1.77 (2)
	and he/she expresses this during the match.			
2.	The coach motivates her/his players during the match.	1.68 (2)	1.51 (9)	1.84 (1)
3.	The coach always supports the players.	1.66 (3)	1.57 (6)	1.74 (3)
4.	Athlete leaders believe that our team will win the	1.65 (4)	1.58 (5)	1.72 (4)
	match and they express this on the field.			
5.	The players play as one team, rather than pursuing	1.64 (5)	1.64 (2)	1.63 (7)
	their individual success.			
6.	My team is in the lead during the second half of the	1.59 (6)	1.69 (1)	1.49 (15)
	match.			
67.	The players fail to complete the tactical directives.	97 (67)	94 (67)	-1.00 (66)
68.	Some players react with anger and frustration when	-1.10 (68)	-1.05 (68)	-1.16 (68)
	one of their teammates makes a fault.			
69.	The players display a discouraged body language	-1.19 (69)	-1.09 (69)	-1.28 (70)
	when the opponent scores a goal.			
70.	The players communicate in a negative way with each	-1.21 (70)	-1.11 (70)	-1.30 (71)
	other.			
71.	The players exhibit a discouraged body language.	-1.39 (71)	-1.30 (71)	-1.47 (72)
72.	Some players play selfishly during the match and do	-1.39 (72)	-1.54 (72)	-1.24 (69)
	not pass to their teammates.			

## 3.2 Study 4 – Sources of Team Outcome Confidence in Basketball

#### 3.2.1 Component construction

As in Study 2, a principal component analysis with Varimax rotation was conducted on the total basketball sample, including both players and coaches. Using the method of Cattell (1966), six components were retained from the component extraction, explaining 47.7 % of the variance. An item was retained to construct a scale based on the component when it had a minimum loading of 0.50, without having a cross-loading higher than 0.40 on any other component. This criterion was stricter than in Study 2 in order to obtain internally coherent scale, given that the present study included much more items (96 sources versus 72 sources in Study 2).

The six scales were labeled as follows: (1) positive task focus, 16 items; (2) positive coaching, 6 items; (3) pre-game match focus, 11 items; (4) recent team success, 4 items; (5) team enthusiasm, 7 items; and (6) negative communication and expression, 17 items. More detailed information on the content of these scales, including the mean values and standard deviations for all included items can be found in Appendix B. The calculated Cronbach's  $\alpha$ 's of the six scales varied between .76 and .94, demonstrating good to excellent internal consistencies (see Table 5).

	Scale	1	2	3	4	5	6
Stu	dy 4 – Team outcome confide	ence scal	es				
1.	Positive task focus	(.94)					
2.	Positive coaching	.67**	(.88)				
3.	Pre-game match focus	.72**	$.58^{**}$	(.89)			
4.	Recent team success	.46**	.29**	.43**	(.76)		
5.	Team enthusiasm	.54**	$.60^{**}$	.54**	.25**	(.84)	
6.	Negative communication and	20**	00*	10**	02	07*	(02)
	expression	20	08	12	02	.07	(.92)
Stu	dy 5 – Collective efficacy scal	es					
1.	Positive task focus	(.93)					
2.	Positive coaching	.61**	(.85)				
3.	Pre-game match focus	.69**	.55**	(.87)			
4.	Recent team success	.43**	$.22^{**}$	.38**	(.74)		
5.	Team enthusiasm	$.48^{**}$	.44**	$.50^{**}$	.23**	(.75)	
6.	Negative communication and	40**	22 <sup>**</sup>	24**	15**	<b>72</b> **	(00)
	expression	49	35	34	13	23	(.90)
*p <	< .05: ** $p < .01$						

**Table 5.** Correlations and Cronbach's  $\alpha$ 's for the six team confidence scales in basketball, both for Study 4 and Study 5.

## 3.2.2 Predictive power for team outcome confidence

Table 6 presents all scales ranked according to their predictive power for players' and coaches' team outcome confidence. A 'positive task focus' (e.g., each player fulfils his/her task well) and 'positive coaching' (e.g., the coach motivates the players during the match) were perceived as most predictive of players' and coaches' team outcome confidence. 'Negative communication and expression' of coach and athletes within the team was perceived as the most important predictor of participants' low team outcome confidence. Our findings confirm Hypothesis 1a in that the *in-game* sources (i.e., scales 'positive task focus' and 'positive coaching') emerged as more important predictors of team outcome confidence than the sources *before the game* (scales 'pre-game match focus' and 'recent team success'). However, it should be noted that the scale 'team enthusiasm', which also includes sources during the game (e.g., the team reacts enthusiastically after making a point), was seen as the scale with the weakest link with team outcome confidence.

**Table 6.** Means at scale level for Study 4 and Study 5, including their standard deviations for the total sample, and for players and coaches separately. The respective ranking of the scales is provided between parentheses.

	Scales	Total sample	Players	Coaches
Stu	ıdy 4 – Team outcome conf	idence scales		
1.	Positive task focus	$1.47 \pm .76$ (1)	$1.47 \pm .76$ (1)	$1.46 \pm .79$ (2)
2.	Positive coaching	$1.42 \pm .81$ (2)	$1.36 \pm .84$ (2)	$1.58 \pm .70$ (1)
3.	Pre-game match focus	$1.24 \pm .84$ (3)	$1.22 \pm .86$ (4)	$1.30 \pm .77$ (3)
4.	Recent team success	1.19 ± 1.17 (4)	1.26 ± 1.13 (3)	$1.01 \pm 1.26$ (5)
5.	Team enthusiasm	$1.18 \pm .83$ (5)	$1.13 \pm .83$ (5)	$1.29 \pm .83$ (4)
6.	Negative communication and expression	-1.18 ± .94 (6)	-1.19 ± .93 (6)	-1.16 ± .95 (6)
Stu	ıdy 5 – Collective efficacy s	cales		
1.	Positive coaching	$1.89 \pm .90$ (1)	$1.45 \pm .95$ (2)	$1.98 \pm .60$ (1)
2.	Team enthusiasm	$1.59 \pm .78$ (2)	$1.54 \pm .80$ (1)	$1.72 \pm .70$ (2)
3.	Positive task focus	$1.51 \pm .80$ (3)	$1.44 \pm .83$ (3)	$1.70 \pm .69$ (3)
4.	Pre-game match focus	1.18 ± .89 (4)	$1.08 \pm .93$ (4)	$1.45 \pm .72$ (4)
5.	Recent team success	$.97 \pm 1.44$ (5)	.97 ± 1.46 (5)	$.99 \pm 1.37$ (5)
6.	Negative communication and expression	-1.40 ± .91 (6)	-1.34 ± .94 (6)	-1.55 ± .81 (6)

## 3.2.3 Background characteristics

To establish the impact of age, gender, team gender, experience, and competition level on the perceived predictive power of the sources of team outcome confidence, linear regression analyses were conducted for players and coaches separately. The different background characteristics served as predictor variables and the different team outcome confidence scales as criteria. Only one significant effect emerged, namely, younger players perceived the scale 'pre-game match focus' as more predictive for their team outcome confidence than older players did ( $\beta = -.20$ ; p = .01). Apart from this effect, the predictive value of the six scales for team outcome confidence did not differ between young and old participants, males and females, male and female teams, more and less experienced responders, at a low and a high level. This conclusion holds for both players and coaches, which testifies that our findings can be generalized.

## 3.2.4 Analyses at item level

To investigate these results in more detail, we examined the predictive power of the sources of team outcome confidence at item level as well. Table 7 presents the mean scores of the six sources most predictive for high team outcome confidence and the six sources most predictive for low team outcome confidence. Players that perform at their maximum and encourage each other were seen as the most predictive sources for high team outcome confidence of both players and coaches. In addition, playing as one team, showing a fighting spirit, and athlete leaders who expressed their team confidence were perceived as important markers of high team outcome confidence. In contrast, the expression of low team outcome confidence by the coach, athlete leaders, and other teammates (i.e., expressing their conviction that their team will lose the game) were perceived as the most important hindrances along the way to team confidence.

**Table 7.** Means of the six sources perceived as most predictive for high team outcome confidence (1-6) and for low team outcome confidence (91-96) out of the 96-item list, based on the total sample in basketball. The respective ranking of the items within each subsample (players and coaches) is provided between parentheses.

Sour	ces of team outcome confidence	All data	Players	Coaches
1.	The players perform at their maximum.	1.93 (1)	1.94 (1)	1.90(1)
2.	The players encourage each other before the game.	1.84 (2)	1.69 (9)	1.87 (2)
3.	The players play as one team, rather than pursuing their individual success.	1.79 (3)	1.77 (3)	1.85 (4)
4.	The players show a fighting spirit on the field.	1.77 (4)	1.77 (4)	1.79 (5)
5.	The players in our team feel that we are one closely knit	1.77 (5)	1.74 (6)	1.86 (3)
	team.			
6.	Athlete leaders believe that our team will win the match	1.75 (6)	1.75 (5)	1.73 (10)
	and they express this on the field.			
91.	Athlete leaders believe that our team will lose the game	-1.31 (91)	-1.32 (91)	-1.28 (91)
	and they express this on the field.			
92.	The coach communicates in a negative way with his/her	-1.34 (92)	-1.27 (90)	-1.51 (94)
	players.			
93.	My teammates believe that our team will lose the game	-1.42 (93)	-1.44 (93)	-1.39 (93)
	and they express this on the field.			
94.	Some players play selfishly during the match and do not pass to their teammates.	-1.57 (94)	-1.54 (94)	-1.63 (96)
95.	The coach believes that our team will lose the game and	-1.59 (95)	-1.59 (95)	/
	expresses this on the field.			
96.	The players communicate in a negative way with each	-1.63 (96)	-1.65 (96)	-1.57 (95)
	other.			

*Note*. The item on place 95 was not rated by the coach, because this source equals the outcome.

## 3.3 Study 5 – Sources of Collective Efficacy in Basketball

### 3.3.1 Component construction

A principal component analysis on the data of Study 5, using Varimax rotation and the method of Cattell (1966) resulted in six scales. The content of these scales closely resembled the scales of team outcome confidence (Study 4) but small differences could be noted. In total, 80.5% of the sources in Study 4 appeared in the corresponding scale in Study 5. The majority of the other 19.5% of the items was excluded in the course of the scale construction of Study 5 because of cross-loadings higher than .40. Because of the considerable overlap, and to allow comparison between the sources of team outcome confidence and collective efficacy, we decided to use the same scales in Study 5, as obtained in Study 4. After all, both studies used exactly the same items, both in a basketball setting.

However, to ensure that the scale structure of Study 4 also matched the data obtained in Study 5, we conducted a confirmatory factor analysis with Stata (version 13) for each of the scales. These confirmatory factor analyses for each of the six scales, which can be found in Appendix C, verified the obtained scale structure for Study 5. Furthermore, the calculated Cronbach's  $\alpha$ 's of the six scales varied between .74 and .93, demonstrating a high internal consistency for each scale (see Table 5).

#### 3.3.2 Predictive power for collective efficacy

In Table 6, all scales are presented in the sequence according to their predictive power for collective efficacy. In line with the findings for team outcome confidence, coaches perceived 'positive coaching' as most important predictor for their collective efficacy, whereas this scale is listed on the second place for the players. However, two major differences can be observed when comparing the sources of collective efficacy (Study 5) with the previously obtained sources of team outcome confidence (Study 4). First, although 'team enthusiasm' was perceived as least important predictor for team outcome confidence, with respect to collective efficacy, athletes listed this scale as most predictive and coaches as second most predictive. Second, the performance-oriented scales (i.e., 'positive task focus' and 'recent team success') were rated by players as respectively first and third most important source for their team outcome confidence. In contrast, for collective efficacy, these scales were perceived as third and fifth most important predictor. The performance-oriented sources are thus more predictive for team outcome confidence than for collective efficacy. These findings confirm Hypothesis 2 that different sources emerge as predictors for team outcome confidence and collective efficacy.

In line with the results in soccer, also in basketball teams 'negative communication and expression' is perceived as most predictive for players' and coaches' collective efficacy. It is noteworthy that the mean value for collective efficacy (M = -1.40) is considerably lower than the mean value for team outcome confidence in Study 4 (M = -1.18); negative communication and expression thus seems more predictive for low levels of collective efficacy than for low levels of team outcome confidence.

#### 3.3.3 Background characteristics

Linear regression analyses examined the relation between background variables (i.e., age, gender, team gender, experience, and competition level) and the perceived predictive value of the collective efficacy scales. Because our large sample resulted in extreme statistical power, only significant relations with a  $\beta$ -value above 0.20 will be discussed (i.e., explaining at least 4% of the variance in perceived predictive power of the scales). The only significant effects all referred to the age of the players; the younger the players, the more predictive they rated 'positive coaching' ( $\beta = -.27$ ; p = .001), 'pre-game match focus' ( $\beta = -.38$ ; p < .001), and 'team enthusiasm' ( $\beta = -.21$ ; p = .01) for their collective efficacy beliefs.

For the coaches, age had no influence on their perceived predictive power of the different scales. In addition, years of experience, gender, team gender, and the level on which participants played or coached, had no influence on the way in which they perceived the different collective efficacy scales as being predictive for their collective efficacy beliefs.

## 3.3.4 Analyses at item level

To provide more insight in our results, we also analyzed the data at item level. The results are presented in Table 8, for the whole sample, as well as for players and coaches separately. The most important sources for collective efficacy at item level resembled the ones for team outcome confidence. Also here, the encouragement among players, the maximal performing of the players, and the team outcome confidence expressed by the athlete leaders were seen as very predictive for participants' collective efficacy. These findings support Hypothesis 1a that in-game sources are more predictive for collective efficacy perceptions than sources before the game.

It should be noted though that athlete leaders seem to play an even more decisive role in determining athletes' collective efficacy (M = 1.92; rank 3) than in determining their team outcome confidence (M = 1.75; rank 6). Furthermore, the involvement of the bench players completed the top 6 of collective efficacy sources, whereas within the list of team outcome confidence sources, this source was only ranked at the 24<sup>th</sup> place. On the negative side of the ranking, the low team outcome confidence expressed by the coach, athlete leaders, the captain, and other team members were perceived as the main source of players' and coaches' lack of collective efficacy. In line with the results of Study 4, also here negative communication and selfish play completed the top 6.

It is noteworthy that, compared to players, coaches listed other sources as most predictive for their collective efficacy. More specifically, the top 4 of the coaches was based on their own coaching (i.e., the coach motivates the players during the game, displays enthusiasm, steers his/her players tactically during the game, and gave a motivational pep talk before the game). Although coaches rated their own coaching as very important for their own team outcome confidence, these actions were perceived as less decisive by the players. This is illustrated by the lower rankings of these items for the players: place 15, 19, 16, and 30, respectively. Despite these differences, we can conclude that both for coaches and for players, the most important predictors for high and low collective efficacy were ingame sources, thereby again supporting Hypothesis 1a in that in-game sources are perceived to be more predictive for collective efficacy than sources before the game.

**Table 8.** Means of the six sources perceived as most predictive for high collective efficacy (1-6) and for low collective efficacy (91-96) out of the 96-item list, based on the total sample in basketball. The respective ranking of the items within each subsample (players and coaches) is provided between parentheses.

Sour	ces of collective efficacy	All data	Players	Coaches
1.	The players encourage each other before the game.	2.03 (1)	1.98 (1)	2.18 (7)
2.	The players perform at their maximum.	1.99 (2)	1.92 (2)	2.19 (5)
3.	Athlete leaders believe that our team will win the match	1.92 (3)	1.87 (5)	2.07 (8)
	and they express this on the field.			
4.	The players in our team feel that we are one closely knit	1.91 (4)	1.80 (8)	2.19 (6)
	team.			
5.	The players encourage each other during the game.	1.90 (5)	1.88 (4)	1.96 (15)
6.	The bench players are involved and concerned about the	1.89 (6)	1.83 (7)	2.03 (11)
	game.			
91.	My teammates believe that our team will lose the game	-1.62 (91)	-1.53 (90)	-1.89 (93)
	and they express this on the field.			
92.	Our captain believes that our team will lose the game	-1.65 (92)	-1.60 (93)	-1.78 (91)
	and expresses this on the field.			
93.	Athlete leaders believe that our team will lose the game	-1.65 (93)	-1.57 (92)	-1.88 (92)
	and they express this on the field.			
94.	Some players play selfishly during the match and do not	-1.66 (94)	-1.57 (91)	-1.90 (94)
	pass to their teammates.			
95.	The coach believes that our team will lose the game and	-1.77 (95)	-1.77 (96)	/
	expresses this on the field.			
96.	The players communicate in a negative way with each	-1.80 (96)	-1.74 (95)	-2.07 (95)
	other.			

*Note.* The item on place 95 was not rated by the coach, because this source equals the outcome.

#### 4. Discussion

Although the benefits of team confidence for optimal team functioning and team performance are beyond dispute (e.g., see Stajkovic et al., 2009), the factors that cause high or low levels of team confidence have remained underinvestigated. To obtain a better insight in this area, the present manuscript includes five studies, which each contribute to our quest to the gas stations and signposts along the road to team confidence. However, our investigation was not restricted to the sources of high team confidence, but also examined the sources of low team confidence. In this regard, we identified the speed bumps, the traffic-jams, and the roadblocks along the road to team confidence, which have a detrimental impact on the team functioning and the team performance (Apitzsch, 2009; Ronglan, 2007).

The present findings point to positive coaching as important fuel to foster team outcome confidence. This finding holds for both soccer and basketball, thereby corroborating previous research that coaches have an important impact on the team confidence of their teammates (Vargas-Tonsing, Myers, & Feltz, 2004). For players, performance-oriented sources (e.g., the own team in the lead, players fulfilling their task well) were even more important in predicting their team outcome confidence, both in soccer and in basketball. With regard to their collective efficacy, team enthusiasm (i.e., bench and field players are enthusiastically involved in the game) was perceived as more important fuel than the performance-oriented sources. This finding is in line with previous research pointing to enthusiasm as one of the key elements in upward spirals of team confidence (Salanova et al., 2011). Furthermore, these findings corroborate previous research demonstrating that sources such as past performance and emotional state were more predictive for players' team confidence than positive coaching (Chase et al., 2003).

#### 4.1 Beyond the Gas Stations and Signposts to the Traffic-Jams and Roadblocks

Our results consistently revealed that negative communication and expression (e.g., expressing low team confidence by athlete leaders or coach) were perceived as critical obstacles to obtain team outcome confidence or collective efficacy. This finding holds for both soccer and basketball and for both players and coaches. Study 2 added that in soccer the communication and body language of athletes was even more destructive for building confidence than team inferiority (i.e., the fact that the team was behind in the game). These findings align with previous research in volleyball (Fransen et al., 2012), which revealed

that negative emotional reactions of players were perceived as most predictive for low team outcome confidence, thereby outscoring performance-oriented scales such as 'errors of the own team' and 'the own team being behind in the game'.

#### 4.2 Sources Before the Game Versus Sources Within the Game

Previous research predominantly focused on team confidence sources before the game. However, the present findings demonstrated that both in soccer and in basketball ingame sources are more predictive for both team outcome confidence and collective efficacy than sources before the game, thereby confirming Hypothesis 1a. These results corroborate the study of Fransen et al. (2012), who demonstrated in a volleyball setting that in-game sources were more predictive for team outcome confidence than sources before the game.

#### 4.3 Team Confidence Sources Across the Different Sports

When comparing the sources of team outcome confidence across the different sports, several similarities can be noted. For both soccer and basketball, coaches indicated their own positive coaching as most predictive for their team outcome confidence, whereas players indicated a positive coaching only as second most important predictor. Furthermore, both soccer and basketball players listed a performance-oriented scale (i.e., 'team superiority' in Study 2 and 'positive task focus' in Study 4) as most predictive for their team outcome confidence. Despite these similarities, also sport-specific differences were observed, which confirmed Hypothesis 1b. Fransen et al. (2012) demonstrated that in volleyball, in-game performance sources (e.g., 'the own team is in the lead') were considered less predictive for participants' team outcome confidence than both 'positive supportive communication among players' and 'positive performance indications before the game' (e.g., my team ranks higher than the opponent). In contrast, the present manuscript revealed that soccer and basketball players perceived in-game performance as most predictive for their team outcome confidence.

A more thorough analysis of the scale content for both studies further supports the existence of sport-specific differences. The content of the 'team superiority' scale for soccer (Study 2) strongly resembles the content of the scale 'own team is in the lead' in volleyball (Fransen et al., 2012). The fact that these performance-oriented sources were much more predictive for players' team outcome confidence in soccer than in volleyball is related with sport-specific game characteristics. In volleyball, being in the lead or being behind in a set

is not that predictive for the final outcome: even when a team has lost a set, the team can easily start over the next set and eventually win the game. By contrast, in soccer, scoring a point (i.e., a goal) is much more decisive for the final game outcome. This is illustrated by the fact that in volleyball at least 75 points are scored in each game (i.e., three sets of 25-0), while in soccer, for example in the 2012 European Championship, only 76 goals were scored in 29 games (i.e., average number of 2.6 goals per game) (UEFA, 2012). Furthermore, Fransen et al. (2012) only included performance sources within a set (e.g., being in the lead of 5 points in a set), whereas Study 2 of the current manuscript assessed performance sources with respect to the whole game (e.g., being in the lead in the first/second half of the match). It is obvious that the second measure is more decisive for the outcome than the first, and as such more predictive for the confidence in winning the game.

If we compare volleyball with basketball, it should be noted that, in contrast with volleyball, the continuous additive score in basketball does not allow to start over with a clean sheet after a quarter of poor play. However, given the larger progress of the score in basketball compared to soccer, it is likely that differences between the sports emerge with regard to the importance of the performance-oriented team outcome confidence sources. At first sight, this does not seem to be the case: the performance-oriented scales were listed in both sports as most important for players' team outcome confidence. However a further content analysis of the respective scales revealed that, unlike the previous study in volleyball, and unlike Study 2 in soccer, the scale 'positive task focus' in basketball contains more process-oriented performance sources, such as 'my team controls the rebound' and 'each player fulfils his/her task well', instead of the outcome-oriented sources (e.g., being in the lead) of Study 2 (see Appendix B for a full overview). Further comparison at item level revealed that in basketball the source 'my team is in the lead halfway the match' was perceived only as 58<sup>th</sup> source out of the 92. In contrast, in soccer 'being in the lead during the first (second) half of the match' were respectively perceived as 25<sup>th</sup> and 6<sup>th</sup> most important source of team outcome confidence (of the 72 sources).

Besides the differences in game scoring, other game characteristics can also cause differences in team confidence sources between the different sports. For example, the source that was perceived as most predictive for players' team outcome confidence in volleyball (Fransen et al., 2012) was the enthusiasm with which the players reacted after scoring a point. It should be noted though that in a volleyball context players coming together after each scored point is a normative behavior, when the team is playing good, but also when

playing poorly. As such, there is a large variance in the enthusiasm with which the players come together, and that caused the source to be perceived as an important indicator of athletes' confidence in winning the game.

In soccer, players perceived this source only as 19<sup>th</sup> most predictive source for their confidence in winning the game. This can be explained by the fact that in soccer, goals are much rarer than points in volleyball. Therefore, soccer players are enthusiastic after most goals and it is likely that there is a much smaller variance in the extent to which a team celebrates different goals. Furthermore, the distance between the players is larger in soccer than in volleyball, which implies that it is not always possible for the keeper, for example, to celebrate with the other players.

Although basketball is also characterized by a higher frequency of scoring, players rated the enthusiasm when scoring only as 40<sup>th</sup> most predictive source of their team outcome confidence (Study 4). Unlike in volleyball and in soccer, where the game is interrupted by short breaks after each point that allow for celebrating a point, in basketball the game continues. Because of this different game structure, it is simply not possible for basketball players to come together after each point and celebrate. These sport-specific differences reflect that the sport environment and the game structure are also important variables that impact on team confidence (Hypothesis 1b).

## 4.4 Collective Efficacy and Team Outcome Confidence

It has been established that team outcome confidence and collective efficacy, two types of team confidence, are clearly distinct constructs and therefore should be distinguished in research (Fransen, Kleinert, et al., 2014). Unfortunately, earlier studies that examined the sources of team confidence did not follow these guidelines. In order to extend the current knowledge in this area, Study 4 examined the sources of team outcome confidence and Study 5 identified the sources of collective efficacy. The fact that both studies were conducted in a basketball setting and both studies used the same sources for their investigation allowed a thorough comparison between the two constructs.

Two eye-catching differences emerged between the sources of team outcome confidence (Study 4) and the sources of collective efficacy (Study 5). First, basketball players rated team enthusiasm (e.g., 'the bench players are involved and concerned about the game' or 'my team reacts enthusiastically after scoring a point') as the least predictive

scale for their team outcome confidence (Study 4). In contrast, the same scale emerged as most predictive for players' collective efficacy (Study 5).

Second, with regard to the performance-oriented scales two differences can be noted. The scale 'positive task focus' (e.g., 'the players perform at their maximum') was ranked as most important for players' team outcome confidence, but only as third most predictive for players' collective efficacy. Similarly, the scale 'recent team success' (e.g., 'my teams ranks higher than the opponent') was ranked as third most predictive source of basketball players' team outcome confidence (Study 4), while the same scale emerged as least predictive for players' collective efficacy (Study 5). These findings perfectly align with Hypothesis 2, assuming that process-oriented sources would be more predictive for collective efficacy, whereas outcome-oriented sources would be more predictive for team outcome confidence.

## 4.5 The Leader as Role Model

At item level, all studies in the present manuscript pointed to the importance of athlete leaders. More specifically, athlete leaders who believe that their team can win and who express this confidence on the field were perceived to positively impact players' and coaches' team outcome confidence in soccer (Study 2), their team outcome confidence in basketball (Study 4), and their collective efficacy in basketball (Study 5). Our findings thereby corroborate previous research, demonstrating the significant positive impact of athlete leaders' on teammates' team confidence (Fransen, Coffee, et al., 2014; Fransen, Haslam, et al., 2014; Ronglan, 2007; Watson et al., 2001). Furthermore, Tamminen and Crocker (2013) confirmed that athlete leaders have an important role in regulating the emotions of the other players.

Previous research demonstrated a stronger relation between athlete leaders' quality and teammates' collective efficacy than with teammates' team outcome confidence (Fransen, Coffee, et al., 2014). This finding is reflected in our results, and more specifically in the higher ranking of athlete leaders in the list of sources of collective efficacy compared with their ranking in the list of sources of team outcome confidence. In addition, all the studies in the present manuscript demonstrated that, by expressing team confidence, not only athlete leaders, but also the coach influenced players' team confidence. This finding holds for team outcome confidence in soccer (rank 3) and for both team outcome confidence and collective efficacy in basketball (rank 10 and rank 6, respectively), thereby corroborating previous research demonstrating the positive impact of the coach on players' team confidence (Vargas-Tonsing et al., 2004).

It is thus beyond dispute that leader figures are perceived to have a positive impact on both types of team confidence. Our present findings in basketball (i.e., Study 4 and Study 5) added that athlete leaders' behavior does not necessarily imply a positive impact on teammates. In contrast, athlete leaders who express low levels of confidence were perceived as one of the most predictive sources of low team confidence (Study 4) and low collective efficacy (Study 5). These findings can be extended to the other team members: the top 6 of sources most predictive for low team confidence (Study 4 and Study 5) included the expression of low team confidence by athlete leaders, but also by the coach, by the team captain, and by the other players.

A case study with an elite handball team supported these findings by revealing that the negative emotions and behavior of the coach and teammates had a clear influence on players' own emotions and behavior (Apitzsch, 2009). As a consequence, these negative emotions spread throughout the team, thereby contaminating all team members, and causing a collective collapse: a sudden underperformance of the team. Other reported factors that possible caused such a collective collapse were negative communication, frustrated reactions of players and coach, and the disregarding of the tactics agreed upon. It is interesting to observe that these behaviors emerged also in our studies as important sources of low levels of team confidence. Similar to our findings, Apitzsch (2009) noted that it was in particular the failure of the role models of the team (i.e., coach, team captain, and other athlete leaders) that caused a negative emotional contagion leading to the spread of low levels of team confidence throughout the team, and in turn a collective collapse of the team performance. Team confidence thus seems to be a bug that spreads throughout the team, in a positive way, but maybe even more pertinent in a negative way.

### 4.6 Strengths of the Present Manuscript

Instead of using the sources of team confidence in a volleyball setting, as examined by Fransen et al. (2012), the present investigation relied on two newly-conducted qualitative studies. By asking a select group of respectively 43 and 30 coaches in soccer and basketball to identify all possible sources for high and low team confidence in their specific sport, we obtained a comprehensive list of sport-specific sources in basketball and soccer. These lists of possible sources, respectively 72 items for soccer and 96 items for basketball, were much larger than the 40-item pool of the previous study in volleyball (Fransen et al., 2012). As such, the present lists captured many new sources, such as the supportive in-game communication of the coach and his/her expression of team confidence. The more extended pools of sources thus allowed a more thorough examination of the sources of team confidence.

Second, the present manuscript encompasses three quantitative studies that each relied on a large sample size (i.e., N = 1028 for Study 2; N = 867 for Study 4; N = 825 for Study 5). These studies included the perceptions of both players and coaches, thereby allowing the identification of the team confidence sources for players and for coaches. Although some smaller differences emerged between players and coaches (e.g., positive coaching was more important for coaches' team confidence than for players' team confidence), it can be concluded that overall players and coaches share very similar perceptions on the sources of team confidence. In addition, the large samples were characterized by a variety of participants with regard to age, sex, years of experience, team gender, and competition level. With the exception of some minor differences, our results revealed a high consistency in the perceptions of young and old participants, males and females, more and less experienced players and coaches of male and female teams, active at high or low competition level. Therefore, our results did not confirm the observed gender differences found in previous research (Hays et al., 2007; Vealey et al., 1998). Instead, the observed consistency for all these different groups testifies to the generalizability of our findings.

### 4.7 Limitations & Further Research

By recognizing the limitations of the present study, several opportunities for future research emerge. First, the present study points at the importance of athlete leaders, and more specifically at the importance of their expressed team confidence in affecting team members' team confidence. However, our findings do not shed light on the underlying processes of how athlete leaders influence their teammates. In this regard, further research could examine vicarious experiences and social persuasion as potential underlying mechanisms of this team confidence contagion process. Modeling the confidence expressed by the leader is a form of vicarious experience that could explain why team confidence spreads throughout the team. As our results indicated, not only the athlete leaders, but also the coach and the other players in the team could serve as sources for vicarious experiences, both in a positive and in a negative way. Furthermore, by verbal persuasion (e.g., encouraging, supporting communication, evaluative feedback) athlete leaders can influence their teammates' team confidence (Chase et al., 2003). Zaccaro, Rittman, and Marks (2001) confirmed that these strategies can be used by effective athlete leaders to build confidence in their team.

Second, team confidence has been demonstrated to be a dynamic construct that varies in the course of weeks, days, or even within a single game (Fransen, Decroos, et al., 2014; Myers & Feltz, 2007). Similarly, it is likely that also the sources that predict team confidence vary during time. Previous research on self-confidence supports our assumption by revealing that some sources of self-confidence fluctuated during the pre-competition period (e.g., physical/mental preparation, situational favorableness), while other sources remained stable throughout time (e.g., social support, coach's leadership) (Kingston, Lane, & Thomas, 2010). It is in particular this variance in the sources that possibly underlies the observed variance in team confidence. Future research should provide more insight in the stability of team confidence sources over time, not only before a competition, but also within a single game.

A third limitation of the present study pertains to the fact that Study 4 and Study 5 relied on different samples. Because we used a stratified sampling technique, both samples were very similar with regard to the percentage of male/female teams and players/coaches. Further descriptive analyses (see Table 1) revealed that also the distribution across the different competition levels and the average age and years of experience of both players and coaches were very similar for both Study 4 and Study 5. In addition, with regard to the sex and the average age of the participants, both samples were shown to be representative for the whole member list of the Flemish Basketball Federation. The similarity between our samples and the large sample size partly justifies our direct comparison of the sources of team outcome confidence (Study 4) and the sources of collective efficacy (Study 5). Yet, a fruitful avenue for further research would be to ask the same players and coaches about their perceptions of the sources of both constructs, rather than using two different samples.

### 4.8 **Practical Implications**

In the present manuscript, we provided more insight in the sources that are generally perceived as most predictive for players' and coaches' high and low team confidence. However, this does not mean that our findings are valid for each individual team, each individual player, and each individual coach. With respect to self-confidence, Vealy et al. (1998) suggested that it is important first to understand each athlete's particular source of self-confidence before intervening to enhance that self-confidence. The same may hold for team confidence. In this regard, coaches should do well to identify the specific sources of team confidence for their team, or even for each individual. As such, coaches are able to construct a positive team environment and to interact in an optimal individualized way with each athlete in order to obtain high levels of team confidence throughout the game.

Furthermore, as noted above, team confidence is a dynamic construct that changes throughout the game, thereby affecting players' performance (Fransen, Decroos, et al., 2014; Stajkovic et al., 2009). Based on previous research findings that demonstrated the positive impact of team confidence on performance, one could assume that the higher the level of players' team confidence, the better. However, previous research also pointed to the risks of overconfidence, such as faulty assessments, unrealistic expectations, and hazardous decisions (Johnson & Fowler, 2011). Furthermore, Apitzsch (2009) suggested that overconfidence can lead to mistakes, followed by negative communication, and choking (i.e., performance decrements in games of which the stakes are high and pressure is involved). In addition, unstable overconfidence may cause a sudden collapse of team confidence, which spreads throughout the team, thereby instigating a collective collapse in performance.

As Arsenal coach Arsene Wenger noted: "confidence is the easiest thing to lose in football but the most difficult to win back" (Mangan, 2013). Therefore, instead of striving for the highest possible confidence, it might be a better strategy for coaches to strive for realistic levels of team confidence that are stable throughout the game. In this regard, Watson et al. (2001) pointed to the importance of athlete leaders in creating "self-correcting spirals of team confidence". More specifically, confident athlete leaders were able to decouple team confidence and performance outcomes: after repeated successes, athlete leaders highlighted the mistakes in order to prevent overconfidence, whereas after repeated failures the athlete leaders strengthened teammates' confidence.

Because the variation in team confidence can be caused by the variation in the sources of team confidence, coaches should strive to enhance the stability of the sources that are most predictive for team confidence. In this regard, it should be noted that some sources are more controllable than others. For example, 'being in the lead' or 'being behind' are important predictors of players' team confidence, but yet to a large extent out of control for

coaches and sport psychologists. Therefore, it is better to focus on the more controllable sources, such as the expression of team confidence by the coach and by the athlete leaders. In this respect, Hatfield et al. (1994) proposed to appoint a team captain that clearly expresses positive emotions and is therefore able to positively influence the other team members.

However, Apitzsch (2009) made the pertinent observation in his case study of an elite handball team that the pressure on the team captain can become too high, as a result of which the team captain is not able to live up to the high expectations of team members. As a consequence, the failure of the team captain might trigger a collective collapse. To avoid the risk of relying on one single person, shared leadership can be recommended. A recent study demonstrated that the number of different athlete leaders in the team was related to higher levels of team confidence among the team members (Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014a). The study revealed four different leadership roles that athletes can occupy (i.e., task leader, motivational leader, social leader, and external leader). Although the motivational leader in particular is in charge for obtaining high levels of team confidence of the four leaders depends strongly on the leader's impact on the team confidence of teammates (Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014b).

In order to enhance the stability of the predictors of team confidence, we should also look beyond the athlete leaders. In this regard, the tactical and encouraging communication among the players is also an important source of team confidence that can be trained. In particular in difficult situations, it is important for players to keep communicating and supporting each other. Apitzsch (2009) noted that the loss of communication among the players is one of the characteristics of a collective collapse. Therefore, coaches should stimulate such disadvantageous situations on training, in which the team is behind or encounters difficulties. By providing sound feedback afterwards and discussing possible solutions with the players, teams learn how to optimize their communication, and as a consequence their team confidence levels, also in difficult situations. Furthermore, it has been demonstrated that athlete leaders also have a key impact in the maintenance of this team communication (Crozier, Loughead, & Munroe-Chandler, 2013).

A final practical implication pertains to the sources of low team confidence. Previous research demonstrated that low levels of team confidence can trigger negative confidenceperformance spirals, in which low team confidence and poor performance amplify each other (Lindsley et al., 1995; Salanova et al., 2011). Therefore, coaches should strive to avoid these low levels of team confidence at any time. As our findings indicated, pointing athlete leaders to their responsibility in expressing high levels of team confidence (and in particular avoid low levels of team confidence) is a first step in the good direction. In addition, our results revealed that in-game sources are much more decisive for the development of team confidence than sources before the game. Instead of spending much time on the pre-game speech, it might thus be better for coaches to prepare their players beforehand on how to cope with potential obstacles during the game. This strengthened team resilience (i.e., the increased ability to cope positively with negative stressors) may diminish the detrimental impact of the hindrances that players encounter during the game. In line with our findings, Morgan et al. (2013) identified high levels of team confidence and shared athlete leadership as characteristics of high-resilient teams.

## 4.9 Conclusion

The present manuscript shed light on the precursors of team confidence, thereby identifying the gas stations and the signposts along the road to team confidence. However, you can refuel as much as you want, if a traffic-jam has developed or you bump up against a roadblock, you are stuck. The present manuscript offers a useful GPS to recognize and prevent these low levels of team confidence, which might be even more decisive for optimal team functioning and performance than striving to maximize players' team confidence. If a traffic-jam has already developed, it has been demonstrated that athlete leaders have the potential to counteract these downward team confidence spirals, thereby provide the necessary fuel to trigger and intensify upward spirals of team confidence.

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# 6. Appendix A

Detailed statistics for Study 2: component loadings, means at scale level and at item level for the sources of team outcome confidence in soccer.

	Team outcome confidence scales and associated items	Component	М	SD
	Team outcome confidence scales and associated items	loading		
1.	Positive coaching		1.54	.79
	1. The coach motivates her/his players during the match.	.71	1.68	.92
	2. The coach always supports the players.	.66	1.66	1.00
	3. The coach communicates in a positive way with the players.	.64	1.50	.95
	4. During half-time, the coach mainly emphasizes the positive actions.	.60	1.20	1.03
	5. The coach believes that our team will win the match and he/she express	ses .54	1.69	.93
	this during the match.			
2.	Team superiority		1.38	.77
	6. My team is in the lead during the first half of the match.	.80	1.22	1.09
	7. My team is in the lead during the second half of the match.	.79	1.59	1.12
	8. My team makes a goal after a collectively executed attack.	.63	1.54	1.01
	9. My team starts the match with a well-executed action.	.60	1.17	.98
	10. My team did really well during the first 20 minutes of the match.	.59	1.40	1.06
3.	Athletes' positive communication and confident body language		1.36	.67
	11 Athlete leaders believe that our team has the capabilities to play well	72	1.52	<b>.</b> 07 96
	during the match.	=	1102	., 0
	12. Both the field players and the bench players cheer enthusiastically	.69	1.26	.98
	during the match.			
	13. The bench players encourage the players on the field.	.68	1.03	1.03
	14. Athlete leaders believe that our team will win the match and they	.68	1.65	.97
	express this on the field.			
	15. The players strongly encourage each other during the match.	.67	1.31	.99
	16. The players display a positive body language (e.g., expressions of self	63	1.40	.89
	confidence).			
	17. Others (e.g., parents, supporters) encourage our team.	.61	1.35	.93
	18. The players clearly express that they are enjoying the match.	.61	1.43	1.00
	19. During the match, the players communicate a lot about the tactics to b	e .52	.97	1.04
	followed (e.g., give each other tactical instructions).			
	20. The players play as one team, rather than pursuing their individual	.51	1.64	1.07
	success.			
4.	Game preparation by the coach		1.14	.83
	21. The coach prepared the team tactically well for the match.	.63	1.39	1.02
	22. Last week our team trained at a high level.	.55	1.26	1.20
	23. The coach endeavours to strengthen the mental condition of the team	.54	.84	1.23
	(anxiety, motivation, etc.).			
	24. The coach works with the players about how to deal with feelings of	.52	.70	1.25
	stress and anxiety (e.g., when you spoiled a penalty kick).			
	25. The coach gave the team a motivating pep talk before the match.	.47	1.50	1.06

5.	Recent team success		1.03	1.07
	26. My team won the last two matches.	.80	1.06	1.50
	27. My team won the match of last weekend.	.78	.93	1.45
	28. My team won the last match against the same opponent.	.69	.97	1.48
	29. My team ranks higher than the opponent.	.61	1.00	1.41
	31. My team played well during the last match.	.52	1.20	1.25
6.	Special starting circumstances		.57	.77
	32. The players feel pressure to perform well.	.51	.19	1.36
	33. The parents of the players are in the audience.	.49	.70	1.21
	34. The team did an enthusiastic yell at the start of the match.	.48	.93	1.26
	35. The players are nervous at the start of the match.	.47	.30	1.23
	36. The players of the opposing team look physically strong.	.47	14	1.12
	37. The players warm up concentrated before the match.	.43	1.46	1.06
7.	Stimulating game circumstances		.49	.91
	38. A player of the opposing team gets excluded.	.66	.89	1.29
	39. My team had a special preparation for this match (e.g., eating together).	.66	.26	1.30
	40. Some players play against their former team.	.63	.67	1.47
	41. The players will be rewarded for winning this match (e.g., the players	.54	.73	1.53
	get a financial reward if they win).			
	42. A player of our team doesn't get his usual player's number.	.47	12	1.25
8.	Team inferiority		43	.88
	43. My team is behind during the second half of the match.	.77	72	1.33
	44. My team is behind during the first half of the match.	.76	27	1.15
	45. A player of our team gets excluded.	.64	79	1.21
	46. The players of the opposing team believe they will win the match and	.56	17	1.17
	they clearly display this on the field.			
	47. My team misses a penalty kick.	.49	18	1.05
9.	Negative communication and expression		91	.81
	48. The players exhibit a discouraged body language.	.79	-1.39	1.21
	49. Some players react with anger and frustration when one of their	.77	-1.10	1.15
	teammates makes a fault.			
	50. The players display a discouraged body language when the opponent	.74	-1.19	1.23
	scores a goal.			
	51. The players communicate in a negative way with each other.	.74	-1.21	1.09
	52. Some players display their frustration after dubious decisions by the	.72	87	1.17
	referee	-	1.00	
	53. Some players play selfishly during the match and do not pass to their	.70	-1.39	1.19
	teammates.			
	54. The players fail to complete the tactical directives.	.66	97	1.21
	55. Some players ignore a teammate who made a fault, rather than	.65	63	1.12
	encouraging him/her.			1
	56. The players commit serious fouls against the opponent.	.57	69	1.22
	5/. The players do not dare to undertake difficult actions (e.g., individual	.50	48	1.25
	action, one against one).	A 1	0.4	1.07
	58. Some players start to intimidate or challenge the opponent.	.41	04	1.25

# 7. Appendix B

Detailed statistics for Study 4 and Study 5: component loadings, means at scale level and at item level for the sources of team confidence in basketball.

Team confidence scales and associated items		Study 4		Stuc	iy 5
Team confidence scales and associated items	loading	М	SD	М	SD
1. Positive task focus		1.47	.76	1.51	.80
1. The players show self-confidence.	.67	1.69	.95	1.74	1.04
2. My team controls the rebound.	.67	1.44	1.19	1.24	1.28
3. Each player fulfils his/her task well.	.66	1.58	1.07	1.51	1.14
4. The players play as one team, rather than pursuing their individual succ	cess61	1.79	1.11	1.80	1.20
5. The players show a positive body language.	.61	1.53	.94	1.71	1.00
6. The players show a fighting spirit on the field.	.61	1.77	1.08	1.83	1.12
7. The players steer each other and give each other tactical advice.	.61	1 47	1.05	1 44	1 09
8. The players perform a 1-against-1 action at the right moment.	.61	1 42	1.06	1 31	1 18
9. The players perform at their maximum.	.60	1.12	99	1.91	1 10
10. The players play in a concentrated and focused way.	.60	1.55	99	1.55	1.10
11. A mistake during an attack is repaired by the defense.	.59	1.05	1.06	1.01	1.11
12. When our team is behind, we build up our play in a quiet way without	t	1.27	1.00	1.50	1.15
rushing.	.56	.97	1.14	1.05	1.24
13. Despite experiencing adversities, the players keep fighting.	.53	1.33	1.03	1.73	.99
14. The players warm up concentrated during the break.	.53	1.17	1.12	1.16	1.29
15. The players ask the coach for individual advice.	.53	.91	1.19	.86	1.39
16. The atmosphere in the team is good during the match.	.50	1.59	1.00	1.84	1.05
2. Positive coaching		1.42	.81	1.59	.90
17. The coach motivates the players during the game/match.	.71	1.60	1.00	1.86	1.11
18. The coach assesses the actions of the opposing team correctly and giv	es			1.00	
advice on how to react.	.08	1.62	.99	1.60	1.17
19. The coach shows enthusiasm.	.63	1.58	1.01	1.83	1.14
20. The coach tactically steers his/her players during the match.	.61	1.62	.96	1.83	1.08
21. The coach focuses on the future actions and not on what has passed.	.55	1.12	1.03	1.24	1.18
22. The coach emphasizes the positive instead of the negative actions of o	our .52	98	1 20	1 17	1 40
team.		.70	1.20	1.17	1.40
3. Pre-game match focus		1.24	.84	1.18	.89
23. My team listens very concentrated during the preview of the match.	.66	1.28	1.18	1.40	1.27
24. The players warm up intensively before the match.	.63	1.15	1.32	.97	1.39
25. Last week our team trained at a high level.	.63	1.36	1.22	1.07	1.39
26. This match was prominently in our players' mind during the whole la week.	st .63	1.15	1.28	.93	1.49
27. The players took care of their body before the match (e.g., enough res healthy food, etc.).	it, .60	.78	1.22	.65	1.45
28. The coach prepared the team tactically well for the match.	.59	1.43	1.15	1.56	1.36
29. Last week, the players steered each other during the training sessions.	.56	1.12	1.20	1.14	1.22
30. The players know the opposing team well and they also know their di	rect .55	1.15	1.30	1.04	1.49

opponent					
31. The players show a positive body language during the warming-up.	53	1 (1	1 1 2	1 7 4	1 1 2
32. The coach let the players think along when determining the match	.55	1.61	1.13	1./4	1.12
strategy.	.52	.80	1.25	.56	1.60
33. The players in our team feel that we are one closely knit team.	.51	1.77	1.15	1.91	1.17
4. Recent team success		1.19	1.17	.97	1.44
34. My team ranks higher than the opponent.	.66	1.14	1.64	.84	2.14
35. My team is in the lead at the break halfway the match.	.64	1.07	1.12	1.02	1.30
36. My team won the last match against the same opponent.	.60	1.15	1.78	.88	2.18
37. My team already won a few matches in a row.	.56	1.40	1.53	1.15	1.95
5. Team enthusiasm		1.18	.83	1.59	.78
38. Parents or friends of the players are in the audience.	.62	1.37	1.26	1.82	1.35
39. My team reacts enthusiastically after scoring a point.	.60	1.29	1.00	1.65	.97
40. The coach of the opposing team takes time-outs or substitutes players.	.60	.94	1.23	1.57	1.27
41. After the time-out, our team did an enthusiastic yell.	.59	1.12	1.13	1.54	1.17
42. The players quickly return to the bench after a time-out or a substitution.	.56	.88	1.12	1.14	1.26
43. The team did an enthusiastic yell at the start of the match.	.54	1.10	1.30	1.53	1.36
44. The bench players are involved and concerned about the game.	.52	1.52	1.02	1.89	1.12
6. Negative communication and expression		-1.18	.94	-1.40	.91
45. The players communicate in a negative way with each other.	.77	-1.63	1.39	-1.80	1.36
46. Athlete leaders believe that our team will lose the game and they express	72	1100	1.07	1.00	1.00
this on the field.	./3	-1.31	1.28	-1.65	1.35
47. The players play selfishly during the match and do not pass to their teammates.	.70	-1.57	1.38	-1.66	1.42
48. The players do not encourage each other in a tough situation.	.67	-1.16	1.42	-1.49	1.46
49. My teammates believe that our team will lose the game and they express this on the field.	.67	-1.42	1.30	-1.62	1.38
50. The players react with anger and frustration when one of their teammates makes a fault or does not score.	.67	-1.23	1.4	-1.35	1.48
51. The players do not return quickly in the transition from attack to defence.	.66	-1.18	1.54	-1.16	1.64
52. The coach communicates in a negative way with his/her players.	.66	-1.34	1.32	-1.58	1.44
53. The coach believes that our team will lose the game and expresses this on the field.	.65	-1.59	1.37	-1.77	1.38

54. The players do not communicate with each other or with the coach. .64 -1.28 1.54 -1.62 1.61 55. The players fail to complete the tactical directives. .64 1.27 -.90 1.42 -.85 56. Some players ignore a teammate who made a fault, rather than .63 -.92 1.32 -1.32 1.44 encouraging him/her. 57. The players exhibit a discouraged body language (e.g., hanging one's .63 -1.10 1.35 -1.26 1.40 shoulders, sighing, etc.). 58. The players commit serious fouls against the opponent. .56 -.76 1.32 -1.07 1.43 59. The players do not dare to undertake difficult actions (e.g., individual .55 -.79 1.49 -1.00 1.65 action, one against one). 60. Our captain believes that our team will lose the game and expresses this .54 -1.16 1.41 -1.65 1.45 on the field. 61. The players do not fight duels with their direct opponent. .51 -.90 1.59 -1.<u>00 1.77</u>

# 8. Appendix C

The fit indices of the confirmatory factor analyses for each of the collective efficacy scales of Study 5.

Sca	ale	$\chi^2/df$	RMSEA	CFI	TLI
1.	Positive task focus	5.31	.07	.94	.93
2.	Positive coaching	3.89	.06	.99	.98
3.	Pre-game match focus	3.57	.06	.96	.95
4.	Recent team success	2.12	.04	1.00	.99
5.	Team enthusiasm	1.22	.02	1.00	1.00
6.	Negative communication and expression	3.77	.07	.91	.90

Is team confidence the key to success?

The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games.

Fransen, K., Decroos, S., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). Journal of Sports Sciences, http://dx.doi.org/10.1080/02640414.2014.942689.

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## Abstract

The present manuscript extends previous research on the reciprocal relation between team confidence and perceived team performance in two ways. First, we distinguished between two types of team confidence; process-oriented collective efficacy and outcomeoriented team outcome confidence. Second, we assessed both types not only before and after the game, but for the first time also during half-time, thereby providing deeper insight into their dynamic relation with perceived team performance. Two field studies were conducted, each with 10 male soccer teams (N = 134 in Study 1; N = 125 in Study 2). Our findings provide partial support for the reciprocal relation between players' team confidence (both collective efficacy and team outcome confidence) and players' perceptions of the team's performance. Although both types of players' team confidence before the game were not significantly related to perceived team performance in the first half, players' team confidence during half-time was positively related to perceived team performance in the second half. Additionally, our findings consistently demonstrated a relation between perceived team performance and players' subsequent team confidence. Considering that team confidence is a dynamical process, which can be affected by coaches and players, our findings open new avenues to optimize team performance.

*Keywords*: winning confidence, in-game measurements, continuous measurements, team dynamics, sport psychology

#### 1. Introduction

Coaches, players and other team sport enthusiasts often mention team confidence as a key to success; "What you believe, you can achieve" (Quinn, 2012, p. 90). Research findings confirmed these on-field perceptions by demonstrating that athletes who were more confident in their team's abilities exerted more effort (Greenlees, Graydon, & Maynard, 1999), set more challenging goals (Silver & Bufanio, 1996), were more resilient when facing adversities (Morgan, Fletcher, & Sarkar, 2013), and ultimately performed better (Stajkovic, Lee, & Nyberg, 2009).

Although these findings stress the importance of team confidence, the existing literature is characterized by inconsistencies in the way in which the construct of team confidence has been conceptualized, operationalized, and measured (Shearer, Holmes, & Mellalieu, 2009). Overall, two distinct types of team confidence can be identified (Collins & Parker, 2010; Fransen, Kleinert, Dithurbide, Vanbeselaere, & Boen, 2014). The first type has been termed collective efficacy and was originally defined by Bandura (1997, p. 477) as "a group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment". In other words, collective efficacy comprises athletes' confidence in the process of their own team, rather than comparing their own abilities with those of the opposing team. Consequently, collective efficacy has been measured as athletes' confidence in the skills of their team required to accomplish a certain task (e.g., "I believe that my team will demonstrate a strong work ethic during this game").

In contrast, the second type of team confidence focuses on outperforming the opponent and comprises athletes' confidence in their team's abilities to obtain a certain outcome (e.g., "I believe that my team will win this game"). Collins and Parker (2010) termed this construct 'team outcome efficacy'. In sports, this outcome-oriented confidence in winning or performing better than the opponent has been termed 'competitive efficacy' or 'comparative efficacy' (Myers & Feltz, 2007). However, this outcome-oriented measure does not capture the process-oriented nature of collective efficacy as described by Bandura (1997). As such, an 'efficacy' label seems inappropriate. Moreover, several authors emphasized the difference between the confidence in outperforming the opponent (i.e., performance judgments) and outcome expectations (Myers & Feltz, 2007; Myers, Paiement, & Feltz, 2007). Bandura (1997, pp. 22-23) noted that "an outcome is the consequence of a performance, not the performance itself." Performance accomplishments can take the form

of letter grades in academia or a final game score in sports. A trophy, praise from the coach, or self-satisfaction are examples of outcomes that might ensue from a performance accomplishment (Myers & Feltz, 2007). Given the conceptual differences between efficacy beliefs and outcome expectations, the outcome-oriented measure of team confidence has recently been labeled 'team outcome confidence' (Fransen, Kleinert, et al., 2014). We adopt this recent conceptualization in the current research and distinguish between 'process-oriented collective efficacy' on the one hand and 'outcome-oriented team outcome confidence' on the other hand.

Although a number of studies have confirmed the reciprocal relation between team confidence and performance (for a meta-analysis see Stajkovic et al., 2009), the difference between process- and outcome-oriented team confidence has been disregarded. Moreover, a number of studies used the outcome-oriented measurement to allegedly assess collective efficacy (e.g., Chen et al., 2002; Fransen et al., 2012; Spink, 1990; Tasa, Taggar, & Seijts, 2007; Vargas-Tonsing & Bartholomew, 2006). Therefore, the present manuscript will go one step further by examining the reciprocal relation between performance and both collective efficacy and team outcome confidence.

In order to ground our hypotheses on the existing literature, previous studies had to be interpreted with regard to the measurements they used to assess the team confidence-performance relation. Based on the distinction described earlier, we classified previous studies as targeting either collective efficacy or team outcome confidence. First, with regard to collective efficacy, the literature review revealed inconsistent results regarding its relation with team performance. Bandura (1997, p. 470) stated: "the higher the sense of collective efficacy, the better the team's performance". A meta-analytic review including 96 studies, confirmed this statement and revealed that collective efficacy is significantly related to group performance (Stajkovic et al., 2009). In line with these findings, Keshtan, Ramzaninezhad, Kordshooli, and Panahi (2010) demonstrated that professional volleyball teams with high levels of collective efficacy were positioned higher in the ranking than professional teams with low levels of collective efficacy. In contrast, a study with university basketball teams revealed no significant relation between a team's collective efficacy and the team's performance, measured by shooting percentage and difference in rebounds taken (MacLean & Sullivan, 2003). Likewise, Chen et al. (2002) revealed that in more recreational basketball teams players' collective efficacy did not
predict the team's performance, assessed by the season winning percentage and the point difference.

Second, with regard to team outcome confidence, the literature consistently revealed a positive relation with performance. In the experiment of Stanimirovic and Hanrahan (2004), teams of secondary school students were assigned to either a repeated success or repeated failure condition. Success and failure were manipulated by having participants compete against a respectively lower or higher score of an imaginary opponent. The results demonstrated the positive impact of performance on team outcome confidence; teams in the repeated success condition reported higher confidence in winning the game than teams competing in the repeated failure condition. On the other hand, two laboratory studies revealed that the reversed causal direction also holds since they observed that teams with a higher team outcome confidence performed better than teams who lost confidence in their winning chances (Chen et al., 2002; Hodges & Carron, 1992). Additionally, field studies in intercollegiate ice hockey teams delivered further support for the reciprocal relation between team outcome confidence and team performance, measured by official game statistics (Feltz & Lirgg, 1998; Myers, Paiement, & Feltz, 2004).

Besides the inconsistencies in how team confidence has been assessed, another shortcoming in the current literature relates to the timing of the measurement. Team confidence has been conceptualized as a dynamic construct, rather than as a trait-like characteristic showing strong cross-temporal stability (Myers & Feltz, 2007). In other words, players' confidence in their team's abilities may change in the course of the game, and these changes may impact on winning or losing. Therefore, Bandura (1997, p. 67) stated that the relation between team confidence and performance is revealed most accurately when both constructs are measured in close temporal proximity.

Myers, et al. (2007) tested the importance of this temporal proximity by examining the relation between team confidence, measured before the game, and three cumulative performance intervals within ice hockey games. Their results revealed that team confidence before the game was a significant predictor of team performance at each of the three performance intervals. However, the magnitude of this relationship did not change significantly as the temporal proximity between team confidence and performance decreased. It should be noted though that team confidence was only measured once within the 24 hours before the game. In the time span between the measurement of team confidence and the team's performance, intervening experiences may have impacted on the players' confidence (e.g., a coach's motivational speech or the playing level of the team). As a consequence, it has been suggested that the best way to minimize this problem is to measure players' team confidence during performance (Myers & Feltz, 2007).

Despite these guidelines and disregarding the dynamic nature of team confidence, the concept of team confidence has traditionally been measured as a trait concept or, at best, before or after a game, but not during a game. The only exception is a study by Edmonds, Tenenbaum, Kamata, and Johnson (2009) in which team confidence was measured at three time points during an adventure race. Their results partially supported the dynamic view on the team confidence–performance relation; the higher athletes' confidence before each discipline, the better they performed at it. However, because the race consisted of five different disciplines (i.e., trekking, canoeing, mountain biking, climbing, and orienteering), the effects of a previous performance on the team's confidence in successfully accomplishing a subsequent task were very small. This variety in the disciplines involved in the adventure race makes it dangerous to generalize the results to sport teams in which players perform a similar task during the entire game (e.g., soccer).

In line with previous recommendations (Bandura, 1997; Myers & Feltz, 2007), the present research took a first step toward a more dynamic in-game measurement of players' team confidence. Therefore, we measured players' team confidence at different time points, but, in contrast to Edmonds et al. (2009), within the same task (i.e., a soccer game). In Study 1, both types of team confidence (i.e., collective efficacy and team outcome confidence) were measured before the game and at the start and the end of the half-time break. In this way, we tried to account for the speech of the coach during half-time, because it has already been argued that verbal persuasion is one of the most effective methods for coaches to build team confidence (Fransen et al., 2012; Vargas-Tonsing & Bartholomew, 2006; Vargas-Tonsing, Myers, & Feltz, 2004). In Study 2, measurements of team confidence after the game were added, thereby aiming at a deeper insight in the dynamics of the reciprocal relation between team confidence and team performance.

Although previous work on the relation between team confidence and team performance revealed inconsistent results, most studies demonstrated a positive reciprocal relation between both constructs; the more confident players were, the better they performed, and vice versa (e.g., Myers, Paiement, et al., 2004; Stajkovic et al., 2009). Bandura (1997, p. 67) added that the relation between team confidence and performance is revealed most accurately when both constructs are measured in close temporal proximity.

Therefore, we expected our results to demonstrate positive reciprocal relations between both types of team confidence (i.e., (a) collective efficacy and (b) team outcome confidence) and team performance. More specifically, we hypothesized that players' team confidence before the game would be positively correlated with the perceived team performance in the first half (H1a,b). Likewise, we hypothesized players' team confidence during half-time to be positively correlated with the perceived team performance in the second half (H2a,b). On the other hand, we also expected the perceived team performance during the first half to be a significant predictor of players' team confidence during half-time (H3a,b). Finally, we hypothesized the perceived team performance during the second half to be positively correlated with players' team confidence during the second half to be positively correlated with players' team confidence during the second half to be positively correlated with players' team confidence during the first half to be positively the perceived team performance during the first half to be positively the perceived team performance during the first half to be positively correlated with players' team confidence during the second half to be positively correlated with players' team confidence after the game (H4).

### 2. Methods

### 2.1 Recruitment

In Study 1, the coaches of 13 Flemish soccer teams were invited via e-mail to participate in our field study. Ten teams agreed to participate, leading to a response rate of 77%. In Study 2, a similar approach was maintained, resulting in a response rate of 67% and again 10 participating teams. The most frequently cited reason for non-participation was the refusal by the coach to allow measurements before the game or during half-time in order to maintain the concentration of the players. There was no overlap in the samples of Study 1 and Study 2.

Before the warming-up, players and coaches were informed in detail about when the different parts of the questionnaire had to be completed. The researcher was present in the locker room to answer any questions. The APA ethical standards were followed in the conduct of the study and players could withhold their participation at any time. No rewards were given for participation in the study. Informed consent was obtained from all participants and confidentiality was guaranteed.

## 2.2 Participants

#### 2.2.1 Study 1

Ten soccer teams participated in the present study, including 134 male players. Seven teams played at U17 regional level (i.e., youth teams playing at regional level and only including players younger than 17 years old at the start of the season), two teams at U17 provincial level, and one team at U19 national level. The players were on average 15.9 years old (SD = 0.8), had an average soccer experience of 9.5 years (SD = 2.4 years) of which 6.2 years in their current team (SD = 3.7 years). All participants filled out the questionnaires, once before the game (i.e., before the warming-up) and both at the start and at the end of the half-time break.

#### 2.2.2 Study 2

This study also involved 10 teams, containing 125 male players. Seven teams played at U17 regional level, one team at U21 regional level, and two teams participated in the regional competition for adults. Participants were on average 17.3 years old (SD = 3.6), played soccer for 10.0 years on average (SD = 4.7) of which 7.5 years in their current team (SD = 4.5).

#### 2.3 Measures

#### 2.3.1 Team confidence

In line with previous research (Collins & Parker, 2010; Feltz & Chase, 1998), Fransen, Kleinert, and colleagues (2014) conceptually distinguished between outcomeoriented team confidence and process-oriented collective efficacy. We adopted this conceptualization in our research, and assembled both concepts under the general term 'team confidence'. Each study assessed both forms of team confidence at three different time points. Study 1 assessed team confidence (i.e., both collective efficacy and team outcome confidence) before the warming-up, at the beginning of half-time, and at the end of half-time. Study 2 assessed players' team confidence before the warming-up, at the beginning of half-time, and after the game. Because there was no break between the warming-up and the start of the game, the nearest moment at which players' team confidence could be measured was right before the warming-up. As such, previous recommendations to measure team confidence at least within 24h prior to the performance were taken into account (Feltz & Lirgg, 2001).

For the measurement after the game, each of the items began with the stem "If you would compete once more against the same team, to what extent do you believe that your team, during this new game, would ..." The hypothetical situation of playing against the same opponent was believed to be the most valid measure, because of its similarity with the previous measures of team confidence before and during the game. If we had measured

players' team confidence after the game with regard to the next game (i.e., competing against a different opponent), the ranking of that specific opponent could have led to a biased response.

### 2.3.2 Collective efficacy

The Collective Efficacy Questionnaire for Sports (CEQS; Short, Sullivan, & Feltz, 2005) included five subscales; Ability (e.g., "play more skillfully than the opponent"), Effort (e.g., "demonstrate a strong work ethic"), Persistence (e.g., "persist when obstacles are present"), Preparation (e.g., "devise a successful strategy"), and Unity (e.g., "keep a positive attitude"). Each of the items began with the stem "To what extent do you believe that, during the upcoming game period, your team has the abilities to ..." Fransen and colleagues (2014) conducted an exploratory factor analysis which revealed that the CEQS consisted of two factors; (1) the Ability subscale of the CEQS, and (2) the other four subscales of the CEQS (i.e., Effort, Persistence, Preparation, and Unity). This factor analysis demonstrated that the Ability subscale focused on the confidence in outplaying the opponent, and as such is outcome-oriented, in contrast to the process-oriented nature of collective efficacy, as originally defined by Bandura (1997). Therefore, in the present research, we will focus on the subscales of Effort, Persistence, Preparation, and Unity that have been shown to represent a valid measure of process-oriented collective efficacy (Fransen, Kleinert, et al., 2014).

Both collective efficacy and team outcome confidence were measured at three different time points in each study. Given the time constraints during half-time, it was not possible to administer the full CEQS scale. As a consequence, to minimize the impact on the team and to avoid concentration losses of the players, we only used the item with the highest factor loading of each of the collective efficacy subscales (i.e., the example items as indicated earlier). Participants assessed the items on a 7-point scale anchored by -3 (*not at all confident*) and 3 (*extremely confident*). In the first study we administered the full CEQS scale before the game as well. Our results revealed a strong correlation (r = .93; p < .01) between the 16-item scale (including all items from subscales Effort, Persistence, Preparation, and Unity) and the 4-item scale (including only the highest loading item of each of these four subscales). The 4-item scale revealed a high internal consistency throughout all measurement points (both in Study 1 and Study 2, before, during, and after the game), demonstrated by Cronbach's alpha's ranging from .81 to .91.

#### 2.3.3 Team outcome confidence

In line with previous guidelines (Fransen, Kleinert, et al., 2014), players assessed the item "To what extent do you believe that your team will win this game?" on a 7-point scale anchored by -3 (*not at all confident*) and 3 (*extremely confident*).

#### 2.3.4 Performance

Previous studies that examined the relation between team confidence and performance mostly used objective measures such as scoring percentage, number of turnovers, or game outcome to measure the team's performance (Feltz & Lirgg, 1998; Myers, Paiement, et al., 2004; Watson, Chemers, & Preiser, 2001). However, Raglin and Morgan (1988) pointed to the advantages of subjective measures of performance. These subjective measures might be more accurate because they can account for performance indicators that objective measures such as the game outcome cannot. To measure the team's performance, we assessed players' subjective perceptions of the team's performance during half-time and after the game. More specifically, players assessed the item "How well did your team play during the previous half?" on a 7-point scale anchored by -3 (*very bad*) and 3 (*very well*). By evaluating players' perceptions of the quality of their team's play, the present measure focuses on the process, rather than on the outcome.

#### 2.4 Data Analysis

The obtained data were analyzed with Stata version 13. For both Study 1 and Study 2, the means, standard deviations, and bivariate correlations among collective efficacy, team outcome confidence, and team performance measures were calculated. Due to the nesting of the players within teams, we also calculated for each variable the proportion of variance attributed to the team level.

Subsequently, the hypothesized relations were tested via structural equation modeling using the maximum likelihood estimation method. The fit of the models was assessed using the chi-square fit statistic ( $\chi^2$ ), the goodness of fit index (*GFI*), the non-normed fit index (*NNFI*), and the standardized root mean squared residual (*SRMR*). A non-significant  $\chi^2$  indicates a good fit of the data to the proposed model. Incremental fit indices (*GFI* and *NNFI*) had to be larger than 0.95. The *SRMR*, an absolute fit index had to be smaller than 0.06 to accept a good fit (Hu & Bentler, 1999).

In addition, the hypothesized structural equation models were analyzed in a multilevel analysis to test the variance in intercepts and slopes that might be attributed to the nesting of players within teams. This was done by comparing the likelihood ratios of the fixed model with a  $\chi^2$  estimation when allowing for random intercepts, and a  $\chi^2$  estimation when allowing for random slopes.

#### 3. Results

Descriptive statistics and correlations among the variables are provided in Table 1 for both studies.

**Table 1.** Means, standard deviations, and correlations across all measures of team outcome confidence (TOC), collective efficacy (CE), and players' perceived team performance for both studies.

Variable	М	SD	1	2	3	4	5	6	7	8
Study 1										
1. TOC before the game	2.28	1.11	1	$.48^{**}$	.52**	.46**	.41**	.47**	10	.16
2. TOC start half-time	1.98	1.18		1	.81**	.37**	.75**	.73**	.28**	.39**
3. TOC end half-time	2.02	1.15			1	.31**	.72**	.82**	.23**	.39**
4. CE before the game	1.87	.94				1	.42**	$.40^{**}$	.06	$.18^{*}$
5. CE start half-time	2.09	.93					1	.81**	.33**	.41**
6. CE end half-time	2.12	.89						1	.27**	.44**
7. Team performance first half	.74	1.27							1	$.40^{**}$
8. Team performance second half	1.22	1.36								1
Study 2										
1. TOC before the game	1.72	1.26	1	.36**	.37**	.49**	.32**	.28**	.01	13
2. TOC half-time	1.75	1.10		1	$.48^{**}$	.26**	.67**	.53**	.38**	.01
3. TOC after the game	1.81	1.20			1	.36**	.49**	.69**	$.20^{**}$	.13
4. CE before the game	1.62	.94				1	.34**	.27**	.15	03
5. CE half-time	1.84	.91					1	.67**	.31**	.25**
6. CE after the game	1.79	.97						1	.29**	.34**
7. Team performance first half	.45	1.67							1	.18
8. Team performance second half	.86	1.53								1

p < .05; p < .01

The measurements of players' team confidence before the game, during the game, and after the game were only moderately correlated, illustrating the dynamic nature of team confidence and its variation within a single game. This was found for collective efficacy (r = .42 in Study 1; r = .27 - .67 in Study 2) as well as for team outcome confidence (r = .48 in Study 1; r = .36 - .48 in Study 2). Furthermore, the correlations between process-oriented collective efficacy and outcome-oriented team outcome confidence before the game (.46 in Study 1; .49 in Study 2) are clearly lower than the correlations between both constructs

during and after the game (respectively .75 and .82 in Study 1; .67 and .69 in Study 2). In addition, it is noteworthy that these correlations were only moderately correlated at all three measurement time-points (i.e., before, during, and after the game), indicating that collective efficacy and team outcome confidence, although related, are two distinct constructs.

When the total variance was partitioned into variance at the team level and into variance at the individual level, the results revealed that the proportion of variance at the team level ranged between 20% and 57% in Study 1 and between 8% and 62% in Study 2. For every variable the likelihood ratios with and without the team-level variance component was significantly different (p < .05). This finding indicates that for all variables the variance proportion at the team level cannot be disregarded. The team variance proportions are provided in the first column of Table 2.

	1 5	0					
	Null model	Structural equation model					
	Variance at team level	Explained variance at team level	Explained variance at individual level	Unexplained (residual) variance			
Study 1							
TOC before the game	57% *	-	-	-			
TOC start half-time	26% *	3%	34%	63%			
TOC end half-time	26% *	0%	69%	31%			
CE before the game	34% *	-	-	-			
CE start half-time	23% *	$8\%^*$	25%	67%			
CE end half-time	20% *	0%	66%	34%			
Performance 1 <sup>st</sup> half	38% *	-	-	-			
Performance 2 <sup>nd</sup> half (a)	39% *	23%*	28%	49%			
Performance 2 <sup>nd</sup> half (b)	39% *	25%*	26%	49%			
Study 2							
TOC before the game	28% *	-	-	-			
TOC half-time	9% *	1%	26%	73%			
TOC end of the game	11% *	0%	32%	68%			
CE before the game	8% *	-	-	-			
CE half-time	9% *	7%	17%	76%			
CE end of the game	18% *	0%	48%	52%			
Performance 1 <sup>st</sup> half	62% *	-	-	-			
Performance 2 <sup>nd</sup> half (a)	59% *	$61\%^*$	7%	32%			
Performance 2 <sup>nd</sup> half (b)	59% <sup>*</sup>	$62\%^*$	4%	34%			

**Table 2.** Variance partition coefficients of team outcome confidence (TOC), collective efficacy(CE), and players' perceived team performance for both studies.

<sup>\*</sup> Team-level variance component adds significantly to the model's likelihood ratio (p < .05).

#### 3.1 Study 1

For Study 1, the hypothesized relations between both types of team confidence (i.e., collective efficacy and team outcome confidence) and the team's perceived performance in the first and second half were modeled in a structural equation model, which is shown in Figure 1 for collective efficacy and Figure 2 for team outcome confidence. The dotted pathways were hypothesized, but failed to show significant regression weights at the p < .05 level. Additionally, modification indices suggested that subsequent assessments of collective efficacy, team outcome confidence, and team performance were also directly predicted by their prior measures. These additional suggested pathways were added and both models provided evidence of a good fit to our data.

Partial support for the reciprocal relations between players' team confidence and perceptions of the team's performance was found. In contrast to H1, no significant relation was found between the team's confidence before the game and its performance during the first half (according to the perceptions of the players), neither for collective efficacy (H1a; p = .99), nor for team outcome confidence (H1b; p = .46). By contrast, the measures obtained during games confirmed the reciprocal relation between players' team confidence and the team's performance; a positive relation was found between the team's confidence at the end of half-time and the team's perceived performance in the second half (for collective efficacy (H2a):  $\beta = .36$ , p < .001; for team outcome confidence (H2b):  $\beta = .31$ , p < .001). These findings confirm H2; the more confident the players were in the capacities of their team during half-time, the better they perceived their performance in the second half. Furthermore, in line with H3, a positive relation appeared between the team's perceived performance during the first half and both types of players' confidence at the beginning of half-time (for collective efficacy (H3a):  $\beta = .32$ , p < .001; for team outcome confidence (H3b):  $\beta = .33$ , p < .001). The better the team performed, the more confident the players were (a) in the capacities of their team to successfully complete the process-oriented tasks and (b) in winning the game.

**Figure 1.** The structural model of Study 1 for the reciprocal relation between players' processoriented collective efficacy and their perceived team performance. All regression coefficients are standardized, significant (p < .001), and presented along the pathways. The proportion of predicted variance is noted above the predicted variables. The team-level variance is shown between brackets. Goodness-of-fit indices are:  $\chi^2(df = 4) = 3.73$ , p = .44, CFI = 1.00, NNFI = 1.00, and SRMR = .03.



**Figure 2.** The structural model of Study 1 for the reciprocal relation between the players' outcome-oriented team outcome confidence and their perceived team performance. All regression coefficients are standardized, significant (p < .01), and presented along the pathways. The proportion of predicted variance is noted above the predicted variables. The team-level variance is shown between brackets. Goodness-of-fit indices are:  $\chi^2(df = 3) = 1.51$ , p = .68, CFI = 1.00, NNFI = 1.02, and SRMR = .02.



#### 3.2 Study 2

Similar to the analysis in Study 1, the reciprocal relations between players' team confidence and perceived team performance were tested in a structural equation model but Study 2 included a measurement of team confidence after the game. Again, dotted lines indicate that the predicted relations were not significant (p > .05). As suggested by modification indices, subsequent measures of the same construct were connected. The resulting models, including the standardized regression path coefficients and the proportions explained variance, are shown in Figure 3 for collective efficacy and Figure 4 for team outcome confidence. Both models showed a good fit to our data.

In contrast to H1, but in line with the findings of Study 1, no significant regression was found between both forms of players' team confidence before the game and the team's perceived performance during the first half (for collective efficacy p = .22; for team outcome confidence p = .84). Our expectation that the team's confidence during half-time would be a predictor of the team's perceived performance during the second half (H2) was confirmed for collective efficacy (H2a;  $\beta = .20$ , p < .01), but not for team outcome confidence (H2b; p = .40). In other words, players' confidence in the game's outcome did not affect the team's performance in the next half. However, players who were confident during half-time in the team's abilities to demonstrate a strong work ethic, to persist when encountering difficulties, to devise a successful strategy, and to keep a positive attitude, perceived their team as performing better in the second half.

In line with H3 and the findings of Study 1, a positive relation existed between the team's perceived performance during the first half and players' team confidence during half-time (for collective efficacy (H3a)  $\beta = .28$ , p < .01; for team outcome confidence (H3b)  $\beta = .37$ , p < .05). Specifically in Study 2, H4 was confirmed by demonstrating a significant positive association between the team's perceived performance during the second half and the players' team confidence after the game (for collective efficacy (H4a)  $\beta = .19$ , p < .01; for team outcome confidence (H4b)  $\beta = .16$ , p < .05). In other words, perceptions of a better team performance during the previous half went hand in hand with a stronger confidence in the team's abilities to fulfill the required processes and to win the game.

**Figure 3.** The structural model of Study 2 for the reciprocal relation between the players' process-oriented collective efficacy and their perceived team performance. All regression coefficients are standardized, significant (p < .01), and presented along the pathways. The proportion of predicted variance is noted above the predicted variables. The team-level variance is shown between brackets. Goodness-of-fit indices are:  $\chi^2(df = 3) = 4.40$ , p = .22, CFI = .99, NNFI = .95, and SRMR = .04.



**Figure 4.** The structural model of Study 2 for the reciprocal relation between the players' outcome-oriented team outcome confidence and their perceived team performance. All regression coefficients are standardized, significant (p < .05), and presented along the pathways. The proportion of predicted variance is noted above the predicted variables. The team-level variance is shown between brackets. Goodness-of-fit indices are:  $\chi^2(df = 2) = 1.12$ , p = .57, CFI = 1.00, NNFI = 1.06, and SRMR = .02.



#### **3.3 Multilevel Analysis**

Testing the same models in a generalized structural model with random intercepts across teams revealed a significant proportion of variance at team level (for collective efficacy in Study 1:  $\Delta \chi^2 (\Delta df = 2) = 22.99$ , p < .001; for collective efficacy in Study 2: :  $\Delta \chi^2 (\Delta df = 2) = 89.79$ , p < .001; for team outcome confidence in Study 1:  $\Delta \chi^2 (\Delta df = 2) = 22.13$ , p < .001; and for team outcome confidence in Study 2:  $\Delta \chi^2 (\Delta df = 2) = 77.66$ , p < .001). However, an intercept by intercept analysis revealed that the initial values of collective efficacy and team outcome confidence predicted more variance of respective subsequent measures than the portion of variance at team level. For these measures, the variance at team level decreased as prior measures were taken into account. Only for the team's performance in the second half, in both models in both studies, a substantial random team effect remained. The predicted variances at team and individual level are provided in Table 2.

Adding random slope effects to the random intercept models failed to show significant added variance (all p > .05). An exception was found with respect to the pathway from collective efficacy before the game to collective efficacy during half-time in Study 2  $(\Delta \chi^2 \ (\Delta df = 2) = 9.05, p < .05)$ . This random slope effect of .08 did not covary significantly with the respective random intercept coefficient (p > .05) and was the only significant random slope detected among all regressions in the four models.

#### 4. Discussion

The present research extended previous research in two ways. First, within a field context, players' team confidence was assessed in a quantitative way, not only before and after the game, but for the first time also during the game. Our findings highlight the dynamic nature of team confidence, demonstrated by the variation of players' team confidence within a single game. This observation contrasts with previous assumptions that team confidence prior to the competition is relatively stable throughout the competition (Myers et al., 2007). Second, we conceptually distinguished between process-oriented collective efficacy and outcome-oriented team outcome confidence and examined their relation with perceived team performance. Our findings provide partial support for the reciprocal relation between players' team confidence (including both team outcome confidence and collective efficacy) and players' perceptions of the team's performance.

Neither within Study 1, nor within Study 2, a significant relation emerged between players' team confidence before the game (both collective efficacy and team outcome confidence) and the team's perceived performance during the first half (H1). With regard to the second half of the game (H2), inconsistent results were found for team outcome confidence; Study 1 revealed that players' team outcome confidence during half-time positively predicted the perceptions of the team's performance during the second half, but this was not confirmed by Study 2. Regarding collective efficacy, both studies provided support for a significant association between players' collective efficacy during half-time and the team's perceived performance during second half. The abovementioned results thus partially confirmed Hypotheses 1 and 2 stating that players' team confidence is a significant predictor of the team's performance in the subsequent half.

Having confidence in the team's abilities to successfully perform the required process (i.e., collective efficacy) was more strongly associated with the team's subsequent performance perceptions than the confidence in winning the game (i.e., team outcome confidence). A plausible underpinning of this finding is the concordance between the measures of team confidence and the way in which performance was measured. As outlined by Myers, et al. (2007), assessments of team confidence in winning the game and performance measured by game outcome). The relation between confidence and performance is expected to be the strongest when the two constructs are not only measured in close temporal proximity, but when they are also concordant (Bandura, 1997).

In our study, the performance was measured by players' subjective perceptions of the overall team performance. By evaluating players' perceptions of the quality of their team's play, the present measure focuses on the process, rather than on the outcome. Therefore, it can be derived that the measure of collective efficacy (representing the confidence in the processes underlying the performance) is more concordant with the performance measure that we used than is the confidence in winning the game. For example, if a team plays against a weakly performing opponent, it is likely that players will not base their performance ratings predominantly on the game outcome, but instead use a process-based evaluation to rate whether their team has played well.

The different findings for the first and second half reflect the inconsistency found in previous literature. Although some studies demonstrated that team confidence judgments taken prior to the competition are predictive of team performance throughout the competition (Chou, Yu, & Chi, 2010; Edmonds et al., 2009; Feltz & Lirgg, 1998; Myers, Paiement, et al., 2004; Myers et al., 2007), other studies did not find such a link (MacLean & Sullivan, 2003; Watson et al., 2001). Chen et al. (2002) conducted both a laboratory study and a field study to test this relation. Although the laboratory study revealed that collective efficacy positively predicted team performance, this relation was not replicated in the field sample. These findings are consistent with previous meta-analytic studies on self-efficacy (Stajkovic & Luthans, 1998), which suggest that efficacy beliefs predict performance more strongly in laboratory settings than in field settings. A plausible rationale for this finding might reside in the situational unpredictability of the surrounding circumstances in field studies, compared to the highly controlled circumstances in laboratory experiments. As Bandura (1997, p. 64) stated "if one does not know what demands must be fulfilled in a given endeavor, one cannot accurately judge whether one has the requisite abilities to perform the task." The fact that the present research includes two field studies may explain why no significant effect was found between players' team confidence before the game and the perceived performance during the first half.

However, it should be considered that players' team confidence before the game is based on general impressions (such as the team's playing level in previous games, the ranking of the opponent, etc.), whereas players' team confidence during half-time is the result of much more concrete experiences during the game (e.g., present-day playing level of the own team and of the opponent). This difference might explain why the team confidence–performance relation was not found for the first half, but did emerge in the second half.

Another plausible reason for this discrepancy in the relation between team confidence and performance relates to the time between the measurements. Previous research (Bandura, 1997; Myers & Feltz, 2007) stated that the relation between team confidence and performance is revealed most accurately when both constructs are measured in close temporal proximity. The time lapse between the measurement of team confidence before the game (i.e., before the warming-up) and the team's perceived performance in the first half allowed for intervening experiences that may have impacted on the team's confidence, such as the pre-game speech of the coach, the team appearance of the opponent during the warming-up, or the cheering of the audience (Ronglan, 2007; Vargas-Tonsing & Bartholomew, 2006). The much smaller time lapse between half-time and the team's performance during second half may have accounted for a more accurate measure of

players' team confidence during half-time, resulting in a significant team confidence– performance relation within the game.

The second aim of our research was to examine whether previous perceptions of the team's performance were a significant predictor of players' team confidence. The present findings provided empirical support for that hypothesis. More specifically, Study 1 and Study 2 demonstrated a significant relation between the perceived team performance during the first half and both types of players' team confidence during half-time (H3). Furthermore, Study 2 added evidence for a significant relation between the perceived team performance during second half and both forms of players' team confidence after the game (H4). These results are consistent with Bandura's theory (1997) that points to prior performance as one of the most important sources of team confidence. Several studies confirmed this statement and revealed that as teams performed better, the more confident they became concerning the abilities of their team (Feltz & Lirgg, 1998; Heuze, Raimbault, & Fontayne, 2006; Myers, Paiement, et al., 2004; Stajkovic et al., 2009; Stanimirovic & Hanrahan, 2004).

Although Myers and Feltz (2007) recommended multilevel modeling as the optimal framework for analyzing collective efficacy data, their meta-analysis demonstrated that previous studies rarely used a multilevel approach. Submitting meaningfully nested observed data to multilevel modeling is seen as the most efficient, most unbiased, and most appropriate way to analyze this type of data (Raudenbush & Bryk, 2002). In contrast to these recommendations, most researchers have focused on either the individuals within groups or the group as a whole, but seldom on both (Moritz & Watson, 1998).

In the present manuscript, the data of both studies were analyzed by a multilevel approach. Our findings revealed that the variance of the measured constructs was explained both at the individual level (i.e., within-team level) and at the team level (i.e., between-team level). The regression weights between the different constructs did *not* vary at team level, indicating that the impact of team confidence on perceived performance and vice versa is similar for every individual player regardless of the team.

The variance of players' perceptions of their team's performance was mainly explained at team level, both for first and second half. With regard to collective efficacy and team outcome confidence, the variance explained at team level decreased with time; although a significant part of the variance of both constructs before the game was explained at team level, during the game the individual perception was the factor that explained most variance. This finding implies that no team effects emerged during the game (e.g., no impact of a motivational speech of the coach directed at the whole team).

Because collective efficacy was originally considered as a group level construct, many studies have used an approach that assesses each player's belief in the team's capabilities as a whole and then aggregates these individual measures to the team level (Myers, Feltz, & Short, 2004; Myers, Paiement, et al., 2004). Although Bandura (2000) assumed that this aggregated collective efficacy estimate is a better predictor of team performance within highly interactive tasks, the present research suggests that, during the game, the focus should be on the individual perceptions of team confidence, rather than on the aggregated team perception.

When interpreting the present findings, it is worth considering the strengths and weaknesses of our study approach. A major strength of this research is that for the first time players' team confidence was assessed not only before and after the game, but also during the game. This in-game measurement allowed us to capture the dynamic nature of players' team confidence within the game. Although Myers et al. (2007) assumed that players' team confidence prior to the competition may be relatively stable during the performance, the moderate correlations between team confidence before, during, and after the game. This finding emphasizes the need to examine team confidence as a dynamic construct instead of as a trait-like characteristic with a strong cross-temporal stability.

A second strength of the present study is that we conceptually distinguished between two forms of team confidence in our two studies; process-oriented collective efficacy and outcome-oriented team outcome confidence. Although most relations were consistent across both forms, an important difference was demonstrated in Study 2; in contrast to team outcome confidence, collective efficacy during half-time was shown to be a significant predictor for the team's performance in the second half. The team's belief in the process (i.e., collective efficacy) is much more controllable than the team's belief to win (i.e., team outcome confidence), which is more susceptible to external factors such as the opponent, dubious referee decisions, or a lucky goal. Given its stronger link with the subsequent team performance, coaches and athlete leaders should primarily focus on enhancing players' collective efficacy, which in turn may foster the team's outcome confidence (Fransen, Coffee, Vanbeselaere, Slater, De Cuyper, & Boen, 2014). In addressing the limitations of the present research, several opportunities for future research emerge. First, although the team's performance was demonstrated to be a significant predictor of players' team confidence, it should be noted that the production of team confidence is an interpersonal process, brought about not only by perceptions of previous performances, but also by persuasive actions of the coach or athlete leaders, by motivational and tactical communication within the team, and by the enthusiasm expressed by the team members (Fransen, Coffee, et al., 2014; Fransen et al., 2012; Ronglan, 2007). Future research may investigate how these behaviors affect players' team confidence within a game and as such the subsequent team performance.

Second, we chose to assess players' subjective perception of the team's performance. Although Raglin and Moran (1988) pointed to the advantages of these subjective measures of performance (e.g., more accurate because they can account for performance indicators that objective measures, such as game outcome, cannot), some limitations should be denoted. Self-serving bias for example can distort these performance perceptions by the need to maintain and enhance self-esteem. In this regard, players are more likely to attribute a winning game to their own abilities (i.e., internal attribution), while blaming a defeat to the circumstances (i.e., external attribution). This self-serving bias would involve that the subjective perceptions of performance represent an overestimation of the actual performance.

Although our subjective measures of performance varied between .45 and 1.22 on a scale from -3 to 3, and as such did not reflect a ceiling effect, examining the in-game relation between team confidence and both subjective and objective measures of performance might be a fruitful line for further research. In this regard, objective performance measures should not only focus on the outcome, but should also include process indicators. Future research could use the recently developed technological devices and mathematical methods to analyze the performance of soccer players (Clemente, Couceiro, Martins, Mendes, & Figueiredo, 2013; Couceiro, Clemente, Martins, & Tenreiro Machado, 2014). Such performance measures can capture both technical and tactical performance, indicated by factors such as ball possession, the covered distance, etc.

Third, constrained by practical feasibility, we included only one measurement point within the game, namely during half-time. Future research may explore the dynamic relation between team confidence and performance even further by including more measurement points within the game. Other team sports that are characterized by multiple breaks within a game, such as volleyball or basketball, might be more appropriate to reach this aim. When aiming for even more dynamic in-game measurements, using continuous observations instead of questionnaires to measure team confidence would be an important step forward to capture the dynamic in-game relation between team confidence and performance (Fransen, Kleinert, et al., 2014).

Fourth, given the time constraints during half-time, it was not possible to administer the full CEQS scale. Instead, we used the short version of the CEQS, which has lower psychometric qualities. However, it should be noted that this questionnaire assesses five specific behaviors that might not capture the key processes underlying the team performance. Therefore, future research should establish whether the same results are observed when using a collective measure that includes the most important game competencies specific for a given sport (e.g., the measures used in Myers, Feltz, et al., 2004; Myers, Paiement, et al., 2004).

Fifth, with regard to the participants in our study, we mainly assessed older youth players. Future research should examine whether our findings can be generalized to other age groups and other competition levels. With regard to age, it is likely that the team confidence of mature players is more stable over time. Furthermore, in high-level teams, the team confidence of the different players within a team could be more homogeneous. A plausible underlying reason for this homogeneity is that in high-level teams the coach is expected to have a higher impact on the players, thereby influencing the team confidence on the team level. Furthermore, high-level players spend more training time together in which the underlying processes for performance are practiced. As such, it is likely that high-level teams share a common confidence in their abilities to perform these processes successfully. As a consequence, we expect that more variance of collective efficacy and team outcome confidence is explained at team level in high-level teams than in low-level teams.

In addition, only soccer players participated in our study. Considering that the outcome in soccer is more unpredictable and susceptible to external factors, such as a lucky goal or a dubious referee decision, it remains to be determined whether our findings apply to other sports as well. For instance, in games such as volleyball and basketball, in which the scoring range is much higher, and as such, the game outcome is more controllable and represents the playing level of both teams better, future research should examine whether team confidence relates similarly to performance in these sports as was the case in soccer.

#### Relation between team confidence and performance

Another fruitful line for future research pertains to the stability of players' team confidence. Although many studies have assessed players' team confidence, the strength of this confidence, or in other words, the stability of this confidence over time, has only rarely been measured. However, considerable individual differences might exist regarding the stability of one's team confidence; some players' team confidence is strong, in the sense that this confidence is able to resist even the strongest pressures to change (such as being behind in the game, a teammate's injury, etc.). On the other hand, if a player's team confidence is unstable and vulnerable to situational pressures, overconfidence at the start of the game might lead to a collapse (both in confidence and performance) if the team is performing worse than expected. Therefore, in line with literature on attitudes (Krosnick & Abelson, 1992), further research could include a measure for the strength or stability of team confidence over time, and investigate the link with performance.

There are a number of practical implications that could be considered by coaches, sport psychologists, and sports teams. First, the only moderate correlations of collective efficacy before, during, and after the game demonstrate that collective efficacy is amenable to change. In this regard, it is important to note that the multilevel analyses of the present study showed that the variance of team confidence during the game is mainly explained at the individual level. Therefore, coaches should strive to enhance each player's team confidence in an individualized way. Based on the present findings, such an individual approach is likely to be more effective than a motivational speech for the whole group.

Second, our findings did not demonstrate a significant relation between players' team confidence before the game and their playing level during first half. In line with the abovementioned comments on team confidence stability, it might be better for coaches to strive for a realistic, but stable team confidence before the game, for instance by strengthening players' confidence in their team's tactical game plan. As such, unrealistic overconfidence at the start of the game can be avoided, thereby reducing the chances on confidence collapses during the game if the team's performance falls short. Because our findings suggest that a players' team confidence during half-time is a positive predictor of the team's performance in the second half, it seems important for coaches to create a team confidence that is not only high, but also stable throughout the game.

Not only coaches, but also athlete leaders within the team play a key role in enhancing the team's confidence and preventing downward efficacy-performance spirals (Lindsley, Brass, & Thomas, 1995). Several studies pointed out that leaders who display confidence are more likely to enhance collective efficacy among their teammates (Fransen et al., 2012; Moritz & Watson, 1998; Vargas-Tonsing et al., 2004; Zaccaro, Rittman, & Marks, 2001). Furthermore, verbal persuasion can be used as an effective form to increase players' team confidence (Vargas-Tonsing et al., 2004). Ronglan (2007) added that team confidence building might be facilitated if key players use their leader status to affect their teammates' confidence positively. As such, an important task for coaches is to make their athlete leaders aware of their potential and responsibility as role models in the team.

In conclusion, the current manuscript provided a deeper insight into the dynamics of the reciprocal relation between team confidence and perceived performance within soccer games. Given the fact that both process-oriented collective efficacy and team outcome confidence are dynamic processes that can be controlled by coach and players, the present findings open new avenues to optimize the team's performance.

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# Part 4

# Athlete Leaders as Key Factors for Optimal Team Functioning

"The leaders who work most effectively, it seems to me, never say 'I'. And that's not because they have trained themselves not to say 'I'. They don't think 'I'. They think 'team'."

~ Peter F. Drucker, 1992 ~

The impact of athlete leaders on team members' team outcome confidence: A test of mediation by team identification and collective efficacy

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## Abstract

Research on the effect of athlete leadership on pre-cursors of team performance such as team confidence is sparse. To explore the underlying mechanisms of how athlete leaders impact their team's confidence, an online survey was completed by 2,867 players and coaches from nine different team sports in Flanders (Belgium). We distinguished between two types of team confidence: collective efficacy, assessed by the CEQS subscales of Effort, Persistence, Preparation, and Unity; and team outcome confidence, measured by the Ability subscale. The results demonstrated that the perceived quality of athlete leaders was positively related to participants' team outcome confidence. The present findings are the first in sport settings to highlight the potential value of collective efficacy and team identification as underlying processes. Because high-quality leaders strengthen team members' identification with the team, the current study also provides initial evidence for the applicability of the identity based leadership approach in sport settings.

*Keywords*: peer leaders, leadership, winning confidence, social identity approach, coaching, sport psychology

#### 1. Introduction

The most talented group of players does not always win a sports game. What matters is how well these players function as a team. In order to optimize this team functioning, effective leadership has been proposed as a crucial determinant (Cotterill, 2013). Although research in sport has typically focused on leadership of the coach (Chelladurai, 2007), recent research has established the importance of high-quality athlete leaders for the effective functioning of sports teams (Price & Weiss, 2011, 2013). In this regard, athletes are an important, but so far underinvestigated, source of leadership within sports teams.

Building upon earlier work (Carron, Hausenblas, & Eys, 2005; Kogler Hill, 2001), Loughead and colleagues (2006) proposed a three-factor classification of athlete leadership functions: (1) task functions, which help the team to achieve its goal (e.g., giving teammates tactical advice); (2) social functions, which foster positive interactions between team members (e.g., caring for a good atmosphere off the field); and (3) external functions, which facilitate communication with people outside the team (e.g., with club management, media, and sponsors). Recently, empirical evidence has been reported for a fourth function, namely the motivational function (Fransen, Vanbeselaere, De Cuyper, Vande Broek, & Boen, 2014). The motivational leader is the best motivator on the field. This leader encourages his/her teammates to do their utmost, and initiates fresh heart into players who are discouraged.

Although previous research on athlete leadership mainly focused on the team captain as the formal leader of the team, recent empirical evidence demonstrated that informal leaders rather than the captain take the lead, both on and off the field (Fransen, Vanbeselaere, et al., 2014). We will therefore focus on the leadership quality of the best athlete leader on each of the four leadership roles instead of investigating the leadership quality of the captain. The task leader and the motivational leader represent on-field leadership roles; the social leader and the external leader represent off-field roles. All these leadership roles can be fulfilled by both formal and informal leaders. The exact descriptions of the four leadership roles (task, motivational, social, and external leader) are presented in Table 1.

**Table 1.** *The definitions of the four leadership roles, as outlined by Fransen and colleagues* (2014).

Leadership role	Definition
Task leader	A task leader is in charge on the field; this person helps the team to focus on our goals and helps in tactical decision-making. Furthermore the task leader gives his/her teammates tactical advice during the game and adjusts them if necessary.
Motivational leader	The motivational leader is the biggest motivator on the field; this person can encourage his/her teammates to go to any extreme; this leader also puts fresh heart into players who are discouraged. In short, this leader steers all the emotions on the field in the right direction in order to perform optimally as a team.
Social leader	The social leader has a leading role besides the field; this person promotes good relations within the team and cares for a good team atmosphere, e.g. in the dressing room, in the cafeteria or on social team activities. Furthermore, this leader helps to deal with conflicts between teammates besides the field. He/She is a good listener and is trusted by his/her teammates.
External leader	The external leader is the link between our team and the people outside; this leader is the representative of our team towards the club management. If communication is needed with media or sponsors, this person will take the lead. This leader will also communicate the guidelines of the club management to the team regarding club activities for sponsoring.

Research has demonstrated that effective leaders can affect team members' team confidence (Bandura, 1997; Hoyt, Murphy, Halverson, & Watson, 2003; Ronglan, 2007; Watson, Chemers, & Preiser, 2001). In turn, higher levels of team confidence have been found to be positively related to several performance-enhancing outcomes: athletes who were more confident in their team's abilities set more challenging goals (Silver & Bufanio, 1996), exerted more effort (Greenlees, Graydon, & Maynard, 1999), and demonstrated higher resilience when facing adversities (Morgan, Fletcher, & Sarkar, 2013). In short, not only did higher team confidence lead to a better team functioning, highly confident teams typically performed better as well (Edmonds, Tenenbaum, Kamata, & Johnson, 2009; Stajkovic, Lee, & Nyberg, 2009). As such, by being able to affect team members' team confidence, athlete leaders hold the key for an optimal team performance.

Recently, two types of team confidence have been distinguished (Collins & Parker, 2010; Fransen, Kleinert, Dithurbide, Vanbeselaere, & Boen, 2014; Myers & Feltz, 2007). The first type of team confidence is termed 'collective efficacy' and is defined as "the group's shared belief in its conjoint capability to organize and execute the courses of action

required to produce given levels of attainment" (Bandura, 1997, p. 477). In other words, this type of confidence comprises athletes' confidence in the abilities of the own team to function effectively (e.g., "I am confident that my team will maintain effective communication during the upcoming game").

The second type of team confidence is termed 'team outcome confidence' and has been defined as "the confidence in the team's abilities to obtain a goal or to win a game" (Fransen, Kleinert, et al., 2014). In contrast to collective efficacy, team outcome confidence does not focus only on athletes' own team, but also on outperforming the opponent (e.g., "I believe that my team will outplay the opposing team"). In work teams, this construct was termed 'team outcome efficacy' (Collins & Parker, 2010), whereas, in sports teams, Myers and Feltz (2007) labeled the confidence in winning (or performing better than the opponent) 'competitive efficacy' or 'comparative efficacy'. However, because this construct is outcome-oriented and does not capture the process-oriented nature of efficacy beliefs as defined by Bandura (1997), we will adopt the term 'team outcome confidence', used by Fransen and colleagues (Fransen, Kleinert, et al., 2014).

It has been demonstrated that athlete leaders influence both types of players' team confidence. On the one hand, athlete leaders have been found to influence players' processoriented collective efficacy (Bandura, 1997; Hoyt et al., 2003; Price & Weiss, 2011; Ronglan, 2007). For example, Watson and colleagues (2001) demonstrated that perceptions of athlete leaders' effectiveness are positively related to players' collective efficacy. On the other hand, only a few studies have revealed a positive relationship between the behavior of athlete leaders and their teammates' team outcome confidence. For example, the confidence expressed by the athlete leaders in the team emerged as the second most important source (out of 40 sources) of players' and coaches' confidence in winning the game (Fransen et al., 2012). Moreover, a study within a basketball setting experimentally confirmed this finding (Fransen, Haslam, et al., 2014). Teams of five basketball players, including one research confederate, participated in a free throw competition. The confederate was perceived as leader of the team and his behavior was manipulated following a standardized script: in half of the teams he had to express high confidence, and in the other half he had to express low confidence. The results revealed that the expression of high confidence by the leader positively affected teammates' confidence in winning the game, while the expression of low confidence negatively affected their outcome confidence.

#### The power of athlete leaders

The current paper attempted to extend the already existing scientific knowledge on athlete leadership in three ways. First, we examined the quality of the four athlete leaders (i.e., the task, motivational, social, and external leader) rather than investigating only the quality of one general leader. Second, we explore the impact of athlete leaders' quality on both types of group members' team confidence; collective efficacy and team outcome confidence. Finally, the present study goes beyond mere description and sought to explain the underlying mechanisms through which these relations occur. Figure 1 presents an overview of the study's hypotheses, which are explained in more detail below.

**Figure 1.** *The hypothesized model of perceived athlete leadership quality, team identification, process-oriented collective efficacy, and outcome-oriented team outcome confidence.* 



First, based on the arguments and evidence presented above, we expect that the perceived quality of the athlete leaders within the team (i.e., task, motivational, social, and external leader) is positively related to players' collective efficacy (Hypothesis 1a) and to players' team outcome confidence (Hypothesis 1b). Second, the few studies that have investigated the two types of team confidence merely focused on the conceptual distinction between them, but not on their interrelationship (Fransen, Kleinert, et al., 2014; Myers & Feltz, 2007). However, based on recent research, we suggest that collective efficacy is a pre-cursor of team outcome confidence. Fransen and colleagues (2012) demonstrated that indicators of collective efficacy (e.g., the confidence in the team's abilities to communicate tactically well and encourage each other) were perceived as the most important sources of team outcome confidence. Further, a recent experimental study in a basketball setting revealed that athlete leader's behavior (i.e., the expression of team outcome confidence (Fransen, Haslam, et al., 2014). In addition, a positive effect on players' performance
emerged. Moreover, Collins and Parker (2010) noted that collective efficacy explains a smaller amount of variance in performance than team outcome confidence does, because collective efficacy relates to processes that are more distinct to performance outcomes. Hypothesis 2 builds upon these relationships in that we expect players' collective efficacy (i.e., confidence in the process) to mediate the relation between players' perceptions of athlete leaders' quality and players' team outcome confidence (i.e., confidence in the outcome).

Third, we also seek to explain the underlying mechanism through which leaders affect the collective efficacy, and in turn, the team outcome confidence of the other team members. In this regard, the recently proposed social identity approach to leadership focuses on team identification as the essential key to influence followers (Haslam, Reicher, & Platow, 2011). Team identification refers to the extent in which we define ourselves in terms of our group membership. It is precisely individuals' internalized sense of a shared identity (their sense of themselves as part of 'us') that "makes group behavior possible" (Steffens et al., 2014; Turner, 1982, p. 21). The social identity approach to leadership encompasses the notion that effective leaders are able to create a shared sense of "we" and "us" within the group; they make different people feel that they are part of the same group, and they clarify their understanding of what the group stands for. In other words, effective leaders strengthen members' identification with the group (Haslam et al., 2011; Steffens et al., 2014). A quote from Drucker (1992, p. 14) nicely illustrates this leadership theory in a sports context: "The leaders who work most effectively, it seems to me, never say 'I'. And that's not because they have trained themselves not to say 'I'. They don't think 'I'. They think 'team'." Although the social identity approach to leadership originated in organizational settings, recent findings in sport settings also demonstrated that effective athlete leaders strengthen their teammates' identification with their team (Steffens et al., 2014). This approach thus offers a promising theoretical framework that underpins our expectation of a positive relation between the perceived quality of athlete leaders and players' identification with their team (Hypothesis 3a).

Furthermore, strong group identification provides the foundation for various individual and group-level outcomes in organizational settings (Haslam, 2004). In this regard, a positive correlation between team identification and collective efficacy has been established in various studies on collective action tendencies (van Zomeren, Leach, & Spears, 2010; van Zomeren, Postmes, & Spears, 2008). Furthermore, Wang and Howell

(2012) demonstrated in an organizational setting that group identification positively affected group members' collective efficacy. In line with the abovementioned findings, we expect that players' identification with their sports team will strengthen their collective efficacy beliefs (Hypothesis 3b).

Building on Hypothesis 3a and Hypothesis 3b, we propose that identification with a sports team will mediate the relation between perceived quality of athlete leadership and players' collective efficacy. The expected mediation of team identification can be underpinned by previous research in organizational settings, showing that team identification mediated the relation between leader's behavior and the team's collective efficacy (Wang & Howell, 2012). Furthermore, a recent experimental study in basketball teams revealed that players' team identification partly mediated the relation between the confidence expressed by the athlete leader and players' collective efficacy (Fransen, Haslam, et al., 2014). However, we expect that, besides strengthening players' team identification, also other mechanisms exist through which athlete leaders can affect their teammates' collective efficacy. In this regard, verbal persuasion and modeling were proposed as likely avenues for leaders' influence on players' collective efficacy (Zaccaro, Rittman, & Marks, 2001). Consequently, we predict that team identification will only partly mediate the relation between perceived quality of athlete leadership and players' collective efficacy. (Hypothesis 3c).

Previous researchers have provided abundant evidence for the influence that coaches have on the mental condition of their athletes. For example, based on a qualitative investigation, Gould and colleagues (2002) concluded that coaches have a crucial influence in the development of psychological characteristics of Olympic champions. Furthermore, the confidence of the coach in the team's abilities was demonstrated to affect athletes' team confidence (Vargas-Tonsing, Myers, & Feltz, 2004) and the team's performance (Chase, Lirgg, & Feltz, 1997). For an optimal team functioning, it is thus not only important to attain and maintain a high team confidence of the players, but also of the coach. To increase the team confidence of the coach, an important role might also be reserved for the athlete leaders.

Therefore, we also examined whether perceptions of the athlete leaders' quality were positively related to coaches' collective efficacy (Hypothesis 1a), and to coaches' team outcome confidence (Hypothesis 1b). Given the fact that the coach can be seen as a member of the in-group (i.e., the sports team), we assume that the same hypotheses will also hold for coaches. More specifically, we expect that the collective efficacy of the coach will mediate the relation between his/her perceived athlete leadership quality and his/her team outcome confidence (Hypothesis 2). In line with the social identity approach for leadership, we expect that the perceived quality of athlete leaders will be positively associated with the identification of the coach with his/her team (Hypothesis 3a). Furthermore, we propose that this strengthened team identification of the coach will be positively related with his/her collective efficacy (Hypothesis 3b). In short, also for coaches, we expect team identification to function as a mediator between perceived athlete leadership quality and collective efficacy (Hypothesis 3c).

# 2. Method

## 2.1 Procedure

Upon a request directed to the Flemish Trainer's School (i.e., the organization responsible for sport-specific education of coaches in Flanders), we obtained access to their database of all licensed coaches in Flanders. We invited 5,535 qualified coaches from nine different team sports (i.e., basketball, volleyball, soccer, handball, netball, hockey, rugby, water polo, and ice hockey) to participate in this study. These coaches were asked to complete a web-based questionnaire and to encourage their players to complete the questionnaire as well. To access participants outside of the Flemish Trainer's School, we also contacted non-qualified coaches and their teams through all the Flemish sport federations. In total, 8,509 players and 7,977 coaches were invited to participate during the last months of the season (i.e. March – May, 2012). The coaches and players who did not respond were sent an email reminder two weeks later. The doctoral research project was approved by the institutional review board and the APA ethical standards were followed in the conduct of the study. No rewards were given for participation, informed consent was obtained from all participants, and anonymity was guaranteed.

## 2.2 Participants

In total, 4,451 participants completed our questionnaire. Our original sample included players (n = 3,193) and coaches (n = 1,258) from 2,366 different teams. It is important to note that participants rated the quality of the athlete leaders in their team. Players who perceived themselves as an athlete leader could exhibit self-perception biases while assessing leader quality (Alicke & Govorun, 2005). Therefore, we included only the

players who did not perceive themselves as a task, motivational, social, or external leader (n = 1,609). The large number of players who perceived themselves as a leader is partly due to the fact that leadership is spread throughout the team and different players within the team occupy the four leadership roles (Fransen, Vanbeselaere, et al., 2014). The 2,867 participants that were used for the present study (i.e., 1,609 players and 1,258 coaches) played in 1,893 different teams. In 68% of these teams, only one player of that specific team participated in our study. In respectively 20% and 7%, two or three players of the same team were included in our sample. As a consequence, the interdependency in the data, due to the nesting of players within teams, is very limited. Considering the small number of athletes per team, multilevel analyses were not possible.

Separate analyses were performed for players and coaches. Participants were from nine team sports in Flanders (Belgium), details of which are displayed in Table 2. Data from this sample have been used in other research (Fransen, Kleinert, et al., 2014; Fransen, Vanbeselaere, et al., 2014); these articles examined different variables and research questions<sup>1</sup>.

	Participants	Level	Team gender	Function	Mean age	Average	
			Men (♂)	Players (P)	(years)	experience	
			Women $(\bigcirc_+)$	Coaches (C)		(years)	
Basketball	1,222 (43%)	18 E (2%)	839 💍 (69%)	814 P (67%)	23.42	13.87	
		220 N (18%)	$383 \circ (31\%)$	408 C (33%)	40.67	1/1 50	
		865 P (71%)	$303 \pm (3170)$	400 C (3370)	40.07	14.57	
		33 RG (3%)					
		28 RC (2%)					
		58 Y (5%)					
Volleyball	818 (29%)	21 E (3%)	327 👌 (40%)	450 P (55%)	23.72	12.98	
		144 N (18%)	491 (60%)	368 C (45%)	43.28	15.56	
		448 P (55%)	+)1 + (00/0)	500 C (4570)			
		106 RG (13%)					
		34 RC (4%)					
		65 Y (8%)					
Soccer	447 (16%)	50 E (11%)	419 👌 (94%)	107 P (24%)	20.81	13.73	
		100 N (22%)	$28 \circ (6\%)$	340 C (76%)	42.53	11.76	
		178 P (40%)	$20 \pm (0/0)$				
		51 RG (11%)					
		11 RC (3%)					
		57 Y (13%)					

 Table 2. Sport specific sample characteristics

<sup>1</sup> The first manuscript (Fransen, Vanbeselaere, et al., 2014) developed a new athlete leadership classification and explored the importance of the team captain as a formal leader. The second manuscript (Fransen, Kleinert, et al., 2014) investigated the validity of previous measures used to assess collective efficacy, thereby distinguishing between collective efficacy and team outcome confidence. Furthermore, a new collective efficacy scale has been developed that provides a first step towards more dynamic measurements of collective efficacy based on observations; the Observational Collective Efficacy Scale for Sports (OCESS).

Handball	85 (3%)	10 E	(12%)	59 👌 (69%)	45 P (53%)	21.87	12.18
		34 N	(40%)	26 ♀ (31%)	40 C (47%)	41.55	15.05
		21 P	(25%)				
		6 RG	(/%)				
Nathall	83 (3%)	14 I 24 F	(1/%) (20%)	13 2 (52%)	50 P (60%)	22 04	15 12
Ivetball	05 (570)	24 L 36 N	(27%)	43 ( (3270)	501 (0070)	22.74	13.12
		3 P	(4%)	40 ♀ (48%)	33 C (40%)	39.00	15.03
		3 RG	(4%)				
		2 RC	(2%)				
		15 Y	(18%)				
Hockey	61 (2%)	9 E	(15%)	33 👌 (54%)	44 P (72%)	24.20	14.82
		32 N	(53%)	28 9 (46%)	17 C (28%)	45.35	10.82
		2 P	(3%)	20 + (10/0)	1, 6 (20,0)		10102
		7 RG	(12%)				
		3 RC	(5%)				
Rughy	57 (2%)	8 I 6 F	(15%) (11%)	19 2 (86%)	33 P (58%)	22.67	3 51
Rugby	57 (270)	27 N	(1170) (47%)	4) (0070)	551 (5670)	22.07	5.51
		4 P	(7%)	8 ♀ (14%)	24 C (42%)	38.25	10.08
		14 RG	(25%)				
		1 RC	(2%)				
		5 Y	(9%)				
Water polo	51 (2%)	9 E	(18%)	46 ♂ (90%)	36 P (71%)	23.58	11.58
		35 N	(69%)	5 <sup>♀</sup> (10%)	15 C (29%)	37.80	13.60
		3 RG	(6%)	- + ()			
		2  RC	(4%)				
Ice bockey	13 (2%)	2 I 12 F	(4%)	10 2 (03%)	30 P (70%)	25.83	13 53
Пестноскеу	43 (270)	12 L 17 N	(20%)	40 ( 9370)	501 (7070)	25.85	15.55
		1 P	(2%)	3 ♀ (7%)	13 C (30%)	44.23	13.31
		10 RC	(23%)				
		3 Y	(7%)				
Total sample	$mnl_{2}$ 2.867	159 E	(6%)	1 855 2 (65%)	1 609 P (56%)	73 33	13 36
rotar sample	2,007	645 N	(23%)	1,055 (0570)	1,0071 (30%)	25.55	15.50
		1,522 P	(53%)	1,012 ♀ (35%)	1,258 C (44%)	41.94	13.97
		223 RG	(8%)				
		91 KC	(5%)				
		227 Y	(8%)				

*Note.* The sample of the players excludes the players who perceived themselves as an athlete leader (task, motivational, social, or external leader). Levels; E, elite level; N, national level; P, provincial level; RG, regional level; RC, recreational level; Y, youth.

# 2.3 Measures

# 2.3.1 Athlete leader identification

The exact descriptions of the four leadership roles, as outlined in previous research (Fransen, Vanbeselaere, et al., 2014) and displayed in Table 1, were presented to the participants. Based on these descriptions, players and coaches were asked to indicate one player in their team who corresponded best to the description of each of the four leadership

functions (i.e., task, motivational, social, and external). If multiple players fulfilled a specific leadership role, participants were asked to indicate the best leader. They could also indicate that a specific leadership role was not present in their team. This type of assessment allowed for the different leadership roles to be held by one player or by different players. In addition, for each of the four different leadership roles, players were asked whether they indicated themselves as a leader.

# 2.3.2 Perceived athlete leadership quality

Next, we assessed the quality of the four athlete leaders, as perceived by players and coaches. The existing leadership research, however, is characterized by different approaches to assess athlete leaders' quality or effectiveness. Price and Weiss (2011) assessed the quality of athlete leadership via perceptions of particular athlete leader characteristics (e.g., being skilled, confident, motivated). Watson and colleagues (2001) used different items to assess the quality of their team captain (e.g., "my captain's behavior is very motivating to me"). Other studies used the Multifactor Leadership Questionnaire (MLQ, Bass & Avolio, 1995), which combines various aspects of transformational and transactional leadership (Paradis & Loughead, 2010; Price & Weiss, 2013). This measurement inconsistency poses serious problems regarding the interpretation of the observed correlates of athlete leaders' quality. A possible alternative was provided by Chemers and colleagues (2000), who used a one-item measure to assess participants' overall leadership ability (i.e., "rate the cadets on their overall potential for military leadership"). Also Tenenbaum and colleagues (2011; 2007) argued for a higher ecological validity of single-item measures.

Likewise, in the present study we chose not to examine particular characteristics or behaviors of the leader, but instead to examine the overall perceived leadership quality of each of the four leaders within the team (task, motivational, social, and external leader) with respect to their specific role. By using a single-item measure, we assessed to which extent the four leaders were perceived to fulfill their specific leadership role well. More specifically, in order to capture players' and coaches' impression of the leadership quality of the task leader (i.e., the player who was indicated as the best task leader in their team), participants completed the item "To what extent do you think that this leader fulfils his/her role as *task leader* well?" on a 7-point Likert scale, ranging from -3 (*very bad*) to 3 (*very good*). Likewise, participants were asked to indicate the perceived quality of the motivational, social, and external leader, with respect to their specific role fulfillment. The

higher participants scored on these scales, the better they perceived the quality of the athlete leaders within their team. Confirmatory factor analyses established that the perceived quality of each of the four different leadership roles contributed to an overall measure of perceived athlete leader quality ( $\chi^2/df = .09$ ; *GFI* = 1.00; *AGFI* = 1.00; *CFI* = 1.00; *RMSEA* < .001).

# 2.3.3 Collective efficacy and team outcome confidence

The Collective Efficacy Questionnaire for Sports (CEQS; Short, Sullivan, & Feltz, 2005) is often used to assess collective efficacy in sports teams and includes five subscales; Ability (e.g., "outplay the opposing team"), Effort (e.g., "play to its capabilities"), Persistence (e.g., "persist when obstacles are present"), Preparation (e.g., "devise a successful strategy"), and Unity (e.g., "be united"). Both for players and coaches each of the items began with the stem "Rate your confidence, in terms of the upcoming game or competition, that your team has the ability to..." The reliability and validity of this measure was demonstrated for players and for coaches, for different sports, for different levels, for different age groups, and for male and female teams (Chou, Yu, & Chi, 2010; Dithurbide, Sullivan, & Chow, 2009; Jowett, Shanmugam, & Caccoulis, 2012; Short et al., 2005).

However, a recent study conducted an exploratory factor analysis on this Collective Efficacy Questionnaire of Sports (Fransen, Kleinert, et al., 2014), thereby detecting two distinct factors: collective efficacy and team outcome confidence. The subscales of Effort, Persistence, Preparation, and Unity were established to be a valid measure of process-oriented collective efficacy, whereas the Ability subscale was demonstrated to be a measure of outcome-oriented team outcome confidence. The present study adopted these measures to assess collective efficacy and team outcome confidence. More specifically, participants rated all items of the CEQS on a 7-point scale, anchored by 1 (*not at all confident*) and 7 (*extremely confident*). The items of the subscales of Effort, Persistence, Preparation, and Unity were combined into a measure for collective efficacy, whereas the items of the Ability subscale were confidence. The higher participants' ratings, the more they were confident in the abilities of their team to complete all required processes successfully or to outplay the opponent.

Confirmatory factor analyses confirmed the psychometric structure of both processoriented collective efficacy (16 items;  $\chi^2/df = 9.47$ ; GFI = .90; AGFI = .87; CFI = .94; RMSEA = .08) and outcome-oriented team confidence (4 items;  $\chi^2/df = 1.60$ ; GFI = 1.00; AGFI = .99; CFI = 1.00; RMSEA = .02). The internal consistency of both the collective efficacy scale (Chronbach's  $\alpha = .95$ ) and the team outcome confidence scale (Chronbach's  $\alpha = .93$ ) was excellent.

#### 2.3.4 Team identification

Based on previous research (Boen, Vanbeselaere, Brebels, Huybens, & Millet, 2007; Doosje, Ellemers, & Spears, 1995) team identification was measured using the same five items for players and coaches; "Being a member of the team is very important for me", "I am very proud to be a member of this team", "I am very happy that I belong to this team", "I feel very connected with this team", and "I identify strongly with this team". This measure was previously used to assess the team identification of 16- to 36-years old elite level volleyball and handball players and was demonstrated to be a highly internally consistent scale (De Backer et al., 2011). Participants assessed these items on a 7-point scale anchored by -3 (*strongly disagree*) and 3 (*strongly agree*). In other words, the higher individuals score on this scale, the more these individuals identify themselves with their team. The internal consistency of this identification scale proved to be excellent (Cronbach's  $\alpha = .88$ ).

# 2.4 Data Analysis

The hypothesized model was tested for both players and coaches through Structural Equation Modeling (SEM) with AMOS. The direct effects of perceived athlete leadership quality on respectively collective efficacy (H1a) and team outcome confidence (H1b) were examined through SEM by including only the variables of interest. Furthermore, to test the mediation effects in this model (H2 and H3), we followed the Structural Equation Modeling (SEM) approach advanced by Holmbeck (1997). Although one might argue that the relations among predictor, mediator, and outcome are not necessarily "causal", the nature of the mediated relation is such that the independent variable influences the mediators were proposed and were each tested separately; collective efficacy as mediator between perceived leadership quality and team outcome confidence (Hypothesis 2) and team identification as mediator between perceived leadership quality and collective efficacy (Hypothesis 3c). SEM is considered as the preferred method to test mediation effects because of the information that it provides on the degree of "fit" for the entire model after controlling for measurement error.

The strategy for testing mediation effects with SEM, recommended by Holmbeck (1997), includes a predictor variable (A), a hypothesized mediator variable (B), and an outcome variable (C). A critical prerequisite for a mediation effect is the significant association between variable A and variable C. Next, also the  $A \rightarrow B$  and  $B \rightarrow C$  path coefficients should all be significant in the directions predicted. The final step is to assess the fit of the  $A \rightarrow B \rightarrow C$  model under two conditions: (a) when the  $A \rightarrow C$  path is constrained to zero, and (b) when the  $A \rightarrow C$  path is not constrained. One then examines whether the second model provides a significant improvement in fit over the first model with a chi-square difference test. If there is a mediation effect, the addition of the  $A \rightarrow C$  path to the constrained model should not improve the fit. In other words, the previously significant  $A \rightarrow C$  path is reduced to non-significance (i.e., it does not improve the fit of the model) when the mediator is taken into account.

#### 3. **Results**

#### **3.1** Descriptive statistics and correlations

Means, standard deviations, Cronbach's  $\alpha$ 's and correlations for the examined variables are provided in Table 3. The data show that, overall, both players and coaches perceive their athlete leaders as good leaders, demonstrated by the relatively high means (M = 1.78 - 1.99; SD = .74 - .93) on a scale from -3 to 3. With regard to the different subscales of the CEQS, the correlation between the Ability subscale and the other four subscales ranged between .53 and .62, whereas the correlations between the subscales Effort, Persistence, Preparation, and Unity ranged between .73 and .81. The lower correlations with the Ability subscale are in line with previous reported correlations between the CEQS subscales by Short and colleagues (2005). After combining the latter four subscales in our measure of process-oriented collective efficacy, a moderate correlation emerged between collective efficacy and team outcome confidence (r = .63 for players; r = .62 for coaches). The fact that both constructs were not highly correlated further corroborates our assumption that these two concepts are related but not the same.

The difference between these concepts was, for instance, manifested in their different correlation with team identification; process-oriented collective efficacy correlated more strongly with team identification (r = .61 for players; r = .55 for coaches) than outcomeoriented team confidence did (r = .39 for players; r = .38 for coaches). Furthermore, it is noteworthy that the perceived quality of the task leader was more strongly correlated with players' and coaches' team identification, their collective efficacy, and their team outcome confidence than the perceived quality of the other leaders.

**Table 3.** Means, standard deviations, correlations and Cronbach's  $\alpha$ 's across all variables for players and coaches.

	Variable		М	SD	1	2	3	4
<b>Players</b> ( <i>n</i> = 1,609)								
1.	Perceived quality athlete leadership	.57	1.84	.67	1	.30	.38	.24
	1a. Task leader		1.78	.93	.78	.25	.34	.25
	1b. Motivational leader		1.90	.74	.73	.17	.29	.23
	1c. Social leader		1.99	.75	.74	.23	.26	.13
	1d. External leader		1.85	.90	.75	.23	.28	.16
2.	Team identification	.93	1.70	1.12	.30	1	.61	.39
3.	Process-oriented collective efficacy	.95	1.20	1.00	.38	.61	1	.63
	3a. Subscale Effort	.84	1.49	1.01	.33	.56	.92	.54
	3b. Subscale Persistence	.84	1.15	1.14	.32	.50	.91	.57
	3c. Subscale Preparation	.84	1.00	1.14	.33	.52	.88	.61
	3d. Subscale Unity	.85	1.18	1.12	.39	.62	.91	.53
4.	Outcome-oriented team confidence	02	1.27	1.25	24	.39	.63	1
	(Subscale Ability)	.)2			.24			
<b>Coaches</b> ( <i>n</i> = 1,258)								
1.	Perceived quality athlete leadership	.76	1.87	.66	1	.31	.46	.26
	1a. Task leader		1.86	.77	.82	.29	.43	.24
	1b. Motivational leader		1.93	.76	.82	.27	.40	.21
	1c. Social leader		1.98	.74	.80	.23	.33	.15
	1d. External leader		1.97	.87	.78	.24	.34	.19
2.	Team identification	.89	1.85	.90	.31	1	.55	.38
3.	Process-oriented collective efficacy	.95	1.49	.89	.46	.55	1	.62
	3a. Subscale Effort	.86	1.68	.91	.41	.51	.92	.53
	3b. Subscale Persistence	.83	1.38	1.02	.39	.47	.91	.57
	3c. Subscale Preparation	.86	1.38	1.04	.39	.49	.90	.62
	3d. Subscale Unity	.83	1.51	.94	.47	.53	.92	.55
4.	Outcome-oriented team confidence	.93	1.45	1.23	.26	.38	.62	1
	(Subscale Ability)							

*Note*. All variables were assessed on a 7pt. Likert scale, ranging from -3 to +3. All correlations were significant at the 0.01 level.

#### **3.2 AMOS Path model**

#### 3.2.1 Players

First, we explored whether the perceived quality of the athlete leaders was positively related with both dimensions of players' team confidence. Our findings support Hypothesis 1a by revealing a significant and substantial path from players' perceived leadership quality to their collective efficacy ( $\beta = .57$ ; p < .001). In addition, Hypothesis 1b was supported by the significant direct path from players' perceived leadership quality to their team outcome confidence ( $\beta = .34$ ; p < .001).

Second, we explored whether players' collective efficacy mediated the relation between players' perceived quality of athlete leadership and their team outcome confidence. Significant direct paths emerged between perceived leadership quality and collective efficacy ( $\beta = .57$ ; p < .001), between collective efficacy and team outcome confidence ( $\beta =$ .64; p < .001), and between perceived leadership quality and team outcome confidence ( $\beta =$ .34; p < .001), supporting the two mediation conditions of Holmbeck (1997). In the third step, we examined the unconstrained model, allowing for a direct regression path between predictor (i.e., perceived leadership quality) and outcome variable (i.e., team outcome confidence). The unconstrained model had a good fit with the data. However, the relation between perceived leadership quality and team outcome confidence was reduced to nonsignificance ( $\beta = .05$ ; p = .53) when the mediator was included. The chi-square difference test between the unconstrained and the constrained model revealed no significant difference between the two models ( $\Delta \chi^2(1) = .40$ ; p = .53), thereby providing support for the constrained model. These findings support Hypothesis 2; players' process-oriented collective efficacy fully mediates the relation between perceived leadership quality and players' outcome-oriented team confidence.

Third, we explored whether team identification mediated the relation between players' perceived quality of leadership and their collective efficacy. Having identified a significant relation between predictor and outcome variable ( $\beta = .57$ ; p < .001), we tested the individual paths between team identification as proposed mediator and both perceived leadership quality and players' collective efficacy. In doing so, the results supported Hypothesis 3a by demonstrating a significant direct path from perceived leadership quality to players' identification with their team ( $\beta = .31$ ; p < .001). In addition, Hypothesis 3b was confirmed by revealing a significant path from players' team identification to their

collective efficacy beliefs ( $\beta = .63$ ; p < .001). The final step to determine whether there is a mediation effect is to assess the fit of the model under two conditions: (a) when the path between perceived leadership quality and collective efficacy is constrained to zero, and (b) when the path between perceived leadership quality and collective efficacy is not constrained. The AMOS maximum likelihood confirmatory path analysis indicated a very good fit of the unconstrained model with the data ( $\chi^2/df = 2.60$ ; GFI = .96; AGFI = .93; CFI = .97; RMSEA = .07). The chi-square difference test between the unconstrained and the constrained model indicated a significant difference between the two models ( $\Delta \chi^2(I) = 43.35$ ; p < .001), which meant that the constrained model was improved by adding the direct path between perceived leadership quality and collective efficacy. These findings support Hypothesis 3c: the relation between players' perceived leadership quality and players' collective efficacy is partly mediated by their team identification.

To build our final model, we explored whether players' collective efficacy mediated the relation between their team identification and their team outcome confidence. First, the results demonstrated a significant relation between predictor (i.e., team identification) and team outcome confidence ( $\beta = .39$ ; p < .001), thereby supporting the first mediation condition. Also the next mediation condition was fulfilled given the significant direct relations between collective efficacy and respectively team identification ( $\beta = 63$ ; p < .001) and team outcome confidence ( $\beta = .64$ ; p < .001). The chi-square difference test between the unconstrained and the constrained model revealed no significant difference between the two models ( $\Delta \chi^2(1) = 1.75$ ; p = .19), indicating that collective efficacy fully mediated the relation between players' team identification and their team outcome confidence. The final model, as shown in Figure 2, provided excellent fit to the data. The standardized regression path coefficients and the proportions explained variance are illustrated in Figure 2. **Figure 2.** The structural model for the players (excluding the leaders) of athlete leadership quality, team identification, collective efficacy and team outcome confidence with the regression coefficients and the proportions explained variance in italic. All coefficients presented are standardized and significant (p < .001). Goodness-of-fit indices were  $\chi^2/df = 2.85$ ; GFI = .95; AGFI = .92; CFI = .96; RMSEA = .07.



# 3.2.2 Coaches

Given previous evidence of the positive impact of coaches' efficacy beliefs on the team's performance (Chase et al., 1997), we also tested the hypothesized model for coaches. In line with Hypothesis 1, coaches' perceived quality of the athlete leaders was positively associated with both dimensions of coaches' team confidence. These findings were supported by the significant direct paths from perceived athlete leadership quality to coaches' team outcome confidence ( $\beta = .25$ ; p < .001) and to coaches' collective efficacy ( $\beta = .57$ ; p < .001). Second, in line with our findings for the players, coaches' collective efficacy fully mediated the relation between coaches' perceived athlete leadership quality and their team outcome confidence, supporting our second hypothesis. Third, our findings demonstrated that coaches' team identification partly mediated the relation between their perceived quality of athlete leadership and their collective efficacy; the constrained model was improved by adding the direct path between perceived leadership quality and collective efficacy ( $\Delta \chi^2(1) = 49.126$ ; p < .001), thereby confirming our third hypothesis. Finally,

coaches' collective efficacy fully mediated the relation between coaches' team identification and their team outcome confidence. As such, the mediation analyses resulted in a similar model for coaches as for players. The final model for coaches including the standardized regression path coefficients and the proportions explained variance is shown in Figure 3, and provides evidence of an excellent fit to the data.

**Figure 3.** The structural model for the coaches including coaches' perceptions of athlete leadership quality, coaches' team identification, their collective efficacy and their team outcome confidence with the regression coefficients and the proportions explained variance in italic. All coefficients presented are standardized and significant (p < .001). Goodness-of-fit indices were:  $\chi^2/df = 2.41$ ; GFI = .95; AGFI = .92; CFI = .97; RMSEA = .07.



## 4. Discussion

The purpose of the current study was to examine whether players' and coaches' perceptions of athlete leaders' quality were positively associated with their team outcome confidence, as well as to test for the mediating roles of team identification and collective efficacy. The results, as represented in Figures 2 and 3, are in accordance with the formulated hypotheses and revealed that the perceived quality of the athlete leaders was positively related to players' and coaches' collective efficacy. This relationship was partially mediated by team identification. Furthermore, process-oriented collective efficacy

fully mediated the relationship between perceived athlete leader quality and team outcome confidence.

The findings contribute to athlete leadership research in sport psychology by indicating that high-quality athlete leaders significantly contribute to their team's collective efficacy (Hypothesis 1a) and their team's outcome confidence (Hypothesis 1b). These results support previous research demonstrating a positive impact of athlete leaders on their teammates' team confidence (Bandura, 1997; Fransen, Haslam, et al., 2014; Fransen et al., 2012; Hoyt et al., 2003; Ronglan, 2007). Furthermore, our results again support the previous finding that the task leader is perceived as the most important leader by players and coaches (Fransen, Vanbeselaere, et al., 2014). Indeed, the strongest correlations were found between the examined outcome variables and the perceived quality of the task leader (compared to motivational, social, or external leader).

Furthermore, collective efficacy was demonstrated to mediate the relationship between perceived athlete leader quality and team outcome confidence (Hypothesis 2). In other words, perceptions of higher athlete leadership quality are linked with sports teams' beliefs that they can be successful, through a strong belief in the processes within the team (i.e., preparation, effort, persistence, and being united as a team). These results corroborate recent experimental findings revealing that collective efficacy is a mediator in the relation between expressed team confidence by the leader and players' team outcome confidence (Fransen, Haslam, et al., 2014).

Finally, team identification partially mediated the relationship between perceived quality of athlete leadership and players' collective efficacy (Hypothesis 3). These findings provide support for the applicability of the identity based leadership approach of Haslam and colleagues (2011) in sport settings by showing that high-quality leaders are indeed able to strengthen their teammates' identification with their team. In turn, a stronger identification with the team enhanced players' and coaches' confidence in realizing the team's outcome goal, through process-oriented collective efficacy beliefs. In short, by strengthening members' identification with their team, athlete leaders can foster their sports team's collective efficacy and in turn members' team outcome confidence.

The three postulated hypotheses were examined not only for players, but also for coaches. The results revealed consistent patterns for all hypotheses across both groups. As such, athlete leaders not only affect their teammates' but also their coach's collective efficacy and team outcome confidence. These heightened efficacy beliefs of the coach

concerning his/her team may in turn positively affect athletes' team confidence (Vargas-Tonsing et al., 2004) and also the team's performance (Chase et al., 1997). Furthermore, as coaches' identification with their team partly mediated the relation between perceived athlete leader quality and coaches' collective efficacy, these findings provide further support that the social identity approach to leadership (Haslam et al., 2011) contributes to our theoretical understanding of leadership in sport settings.

The present study goes beyond mere description and attempts to explain the mechanisms through which predicted relations occur. In doing so, the present findings are the first in sport settings to highlight the potential value of collective efficacy and team identification as processes underlying how athlete leaders impact their teammates' team outcome confidence. Watson and colleagues (2001) pointed out that leaders can initiate upward spirals of high collective efficacy through persuasion, facilitating effective coordination, and modeling confidence and success. The present study adds to this view that athlete leaders can foster their team's collective efficacy by strengthening players' and coaches' identification with their team.

Indeed, the present findings demonstrated that high-quality leaders are able to strengthen members' identification with their team. In this regard, we have highlighted the potential value of the social identity approach to leadership for gaining a greater understanding of leadership processes in sport. Haslam and colleagues (2011) provided more detail on how the effectiveness of leaders is tied to members' identification with the group, thereby proposing four key rules to effective leadership. First, leaders need to be ingroup prototypes (i.e., represent the unique qualities that define the group). Second, they need to be in-group champions (i.e., advance and promote the core interests of the group). Third, leaders need to be entrepreneurs of identity (i.e., bring people together by creating a shared sense of 'us' within the group). And fourth, leaders need to be embedders of identity (i.e., develop structures that facilitate and embed shared understanding, coordination, and success). Future work is required to determine the contribution of each of these identity-based leadership dimensions in sport settings and to indicate how these dimensions can be translated into practice.

The present findings also provided evidence for a positive relation between team identification and significant group-level outcomes such as collective efficacy and team outcome confidence. As outlined by Wang and Howell (2012, p. 780), three arguments underpin these findings. First, individuals who identify with a group are more likely to

attribute positive qualities to the group. As a consequence, they will evaluate their team's capabilities to achieve group tasks more optimistically (Tajfel, 1982). Second, when group members strongly identify with their group, they tend to follow the group norms. As a result, group members may synchronize more effectively because they are able to anticipate each other's behavior and actions. This improved coordination may, in turn, contribute to positive beliefs about the group's abilities to successfully accomplish the processes that may lead to success, and in turn to achieve the group goal. Third, according to the Social Cognitive Theory (Bandura, 1997), group members' collective efficacy beliefs may be threatened by members' negative emotional states. An individual's emotional state, often resulting from feelings of stress, anxiety, or fear of failure, may have a detrimental impact on the performance, especially in sport settings (Jones, 2003). However, a strong identification with the team can serve as a buffer that protects individuals from these negative emotions. A shared team identification can foster a cohesive and trusting team climate in which group members help each other and provide emotional support (Jetten, Haslam, & Haslam, 2012). As such, the counterproductive effect of players' negative emotional state on their collective efficacy will be reduced. A further in-depth investigation of the arguments outlined above is a promising avenue for future research as it would provide more insight in how team identification fosters members' collective efficacy and team outcome confidence.

There are a number of practical implications that could be considered by coaches, sport psychologists, and sports teams. First, coaches would do well to identify the leadership qualities within their team. Previous research (e.g., Fransen, Vanbeselaere, et al., 2014; Loughead et al., 2006) has demonstrated that informal leaders usually take the lead. Looking only at the formal team captain would therefore constrain the potential of good team leadership. The current findings show that guiding and improving the way in which athlete leaders fulfill their leadership role can increase the team's collective efficacy and its team outcome confidence, two factors that are closely linked with performance (Chase et al., 1997; Myers, Feltz, & Short, 2004). Conducting leadership role optimally, could help coaches to guide the development of athlete leaders within the team.

Second, as explained in the preceding theoretical discussion of the study findings, it could be valuable for leaders to strengthen athletes' identification with the team. In order to improve their effectiveness, athlete leaders need not only to 'be one of us' (identity

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prototypicality), but also to 'do it for us' (identity advancement), to 'craft a sense of us' (identity entrepreneurship), and to 'embed a sense of us' (identity impresarioship) (Haslam et al., 2011). In this regard, athlete leaders would do well to understand the values that athletes ascribe to their membership of the sports team, which in turn, will increase leaders' abilities to represent the group and strengthen members' identification with the team. An increased identification with the team has been found to reduce social loafing and to enhance team performance (Hoigaard, Boen, De Cuyper, & Peters, 2013).

Third, the findings revealed that process-oriented collective efficacy and outcomeoriented team outcome confidence are different concepts, and additionally, that collective efficacy may impact upon team outcome confidence. The team's belief to realize its outcome goal (i.e., team outcome confidence) is less controllable given its susceptibility to external factors such as the opponents, the referee, or a lucky goal. On the other hand, the team's belief in the process (i.e., Effort, Preparation, Persistence, and Unity) is more controllable than the outcome, and the present study suggests that this controllable processoriented collective efficacy may enhance the less controllable outcome-oriented team confidence. Based on this evidence, coaches and athlete leaders in sports teams should primarily focus on enhancing (controllable) collective efficacy processes, which in turn may foster the team's outcome confidence.

When interpreting the findings of the current study, it is worth considering the strengths and weaknesses of the approach. A major strength of this study is the large sample size including male and female athletes and coaches across diverse team sports and levels of competition. The consistency in the relations demonstrated for both players and coaches testifies to the reliability and generalizability of the study's findings. Furthermore, the study goes beyond mere description and attempts to explain the mechanisms through which the predicted relations occur. In doing so, we have highlighted the potential value of the social identity approach to leadership for gaining a greater understanding of leadership processes in sport.

Notwithstanding these strengths, it should be noted that the current study included individual players and coaches rather than complete teams. Because the 2,867 participants were active in 1,893 different teams, it was not possible for the present study to account for the nested structure in the data. However, from a research perspective, it is clear that further investigation at the team level is warranted because the variables of interest (e.g., team identification, collective efficacy, team outcome confidence) possibly exhibit a significant

degree of intra-group consensus within sports teams. In terms of the design, a crosssectional approach was adopted, limiting our ability to infer causality from the results. A recent experimental study confirmed the impact of athlete leaders on players' team outcome confidence, and provided support for the mediating role of collective efficacy and team identification (Fransen, Haslam, et al., 2014). Hence, future research may explore these relations across a season or during a game to establish how these relations change over time. With regard to the measurement, we opted in favor of a one-item measure assessing the quality with which athlete leaders fulfilled their specific leadership role. Both players and coaches perceived their leaders on average as good leaders. A possible ceiling effect, due to the selection of good leaders, might have led to an underestimation of the strength of the relations in our model. Therefore, future research may further investigate which behaviors or characteristics are most decisive in determining perceptions of athlete leaders' quality. As such, more specific guidelines for coaching workshops could be developed.

In conclusion, the current study has provided initial evidence for the importance of perceived quality of athlete leaders in order to optimize teams' collective efficacy and team outcome confidence. Athlete leaders who are perceived to fulfill their leadership role well, together with a focus on the more controllable collective efficacy beliefs, are likely to strengthen players' and coaches' team outcome confidence. Moreover, team identification provides a mechanism through which leaders are able to foster pertinent group-level outcomes such as collective efficacy. Consequently, based on the current findings, the social identity approach to leadership offers a promising theoretical framework to extend our knowledge of leadership in sporting contexts. Having high-quality athlete leaders within the team fosters players' and coaches' team identification and team confidence, which in turn may lead to a better team performance.

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Believing in 'us': Exploring leaders' capacity to enhance team confidence and performance by building a sense of shared social identity

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# Abstract

The present study examined the impact of athlete leaders' perceived confidence on their teammates' confidence and performance. Male basketball players (N = 102) participated in groups of four. To manipulate leaders' team confidence, the appointed athlete leader of each newly formed basketball team (a confederate) expressed either high or low team confidence. The results revealed an effect of team confidence contagion such that team members had greater team confidence when the leader expressed high (rather than low) confidence in the team's success. Second, the present study sought to explain the mechanisms through which this contagion occurs. In line with the social identity approach to leadership, structural equation modeling demonstrated that this effect was partially mediated by team members' increased team identification. Third, findings indicated that when leaders expressed high team confidence, team members' performance increased during the test, but when leaders expressed low confidence, team members' performance decreased. Athlete leaders thus have the capacity to shape team members' confidence-and hence their performance—in both positive and negative ways. In particular, by showing that they believe in 'our team', leaders are able not only to make 'us' a psychological reality, but also to transform 'us' into an effective operational unit.

*Keywords*: athlete leaders, collective efficacy, team identification, social identity approach, coaching, sport psychology

#### 1. Introduction

Leaders in fields ranging from sports, politics, to business, acknowledge that, in order to succeed, they have to strengthen team members' confidence in the capabilities of their team. Joe Paterno for instance, a successful American college football coach, highlighted the importance of team confidence by stating: "When a team outgrows individual performance and learns team confidence, excellence becomes a reality" (Benson, 2008, p. 199). Yet, the question remains as to *how* leaders inspire such confidence among team members. Is confidence a bug that followers catch from the leader? In other words, is the confidence of leaders contagious such that team members will mimic the level of confidence that the leader displays? Or, can this process instead be explained by the ways in which leaders' activities serve to strengthen team members' attachment to, and belief in, the *team*? These are the questions that the present paper addresses.

Prior research has paid attention to the ways in which leaders' mood has an impact on the mood of followers (Avey, Avolio, & Luthans, 2011; Bono & Ilies, 2006; Johnson, 2009; Sy, Cote, & Saavedra, 2005). This transfer of moods can be seen as a form of contagion, which has been defined as the tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another person and, consequently, to converge emotionally (Hatfield, Cacioppo, & Rapson, 1994, p. 5). Furthermore, research attention has been devoted to examining the impact of leaders' selfconfidence on followers' performance (De Cremer & van Knippenberg, 2004; De Cremer & Wubben, 2010). However, little research has examined the role of leaders' expression of confidence in the *team* as a whole and, more specifically, whether (and how) this expressed leader confidence can influence followers' shared belief in the team's future success. In addition, little research attention has been devoted to studying the impact of leaders' expression of team confidence on members' actual performance.

## 1.1 Leaders' Confidence as a Means of Enhancing Perceived Effectiveness

Theory and research on positive psychological capital and transformational leadership suggest that a critical component of leaders' effectiveness derives from their positive psychological capital—that is, their "positive appraisal and belief in the situation, and available and/or potential psychological resources that can be used to attain success" (Norman, Avolio, & Luthans, 2010, p. 351). Along these lines, it has been argued that

leaders' success in galvanizing followers' energies is dependent on the degree to which they possess and express positivity in the form of hope, resilience, efficacy, and optimism (e.g., see Avolio & Gardner, 2005; Youssef & Luthans, 2007). For instance, Bono and Ilies (2006) found that leaders' positive emotional expressions determined followers' perceptions of leaders' effectiveness (see also Walter & Bruch, 2009). In addition, leaders' displays of positivity have also been found to enhance team members' trust in leaders (Norman et al., 2010).

These insights from previous research pertain primarily to leaders' impact on team members' evaluations of leaders' effectiveness. However, leaders' impact on team members' own confidence and their capacity to perform has been largely ignored. To address these issues in more detail and to examine whether and how a leader's confidence in the *team* can impact followers, we now turn to an approach that places the meaning of the group for followers at the center of its analysis: the social identity approach to leadership.

# 1.2 Leaders' Confidence in the Team as a Means of Strengthening a Sense of 'Us'

The social identity approach is a psychological meta-theory that encompasses the principles and assumptions articulated within social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Haslam, 2004; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). This approach asserts that people's sense of self can be defined in terms of both their personal identity (i.e., their sense of themselves as unique individuals) and their social identity (i.e., their sense of themselves as group members who share goals, values, and interests with others). In other words, the psychology and behavior of team members is shaped not only by their capacity to think, feel, and behave as individuals (as 'I' and 'me'), but also—and often more importantly— by their sense of themselves as group members (as 'we' and 'us'; Haslam, 2001; Postmes & Branscombe, 2010; Tajfel & Turner, 1979; Turner et al., 1987).

In its more recent application to leadership, it has been argued that leaders are able to exert influence on team members (i.e., making them want to contribute to the achievement of shared goals) to the extent that they manage—that is create, embody, advance, and embed—a collective sense of 'us' (Ellemers, De Gilder, & Haslam, 2004; Haslam, Reicher, & Platow, 2011; Hogg, 2001; Reicher, Haslam, & Hopkins, 2005; Steffens, Haslam, & Reicher, 2014; Steffens, Haslam, Reicher, et al., 2014; Turner & Haslam, 2001; van Knippenberg & Hogg, 2003). In this way, the social identity approach points to particular social psychological mechanisms through which the leader's confidence transfers to that of other team members. More specifically, leaders' confidence should transfer to followers not through a mystical process of contagion (Reicher, 1987), but rather by means of group processes that strengthen team members' collective sense of 'us', as manifested by their increased social identification with the team (i.e., the extent to which the group is valued and self-involving; Haslam, 2004). Therefore, we expect that leaders' confidence in the collective should be capable of shaping team members' confidence in ways that lead those team members to identify with, and internalize, a shared group membership.

# **1.3** Leaders' Confidence in the Team as a Means of Strengthening a Sense of "Yes, we can!"

Previous literature demonstrated that the more confident team members were in their team's abilities, the more challenging goals they set, the more effort they exerted, the longer they persisted when facing adversity, and ultimately, the better they performed (Greenlees, Graydon, & Maynard, 1999; Silver & Bufanio, 1996; Stajkovic, Lee, & Nyberg, 2009). Bandura (1997, p. 477) termed this confidence 'collective efficacy' and defined it as "the group's shared belief in its conjoint capability to organize and execute the courses of action required to produce given levels of attainment."

Collins and Parker (2010) identified two kinds of collective efficacy; 'team process efficacy' and 'team outcome efficacy'. Team process efficacy pertains to the team's confidence in their ability to work collectively, whereas team outcome efficacy refers to the team's belief in achieving the team goals. In sports, this outcome-oriented confidence in winning or performing better than the opponent has also been termed 'competitive efficacy' or 'comparative efficacy' (Myers & Feltz, 2007). However, because this outcome-oriented measure is not congruent with the process-oriented nature of collective efficacy as defined by Bandura (1997), this measure has recently been labeled 'team outcome confidence' (Fransen, Kleinert, Dithurbide, Vanbeselaere, & Boen, 2014). We will adopt this recent conceptualization in the current research and therefore distinguish between 'process-oriented collective efficacy' and 'outcome-oriented team outcome confidence'.

Leaders' expressed team confidence may not only influence team members' social identification with the team, but also strengthen team members' confidence to successfully

perform the team-oriented behaviors that are needed to achieve collective success. More specifically, a leader's expressed confidence is likely to enhance team members' confidence in the team's abilities to communicate effectively with each other, cheer each other up following failure, and react enthusiastically following successful activities (i.e., enhance process-oriented collective efficacy; Fransen, Kleinert, et al., 2014). Consistent with these ideas, previous research suggests that the more team members perceive athlete leaders to be of high quality (such that they act as a task leader, a motivational leader, a social leader, and an external leader), the more confidence; Fransen, Coffee, et al., 2014). This process was found to be mediated by members' process-oriented collective efficacy. In other words, perceptions of higher athlete leadership quality are linked to a team's belief that it can be successful, through a strong belief in the processes within the team. Building on and extending this research, we suggest that leaders' team confidence to the extent that leaders' behavior enhances members' identification with the team.

# **1.4 Leaders' Confidence in the Team as a Means of Enhancing Team Members' Performance**

Increased confidence of team members in their potential to succeed as a team is likely to increase those members' internalization of the group's goals as well as their motivation to exert effort on behalf of the team, thereby ultimately enhancing their performance (Haslam, Powell, & Turner, 2000). Several studies have confirmed these predictions by demonstrating that the higher team members' confidence in the team and the stronger their identification with the team, the better they perform (Fransen, Decroos, et al., 2014; Solansky, 2011; Stajkovic et al., 2009). Based on the above reasoning, we expect that, by expressing team confidence, the leader has a positive impact on team members' identification with the team and their team confidence, and that this in turn enhances team members' performance.

In this regard, the Pygmalion and the Golem effect (i.e., two special cases of selffulfilling prophecies) might further contribute to the impact of the leader's confidence on team members' performance. The Pygmalion effect refers to a phenomenon where the more that is expected from people, the better they perform. The opposite effect is termed the Golem effect, where low expectations lead to reduced performance. Although meta-analyses within both educational and organizational settings provide support for Pygmalion and Golem effects (e.g., see Kierein & Gold, 2000), results in sport settings are more ambiguous. Moreover, the nature of the psychological mechanisms that underlie these various outcomes is poorly understood (Rejeski, Darracott, & Hutslar, 1979; Siekanska, Blecharz, & Wojtowicz, 2013; Solomon, Golden, Ciapponi, & Martin, 1998). In particular, this is because it seems that inflated expectations of performance potential can create stress for an athlete, and, as a result, have a *negative* impact on actual performance outcomes. Nevertheless, to date, research on the Pygmalion and Golem effects in sport settings is limited and has focused only on the impact of a coach. As a result it is also unclear whether Pygmalion and Golem effects also hold for athlete leaders when they try to shape the performance of those they lead. In other words, is it the case that team members live up to the expectations set by their athlete leaders by performing better (or worse) when their athlete leaders express high (or low) team confidence?

# **1.5 The Present Research**

Consistent with the ideas outlined above, the present study tests the core proposition that leaders are capable of transferring their own confidence to other team members and that this increased confidence translates into improved performance. Rather than assuming that expressions of confidence by the leader will automatically affect followers (as was suggested by the more classical theories on contagion; for a critique, see Reicher, 1987), the present research also aims to shed light on the underlying mechanisms of so-called contagion effects by looking at the role of potentially relevant social psychological processes—in particular, members' social identification with the team. More specifically, the study tests the following hypotheses:

- H1: Perceptions of team leader's confidence in the team will transfer to members' confidence in the team's ability to succeed. In this way, when the leader is perceived to express high (rather than low) team confidence, members will (H1a) feel more confident about their team's success themselves, and (H1b) will perceive other members to be more confident too.
- H2: The team leader will have a stronger impact on team members' confidence than other team members (in both positive and negative directions).
- H3: The effect predicted under H1a (i.e., confidence contagion) will be mediated by (H3a) team identification and (H3b) collective efficacy. That is, when the leader is perceived

to express high (rather than low) confidence in the team, this will increase members' identification with the team, which in turn will enhance those members' team confidence (H3a). Furthermore, when the leader is perceived to express high (rather than low) confidence in the team, this will enhance members' confidence in the processes within a team (i.e., collective efficacy), which in turn will make team members more confident about their team's ability to succeed (H3b).

H4: Team leader's perceived confidence in the team will affect team members' performance over time such that team members' performance will increase when the leader is perceived to express high confidence in the team's ability to succeed. In contrast, team members' performance is expected to decrease when the leader is perceived to express low team confidence.

# 2. Method

#### 2.1 Procedure

We contacted the presidents of 47 Flemish basketball clubs, inviting their players to participate in our experiment. Seven clubs agreed to participate. Informed consent was obtained from all participants. A reward (basketball shirts signed by elite players) was offered to the team that ended up winning the shooting contest. All participants were guaranteed full confidentiality. After the experiment, participants were informed about the aim of the experiment and the outcome of the shooting contest.

## 2.2 Participants

Participants were 104 Flemish basketball players, on average 14.6 years old (SD = 1.3) with 6.3 years of experience as basketball player (SD = 2.7). Two players were excluded from analysis because their intellectual disabilities hindered an adequate understanding of the questionnaire (i.e., they did not understand the purpose of the questions despite further explanations by the experimenter). Twenty-six participants played on national level in their club, the remaining players played on provincial level. Participants were divided into 26 groups of four. In order to rule out prior familiarity between participants, each group consisted of players from different club teams in the included age range (12 - 17 years old).

#### 2.3 Experimental Design

Each experimental session lasted about 40 minutes and took place on one half of a basketball court. Each team of four players was complemented by a confederate (hereafter termed 'team leader'), introduced as captain of the team, and unknown to the other players. Two confederates of the same age and with similar basketball skills functioned alternately as team leader, randomly appointed to a team, but in such a way that both confederates participated equally in the two test conditions. The results of the present study were similar for both confederates. To enhance the external validity of these newly-assembled teams, we facilitated team identification by giving all players identical basketball shirts. Furthermore, the team participated in a short quiz about technical and tactical basketball knowledge, in which they had to discuss as a team to find the answers.

The cover story was that each team was participating in a national free throw shooting contest. As a team, participants had to aim for the highest team score (i.e., a sum of the individual scores). A pilot study revealed that this cover story was very convincing, and, as a consequence, made the participants eager to obtain a high team score and to win the competition against the other participating teams. Both the warm-up and the test condition followed the same procedure: each player took two free throws after each other, followed by the next player, until all players had taken 10 free throws. To control for possible influence of the performance of the team leader, our confederates had to score 5 out of 10 free throws during the test session, both in the high- and in the low-confidence test condition. Because both confederates were very skilled basketball players, whose scoring ability considerably exceeded 50%, they were able to manage the number of scored shots (by deliberately missing free throws if needed).

In order to ensure that participants perceived the confederate as leader of their team, we introduced him as team captain. Furthermore, based on suggestions of previous literature (Glenn & Horn, 1993; Price & Weiss, 2011), our confederate was on average six years older than the other team members and had greater basketball experience and competence. Because our confederate knew the correct answers to the quiz questions, he was able to affirm his leader status even further.

Furthermore, we manipulated the level of team confidence expressed by the team leader. More specifically, during the test session, the team leader clearly expressed high team confidence in half of the teams (n = 13; randomly selected) and low team confidence

in the other half. To determine the behaviors and actions that indicate high team confidence, we relied on the sources of team confidence identified by Fransen and colleagues (2012). To standardize this manipulation, we developed a detailed script with all the actions (and their frequency) that the team leader had to perform. For instance, the script for the high-confidence condition prescribed that the team leader encourages his teammates, communicates his confidence in outplaying the opponent, reacts enthusiastically when his team scored, and displays confident body language. The prescribed behavior and communications were outlined by standardized phrases, such as "Great play team! If we keep playing like this, we will easily outscore the other team!"

In the other half of the teams (n = 13), the team leader clearly expressed low team confidence. Here again a detailed script was elaborated based on established sources of low confidence (Fransen et al., 2012). In these teams, the team leader was, among other things, recommended to react angrily and in a frustrated manner when teammates missed a free throw, to make demoralizing comments, and to express a discouraged body language. This expression of low confidence was outlined by standardized phrases such as "This situation is really getting desperate. If we keep playing like this, we will never win this contest. Do we really have to keep on playing?"

#### 2.4 Measures

A two-page questionnaire was completed after the warm-up session and after the test session. The following measures were included.

## 2.4.1 Manipulation check

#### Perceived leader status

The effect of instilling the team leader's status as 'leader of the team' was assessed by means of the item "To what extent do you perceive each of your teammates to be a leader of your team?" Participants answered this item before the start of the test session for each of their teammates on a scale from -3 (*not at all*) to 3 (*completely*). The team leader's score was compared with the leader status of the other players in order to obtain a manipulation check for the perceived leader status of the appointed team leader.
## Perceived leader's team confidence

To check whether the difference in the team leaders' expressed team confidence (high versus low) was detected by the other players, participants responded to the item "To what extent does each of your teammates believe that your team will win the free throw competition?" Participants answered this question after the warm-up and after the test session for each of their teammates on a scale from -3 (*not at all*) to 3 (*completely*).

#### 2.4.2 Relative impact of the leader on team confidence contagion

To examine the influence of the leader on the confidence of his teammates relative to the influence of the other players, participants responded after the test to the item "To what extent did the behavior of each of your teammates affect your confidence that your team will lose/win the free throw contest?" on a scale ranging from -3 (*his behavior made me strongly confident of losing*) to 3 (*his behavior made me strongly confident of winning*).

## 2.4.3 Process-oriented collective efficacy

Process-oriented collective efficacy was measured after the test using the five-item Observational Collective Efficacy Scale for Sports (OCESS; Fransen, Kleinert, et al., 2014). Previous research stresses that, even though collective efficacy is defined as a shared belief, it still reflects individuals' perceptions of the team's capabilities, and therefore should be measured by asking athletes to assess their own confidence in the team's capabilities (Myers & Feltz, 2007). In line with these recommendations, all items in the OCESS focus on the individuals' confidence in the team's abilities. A sample item is "Rate your confidence, in terms of the upcoming contest, that your team has the ability to encourage each other during the contest". Participants responded to the items on 7-point scales anchored by 1 (*not at all confident*) and 7 (*extremely confident*). Confirmatory factor analysis confirmed the psychometric structure of this 5-item scale ( $\chi^2 = 4.20$ ; df = 3; p = .24; CFI = 1.00; TLI = .99; *RMSEA* = .063; *pclose* = .34). The internal consistency of this scale was excellent ( $\alpha = .93$ ).

#### 2.4.4 Team outcome confidence

In accordance with previous literature (Fransen, Kleinert, et al., 2014) outcomeoriented team confidence was measured after the test by the item "Our team believes that we are going to win this free throw contest", scored on a scale anchored by -3 (*strongly disagree*) and 3 (*strongly agree*).

#### 2.4.5 Team identification

Based on previous research (Boen, Vanbeselaere, Brebels, Huybens, & Millet, 2007; Doosje, Ellemers, & Spears, 1995) team identification was measured using three items; "I feel very connected with this team", "Being a member of the team is very important for me", and "I am very happy that I belong to this team". Participants responded to these items after the test on a 7-point scale anchored by -3 (*strongly disagree*) and 3 (*strongly agree*). As in previous research, these items formed a highly reliable scale ( $\alpha = .95$ ). In addition, confirmatory factor analysis confirmed the structure of the present scale ( $\chi^2 < .001$ ; df = 0; p< .001; CFI = 1.00; TLI = 1; *RMSEA* < .001; *pclose* = 1.00).

## 2.4.6 Performance

An objective measure of team performance was used by registering the number of free throws scored by every player. This resulted in a score between 0 and 10 for both the warm-up and the test session.

## 2.5 Data Analysis

We used the Shapiro-Wilk Test (Razali & Wah, 2011) to assess whether the distribution of our data deviated significantly from the normal distribution. Because the data were not normally distributed, the Wilcoxon Signed Rank Test was used as a non-parametric alternative for the Dependent *t*-test, the Mann-Whitney U-Test was used as a non-parametric alternative for the Independent *t*-test, and the Aligned Friedman Rank Test was used as a non-parametric alternative for the Repeated Measures ANOVA.

Furthermore, because the individual players are nested within teams, a multilevel approach would provide the optimal framework for data analysis. However, the rule of thumb proposed by Hox (2002) and Kreft (1996) suggests that multilevel analyses should only be performed when there are at least 30 groups and 30 persons in each group (or 100 groups and 10 persons in each group). In the present case, the small number of players within each team (n = 4) thus made it inappropriate to perform multilevel analyses.

#### 3. Results

### 3.1 Manipulation Check

### 3.1.1 Perceived leader status

On average, the appointed team leader was clearly perceived to be the player who had the highest leader status in the team (M = 2.11; SD = .72). With the appointed team leader excluded, the average leader status of the best leader in the team was 1.69 (SD = .62). A Shapiro-Wilk Test (Razali & Wah, 2011) revealed that the distribution of the leader status of both the team leader and the other players deviated significantly from the normal distribution (p < .001). Therefore, the non-parametric Wilcoxon Signed Rank Test was used and confirmed that the team leader was perceived to have significantly greater leader status than all other players (p < .001).

## 3.1.2 Perceived leader's team confidence

Table 1 provides details of the extent to which players perceived each of their teammates (including the team leader) to believe that their team was going to win the competition (i.e., expressing team outcome confidence).

**Table 1.** *Perceived confidence expressed by both team leader and other players, as well as own team outcome confidence in the warm-up and both high- and low-confidence test conditions (standard deviations between parantheses)* 

	Perceived team confidence of the Own team outcome				
	Team leader	Other players	confidence		
High-confidence test condition					
After warm-up	1.18 (1.21)	0.92 (1.25)	0.82 (1.52)		
After test (high confident leader)	1.78 (1.38)	0.99 (1.43)	1.14 (1.44)		
Low-confidence test condition					
After warm-up	1.52 (1.34)	1.01 (1.43)	1.14 (1.31)		
After test (low confident leader)	-0.63 (1.82)	0.17 (1.61)	-0.39 (1.78)		

*Note*. The perceived team confidence was rated on a scale from -3 to 3.

The Shapiro-Wilk Test indicated that the distribution of these variables deviated significantly from the normal distribution (p < .01). The Mann-Whitney U-Test revealed no significant difference between the perceived team confidence expressed by the leader during

the warm-up in both test conditions (p = .09), indicating a successful standardization of leader behavior across the test conditions. Furthermore, the Wilcoxon Signed Rank Test revealed that, in the high-confidence condition, the team leader was perceived to express significantly more team confidence than other players (p < .001). In the low-confidence condition, the players perceived their team leader to express significantly less team confidence than their teammates (p = .001). Moreover, when we compared the team confidence expressed by the team leader during the test with the leader's expressed confidence during the warm-up, the Wilcoxon Signed Rank Test revealed a significant increase in the high-confidence test condition (p < .001) and a significant decrease in the low-confidence test condition (p < .001). These findings confirm that the manipulation of the expressed confidence of the team leader (high versus low) was successful.

#### 3.2 Team Leader's Perceived Influence on Team Members' Confidence

Table 1 displays players' own team outcome confidence as well as their perceptions of teammates' team outcome confidence for the warm-up and both test conditions. The distribution of the data for both constructs deviated significantly from the normal distribution (p < .01), as indicated by a Shapiro-Wilk Test. The contagion of leaders' expressed confidence to team members' confidence manifested itself in two ways.

First, a Mann-Withney U-Test revealed a significant difference (p < .001) regarding members' perceptions of their own team confidence (thereby confirming H1a); when the leader was perceived to express high confidence, players were more confident in the team's success (M = 1.14) than when the leader was perceived to express low confidence (M = -.39). To obtain greater insight into the difference between the positive and negative condition, we compared players' team confidence after the test session with their confidence after the warm-up (i.e., when the leader acted in a neutral fashion). For this purpose, we used the Aligned Friedman Rank Test as a non-parametric alternative for a Repeated Measures ANOVA, following the procedure recommended by Beasley and Zumbo (2003). Time was used as within-subjects repeated measure (warm-up versus test session) and the perceived confidence expressed by the appointed team leader (high versus low) served as a between-subjects variable. The results revealed a significant interaction effect (F(1,100) =35.14; p < .001) which is presented graphically in Figure 1. Furthermore, one-tailed Wilcoxon Signed Rank Tests revealed that the simple effects for both positive and negative test conditions were significant. More specifically, when the leader expressed high team confidence, team members' team confidence significantly increased relative to the warm-up (p < .05). In contrast, when the leader expressed low team confidence, team members' team confidence significantly decreased over time (p < .001).

**Figure 1.** *Team confidence of the team members after the warm-up and after the test session for both high- and low-confidence test conditions.* 



Second, a significant difference (p < .01) emerged regarding members' perceptions of their teammates' team confidence (thereby supporting H1b); when the leader was perceived to express high confidence, players perceived their teammates (with exception of the leader) to be more confident in the team's success (M = .99) than when the leader was perceived to express low confidence (M = .17). To compare the perceived team confidence of the teammates after the test session with their perceived team confidence after the warmup, we performed an Aligned Friedman Rank Test. Here, as with participants' own confidence in the team (discussed above) there was a significant interaction effect for the perceived team confidence of other team members (F(1,100) = 26.34; p < .001). One-tailed Wilcoxon Signed Rank Tests again provided insight into the simple effects here. For the positive test condition, the perceived team confidence of teammates was higher after the test session than after the warm-up, but this difference was not significant (p = .13). For the negative test condition the perceived team confidence of the teammates after the test session was significantly lower than after the warm-up (p < .001). In conclusion, when the leader was perceived to express high (rather than low) team confidence, members not only felt more confident about their team's success themselves (H1a), but also perceived their team members to be more confident too (H1b).

## 3.3 Relative Impact of the Leader on Team Confidence Contagion

To explore these dynamics further, we compared the perceived impact of the leader on players' team confidence with the perceived impact of the other players. The Shapiro-Wilk Test indicated that the distribution of the perceived impact of the leader deviated significantly from the normal distribution (p < .001). The Wilcoxon Signed Rank Test revealed that, if the leader was perceived to express high confidence, players perceived the impact of the leader (M = 1.55; SD = 1.05) as significantly more positive (p < .001) than the impact of the other players (M = .95; SD = 1.18). In contrast, if the leader was perceived to express low confidence, his impact (M = ..75; SD = 1.74) was perceived as significantly more negative (p < .001) than the impact of the other players (M = .18; SD = 1.36). The team leader was thus perceived to have a greater impact on members' team confidence than the other team members, both in positive and negative directions, thereby confirming H2.

## 3.4 Mediating Role of Team Identification and Collective Efficacy

The mediation model posited under H3, including the hypothesized mediating effects of both team identification (H3a) and collective efficacy (H3b), was tested by performing a Confirmatory Factor Analysis (CFA) using STATA. To test the mediation effects in this model, we followed Holmbeck's (1997) Structural Equation Modeling (SEM) approach. SEM is the preferred method for testing mediation effects as a result of the information it provides concerning the degree of "fit" for the entire model after controlling for measurement error. Table 2 includes the descriptive statistics and correlations between all variables included in the hypothesized model.

**Table 2.** Means, standard deviations, and correlations between all variables included in the hypothesized model

	М	SD	1	2	3	4
1. Perceived team confidence expressed by the team leader	.58	2.01	1	.63**	.72**	.68**
2. Team identification	1.29	1.35		1	.76 <sup>**</sup>	.63**
3. Process-oriented collective efficacy	1.06	1.41			1	.72**
4. Outcome-oriented team confidence	.37	1.79				1

Note. \*\* *p* < .01

First, as outlined in the Introduction, we explored whether team identification mediated the relationship between the perceived confidence of the team leader and players' collective efficacy (H3a). The first pre-condition for a mediation model (a significant relationship between predictor and outcome variable) was fulfilled by the significant path between the leader's perceived team confidence and players' collective efficacy ( $\beta = .72$ ; p < .001). Furthermore, the paths between team identification as proposed mediator and both the leader's perceived team confidence and players' collective efficacy were significant in the predicted directions (p < .001), thereby fulfilling the second and third pre-conditions. The final step in assessing whether there is a mediation effect involved assessing the fit of the model under two conditions: (a) when the path between the leader's perceived team confidence and players' collective efficacy was constrained to zero, and (b) when the given path was not constrained. A chi-square difference test between the unconstrained and the constrained model indicated a significant difference between the two models  $(\Delta \chi^2(l) =$ 25.36; p < .001), suggesting that the constrained model was improved by adding the direct path between the leader's perceived team confidence and players' collective efficacy. These results support H3a in indicating that the relationship between the perceived team confidence expressed by the team leader and players' collective efficacy is partially mediated by team identification.

Second, we explored whether players' collective efficacy mediated the relationship between the leader's perceived team confidence and players' confidence in winning the contest (i.e., their team outcome confidence), as proposed under H3b. All direct paths between the included variables were significant (p < .001), fulfilling the three preconditions for mediation as suggested by Holmbeck (1997). In the third step, the chi-square difference test between the unconstrained and the constrained model revealed a significant difference between the two models ( $\Delta \chi^2(I) = 14.87$ ; p < .001), thereby providing support for the unconstrained model. These findings support Hypothesis 3b in showing that collective efficacy partially mediates the relationship between the leader's perceived team confidence and players' team outcome confidence. Similar analyses showed that collective efficacy fully mediated the relationship between players' team identification and their confidence in winning. Based on the results of the different analyses, the final model, as shown in Figure 2, provided good fit to the data ( $\chi^2 = 1.90$ ; df = 1; p = .17; CFI = 1.00; TLI = .98; RMSEA =.09; pclose = .22). The standardized regression path coefficients and the proportions explained variance are included in Figure 2. **Figure 2.** The structural model of perceived leader's team confidence and players' team outcome confidence, with team identification and collective efficacy as mediators. The standardized regression coefficients are presented (all p < .001), as well as the proportions explained variance in italic.



Besides the reported direct effects, further analyses revealed that the leader's perceived team confidence had a significant indirect effect on players' collective efficacy (.32; p < .001) and on players' team outcome confidence (.34; p < .001). In addition, the indirect effect of players' team identification on their team outcome confidence was also significant (.24; p < .001). The total effects are represented in Table 3.

**Table 3.** *Total effects (TE), standard deviations (SD), and confidence intervals (CI) for all paths in the postulated model between predictors (in rows) and outcomes (in columns).* 

	Tear	Team identification		Collective efficacy			Team outcome confidence		
	TE	SD	CI	TE	SD	CI	TE	SD	CI
Perceived confidence of the team leader	.63	.08	[.48; .78]	.72	.07	[.58; .85]	.68	.07	[.54; .83]
Team identification				.50	.07	[.36; .65]	.24	.04	[.17; .31]
Collective efficacy							.48	.09	[.30; .66]

Note. All total effects were significant at the .001 level.

## 3.5 The Impact of Perceived Leader's Confidence on Players' Performance

Players' performance was measured objectively as the number of scored free throws out of 10 attempts. The Shapiro-Wilk Test indicated that the distribution of the performance both during the warm-up and during the test session deviated significantly from the normal distribution (p < .05). Accordingly, analyses involved non-parametric tests. Here a Mann-Whitney U-Test indicated that players' performance during the warm-up did not differ significantly (p = .72) between the two test conditions (high-confidence condition: M =4.14, SD = 2.20; low-confidence condition: M = 4.24, SD = 1.87), indicating a successful randomization of the participants across the test conditions. During the test session, players with a high-confidence leader performed better (M = 4.86, SD = 2.17) than players with a low-confidence leader (M = 4.47, SD = 1.91), but a Mann-Whitney U-Test revealed that this difference was not significant (p = .32).

Because the leader behaved neutrally during the warm-up, the impact of the leader's perceived confidence on performance was expected to manifest itself only gradually over the course of the test session. To test this hypothesis, we conducted an Aligned Friedman Rank Test on the test session as non-parametric alternative to a Repeated Measures ANOVA, thereby following the procedure recommended by Beasley and Zumbo (2003). Time was used as a within-subjects repeated measure (first five versus last five free throws) and the perceived confidence as expressed by the appointed team leader (high versus low) as a between-subjects variable. Results revealed a significant interaction effect (F(1,100) =7.77; p = .006), which is presented graphically in Figure 3. In addition, one-tailed Wilcoxon Signed Rank Tests revealed that the simple effects within the positive and negative test conditions were both significant (both p < .05). Thus, when the leader was perceived to express high team confidence, team members' performance increased significantly over the course of the test session. In contrast, when the leader was perceived to express low team confidence, team members' performance decreased significantly over time. These findings support H4 in showing that team members' performance varied as a function of the perceived leader's team confidence.





#### 4. Discussion

The present experiment examined the impact of perceived leaders' confidence in their team on followers' responses in a basketball shoot-out contest. More specifically, it tested the core hypotheses that team members' perceptions of leaders' confidence in their team would affect the confidence team members have in their ability to succeed (H1) and team members' task performance (H4). Findings indicated that the level of perceived team confidence expressed by the team leader transferred to the confidence of team members such that team members were more confident in the team's prospects of winning when the leader was perceived to express high (rather than low) team confidence, thereby confirming H1. The team leader's perceived confidence had a greater impact on members' team confidence than the perceived confidence of other team members, both in positive and negative directions, thereby confirming H2. Moreover, our findings indicate that these effects were mediated by team identification (H3a) and collective efficacy (H3b) suggesting that team members adapted to the perceived confidence standards set by the leader to the extent that they (a) identified more strongly with the team (H3a; Haslam, 2001; Van Dick, 2001), and in turn, (b) experienced more process-oriented collective efficacy (H3b; Fransen, Coffee, et al., 2014). Finally, there was also evidence that, in addition to the impact upon

team members' psychological states (social identification, collective efficacy, and team outcome confidence), the leader's persistent expressions of team confidence also contributed to team members' capacity to perform (in both positive and negative ways), thereby confirming H4.

## 4.1 Theoretical and Practical Implications

The present findings have a number of important implications. First, they extend prior research on leader confidence by demonstrating its significant impact on relevant outcomes. More specifically, findings indicate that leaders can inspire followers by expressing confidence in the team that they are leading. Moreover, whereas prior research has focused largely on the impact of leader's self-confidence on team members' reactions towards them (e.g., in terms of perceived effectiveness; Hoffman, Woehr, Maldagen-Youngjohn, & Lyons, 2011), the present research revealed that, to the extent that leaders display belief in the capacities of the collective, and are perceived to do so by team members, they inspire confidence among members that they can make a difference as a team. At the same time, though, the findings also point to leaders' potentially negative effect on members' team confidence and performance to the extent that they are perceived to express low confidence in the team's abilities.

Second, and related to the previous point, the present research also contributes to research into leaders' emotional influence on followers. In particular, previous research has shown that leaders are capable of inducing 'contagion' such that their expressions and feelings have a significant impact on those of fellow team members—for example, because leaders' positive mood 'spills over' to the positive mood of followers (Avey et al., 2011; Bono & Ilies, 2006; Johnson, 2009). In this regard, a qualitative case study with a female curling team revealed that the team leader played an important role in the team by regulating the emotions of her teammates (Tamminen & Crocker, 2013). Furthermore, this leader was shown to engage in a high degree of emotional self-regulation (e.g., masking her own negative emotions) because she was aware of the contagious impact of her own expressed emotions on the emotions of her teammates. Likewise, in organizational settings, Wagstaff, Fletcher, and Hanton (2012b) highlighted the key role of leaders in a study showing that the new CEO of a sport organization was the catalyst for the spread of pride and passion for success throughout the organization.

#### Team confidence contagion by the leader

Furthermore, evidence from a variety of domains (e.g., organizational, political) shows that team members' emotions are affected not only by the leader, but also by fellow team members (Kelly & Barsade, 2001; Moll, Jordet, & Pepping, 2010; Totterdell, 2000; Uphill, Groom, & Jones, 2012). For example, semi-structured interviews with members of sport organizations (players, coaches, and directors) demonstrated that individuals attempted to manage others' emotions through the deliberate expression or suppression of their own emotions (Wagstaff, Fletcher, & Hanton, 2012a). In addition, individuals who were more capable of managing their own emotions and the emotions of others were demonstrated to develop and maintain more successful interpersonal relations (Wagstaff et al., 2012b). Our findings thus confirm the suggestion by Tamminen et al. (2013) that failure of team members to appropriately regulate emotions within a team can have negative consequences for performance outcomes.

The present research extends this work in two ways. First, our findings provide quantitative evidence not only for positive confidence contagion but also for a potential negative confidence spiral, whereby leaders' expression of low confidence reduces the team confidence of the other members. Second, the present findings shed light on the *processes* that explain how leaders' expressions do (or do not) affect followers. Specifically, the present findings show that leaders' perceived expression of confidence spread to the confidence experienced by their team members partly because confident leaders encourage team members to internalize a sense of shared social identity (a sense of 'us') and consequently to strengthen their confidence that they will be able to work more effectively as a unit. This also implies that when leaders are seen to give up on their team, team members may be adversely affected by leaders' lack of confidence because they distance themselves not only from the leader but also from other fellow team members, resulting in a weaker performance.

Third, the results support the suggestion that beyond singular one-to-one relationships in which emotional expressions by the leader affect parallel expressions by team members (as encapsulated by the notion of 'contagion'), leader's behavior also has broader implications for team members' relationship with their team. Indeed, providing a more comprehensive view than the notion of 'contagion' would suggest, the present research indicates that team members' perceptions of the leaders' team confidence not only determines team members' team confidence (through its capacity to enhance team identification and collective efficacy) but also their performance.

It should be noted however, that this performance advantage was not apparent from the moment when the leader started to inspire confidence in team members, but instead, emerged steadily over time. In this sense, the findings are consistent with dynamic accounts of leader–follower influence processes, which point to the unfolding impact of leader expressions on team members' affective tone and perceived effectiveness (Sy, Choi, & Johnson, 2013). In the present study, this meant that it was only in the final phase of the task that the leaders' belief in 'us' was observed to impact the performance of team members.

The present findings can also be interpreted as examples of two special cases of the self-fulfilling prophecy — namely, a Pygmalion effect and a Golem effect. When the team leader was perceived as highly confident in the abilities of the team to win the game, team members lived up to the leader's expectation and gradually performed better during the course of the test session, consistent with the Pygmalion effect. By contrast, when the team leader was seen to be convinced that the team would lose the game, team members gradually acted in the expected way and their performance decreased, along the lines of the Golem effect. Our findings thus accord with previous evidence of these effects in educational and organizational settings (for a review see Kierein & Gold, 2000). However, in contrast with most previous literature, in the present experiment, we observed such effects at the team level; the leader expressed high versus low confidence *in the team*, rather than in a specific individual.

Although these findings provide a useful descriptive gloss on our results, it is however worth noting that by pointing to the role that team identification plays in this process, the present study advances beyond previous work which has hitherto shed little light on the psychological mechanisms that underpin Pygmalion and Golem effects. This helps us to understand why—when leaders fail to build team identification—such prophecies sometimes do not occur.

## 4.2 Limitations and Future Research

The present study provides experimental evidence of the impact of leaders' expressed team confidence as perceived by the team members. Nevertheless, the study also has a number of limitations. Most obviously, our experiment involved a design that includes a highly structured task. Although the experiment was dynamic in relying not merely on one-time performance measurements but instead on tracking the performance over time, it

would be interesting (although logistically challenging) to examine the present relationships in more dynamic performance contexts. Similarly, it would be worthwhile to examine the present phenomena in natural groups in different contexts (e.g., different sport disciplines, different kinds of competitions) with varying degrees of skill levels and task interdependence (Van der Vegt & Janssen, 2003). When members have to interact and rely on each other to successfully complete their given task, we expect that the persistent demonstration of leaders' team confidence might have even more pronounced effects.

In addition, it should be noted that the present experiment did not contain a control group. As a result, it is unclear what the effect of having no leader or having a leader who acts in a neutral fashion (i.e., with no clear expression of positive or negative team confidence by the leader) might be. Adding a neutral condition to the experiment would constitute a fruitful avenue for further research for two reasons. First, such an approach could clarify whether the observed increase in performance from warm-up to test session, both in the positive and in the negative test condition, is due to a learning effect. Second, this neutral condition could provide insight into whether the strength of the leader's influence differs as a function of its direction (positive versus negative).

Moreover, as noted above, because individual players are nested within 26 teams of four players each, a multilevel approach would provide the optimal framework for analyzing our data. However, the small number of players within one team (n = 4) made it impossible to account for the possible interdependence within this nested data structure. Future research may therefore benefit from using larger teams to shed further light on the processes examined here.

Furthermore, it is noteworthy that the onset of the strong manipulation of leaders' expressed team confidence from the warm-up to the test session was fairly abrupt. This may have initially led team members to resist any novel influence attempts by the team leader and may partly explain why team members' perceptions of the leader's expression of team confidence showed a time-sensitive and 'lagged' effect on performance (such that they had greater impact in the final phase of the experiment). Future research might employ experiments with more subtle and gradual changes in leaders' expressions of team confidence in order to allow for a more fine-grained understanding of their unfolding impact.

## 4.3 Conclusion

The present research expanded upon prior research by pointing to the impact that leaders' perceived expressions of team confidence have on team members' experience of team confidence and also on their ability to perform as a team. At the same time, we also extended upon prior work by suggesting that contagion phenomena are not mysterious and free-floating but can be explained in terms of relevant team processes. More specifically, our findings show that perceptions of leaders' team confidence transferred to the confidence of team members to the extent that leaders strengthened members' psychological connection to the team and fostered their belief in efficacious team behaviors. Finally, the present findings demonstrate that by displaying disbelief in the team's ability to succeed, a leader can also undermine team members' capacity to perform on behalf of the team. Indeed, as alluded to at the beginning of this paper, it appears that giving people team confidence is a critical component of leaders' ability to create a winning team. More particularly, by showing that they believe in us, leaders are able not only to make 'us' a psychological reality but also to transform 'us' into an effective operational unit. It is by such means, we suggest, that teams of champions become champion teams.

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# **General Discussion**

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## 1. Overview of the Present PhD Thesis

With the present PhD thesis, we attempted to expand the existing research knowledge in four ways. First, we elaborated the theoretical foundation of the key concepts: athlete leadership and team confidence. Second, different studies within the PhD thesis provided support for the impact of athlete leaders on team members' team confidence, and in turn on their performance (in line with the model presented in Figure 1, which equals Figure 2 in the Introduction). Third, the present research project constitutes a methodological contribution to the existing knowledge by the development of two new measurement instruments (namely, the ILI and the OCESS), by examining leaders' characteristics relative to the characteristics of other team members, and by applying Social Network Analysis (SNA) for the first time in a sport context. Fourth, we attempted to move beyond description and sought to explain the mechanisms through which the observed relations occur. In this regard, the Social Identity Approach to Leadership (Haslam, Reicher, & Platow, 2011) and the Theory on Shared Leadership (Pearce & Conger, 2003) provided useful theoretical frameworks to discuss our findings. We will now elaborate each of the four contributions of this project. In addition, we will also highlight the strengths and limitations of the present PhD thesis, as well as possible avenues for future research. To conclude, we will focus on the practical implications that this PhD thesis brings along for coaches, sport psychologists, and other sport professionals.

## 2. Conceptual Contribution

#### 2.1 Athlete leadership

## 2.1.1 Athlete leadership classification

Paper 1 developed a new athlete leadership classification, which includes two leadership roles on the field (i.e., task and motivational leader) and two leadership roles off the field (i.e., social and external leader). Although Paper 1 only identified the best leader in the team on the several leadership roles, Paper 4 verified the reliability of this four-fold leadership classification when taking into account the full leadership network of sport teams, encompassing all team members (by using SNA).

Figure 1. General overview of the present PhD thesis.



First, in both Paper 1 and Paper 4 moderate positive correlations emerged between the different leadership roles. To some extent, the different leadership roles thus have some leadership abilities in common. The strongest correlation was found between the task leadership role and the motivational leadership role. In other words, an athlete who is perceived as a high-quality task leader is more likely to be perceived as a high-quality motivational leader. However, the observed correlations were only moderate. In Paper 1, not more than 20% of the athletes were perceived as being the best task and motivational leader at the same time. The overlap between the other leadership roles was even smaller. It can thus be concluded that the newly developed leadership classification includes four conceptually distinct leadership roles that are very often fulfilled by different athletes in the team. Leadership appears to be spread throughout the team; different players within the team are perceived as being the primary leader with respect to the four roles.

Second, previous existing leadership classifications (e.g., Loughead, Hardy, & Eys, 2006) did not take into account the leadership role of the on-field motivational leader. The present results reveal that this leadership role is clearly distinct from the already established leadership roles. Moreover, the newly added motivational leadership role appears to be equally prominent as the already established task and social leadership roles. The external leader is less prominent, which corroborates earlier studies (Eys, Loughead, & Hardy, 2007; Loughead et al., 2006). Furthermore, participants perceived their motivational leader as the second most important leader, preceded by the task leader. Paper 8, investigating the sources of team confidence, listed positive supportive communication, which is an important characteristic of the motivational leader, as the most important predictor of athletes' team outcome confidence. Also in Paper 9, encouraging communication between team members was listed as one of the most important sources of both team outcome confidence and collective efficacy. Because motivating and encouraging behaviors are perceived as essential for effective athlete leadership (Apitzsch, 2009; Cotterill, 2013; Dupuis, Bloom, & Loughead, 2006; Holmes, McNeil, & Adorna, 2010), this new leadership classification, encompassing the role of motivational leader, is more relevant for coaching practice than previous classifications.

Third, the results of Paper 1 highlight the relevance of this leadership categorization for optimal team functioning. The presence of more leadership roles in the team fostered the collective efficacy of the team members (i.e., confidence in the team's abilities), as well as the extent to which athletes identified themselves with their team. As

with any new classification or measurement, there is always room for improvement. Some limitations of the current leadership classification will be noted in Section 7.1. Nevertheless, the developed athlete leadership classification creates a more solid conceptual framework of athlete leadership to support further research in this area.

## 2.1.2 Formal versus informal athlete leadership

#### 2.1.2.1 Team captain versus other players

Although the team captain is often assumed as the leader of the team, Paper 1 revealed that only in 1% of the teams, the team captain is perceived as the best leader on the four different leadership roles (task, motivational, social, and external leader). This finding is in contrast with the wide-spread illusion that the team captain is the only leader of the team. Even more noteworthy is the finding that almost half of the players and coaches (44%) did not perceive their team captain as the best leader on any of the four roles, neither on the field (as task or motivational leader), nor off the field (as social or external leader). Although most coaches and players assume that their team is an exception to the rule, it seems that, in this case, the exception proves to be the rule. In the present study informal leaders, rather than the team captain, took the principal lead, both on and off the field (i.e., 70.5% of the time). This finding was true for all teams, regardless of team gender, sport, or level, thereby underlining the general overrating of the leadership qualities of the team captain.

However, it should be noted that Paper 4 somewhat tempered these initial findings. Paper 4 looked beyond the *best* leader on a given leadership role (as was the case in Paper 1) and took into account all athletes within the team by using Social Network Analysis. The findings of Paper 4 demonstrated that in half of the teams, informal leaders, rather than the team captain, were perceived as best leaders by their teammates. In particular on the motivation and social leadership roles, the informal leaders took the lead.

Although the team captain is not always perceived as the best leader, Paper 4 demonstrated that the team captain does nevertheless fulfill an important leadership function in most teams. For example, in 83% of the investigated teams, the team captain was seen as one of the three best leaders in the team. On the task and external leadership roles in particular, the team captain outscored the informal leaders. Based on the findings

of the present PhD thesis, we can conclude that the leadership qualities attributed to the team captain as the team's only leader are overrated. Instead, leadership is spread throughout the team; informal leaders and the team captain take the lead together, both on and off the field.

Our findings demonstrate that in most teams the team captain is not the most important leader. As a consequence, the question arises which reasons motivated the selection of this captain. In this respect, Paper 2 provided a preliminary answer. The findings reported in this paper demonstrated that the team captain outscored the informal leaders in only one of the investigated characteristics, namely team tenure. It thus seems that athletes that play longer for the team are more likely to be appointed as team captain, regardless of their leadership capacities.

Furthermore, we conducted a qualitative study, which is not included in the present PhD thesis. In this study, we asked 425 players and coaches two open questions: (1) "Because of which characteristics was your current team captain selected as a captain?", and (2) "Which are the characteristics of an ideal team captain?" Subsequently, we categorized all answers in five categories: one category for each of the four leadership roles that encompassed the typical attributes for that role (e.g., 'giving tactical advice' was included in the category of task leader, 'motivating team members during the game' belonged to the category of motivational leader, etc.). Besides the four leadership categories, one additional category included all game-irrelevant characteristics (e.g., daughter of the club's president, sister of the previous team captain, choice by turns, oldest player in the team, sponsor of the team, etc.). The items that did not belong to any of these five categories will not be discussed.

The preliminary results are shown in Figure 2. More specifically, the graph presents the percentage of participants who gave an attribute in accordance with one of the listed categories. The dark grey bars represent the answers on the first question (i.e., "Because of which characteristics was your *current team captain* selected as a captain?"), whereas the light grey bars represent the answers on the second question (i.e., "Which are the characteristics of an *ideal team captain*?").



**Figure 2.** Leader attributes that were listed by participants for their current and ideal team captain.

The findings in Figure 2 demonstrate that the current captain is not able to live up to the standards that players and coaches set for their ideal team captain. Especially, with regard to the roles of task, motivational, and social leader, several participants listed the corresponding behaviors as essential for their ideal team captain. However, participants did not list these characteristics to the same degree for their current team captains. The last category of the game-irrelevant attributes in particular demonstrates what may have caused the findings of Paper 1 and Paper 4. Although players and coaches did not perceive these game-irrelevant characteristics as essential attributes for their ideal captain, in many teams typically game-irrelevant attributes, and not leadership attributes determined who was appointed to be the team captain.

Overall, our findings corroborate previous research suggesting that informal leaders should not be disregarded (Loughead & Hardy, 2005; Loughead et al., 2006). Although most studies on athlete leadership still focus exclusively on the team captain (Dupuis et al., 2006; Grandzol, Perlis, & Draina, 2010; Kent & Todd, 2004; Voelker, Gould, & Crawford, 2011), our findings emphasize that informal athlete leadership is at least equally, if not more important. To obtain a full insight in the leadership structure of a team, these informal leaders can thus no longer be ignored.

## 2.1.2.2 The coach versus athlete leaders

Paper 4 provided a comprehensive understanding of the leadership structure within the team by also including the coach in its Social Network Analysis. As a consequence, it was possible to compare coach and athlete leadership. Although leadership research to date predominantly focused on the leadership of the coach, Paper 4 demonstrated that in 65% of the teams, athlete leaders were perceived as better leaders in general than their coach. When we took a closer look at the different leadership roles, no significant differences emerged between the perceived quality of the coach and of the athlete leader with regard to task and external leadership. These findings contradict previous research demonstrating that coaches exhibited more task-oriented behavior than athlete leaders (Loughead & Hardy, 2005). On the motivational and the social leadership role, the athlete leaders were perceived as significantly better leaders than their coach. These findings align with the research of Loughead and Hardy (2005), indicating that athlete leaders were perceived to express behaviors of positive feedback and social support to a greater extent than their coaches.

Recently, we conducted a study that investigated the relative impact of athlete leaders and coaches on team identification and task cohesion (35 teams; 421 players; soccer (n = 130), volleyball (n = 81), basketball (n = 132), and handball (n = 78)). However, at the moment, the results of this study have not yet been submitted for publication, and were therefore not included in the present PhD thesis. Nevertheless, the preliminary results of this study revealed that both coaches and athlete leaders contributed in a very similar way to team members' team identification and their perceptions of task cohesion. Team identification served as partial mediator in the relation between the perceived leadership quality of both coach and athlete leaders and athletes' perceptions of task cohesion, which in turn predicted athletes' collective efficacy and team outcome confidence. The mediating role of team identification in this study provides further support for the Social Identity Approach to Leadership (Haslam et al., 2011).

In conclusion, effective leadership was proposed as a crucial determinant of optimal team functioning (Cotterill, 2013). The present findings suggest that one should move beyond the myth of the coach as the single leader of a sport team. Instead, shared leadership of the coach, the team captain, and the informal athlete leaders within the team seems to be the key for optimal team functioning.

#### 2.1.3 Characteristics of athlete leaders

Although athlete leadership strongly depends on the surrounding team context, to date, the characteristics of athlete leaders have only been measured at the individual level. The present PhD manuscript used two specific methods to move beyond the shortcoming of the current literature to capture the context-dependency of athlete leaders' characteristics. Paper 2 was based on individual perceptions, but used a novel context-dependent measure that assessed a leader's characteristics in a relative way (i.e., in comparison with the other team members). Paper 5 went a step further by investigating complete teams, thereby using SNA to link leaders' characteristics to the extent that leaders were perceived as good leaders by all their teammates.

Furthermore, the present PhD thesis moved beyond most previous research that investigated only the characteristics of leadership in general: both Paper 2 and Paper 5 examined the characteristics of high-quality athlete leadership on each of the four leadership roles (task, motivational, social, and external). Both Paper 2 and Paper 5 listed social connectedness as the decisive attribute of athlete leaders' quality. In Paper 2, being socially well accepted by teammates emerged as second most important characteristic (of the 27 examined characteristics) of the perceived quality of the task, the motivational, and the social leader. In Paper 5, social connectedness emerged as the most decisive attribute for high-quality leaders, both for leadership quality in general, as well as for leadership quality in each of the four leadership roles.

These results corroborate previous research in business settings, showing that good social relations between the leaders and both peers and followers were associated with more positive leadership perceptions (Mehra, Dixon, Brass, & Robertson, 2006). Also in sport research, it has already been established that perceptions of connectedness were associated with athlete leadership (Moran & Weiss, 2006; Price & Weiss, 2011; Tropp & Landers, 1979). These findings clearly contradict the widespread perception of coaches and athletes that the leadership quality of an athlete is not related to his/her popularity within the team but solely depends on the individual's leadership abilities (Holmes et al., 2010). Paper 5 distinguished between the degree to which the others felt connected to the leader and the degree to which the leader felt connected with the other team members, thereby demonstrating that the first factor (i.e., perceptions of others) emerged as the most predictive characteristic for the leader's perceived quality. In contrast, the degree to which the leader felt connected with the others was not

significantly related to his/her perceived leadership quality on any of the roles. These findings suggest that the perceptions of the followers, rather than the behavior of the leader, constitute the key for effective leadership.

In Paper 2, only one characteristic was more important for leadership quality than social connectedness, namely the impact on team members' team confidence, an attribute that was not an object of investigation in Paper 5. The impact on teammates' team confidence emerged as a significant leadership attribute for all four leadership roles. This is in line with previous research, emphasizing the important function of athlete leaders to strengthen the team confidence of their teammates (Bucci, Bloom, Loughead, & Caron, 2012; Hoyt, Murphy, Halverson, & Watson, 2003; Ronglan, 2007; Watson, Chemers, & Preiser, 2001). Furthermore, this finding provides additional support for the framework of the present PhD, displayed in Figure 1.

The two most decisive attributes (i.e., the ability to influence teammates' confidence and the perceived social connectedness of team members) are thus characteristic for the perceived leadership quality on the different leadership roles. However, with regard to the other examined characteristics, distinctive attributes emerged for each of the leadership roles.

Furthermore, using the same samples as in Paper 4, Paper 5, and Paper 6, we investigated whether athlete leaders occupied a more central field position than the other athletes (these results are not included in the present PhD thesis). A central field position referred to the guard in basketball, the setter in volleyball, the centre backcourt in handball, and the central defender or midfielder in soccer. The results revealed that the athletes who played on a central position were perceived as significant better leaders than their teammates who played on non-central positions, both in general (t = 3.69; p < .001) and on the task (t = 2.82; p < .01), motivational (t = 2.48; p < .05), and external leadership role (t = 2.56; p < .05) in particular. However for the social leadership role, the centrality of athletes' playing position did not matter (t = 1.51; p = .13). These findings partially confirm our assumption that given the clearly distinct role content of the leadership roles, different leader attributes are predictive in determining the leadership quality for these four specific roles.

In contrast to previous research that predominantly investigated trait characteristics (as was illustrated in Section 3.4 of the Introduction), the present PhD

thesis did not only investigate individual characteristics (e.g., age, sport competence), but also more relation-oriented attributes (e.g., social connectedness with others). From the present findings we can infer that relation-oriented attributes, such as social connectedness, were more decisive for athlete leaders' quality than the more individual attributes, such as age, sport competence, team tenure, and experience. Although Paper 5 termed the individual characteristics 'trait-oriented characteristics' and the relationoriented characteristics 'process-oriented characteristics', it should be noted that attributes such as age and experience also contain a process-oriented connotation (i.e., the fact that older and more experienced athletes are perceived as better athlete leaders might reflect that leadership is learned throughout practice).

Finally, we argue that the two most decisive attributes are linked with each other. More specifically, we put forward that social connectedness can function as a booster for the impact of athlete leaders on the team confidence of their teammates. As discussed in the present PhD thesis, strengthening team members' team identification is one way to influence team members' team confidence. The tendency of emotional contagion constitutes another plausible mechanism. Emotional contagion is defined by Schoenewolf (1990, p. 50) as "a process in which a person or group influences the emotions or behavior of another person or group through the conscious or unconscious induction of emotion states and behavioral attitudes."

A previous study in a business setting revealed that emotional contagion did indeed occur between the leader and his/her followers (Avey, Avolio, & Luthans, 2011). More specifically, the leader's positivity had a positive effect on followers' positivity. Social connectedness can serve as a booster of this emotional contagion process, because people who like each other exhibit more spontaneous mimicry (McIntosh, 2006). Although further research is required, we suggest that social connectedness strengthens the impact of an athlete leader on teammates' team confidence. More specifically, the more an athlete feels connected to his/her leader, the more emotional contagion will occur, and the faster the athlete will adopt the team confidence expressed by the leader. It should be noted that this contagion can lead to favorable or unfavorable consequences, according to the team confidence expressed by the leader.

**General Discussion** 

## 2.2 Team confidence

## 2.2.1 Conceptualization of team confidence

Besides athlete leadership, the present PhD also elaborated the theoretical foundation of its second key construct: team confidence. As outlined in Section 4.1 of the Introduction, the existing research on team confidence is characterized by inconsistencies in the manner in which team confidence has been conceptualized, operationalized, and measured (Shearer, Holmes, & Mellalieu, 2009). In this regard, collective efficacy has allegedly been used as umbrella term for both process- and outcome-oriented measures of team confidence.

The present PhD thesis demonstrated that the process- and outcome-oriented types of team confidence are two clearly different constructs. Paper 7 therefore provided further insight into the conceptual distinction between process-oriented collective efficacy and outcome-oriented team outcome confidence. Other papers in this PhD thesis have provided additional support for our view that the two constructs should be investigated separately. More specifically, Paper 9 demonstrated that the sources of collective efficacy differed from the sources of team outcome confidence. In addition, Paper 7 revealed that different demographic variables were related to the two types of team confidence. More specifically, the place in the ranking and last weekend's playing level of the own team were significantly related to collective efficacy, whereas the place in the ranking of next game's opponent and the score of the previous game against the same opponent significantly determined athletes' team outcome confidence. These findings again highlighted that collective efficacy is oriented on the process of the own team, whereas team outcome confidence is more focused on the comparison with the opponent team.

Paper 7 also investigated the validity of previous measures of collective efficacy, such as the Collective Efficacy Questionnaire for Sports (CEQS; Short, Sullivan, & Feltz, 2005), which has often been used to measure collective efficacy in sport teams. Paper 7 revealed that the CEQS encompasses both the process- and the outcome-oriented types of team confidence. More specifically, the Ability subscale was found to assess team outcome confidence, whereas the other four subscales (i.e., Effort, Persistence, Preparation, and Unity) constitute a valid measure for collective efficacy.

Paper 11 further supported these findings by demonstrating that the correlation between the Ability subscale and the other four subscales (i.e., Effort, Persistence, Preparation, and Unity) ranged between .53 and .62, whereas the correlations between the other four subscales ranged between .73 and .81. In this paper, the difference between both constructs was further manifested by their different relation with team identification; process-oriented collective efficacy correlated more strongly with team identification (r = .61 for athletes; r = .55 for coaches) than outcome-oriented team confidence did (r = .39 for athletes; r = .38 for coaches). In addition, Paper 11 and Paper 12 suggested that collective efficacy impacted upon team outcome confidence.

Paper 10 revealed only moderate correlations between both constructs, before, during, and after the game, thereby providing further support for the view that both types of team confidence are related but nevertheless different constructs. Furthermore, the findings revealed that athletes' in-game collective efficacy was more strongly associated with the athletes' subjective performance perceptions than athletes' team outcome confidence.

These findings highlight that collective efficacy and team outcome confidence are different constructs, which relate in a different way to outcome variables such as team identification and performance. To move the research on team confidence forward in a coherent way, both constructs should be distinguished and assessed separately. We hope that the findings in the present PhD contribute in creating more conceptual clarity in future research on team confidence.

#### 2.2.2 Dynamic nature of team confidence

To explore the dynamic nature of team confidence within a single game, we conducted a study with the national junior female volleyball team of Belgium. In a friendly game in and against Germany (May, 2011), as preparation for the World Qualification Tournament, we assessed the team outcome confidence (i.e., confidence in winning the game) of three different athletes within this game. We deliberately selected the middle hitters and the libero, because these athletes change each half rotation, which allowed them to rate their team outcome confidence on that specific moment on a scale from 0 (*strongly confident in losing the game*) to 10 (*strongly confident in winning the game*). Figure 3 displays the dynamic evolution of athletes' team confidence throughout the game.


Figure 3. Evolution of athletes' team outcome confidence during the game.

The results revealed that athletes' team outcome confidence was at its highest in the winning set. Furthermore, it can be observed that athletes' ratings of team outcome confidence seem to manifest a ceiling effect. Two cognitive biases can produce an overestimation of one's confidence in the team's chances to win. First, although the athletes passed their ratings to the assistant-coach on the bench, the coach was within earshot. Because athletes are always told to believe in their team, the proximity of the coach could have led to a social desirability bias (i.e., a tendency to over-report socially desirable characteristics or behaviors of one self; Dalton & Ortegren, 2011). Second, although this was a friendly game, it was the last international test before the official tournament. This game was the climax after a training week and it was played for a full house. As a consequence, the athletes' strong desire to win could have led to an unrealistic optimism bias (i.e., the tendency to be over-optimistic, thereby overestimating favorable and pleasing outcomes; Hardman, 2009, p. 104).

These cognitive biases might explain why the variation of team confidence is limited to the upper half of the graph. Nevertheless, considerable changes in athletes' team confidence can be observed during the game. In contrast with previous research, which treated team confidence as a trait-like construct with a strong cross-temporal stability (Myers, Paiement, & Feltz, 2007), the findings of the present study therefore underline the dynamic nature of team confidence.

Paper 10 further supported the dynamic nature of team confidence by examining both types of team confidence (i.e., collective efficacy and team outcome confidence) before, during, and after soccer games. The results showed that the team confidence perceptions before, during, and after the game, were only moderately correlated. This finding held for both collective efficacy and team outcome confidence, thereby demonstrating that both types of team confidence fluctuate substantially during the game. These findings emphasize the need to examine team confidence as a dynamic construct instead of a trait-like characteristic with a strong cross-temporal stability.

#### 2.2.3 Sources of team confidence

Paper 8 investigated the sources of team outcome confidence within volleyball, while Paper 9 examined the sources of team outcome confidence in soccer and basketball and the sources of collective efficacy in basketball. Five important conclusions could be derived.

First, in Paper 8, positive supportive communication (tactical and encouraging communication, enthusiasm, etc.) emerged as the most predictive scale for high levels of team outcome confidence. Paper 9 also included sources pertaining to the behavior and emotions expressed by the coach. The results revealed that for coaches, their own positive coaching was the most important predictor of their own team outcome confidence in both basketball and soccer. The athletes on the contrary perceived the performance-oriented sources (e.g., the own team in the lead, players fulfilling their task well) as more predictive for their team outcome confidence.

Second, whereas outcome-oriented sources were more predictive for athletes' team outcome confidence, Paper 9 pointed at the importance of team enthusiasm (i.e., a more process-oriented scale) in predicting athletes' collective efficacy. This finding highlights the differences between the sources of team outcome confidence and collective efficacy. Despite the differences, also similarities emerged. For example, for players and coaches, and for all sports, negative communication and emotions of players and coaches emerged as the most predictive scale for low levels of team outcome confidence and collective and collective efficacy.

Third, although previous research suggested that past performance was the strongest source of team confidence (Bandura, 1997; Chase, Feltz, & Lirgg, 2003), the

present findings reveal that in-game sources were even more important predictors of team members' team outcome confidence and their collective efficacy.

Fourth, at item level, the expression of team confidence by the athlete leaders was perceived as a very predictive source of athletes' and coaches' team confidence during the game, in all sports, and with regard to both team outcome confidence and collective efficacy. These findings perfectly fit within the overview of the present PhD as presented in Figure 1, thereby supporting previous research demonstrating that high team confidence expressed by the leader may lead to higher team confidence among the team members (Bandura, 1997; Hoyt et al., 2003; Ronglan, 2007; Watson et al., 2001).

Paper 9 revealed that athlete leaders do not always have a positive impact on their teammates' confidence. Instead, athlete leaders, expressing low levels of team confidence, were perceived as very predictive for low levels of team outcome confidence and collective efficacy of athletes and coaches. These findings corroborate a case study in a handball team (Apitzsch, 2009), in which the failure of role models within the team caused a negative emotional contagion within the team, which, in turn, led to a collective collapse of the team performance. Team confidence thus seems to be a bug that emanates from the leader and spreads throughout the team, in a positive way, but maybe even more pertinent in a negative way.

Fifth, besides the general consistencies across the different sports, also some differences were noted in Paper 9. These sport-specific differences in the sources of team confidence reflect the specific sport environment and game structure for each sport. For example, in volleyball, coming together after a point is a normative behavior. The enthusiasm with which a team comes together varies strongly and was therefore perceived as the most predictive source of team outcome confidence. However, in basketball, where the game continues, there is no time to come together and celebrate a point. As such, that source was not as predictive for team confidence in basketball. Future research should take into account these sport-specific differences when examining the sources of team confidence.

# 2.2.4 Impact of team confidence on the team performance

Previous research on the relation between team confidence and performance assessed team confidence only before or after the game, but never during the game. However, the perceptions of performance and team confidence after the game may significantly differ from in-game perceptions. In this regard, it was demonstrated that moment-by-moment assessments of a holiday significantly differed from the overall memories of the holiday experience (Wirtz, Kruger, Scollon, & Diener, 2003). Kahneman and Riis (2005) added that remembered measures embody cognitive errors. To obtain a better insight in the relation between team confidence and performance, it is thus essential to measure both constructs in a more dynamic way during the game.

In Section 2.2.2, we outlined an unpublished study with the national junior volleyball team of Belgium. In the same game, we also recorded the game score each time one of the three players rated their team outcome confidence. In Figure 4, the team outcome confidence of the three tested players is plotted against the team performance, measured by the point difference (i.e., points in the lead or points behind).

**Figure 4.** *The relation between athletes' team outcome confidence and the team's performance, measured by the point difference (i.e., points in the lead or points behind).* 



The results revealed that the team outcome confidence of each of the three players was positively related to the objective team performance, with percentages of explained variance ranging from 24% to 69%. It should be noted that it is not possible to draw any causal conclusions from these results. More specifically, the direction of the relation between athletes' team confidence and the team's performance is not clear. Is it that the more athletes are confident, the better they perform? Or is it that the better the team performs, the more confident the athletes are in winning the game? Based on previous

studies (Feltz & Lirgg, 1998; Myers, Paiement, & Feltz, 2004), we expect a bidirectional relation between team confidence and performance. Although we are not able to draw causal conclusions, this study nevertheless constitutes a first attempt to capture the relation between team confidence and performance within a game in a more dynamic way.

To obtain more insight in the causality of the team confidence—team performance relation during the game, Paper 10 assessed team confidence not only before and after the game, but also during half-time. Furthermore, the study included subjective performance measurements of the first and the second half (i.e., assessed after each half). The findings provide partial support for the reciprocal relation between players' team confidence (both collective efficacy and team outcome confidence) and players' perceptions of the team's performance. With regard to the impact of team confidence on performance, athletes' team confidence before the game was not significantly related to the team performance in the first half. However, athletes' team confidence during half-time was positively related to the team performance in the second half ( $\beta = .20 - .36$ ). With regard to the impact of previous performance on team confidence, the findings consistently demonstrated a positive relation between the team performance and players' subsequent team confidence with regard to both first half ( $\beta = .28 - .37$ ) and second half ( $\beta = .16 - .19$ ).

Paper 12 provided experimental support for the influence of an athlete's team confidence on his/her subsequent performance. In this study, the leader of a newly formed basketball team (i.e., research confederate) was asked to express either high or low team confidence. The leaders' behavior in turn fostered high or low team confidence among the team members. In the high-confidence condition the performance of the athletes improved significantly during the test, whereas in the low-confidence condition, athletes' performance significantly decreased. Considering that team confidence is a dynamic process that can be affected by coaches, athlete leaders, and team members, our findings open new avenues to optimize team performance.

With regard to the distinction between collective efficacy and team outcome confidence, it is noteworthy that in Paper 10 collective efficacy revealed the strongest correlation with subsequent performance. In contrast, further analyses for the experiment described in Paper 12 revealed no significant correlation between athletes' collective efficacy after the warming-up and the performance during the subsequent test session (r

= .14; p = .15). However, a significant relation did emerge between team outcome confidence and the subsequent performance (r = .24; p = .02).

The inconsistent findings in the different papers of the present PhD can be explained in the light of two important aspects of the team confidence—performance relation. Bandura (1997) stated that the relation between self-efficacy judgments and performance the strongest is when (1) the two sets of measures are concordant (i.e., tapping in similar abilities to measure the construct) and (2) both measures are assessed in close temporal proximity. Myers, Paiement, and Feltz (2007) argued that the same conditions hold for the relation between team confidence and performance.

First, the concordance between the measures of team confidence and performance may have accounted for the observed differences in Paper 10 and Paper 12. In Paper 10, performance was measured with athletes' subjective perceptions of the team performance. By asking athletes to evaluate the quality of the team's play, it is likely that they take the process into account, rather than the outcome. As such, this performance measure is more concordant with collective efficacy than with team outcome confidence. In contrast, Paper 12 assessed the objective performance by counting the number of scored free throws. It is obvious that this outcome-oriented performance measure is more concordant with team outcome confidence than with collective efficacy. As such, it can be concluded that both papers consistently support Bandura's (1997) statement that the relation between team confidence and performance is the strongest when the two measures are concordant. Paper 9 provided further support for this statement by examining the sources of both collective efficacy and team outcome confidence. The findings revealed that performance-oriented sources (e.g., being in the lead/behind) were perceived as more predictive for players' and coaches' team outcome confidence, whereas process-oriented sources were more predictive for participants' collective efficacy.

Second, Paper 10 demonstrated that both types of team confidence before the game were not related to the performance in the first half, whereas team confidence during half-time was significantly related to the performance in the second half. Temporal proximity possibly accounted for these differences because the time lapse between the measurement of team confidence before the game (i.e., before the warming-up) and the team's performance in the first half was much longer than the time lapse between the measurement of team confidence during half-time and the performance in

the second half. As such, intervening experiences such as the pre-game speech of the coach or the warming-up may have impacted athletes' team confidence (Vargas-Tonsing & Bartholomew, 2006).

## 3. The Impact of Athlete Leaders on the Team Functioning

In Section 3, we look at the bigger picture of this PhD, as presented in Figure 1. Different papers within this PhD provided support for the impact of athlete leaders on team members' team confidence, and in turn on their performance. We will shortly elaborate the contribution of each of these papers to our proposed model.

#### 3.1 Leaders' impact on team members' team confidence

Joop Alberda, former coach of the Dutch national volleyball team, pointed at the risks of low levels of team confidence: "It was a core duty of my leadership to remove the extreme awe of my athletes for the Italian team, which has defeated us so many times. Instead, I had to make the athletes realize that on the field, it was six against six. The submissiveness made room for a healthy dose of respect" (Westerbeek & Smith, 2005, p. 40). When analyzing the worst competition start of the Belgian soccer team Anderlecht in 15 years journalist Peter Vandenbempt also emphasized the detrimental impact of low team confidence, thereby underlining the essential role of athlete leaders: "The main problem is the organization and the confidence in defense. With every counterattack, the players are trembling with fear. There is a harrowing lack of leadership on the field. We already noted that before. No one takes the team in tow when the team encounters difficulties. The best proof is that not once this season Anderlecht has been able to come back after being behind" (Vandenbempt, 2013).

The present PhD confirmed these on-field perceptions of coaches, players, and media. More specifically, Paper 2 revealed that the impact on teammates' team confidence was perceived as the most important attribute of high-quality athlete leaders. Furthermore, Paper 8 and Paper 9 demonstrated that coaches and athletes perceived the team confidence expressed by the athlete leaders as one of the most decisive sources of their own team confidence (i.e., both collective efficacy and team outcome confidence). Paper 12 experimentally confirmed these findings by demonstrating that, by acting in a confident or in an unconfident manner, athlete leaders affect teammates' collective efficacy and team outcome confidence in a positive or negative way, respectively.

We also conducted a replication study of the basketball experiment (Paper 12). This experimental study is not yet published and therefore not included in the present PhD thesis. Participants were 144 soccer players ( $M_{Age} = 14.2$  years old), who were divided in groups of four. Similar to the basketball experiment, each of the 36 teams was complemented by a confederate, introduced as captain of the team, and unknown to the other players. The task consisted of a dynamic passing test in which players had to complete a stipulated parcours as fast as possible by passing to each other. In contrast to Paper 5, this replication included not two but three experimental conditions: The leader acted neutral during the warm-up, but expressed high, neutral, or low team confidence during the test session. A manipulation check confirmed that the team confidence expressed by the leader was also perceived as high, neutral, or low by the participans.

To obtain greater insight into the difference in team confidence contagion between the positive, neutral, and negative condition, we compared players' team confidence after the test session with their confidence after the warm-up (i.e., when the leader acted in a neutral fashion). For this purpose, we used a Repeated Measures ANOVA, in which time was used as within-subjects repeated measure (warm-up versus test session) and the perceived confidence expressed by the appointed team leader (high versus neutral versus low) served as a between-subjects variable. The results revealed a significant interaction effect (F(1,137) = 7.14; p < .001) which is presented graphically in Figure 5.

**Figure 5.** Team confidence of the team members after the warm-up and after the test session for the three experimental conditions.



Besides expressing confidence, Paper 3 demonstrated that also an identity-based athlete leadership style, assessed by the Identity Leadership Inventory (ILI), is related to higher levels of team confidence among the team members. In addition, Paper 11 pointed to the positive relation between the perceived athlete leadership quality in each of the four leadership roles and athletes' team confidence.

These findings corroborate previous research, which demonstrated the positive impact of leaders on the team confidence of team members (Bandura, 1997; Hoyt et al., 2003; Ronglan, 2007; Watson et al., 2001). Paper 12 added that the leader had a greater impact on members' team confidence than the other team members, both in the positive and in the negative direction. These findings are in line with previous research in an organizational setting demonstrating that high status individuals (i.e., the leaders) are more likely to transmit their moods to low status individuals (i.e., the followers) than vice versa (Anderson, Keltner, & John, 2003; Sy, Cote, & Saavedra, 2005). In other words, leaders function as the trigger of the emotional contagion process. Watson and colleagues (2001) further illustrated that leaders can trigger these upward spirals of team confidence through persuasion, modeling confidence and success, and facilitating effective coordination. With regard to these confidence spirals, Lindsley (1995) noted that athlete leaders have the potential to counteract not only upward but also downward team confidence spirals. It thus seems that athlete leaders cannot only function as the trigger to initiate positive or negative confidence spirals, but also serve as the fuel to intensify these spirals.

# **3.2** The mediating role of team identification

#### 3.2.1 Leader's impact on team members' identification with the team

This PhD thesis went beyond mere description and sought to explain the mechanisms through which the observed relationships occur. In doing so, we have highlighted the potential value of the Social Identity Approach to Leadership (Haslam et al., 2011) for gaining a greater understanding of leadership processes in sport. More specifically, five papers provided support for the impact of the leader on team members' identification with the team. Paper 1 revealed that when more leadership roles were present within the team, athletes identified stronger with their team. Paper 3 demonstrated that an identity-based leadership style, in terms of the ILI (and in particular the dimension of identity entrepreneurship), fostered team members' identification with

the team. Paper 5 revealed that teams with high-quality athlete leadership were characterized by higher levels of team identification. Furthermore, Paper 11 and Paper 12 provided support for the mediating role of team identification in explaining the impact of athlete leaders (i.e., athlete leaders' perceived quality in Paper 11 and leaders' expressed confidence in Paper 12) on team members' collective efficacy.

The unpublished soccer experiment, as presented earlier, further confirmed the mediating role of team identification. The overarching model of the presented PhD thesis, including the mediating effects of both team identification and collective efficacy, was tested by performing a Confirmatory Factor Analysis (CFA) using STATA. The overarching model, as shown in Figure 6, provided good fit to the data ( $\chi^2 = 4.57$ ; df = 1; p = .03; CFI = .99; TLI = .94; RMSEA = .16; pclose = .06). The standardized regression path coefficients and the proportions explained variance are included in Figure 6.

**Figure 6.** The structural model of perceived leader's team confidence and players' team outcome confidence, with team identification and collective efficacy as mediators. The standardized regression coefficients are presented (all p < .001), as well as the proportions explained variance in italics.



Although the Social Identity Approach to Leadership (Haslam et al., 2011) originated from organizational settings, our findings demonstrated that this leadership approach also constitutes a useful theoretical framework in sport settings, and more specifically to explain the impact of athlete leaders on team members' identification with their team. High-quality athlete leaders are thus able to create a shared sense of 'we' and 'us' within the group. They make different athletes feel that they are part of the same team, thereby clarifying their understanding of what the team stands for. This reminds us of CEO Lewis Ergen, who noted that "the ratio of We's to I's is the best indicator of the

development of a team" (Quick, 1992, p. 20). The present findings suggest that the athlete leaders are of crucial importance to foster this sense of 'we'.

## 3.2.2 Team identification fosters team members' team confidence

Both Paper 11 and Paper 12 demonstrated the mediating role of team identification. More specifically, athlete leaders fostered team members' identification with their team. This stronger identification with the team, in turn, enhanced players' and coaches' confidence in the team's abilities to successfully perform all the needed processes to reach their goal.

Wang and Howell (2012, p. 780) underpinned the positive impact of team identification on team members' collective efficacy in three ways, which, in our opinion, are also applicable in a sport setting. First, athletes who identify more strongly with their team tend to attribute more positive qualities to the group. As a result, these athletes will have a more optimistic view on the team's abilities that are required to succeed (Tajfel, 1982). Second, athletes who identify more strongly with the team are more likely to follow the team norms. As a consequence, the behavior and actions of the athletes will be more effectively synchronized (Haslam, 2004; Wetherell, 1996). This improved coordination may strengthen athletes' confidence in the team's abilities to successfully perform the required processes and, in turn, strengthen athletes' confidence in achieving the common goal. Finally, Bandura (1997) postulated that team members' collective efficacy may be threatened by members' negative emotional states. For example, athletes' feelings of stress, anxiety, or fear of failure may have a detrimental impact on their performance (Jones, 2003). In this regard, a strong identification with the team may serve as buffer that protects athletes from the counterproductive impact of these negative emotional states. For example, van Dick and Haslam (2012) demonstrated in organizational contexts that a shared team identification fostered a cohesive and trusting team climate, in which team members help each other and provide emotional support. The support of team members will reduce the detrimental impact of athletes' negative emotional state on their collective efficacy. In order to obtain more insight in how team identification strengthens athletes' collective efficacy and team outcome confidence, a further investigation of each of these arguments would constitute a promising avenue for future studies.

#### **3.3** The overarching model

In short, several studies within the present PhD demonstrated that by strengthening members' identification with their team, athlete leaders can foster their sport team's team confidence. Furthermore, Paper 11, Paper 12, and the unpublished soccer experiment demonstrated that collective efficacy mediated the relationship between perceived athlete leadership quality and team members' team outcome confidence. Paper 7 also showed that the most important sources of team outcome confidence, as observed in Paper 8, represented collective efficacy. In other words, perceptions of higher athlete leadership quality are linked with athletes' confidence that their team can obtain the desired goal through a strong belief in the team's abilities to perform the processes within the team successfully (e.g., communicating tactically well, encouraging each other, persist when difficulties arise, etc.).

In our overarching model, we also included performance as the ultimate desired outcome in the eyes of most athletes and coaches. In this regard, Paper 10 demonstrated that higher in-game levels of team confidence were associated with a better subsequent team performance. Furthermore, Paper 12 demonstrated that when the athlete leader expressed high confidence in the team, team members' performance significantly increased during the test session. In contrast, when the athlete leader expressed low confidence in the team, team members' performance decreased significantly. The unpublished soccer experiment used the time that the team needed to perform the stipulated parcours as performance measure: the less time needed, the better the performance. The results for the three conditions are presented in Figure 7.



Figure 7. The performance of both warm-up and test session for the three conditions.

The improvement of team performance over time (i.e., a decrease in time) is caused by a learning effect, which is visualized by the decrease in performance time in the neutral condition. To investigate the difference between the three experimental conditions, we conducted a Repeated Measures ANOVA, in which time was used as within-subjects repeated measure (warm-up versus test session) and in which the perceived confidence expressed by the appointed team leader (high versus neutral versus low) served as a between-subjects variable. The results revealed a significant interaction effect (F(1,137) = 12.13; p < .001). In other words, when the leader expressed positive team confidence, the other team members demonstrated the largest progress in performance. In contrast, when the leader expressed that he had lost all confidence in the winning chances of his team, the leader's behavior had the most detrimental impact on teammates' performance.

To conclude, several studies in the present PhD thesis have confirmed that, by strengthening members' identification with their team, athlete leaders can foster teammates' confidence in the team's abilities to perform the processes successfully and reach their goal, which in turn improves members' performance.

## 4. Methodological Contribution

The present PhD thesis attempted to provide a methodological contribution on each of its central concepts, as a foundation for future research in these areas. First, with respect to athlete leadership, in Paper 1 we developed a new athlete leadership classification that encompasses four different leadership roles that an athlete can occupy. To measure leaders' differentiating attributes while taking into account the surrounding team context, Paper 2 proposed a context-dependent measure that assessed athlete leaders' characteristics in a relative way (i.e., in comparison to the other team members). Paper 5 went one step further by including the leadership perceptions of all team members in a Social Network Analysis (SNA). Although this technique has not yet been applied in sport settings to study leadership, Paper 4, Paper 5, and Paper 6 revealed that SNA is a pioneering but valuable tool to investigate leadership in a sport setting. It does not only provide full insight in the leadership structure within sport teams, but is also the ideally suited tool to identify attributes of high-quality leadership, both at the individual and at the team level. Second, with respect to collective efficacy, Paper 7 established the validity of the Observational Collective Efficacy Scale for Sports (OCESS) as a short measure of process-oriented collective efficacy. This five-item measure offers a valid alternative to the one-item measures (which are often outcome-oriented) for assessing collective efficacy in sport teams whenever the time for administering long questionnaires is not available. Because the OCESS includes behaviors that can be assessed by observers, this short measure has the potential to overcome the limitations of traditional questionnaires, which hindered a more continuous in-game assessment. As such, the OCESS might constitute a starting point for the development of a continuous in-game measure of collective efficacy.

Third, with respect to the Social Identity Approach to Leadership (Haslam et al., 2011), a first measure was developed to assess this identity based leadership style, in cooperation with Nik Steffens and Alex Haslam (Paper 3). The Identity Leadership Inventory (ILI) includes the four dimensions of identity based leadership. Namely, in order to be an effective leader, leaders need not only to 'be one of us' (*identity prototypicality*) but also to 'do it for us' (*identity advancement*), to 'craft a sense of us' (*identity entrepreneurship*), and to 'embed a sense of us' (*identity impresarioship*). In this way, the ILI allows researchers and practitioners to assess more comprehensively the various ways in which leaders can bring their followers through the transformation from 'I' and 'you' into 'we' and 'us'. The present inventory can be used to advance theory and practice in order to achieve a more comprehensive examination of the Social Identity Approach to Leadership in sport settings.

Although it might be tempting to assume that engaging in all four aspects of identity based leadership constitutes a recipe for success, it is important to realize that the present inventory is not a kind of 'shopping list' that leaders simply need to complete in order to guarantee success. First, it should be noted that the degree to which a leader is perceived as engaging in effective social identity management strongly depends on the context. Furthermore, as outlined by Steffens et al. (2014), a range of necessary and sufficient conditions exist that modulate the effectiveness of any of these dimensions. For example, an important influencing factor is the match between the identity that is represented, advanced, crafted, and embedded by the leader, and the extent to which team members perceive this identity as self-relevant and self-defining (Haslam, Eggins, & Reynolds, 2003).

# 5. Theoretical Contribution

The present PhD is the first to provide support for the application of two theoretical frameworks to athlete leadership. As already outlined in detail in Section 3.2.1, our findings corroborate the Social Identity Approach to Leadership (Haslam et al., 2011) by demonstrating that high-quality athlete leaders or athlete leaders who express team confidence strengthen team members' identification with the team.

Furthermore, we also frame our findings in the Theory of Shared Leadership (Pearce & Conger, 2003). Only since the last decade, the concept of shared leadership has been introduced in the organizational leadership research. Because leadership in sport settings is still predominantly focused on the coach as leader of the team, it should not come as a surprise that the Theory of Shared Leadership has not yet intruded the sport setting. By comparing the leadership role of the coach with the leadership role of the team captain and the informal athlete leaders, the present PhD thesis supported the Theory of Shared Leadership. To discuss our findings, we will adopt the Integrative Model of Locke (2003) as encompassing theoretical framework. As outlined in the Introduction, this Integrative Model includes three different leadership approaches: (1) top-down leadership, (2), shared leadership or lateral leadership and (3) bottom-up leadership. In this model the term 'shared leadership' only points to the lateral influence among peers. However, we will adopt the definition of Pearce and Conger (2003, p. 1), thereby using the term 'shared leadership' as umbrella term that encompasses the three different leadership approaches.

The findings in the present PhD provide support for each of the three leadership approaches in the Integrative Model (Locke, 2003). By using a social network approach, Paper 4 encompassed the leadership perceptions of all team members, including the coach, which allowed us to compare the perceived leadership quality of the coach with the perceived leadership quality of the formal and informal athlete leaders.

First, with regard to top-down leadership, Paper 4 demonstrated that in more than half of the teams, the coach took the lead on the task and external leadership role, which supported the top-down influence of the coach. Furthermore, Paper 9 established that the team confidence expressed by the coach is an important predictor in affecting team members' collective efficacy and team outcome confidence in both soccer and basketball. These findings corroborate previous research demonstrating that the confidence of the coach in the team's abilities does indeed affect athletes' team confidence (Vargas-Tonsing, Myers, & Feltz, 2004).

Second, several papers in the present PhD provided support for lateral leadership, (i.e., shared leadership among team members). Paper 1 demonstrated that different athletes in the team occupied the four different leadership roles (i.e., task leader, motivational leader, social leader, and external leader). Paper 4 confirmed these findings by adopting a network approach. Furthermore, Paper 4 demonstrated that the team captain together with the athlete leaders shared the lead on the different leadership roles.

Previous findings within a business setting revealed that the emergence of informal leaders was positively related to higher individual and team performance (Z. Zhang, Waldman, & Wang, 2012). Furthermore, co-leadership in sports has been associated with positive outcomes for both team members and leaders (Cotterill, 2013). Paper 1 corroborates these findings by demonstrating that the number of athlete leaders (i.e., number of different leaders occupying the four different leadership roles) in a team is positively related to players' team confidence and the team's performance.

In addition, the Appendix supplementing Paper 6 went one step further and examined whether shared leadership within a single leadership role (e.g., more than one task leader) is still beneficial. The findings revealed that shared leadership within the task leadership network (i.e., two task leaders, rather than one task leader, rather than no task leaders) was associated with higher task cohesion within the team. Furthermore, shared leadership within the social leadership network (i.e., two social leaders, rather than one social leader, rather than no social leaders) was associated with a stronger social cohesion within the team. Moreover, these findings also hold for each of the other leadership roles. In other words, when more different athletes in a team are perceived as task, motivational, social, or external leader (i.e., higher degree of shared leadership within a particular role), the team's task and social cohesion will be higher. However, there is no effective leadership without followers, and as such having only athlete leaders in the team might not be the ideal situation. Therefore, future research should provide more insight in the ideal number of athlete leaders within sport teams. In this regard, section 7.1.3 points to a number of factors that can influence the ideal number of athlete leaders in a team.

Third and finally, with regard to bottom-up leadership, Paper 4 demonstrated that on the motivational and social leadership role, the athletes within the team were clearly perceived as being better leaders than their coach. Furthermore, Paper 11 revealed that the perceived quality of athlete leaders determined coaches' identification with the team, as well as coaches' collective efficacy and team outcome confidence. In addition, Paper 8 and Paper 9 demonstrate that the expression of team confidence by athlete leaders is one of the most decisive sources for coaches' collective efficacy and their team outcome confidence.

If the team captain as formal leader is also perceived as hierarchically above the informal athlete leaders, Paper 4 provides further evidence for bottom-up leadership. More specifically, Paper 4 demonstrated that in half of the teams, informal leaders, rather than the team captain, were perceived as the best leaders. Especially on the roles of motivational and social leader, the informal leaders, rather than the captain take the lead. These findings corroborate previous research that informal athlete leadership should not be ignored (Loughead & Hardy, 2005; Loughead et al., 2006). Together, these findings support bottom-up leadership by revealing that informal leaders, rather than the coach or the team captain, take the lead on the motivational and social leadership role.

We can conclude that the present PhD thesis provided evidence for the three approaches to leadership. For the first time in sport settings, we confirmed the idea of Pearce and Sims (2002, p. 183) that "shared leadership is a more useful predictor of team effectiveness than vertical leadership".

It is noteworthy that previous research pointed to team confidence as a central aspect in the process of shared leadership (Burke, Fiore, & Salas, 2003). With more than one individual taking the lead, it is essential that all team members have confidence in the ability of each other team member, because any team member can take up a leadership role at any given time. Because team confidence reflects this belief in the abilities of the team and its members, Burke et al. (2003, p. 115) stated that "without a belief in that person's ability, members may be reluctant to follow guidance and direction given by that member". As such, they propose that team confidence is the prerequisite for an effective transference of leadership functions among team members. Paper 1 already provided preliminary support for these assumptions by demonstrating that higher levels of team confidence in the team are positively related to perceptions of more shared leadership.

#### 6. Strengths

#### 6.1 Different research designs

The present PhD thesis adopted different research designs to test specific parts of the model, outlined in Figure 1. Most papers used a cross-sectional study design, but Paper 10 made a first attempt towards a more longitudinal research design. Finally, Paper 12 used an experimental design to verify the cross-sectional findings of the other papers. Furthermore, both qualitative and quantitative approaches have been used to test our hypotheses. The consistency in the PhD findings throughout the various papers attests to the reliability of our results.

# 6.2 Large samples including a variety of participants

The papers within the present PhD thesis relied on large samples, including a broad variety of young and old players and coaches, active in male and female teams, in different competition levels, ranging from youth, to recreational level, to professional level. For example, Paper 8 included 2365 volleyball athletes and coaches. Paper 9 reports three studies that included respectively 1028 soccer participants, 867 basketball participants, and 825 basketball participants. Each of these samples included both male and female athletes and coaches, active at all different competition levels.

To compare our findings between the different sports, several papers included athletes and coaches from different sports. In this regard, Paper 1, Paper 2, and Paper 7 relied on a sample of 4451 players and coaches, active in nine different team sports. Paper 4, Paper 5, and Paper 6 relied on a stratified sample of 46 sport teams (575 athletes) that aimed for an equal number of male and female teams, high and low level teams, active in four different sports (i.e., soccer, basketball, volleyball, and handball). Such a high number of teams by far exceeded previous studies that used only one to three teams as object of their social network analysis (Cotta, Mora, Merelo, & Merelo-Molina, 2013; Kyoung-Jin & Yilmaz, 2010; Lusher, Kremer, & Robins, 2013; Lusher, Robins, & Kremer, 2010; Passos et al., 2011; Warner, Bowers, & Dixon, 2012).

This variety allowed us to examine differences according to team gender, competition level, and sports. Both Paper 1 and Paper 4, testing the validity of the four-fold athlete leadership classification, revealed high consistency between the perceptions of both male and female teams, at high and low level, and in different sports, which

testifies to the reliability of the four-fold athlete leadership classification. Paper 8 and Paper 9 concluded that athletes and coaches, regardless of their age, experience, sex, and level on which they play or coach, share very similar perceptions about the sources predicting team outcome confidence and collective efficacy. However, although Paper 9 revealed many similarities between the sources of team confidence across the different sports, also some differences could be noted, depending on the specific game structure of the sports.

Paper 2 and Paper 5 investigated the characteristic attributes of athlete leaders. The study findings revealed a high degree of equivalence between the attributes of athlete leaders in male and female teams and between high and low competition level teams. Paper 2 revealed that both athletes and coaches, of male and female teams, listed the same attributes as most decisive for high-quality athlete leadership. However, also sportspecific attributes emerged, which were characteristic for athlete leaders' quality on the different roles. Paper 5 revealed that perceptions of social connectedness emerged as the most decisive attribute for athlete leaders' quality, for both male and female teams, active at high or low level, and within the four included sports. With regard to the other investigated attributes, the study findings revealed significant differences between these groups. Future research should thus take into account that the attributes of high-quality athlete leadership cannot automatically be generalized, regardless of team gender, competition level, or sport.

Finally, Paper 11 examined the complete model as presented in Figure 1, with exception of athletes' performance. The consistency demonstrated between athletes and coaches provided additional support for the underlying mechanisms of how athlete leaders impact team members' confidence. Future research should further verify the consistency of the complete model, including performance, for young and old athletes and coaches, male and female teams, active in different sports at different competition levels.

Furthermore, caution is warranted when generalizing our findings to professional sport teams. Although our samples included players and coaches who are active at the highest competition level, only few of the participants are professional athletes and coaches. It is plausible that the extreme focus on performance in professional sport teams brings along a different leadership structure in the team. Although a degree of social connectedness among the athletes is important to build a well-functioning team, it is

likely that in professional teams task leadership is by far the most essential to create a shared task focus.

Special consideration should be given to national teams, in which the most talented players of different club teams come together to play for their country. Typically, these players all have a leadership function in their club teams. However, as Schumann stated: "If we were all determined to play the first violin, we should never have an ensemble" (Andersen, 2008, p. 127). In other words, there is no effective leadership without followers. In Section 8.1.2, we will elaborate on the importance of role clarification. Players in national teams only play together during a short period. Therefore, it is crucial to quickly attain optimal levels of team functioning and a maximal performance. Clarifying the individual responsibilities of each team member and in particular identifying the different leadership roles will be important to foster the team functioning. A transparent communication of the coach will create a shared vision among the team members and will enhance the acceptance of the athlete leaders by their teammates.

## 6.3 Focus on both the individual level and the team level

Although athletes do not play in a social vacuum, previous research has typically focused on individual perceptions when examining athlete leadership, thereby ignoring the surrounding team context. Paper 4 used SNA to investigate the leadership quality of the coach, the team captain, and the informal athlete leaders, by assessing the leadership perceptions of all other team members. Paper 5 and Paper 6 also moved beyond the individual level and identified the team-level attributes of teams with high-quality athlete leadership. In this regard, it was demonstrated that higher levels of team identification, a stronger social connectedness, and a stronger task and social cohesion characterize teams with high-quality athlete leadership.

Similarly, team confidence has mostly been examined at the level of individual perceptions, rather than investigating team confidence at a team level. Paper 10 used multilevel modeling to investigate the team confidence—team performance relation both at the individual and at the team level. The results revealed that the impact of team confidence on performance and vice versa did not vary at the team level, and thus are similar for every athlete, regardless of the team. However, with respect to team confidence (both collective efficacy and team outcome confidence), the variance

explained at the team level decreased over time. During the game, the individual component explained most variance. Although Bandura (2001) assumed that aggregated team confidence (i.e., perceptions of team confidence aggregated over all team members) is a better predictor of team performance for highly interactive tasks, the present findings suggest that, during the game, one should better focus on the individual perceptions of team confidence.

#### 6.4 Objective and subjective performance measures

A fourth and final strength of the present PhD is that both objective and subjective measures of performance were used. Paper 1 included the place of the team in the ranking and Paper 12 assessed the number of scored free throws as objective measures of performance. Also the unpublished study with the national junior volleyball team used an objective performance measure, namely the point difference between the own team and the opponent team (i.e., points in the lead or behind). In contrast, Paper 10 opted for a subjective performance measure, namely athletes' evaluations of the team's performance in the previous game half.

It should be noted that Paper 10 revealed that a considerable amount of the variance of the subjective performance measures is explained at the individual, rather than at the team level. Athletes thus compare the team's playing quality against their own standards of what good playing quality looks like. In contrast, the variance of objective performance measures is fully explained at the team level (i.e., the number of scored free throws by the team is the same for every athlete in the team).

The study findings do not allow to determine which measure constitutes the best way to measure performance. Instead, previous research revealed specific advantages that characterize subjective and objective measures. Raglin and Morgan (1988), for example, argued for the use of subjective measures of performance, because these measures are able to account for much more performance indicators compared with objective performance measures such as the game outcome. On the other hand, the need to maintain and enhance self-esteem may lead to self-serving biases that distort these performance perceptions. As such, athletes tend to attribute a victory to their own abilities (i.e., internal attribution), while blaming a defeat to the external circumstances (i.e., external attribution). The present PhD did not encompass a study that included both objective and subjective performance measures at the same time. Examining athlete leaders' impact on team members' team confidence, and in turn, investigating the impact on both objective and subjective performance, offers a valuable avenue for further research.

## 7. Limitations and Avenues for Future Research

In addressing the strengths of the present PhD thesis, already several opportunities for future research emerged. Furthermore, research on the central themes of this PhD thesis (e.g., athlete leadership, application of the Social Identity Approach to Leadership and SNA in a sport setting) is still in its infancy. As such, numerous other opportunities emerge to extend the current knowledge. Therefore, the present papers only constitute first foundations stones, which can hopefully inspire further research in these areas. In this section, we will only elaborate on a limited selection of limitations and avenues for further research.

# 7.1 Limitations and future research with respect to athlete leadership

## 7.1.1 Perceived leadership behavior or actual leadership?

In the present PhD thesis, leadership was investigated based on the perceptions of the participants, rather than on the actual behavior of the athlete leader. More specifically, in Paper 1, Paper 2, and Paper 11, participants appointed the athlete that most strongly conformed to the definition of task, motivation, social, and external leader. In Paper 4, Paper 5, and Paper 6, the leadership quality of each athlete was based on the leadership perceptions of all other team members. In addition, in Paper 2 participants rated the attributes of the appointed leader. In contrast with the other papers, Paper 5 related a leader's self-reported attributes with the leader's perceived leadership quality by the other team members. However, also in this paper, the most decisive attribute was the extent to which the others felt connected with the leader. The perceptions of the others (i.e., in this study with respect to social connectedness with the leader) appeared to be more predictive for leadership quality than the leader's own perceptions (i.e., the leader's connectedness towards others).

Although athletes' perceptions of the leader's behavior can differ from the leader's actual behavior, Shaver (1975) noted that "an individual's perception of a situation is more important than the objective situation in determining one's feelings and

actions." In the context of social support, it was demonstrated that perceived availability of social support and actually received social support were only mildly related (Kaul & Lakey, 2003). Furthermore, it has been established that perceived support had a stronger impact on well-being and health than received support (Finch, Okun, Pool, & Ruehlman, 1999; Helgeson, 1993). Similarly, leadership can be viewed as a socially constructed phenomenon in which leadership effectiveness is rooted in the perceptions of the followers (Haslam et al., 2011). Therefore, assessing followers' perceptions of leadership behavior, rather than investigating leaders' actual behavior, seems the best way to move leadership research forward.

#### 7.1.2 Only limited leadership behaviors and attributes were studied

Paper 1 and Paper 4 developed a four-fold athlete leadership classification that encompassed leaders' task, motivational, social, and external functions. Although this classification provides a sound framework for further research on athlete leadership, it was by no means our intention to claim that this classification is all-embracing. In contrast, it is plausible that leaders could serve other functions than the ones included in our classification, such as being the liaison between the team and the coach. With regard to the team captain, it is plausible that the team captain outscores the informal leaders on qualities that were not investigated in the present papers. Our unpublished qualitative study, which was outlined in Section 2.1.2, provided a foretaste of other functions that a team captain fulfills, such as having an exemplary function, standing up for the team, discussing with the referee, being a club player who represents the club values, etc.

Paper 2 and Paper 5 investigated the characteristic attributes of athlete leadership quality on the four different leadership roles. In this regard, a variety of attributes were investigated, ranging from personal characteristics (e.g., age), over leaders' behaviors (e.g., tactical communication, encouragement), to leaders' impact on teammates' team confidence. Despite this broad variety in characteristics and behaviors, also here no comprehensiveness can be claimed. In particular with regard to the trait/process-discussion in Paper 5, caution is warranted when interpreting the results. In this paper, we considered attributes such as age and years of experience as trait-oriented characteristics because these attributes cannot be changed on purpose, neither can they be influenced by athlete leadership development programs. Nevertheless, it is important to note that these characteristics have also a deeper process-oriented connotation. Indeed,

the idea that leadership is a process that can be learned throughout practice is reflected in the fact that older and more experienced athletes are perceived as better athlete leaders.

Although process-oriented attributes (e.g., impact on teammates' confidence, perceived social connectedness) were clearly the most decisive predictors for athlete leadership quality, future research should include more pure personality traits, such as extraversion, optimism, and dominance, to establish a more reliable comparison between trait- and process-attributes. Although leadership is a process, and athletes can learn how to become good leaders, it should not be disregarded that certain athletes are more suitable to occupy a leadership function than others. Future research could clarify whether trait characteristics (e.g., optimism, extraversion, expressiveness) foster the development of process-oriented leadership attributes (e.g., impact on teammates' confidence).

# 7.1.3 Situational dependency of leadership behavior

As outlined in Section 3.5 of the Introduction, athlete leadership can be situated in the classification scheme of Behling and Schriesheim (1976), and more specifically, in the 'Behaviors—More Specific' segment. In this regard, we assume that leader effectiveness is to a certain degree situation-specific and that the same leader behavior that is effective in one situation may not be effective in another situation. For example, after repeated successes, athlete leaders may highlight the mistakes in order to prevent overconfidence, whereas after repeated failures is important for athlete leaders to rebuild and strengthen teammates' confidence. In this regard, Watson et al. (2001) pointed to the situation-specific behavior of athlete leaders in creating "self-correcting spirals of team confidence" (i.e., preventing overconfidence, but also preventing too low levels of team confidence).

In addition to the situation-specificity, effective leadership strongly depends on the specific team environment. For example, the ideal number of athlete leaders in a team may differ for each team. The findings in the current literature with respect to the ideal number of athletes in a sport team are inconsistent and vary between only one or two leaders (Glenn & Horn, 1993) and the overwhelming majority (namely 85%) of the team members (Crozier, Loughead, & Munroe-Chandler, 2013). An important characteristic that the previous studies did not take into account is the quality of athlete leadership (e.g., a few high-quality athlete leaders might be better for the team's functioning than 10 bad leaders). The similarity of the provided information by different leaders also influences the ideal number of athlete leaders. For example, different task leaders on the field who each provide contrasting tactical instructions will not benefit the team's play. However, if these task leaders each have clearly demarcated roles, shared task leadership might be very valuable for optimal team functioning. By creating a shared vision and shared goals within the team, the coach can bring the different athlete leaders on one line, thereby affecting the ideal number of athlete leaders within the team. Transparent communication is essential in this regard to clarify the responsibility of all team members.

The particular developmental stage of the team might also constitute to the teamand situation-specificity of effective athlete leadership. Tuckman (1965) distinguished four different stages of group development: forming, storming, norming, and performing. In other words, a team has to grow, encounter challenges, tackle problems, find solutions, and develop shared norms in order to attain the stage of optimal performing. For example, in the stage of norming, athlete leaders could be important to verify whether all team members fulfill their role and adopt the shared norms. This is nicely illustrated by Mike Krzyzewski, head coach of the men's basketball team at Duke University: "Talent is important. But the single most important ingredient after you get the talent is internal leadership. It's not the coaches as much as one single person or people on the team who set higher standards than that team would normally set for itself" (Janssen, 2003, p. xxxi). Teams that are characterized by shared leadership, in which athletes adjust each other, function more efficiently than teams in which the coach adjusts team members in an authoritarian manner. Future research could further explore the importance of athlete leaders in each of these development stadia.

Finally, effective leadership might also vary within a team according to the particular follower who is the object of a leadership intervention. For example, for a motivational leader, different leadership behaviors might be needed to get each athlete in his/her optimal arousal zone for performance. Some athletes need emotional support, while other athletes may benefit more from a hard-handing approach. Some athletes need to be aroused, while others need to be calmed down (e.g., when reacting frustrated towards the referee). It is likely that effective athlete leaders do not only adapt their leadership behaviors to the team that they are leading, but even to each individual member within the team, in accordance with the specific situation.

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It should be noted tough that in the present PhD thesis, the situational dependency of athlete leadership was not yet tested. Several papers within this PhD did demonstrate that athlete leaders' characteristics differ according to the leadership role they occupy (i.e., task, motivational, social, or external leader). Future research should establish whether these attributes also differ depending on the specific situation and the specific team.

# 7.1.4 Longitudinal approach to athlete leadership

The present PhD thesis only encompassed cross-sectional studies to investigate athlete leadership, as did most previous studies on leadership (Moran & Weiss, 2006; Price & Weiss, 2011). Paper 1, Paper 2, Paper 4, Paper 5, Paper 6, and Paper 11 all relied on data collections that were gathered at the second half of the season, in order to leave sufficient time for team relations to grow and for athletes to obtain insight in the athlete leadership within their team. However, these papers do not enhance our understanding of the evolution of these leadership perceptions throughout a season.

Emery, Calvard, and Pierce (2013) used leadership networks to investigate emerging leadership in a newly formed student group. Their findings demonstrated a significant variation in leadership perceptions over time. Hoppe and Reinelt (2010, p. 600) emphasized that "understanding the nature of networks and changes in them is an increasingly important aspect of leadership development evaluation." In the context of organisational environments, characterized by shared leadership, Burke, Fiore, and Salas (2003, p. 105) stated that the transfer of leadership functions among team members is driven by the demands of the situation and the type of skills that is needed in a particular situation.

Also in sport settings, a longitudinal design would enable researcher to investigate the stability of the different leadership roles in a sport team throughout the season. Although two previous longitudinal studies had revealed that *the number* of task, social, and external leaders within a team remained relatively stable throughout a season (Eys et al., 2007; Loughead et al., 2006), these studies did not reveal whether the same athletes occupy the different leadership roles during the whole season or whether leadership functions are transferred among team members in the course of a season. In this regard, it is likely that the new players in the team perceive their captain as a leader in the beginning of the season because of his/her formal leader status. However, as the season unfolds, informal leadership could become more apparent, and thus more decisive for the leadership structure within a team. As such, a shift from formal towards informal leadership could be expected. However, to underlie these assumptions and to gain additional information on how the leadership structure changes throughout a season, we recommend future research to adopt a longitudinal study design.

## 7.1.5 Intervention studies

The present PhD thesis demonstrated that high-quality athlete leadership is related to higher levels of team identification, collective efficacy, team outcome confidence, task cohesion, social cohesion, and ultimately a better performance. It is clear that coaches and sport psychologists should aim for high-quality athlete leadership in their teams, but the main question remains: how do we develop and strengthen the leadership abilities of our athletes? In order to construct effective athlete leadership development programs, future research should further clarify the processes through which effective leadership skills can be developed. Subsequently, experimental intervention studies could determine the effectiveness of these programs and their applicability to other sports and competition levels.

Intervention studies would also provide more insight in the impact of the leadership style of the coach on the emergence of high-quality athlete leadership in the team. Previous research typically distinguished between two leadership styles: an autocratic controlling style and an autonomy supportive style. Previous studies investigated the relation between these leadership styles of the coach and important team outcomes, and demonstrated, for example, that a democratic leadership style, rather than an autocratic style, was positively associated with the team performance (Rajabi, 2012).

With respect to the autonomy supportive leadership style, seven autonomy supportive coaching behaviors were postulated (Mageau & Vallerand, 2003). One of these behaviors was to allow athletes to work independently and to have input when solving problems. Future research could verify whether such a coaching style, in which athletes are given autonomy, rather than being controlled, fosters the development of athletes' leadership abilities.

#### 7.1.6 Transfer to other cultures

Another interesting avenue for further investigation would be to verify whether our findings on athlete leadership can be generalized to other cultures. All our papers (except Paper 3) relied on data samples that were gathered in Flanders (Belgium). Paper 3 is the only paper in the present PhD thesis that relied on three different cultural samples (i.e., the United States, China, and Belgium). The results revealed that the Identity Leadership Inventory was valid in each of these cultures. However, differences did emerge with regard to the impact of the specific dimensions of the ILI on team members' identification with the team and other team outcomes. Since the samples in China and the United States included employees, whereas the Belgian sample relied on leadership perceptions of the team captain, it is not possible to determine whether the leadership perceptions are culture-specific or whether the observed differences are caused by the different settings in which the studies were conducted. Future research should explore these contextual sensitivities in a more structured way.

With respect to all the other papers, it is important to note that in Flanders, it is a common practice in sport settings to clearly visualize signs of formal leadership, for example by the armband of the team captain or by the underlined number on the captain's shirt. The public visibility of this formal leadership function goes often hand in hand with an emotional value for the athlete him/herself and with respect from the fans and club board. It could well be that in other more group-oriented rather than individual-centered cultures, where less importance is assigned to the visibility of formal leadership signs, athlete leadership perceptions will differ from our findings.

In this regard, the Implicit Leadership Theory postulates that everyone has a set of implicit assumptions about what a 'good' leader looks like. These assumptions are rooted in the beliefs and stereotypes of a particular culture. Given that these assumptions, beliefs, and stereotypes tend to differ across cultures, it is logical that also the underlying beliefs of what determines a good leader differ across cultures. Organizational research indeed demonstrated cultural differences in leadership perceptions of managers (Brodbeck et al., 2000; Javidan, Dorfman, de Luque, & House, 2006). Likewise, future research should verify whether these cultural differences can also be observed for athlete leadership in sport teams.

From a more general viewpoint, it would be interesting to investigate whether the overarching model (as presented in Figure 1) could be replicated across different cultures. Previous research pointed out that social identities differ across cultural groups, as well as the relation between these social identities and other relevant constructs such as efficacy beliefs (Feitosa, Salas, & Salazar, 2012; L. R. Johnson et al., 2012). Future research is needed to provide more clarity on the generalizability of our findings to other cultures.

# 7.2 Limitations and future research with respect to team confidence

# 7.2.1 Stability of team confidence

The findings in the present PhD thesis revealed that higher levels of team confidence were related to an improved performance. On the contrary, previous studies revealed that low confidence levels were negatively related to the team's functioning (Lindsley et al., 1995; Ronglan, 2007). It thus seems that the more confidence players have, the better the performance of the team. However, overconfidence also captures a risk for faulty assessments, unrealistic expectations, and hazardous decisions (D. D. P. Johnson & Fowler, 2011). As Arsenal coach Arsene Wenger noted: "confidence is the easiest thing to lose in football but the most difficult to win back" (Mangan, 2013). Rather than striving for the highest possible confidence, it might thus be a better strategy to strive for a realistic but stable confidence.

Despite the abundant research on athletes' team confidence, the stability of this confidence over time has rarely been measured. It is likely that individual differences exist with regard to the stability of team confidence. For example, some athletes have a very stable team confidence, which is able to resist encountered pressures (e.g., being behind in an important game, a teammate's injury, referee's errors, etc). However, the team confidence of other players could be rather unstable and vulnerable to situational pressures. For these athletes, overconfidence at the beginning of the game might lead to a confidence collapse when they encounter unexpected disappointments (e.g., being behind, performing poorly). Often, such a confidence collapse goes hand in hand with a collapse in performance.

Future research is needed to investigate the importance of the stability of athletes' team confidence during competition games. Rather than only measuring the strength of athletes' team confidence, measures of confidence stability should be included. In doing

so, researchers may draw inspiration from the literature on attitudes. Like the differences in team confidence, Krosnick and Abelson (1992, p. 177) point to the differences in attitudes: "some attitudes are strong, in the sense that they have profound effects on individuals' cognition and behavior, and resist even the strongest pressures toward change. And other attitudes are weak, vulnerable to situational pressures, and with little if any impact on an individual's thinking and action". Similar to our recommendations, also these authors argued to assess both strength and stability of attitudes.

## 7.2.2 Validation of the OCESS

The research on team confidence as a dynamic construct is still in its infancy. In the present PhD thesis, we only took a first step in the exploration of team confidence as dynamic construct. As outlined in Section 2.2.2, Paper 10 measured team confidence not only before and after the game, but also during the game. Furthermore, the unpublished study with the national junior volleyball team further supported the dynamic in-game variation of team confidence. However, when striving for even more dynamic in-game measures of team confidence, questionnaires form the major barrier. Using continuous observations instead of questionnaires to assess team confidence would be an important step forward to capture the in-game team confidence—performance relation.

To advance the research in this area, Paper 7 developed the OCESS as observational tool for assessing team confidence in a more dynamic way, based on observations rather than on questionnaires. However, it should be noted that the present paper relied on self-reported efficacy behaviors. By demonstrating that these selfreported efficacy behaviors (i.e., the OCESS) are highly correlated with a validated collective efficacy measure (i.e., subscales 2-5 of the CEQS), Paper 7 provided the first but necessary step in the validation process.

However, future work is required to complete the final step in this validation process, namely to establish a high correlation between the self-reported efficacy behaviors and the observer-reported efficacy behaviors in a real game setting (both assessed by the OCESS). In order to obtain a high inter-observer reliability, it will be critical to define and standardize the observation of the five behaviors for each specific sport, as well as to train the observers in this behavioral assessment. Furthermore, future research should establish the possible sport-specificity of the OCESS, which was originally developed based on perceptions of team confidence in volleyball. For example, the item 'react enthusiastically when making a point' might be volleyball-specific because in other sports, such as basketball or handball, there is simply no time to express much enthusiasm because the game continues.

#### 7.3 Limitations and future research with respect to the overarching model

#### 7.3.1 One-directional or bidirectional paths?

The model in Figure 1 seems to rely on one-way directions. However, it is noteworthy that these relations are possibly bidirectional pathways. Because of the cross-sectional nature of most of our studies, it is not possible to draw causal conclusions based on our findings. Only Paper 12 provided experimental support for the view that athlete leaders' expressed confidence influenced the confidence of the other team members and, in turn, their performance.

Although we acknowledge that some of the investigated relations in Figure 1 may be bidirectional, we would like to emphasize that our reasoning is based on a recursive dynamic influence process, rather than on circular reasoning. Our main reason underlying the proposed directions of the relations in Figure 1 is the degree to which these constructs can be influenced. For example, Paper 10 demonstrated a consistent positive relation between performance and the subsequent team confidence. Although it is interesting for coaches to know that team performance affects athletes' team confidence (e.g., organizing an easy practice game to enhance athletes' confidence before an important tournament), this finding does not offer that much relevant information for their coaching *during* competition games.

By contrast, if we could find controllable factors that affect performance, even if it is only for a very small extent, these small details can make the difference between winning and losing. The discovery of such controllable factors would for the majority of coaches, who spend days and nights in figuring out the ideal game strategy, resemble the discovery of the Holy Grail. In this regard, Paper 10 suggested that athletes' team confidence during half-time constitutes such a controllable factor that positively relates to the subsequent performance. Jorge Jesus, the coach of Benfica Lissabon, who just lost the final of the Europa League in the shoot-outs, illustrated the importance of this team confidence: "At the end of the game we were the better team. We created opportunities, but they did not work out. The team that was most confident in the penalties was FC Sevilla. With regard to the play, the best team did not win the Europa League" (Sporza,

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2014). In very tight games, team confidence thus seems a factor that can make the difference between winning and losing.

The findings in the present PhD suggest that athlete leaders have the potential to impact teammates' team confidence. Although more research is requested, according to for example Paper 12, the team confidence expressed by the athlete leaders, which is to a considerable extent controllable, impacted teammates' team confidence and, in turn, also their performance. The present PhD thesis thus attempted to identify the controllable pathways on how to affect the team performance, rather than examining whether the observed relations were bidirectional.

#### 7.3.2 Strengthening team members' identification with the team

In the present PhD thesis, we used different measures to determine how athlete leaders impact their teammates' identification with the team. In Paper 1 and Paper 11, athletes appointed the best leader on a given role, and subsequently rated his/her leadership quality. In Paper 5, we assessed athletes' leadership quality, as perceived by the other team members. In Paper 3, we used athletes' perceptions of the identity based leadership style of their team captain (i.e., on the four dimensions of the Identity Leadership Inventory). Finally, in Paper 12, we examined the perceived expression of team confidence by the athlete leader. All these papers demonstrated that higher levels of perceived athlete leadership quality or higher team confidence expressed by the athlete leader were associated with a stronger identification of the athletes with their team.

Nevertheless, it is plausible that other leadership styles than the ones investigated in our study also strengthen team members' identification with their team. In this regard, the Servant Leadership Theory (Greenleaf, 1977) also describes a useful leadership style for further investigation. In contrast to previous leader-centered approaches, the Servant Leadership Theory puts the follower in the centre of attention. In line with the upcoming idea of shared leadership (Pearce & Conger, 2003), servant leaders share the lead with their followers. However Greenleaf (1977, p. 27) went a step further than 'sharing the lead': "The servant-leader is servant first. It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. That person is sharply different from one who is leader first." Because servant leaders transform their organization into a nurturing environment in which employees can grow and develop, employees tend to identify stronger with their organization. A few studies already confirmed that servant leadership in business organizations is positively associated with higher levels of team identification in the group (Vondey, 2010; H. Zhang, Kwong, Everett, & Jian, 2012). These results suggest that both the identity based leadership style (Haslam et al., 2011) and the servant leadership style (Greenleaf, 1977) positively affects athletes' identification with their team. The present PhD thesis provided support for the applicability of the Social Identity Approach to Leadership in sport settings. A fruitful line for further inquiry is to investigate whether servant leadership in sport settings has a similar impact on team members' team identification.

# 7.3.3 Underlying mechanisms other than the ones suggested by the Social Identity Approach to Leadership

Previous research already demonstrated that leader's positive mood spills over to the positive mood of followers (Avey et al., 2011; Bono & Ilies, 2006; S. K. Johnson, 2009). However, these studies did not investigate the underlying processes of this contagion process. The present PhD thesis used the Social Identity Approach to Leadership (Haslam et al., 2011) as a first approach to identify the underlying mechanisms of the impact of athlete leaders on team members' confidence in the team's abilities. More specifically, athlete leaders are assumed to impact the confidence of their team members partly because athlete leaders encourage team members to internalize a sense of shared social identity ('we' and 'us', rather than 'I' and 'you'), thereby strengthening their confidence to work more effectively as a unit. It should be noted though that Paper 11 and Paper 12 demonstrated only a partial mediation by athletes' team identification, suggesting that also other processes underpin the impact of athlete leaders on teammates' team confidence.

Another theory that possibly underpin our findings is the Social Cognitive Theory (Bandura, 1986), which is perhaps the most influential theory of learning and development. In contrast with the traditional psychological theories, which emphasized that learning occurred through the effect of one's actions, Bandura (1986) suggested that learning phenomena resulted from observing people's behavior and the resulting consequences (i.e., vicarious learning). In this regard, Bandura (1986) suggested that modeling, instruction, and social persuasion were mechanisms that shaped individual's expectations, beliefs, and cognitive competencies. Watson et al. (2001) supported this

statement by suggesting that leaders can initiate upward spirals of team confidence through persuasion and modeling confidence and success.

By perceiving the expressed confidence of the leader, team members thus adapt to the leader's behavior and thereby also adopt the leader's levels of team confidence. As such, athlete leaders are capable of inducing a 'team confidence contagion' whereby their expression of team confidence spreads throughout the team, thereby instilling high (or low) confidence in the team members. In addition, further development in Social Cognitive Theory has revealed that learning is most likely to occur if there is a close identification between the observer and the leader (Pal, 2011). Identification may thus also serve a moderating role in the contagion process explained by vicarious learning. The in-depth study of how vicarious learning and modeling can explain the impact of athlete leaders on teammates' team confidence is a fruitful avenue for future research.

# 7.3.4 Balancing between internal and external validity

Conducting sound and reliable research, but in the meanwhile, striving for a high applicability to the field always comprises balancing between internal and external validity. This balance can particularly be recognized in the experimental study in Paper 12. This experiment is a compromise between internal and external validity. By creating detailed scripts of what the leaders should say and how they should act in respectively the high and low confident condition, we attempted to control our manipulation as much as possible, thereby increasing the internal validity. Despite our attempts, this field experiment remains susceptible to much more influencing circumstances than a similar experiment in a lab setting. These influencing external influences reduce the internal validity. However, in favor of the external validity, we did choose not to conduct a lab experiment, but instead attempted to create a situation that resembles a real-life situation: five basketball players constituting a team that competes against other (virtual) teams by taking free throws, a typical basketball task.

However, one aspect that causes a lower external validity of the experiment, compared to a real-game setting, was that these free throws constitute a highly structured task, which does not resemble the highly dynamic performance in a real basketball game. In the earlier described unpublished soccer experiment, we used a more dynamic performance setting, in which members had to interact and rely on each other to successfully complete the given task.

Nevertheless, even in the latter soccer experiment, the external validity is imperfect: the players did not know each other and the leader was a stranger who was perceived as the leader through an experimental manipulation. However, we can assume that in a real game setting, in which the leader has earned respect and credibility over years of competing together, the impact of the leader's behavior or his/her expressed emotions will have a more profound impact on the team members than in our experiments.

## 7.3.5 The broader social context

The contingency perspective of leadership posits that leadership is a social construct that cannot be fully understood when it is isolated from the context in which it occurs (Yukl, 2006). Also in sport settings, teamwork is much more than the sum of the individual contributions. Because athletes rely on each other on the field, but often also off the field, it makes no sense to isolate athletes from their surrounding context. In the present PhD thesis, we attempted to investigate the athletes within their team (i.e., in relation with their team members and coach). However, it is conceivable that the surrounding context, which influences an athlete's feelings and behaviors, reaches further than only the team members and the coach.

In a recent qualitative study (already indicated in Section 2.1.2, but not a part of this PhD thesis), we asked 425 players and coaches which persons influenced the choice of the team captain. The coach was typically indicated as having the strongest influence on this decision, followed by the athletes. However, it should be noted that respectively 29% and 15% of the participants indicated that also the club management and the fans exerted influence on this decision. Similar to the selection of the team captain, also athletes' team confidence seems to rely on external factors, such as the opponent and the audience (Ronglan, 2007). The importance of body language to impress the opponent was illustrated by Jim Loehr, a world-renowned sport psychologist, who postulated that great competitors are great actors. One of his principles reads as follows: "Project on the outside the way you want to feel on the inside" (Loehr, 1995, p. 143). Also Ronglan (2007) observed that clearly expressing enthusiasm and displaying team confidence after a winning streak might strengthen the opponent's feeling of defeat. In addition, the author noted that teams being supported by an enthusiastic audience might experience higher levels of team confidence. The importance of the home advantage, which was

supported by numerous studies, further supports the impact of the surrounding context (Bray & Widmeyer, 2000; Gayton, Broida, & Elgee, 2001; Wolfson, Wakelin, & Lewis, 2005).

The club management and the fans are thus factors that should not be disregarded when looking at the total picture. At a higher level, federations can also play a significant role. For example, the Royal Belgian Football Association created 'devil challenges' for the fans of the national Belgian soccer team (also termed Red Devils). This campaign resulted not only in a stronger identification of the fans with the Belgian Red Devils (Stockmans, 2014), but the public visibility may also have caused the athletes themselves to become more proud for being a Red Devil. Investigating the impact of club management, fans, and federations on athletes' team confidence, their team identification, and the team's performance constitutes a fruitful avenue for further research.

### 7.3.6 Translating the knowledge to other settings

The translation of our findings in the present PhD thesis to other settings, such as business or educational settings constitutes another interesting avenue for further research. Although the paradigm of 'shared leadership' already entered organizational literature, this research line is still in its infancy and many opportunities exist for further exploration. For example, several studies in organizational research demonstrated that shared leadership (i.e., different individuals taking the lead together) is beneficial for the team's effectiveness. However, it still remains concealed whether these leaders also occupy different leadership roles, which possibly constitutes an additional favorable factor for the team functioning.

In line with previous research in organizational settings, Paper 1 of the present PhD thesis demonstrated that shared leadership (i.e., different athletes taking the lead) was positively related to athletes' team identification, their team confidence, and the team's position in the ranking. Although these correlations were rather small, they suggest that it is better to have different leaders in the team than only one leader (e.g., the captain). Paper 1 added that the more different leadership roles were occupied within a team, the more athletes identified with their team, the higher their team confidence, and the higher the team was positioned in the team ranking. The Appendix of Paper 6 even demonstrated that shared leadership within each leadership role (e.g., several task
leaders) was related to a stronger task and social cohesion in the team. Based on these findings, it is likely that the already demonstrated importance of shared leadership for optimal team functioning (e.g., see Carson, Tesluk, & Marrone, 2007) would become even stronger when the different leaders in the team fulfill different leadership roles.

Future research could conduct a qualitative study within organizations that verifies the presence of our four leadership roles (i.e., task, motivational, social, and external leader) and identifies possible other leadership roles that may exist on the work floor. Afterwards, it would be interesting to examine the importance of shared leadership on these different leadership roles for outcomes such as job satisfaction, organizational citizenship behavior, turn-over intention, organizational commitment, and work performance. The extension of our findings from sport teams to other settings, such as the organizational setting, would meet the increasing interest of organizations in informal and shared leadership.

## 7.3.7 Representativeness of our samples

Although the variety within our large samples is a considerable strength of the present PhD thesis, we should add that this does not imply that our samples were also representative for the target population (i.e., all players and coaches practicing a team sport). For example, Paper 1, 2, 7, 8, 9, and 11 relied on data that were gathered via online questionnaires. Although this online approach offers many advantages (e.g., lower cost, avoidance of social desirability effects caused by an interviewer, more convenient for the responder), this approach also has disadvantages. For example, with this approach we do not reach the people without internet access, such as the elderly. Because the greater part of these elderly do not participate in team sports (Scheerder, Thibaut, Pauwels, Vandermeerschen, & Vos, 2011), it is unlikely that the potential non-response by elderly has caused bias with regard to the representativeness of our sample.

People with a lower education constitute a more relevant group that might also have limited internet access. Furthermore, it is likely that less educated people are not that interested in filling out academic questionnaires. To analyze this difference further, we compared the education level of the athletes in the sample that was used for Paper 1, 2, 7, and 11 with the education level of all participants of sport clubs in Flanders (Scheerder et al., 2011). The results revealed that 27% of our participants had a university degree (versus 31% of all sport club participants in Flanders), 27% of our participants had a higher non-university degree (versus 26% in Flanders), 30% had a higher secondary degree (versus 24% in Flanders), 12% had a lower secondary degree (versus 17% in Flanders), 4% of the participants had a degree of lower education (versus 17% in Flanders), and only 0.4% of our participants had no degree (versus 7% in Flanders). The underrepresentation of the less educated participants might be caused by the online method of assessment.

With respect to our target group (players and coaches within team sports), the main source of potential bias (i.e., in the sense of non-representativeness) was probably not caused by athletes and coaches that had no internet access but by the non-response caused by athletes and coaches who received the questionnaire but did not participate in the study. These non-responders might have a different profile than the participants, as a result of which we should be cautious in generalizing our findings to the whole population. The same holds for the athletes and coaches who did not want to participate in the other studies that we conducted. In this respect, we should account for the possibility that mainly the motivated athletes and coaches filled out our questionnaire. It is plausible that it were precisely these athletes and coaches that were already interested in leadership phenomena, which might have caused bias in our results.

Regarding the representativeness with respect to sex, the report of Scheerder and colleagues (2011) demonstrated that more males (69%) than females (31%) are member of a sport federation in Flanders. This male dominance was represented in the sample that was used for Paper 1, 2, 7, and 11 (respectively 65% versus 35%). Moreover, the sex distribution for the different sports that were reported by Scheerder et al. (2011) was comparable to the sex distribution in our sample. Furthermore, with respect to sport, Scheerder et al. (2011) revealed that soccer, volleyball, and basketball were the most popular team sports in Flanders, which is reflected in our sample that was used for Paper 1, 2, 7, and 11. It should be noted tough that the active cooperation with the basketball and the volleyball federation may have partly underlain the larger samples within these sports.

In conclusion, despite the size and the variety within our samples, we cannot claim representativeness. Therefore, we recommend future research to replicate our findings using representative samples of athletes and coaches in Flanders, but also in other countries. In this regard, we refer to Section 7.3.5, in which we discussed the potential differences that can be found in other cultures.

# 8. Practical Implications of the Present PhD Thesis

The findings of the present PhD thesis suggest a number of practical implications that can be considered by coaches, sport psychologists, and sport teams. We will classify these suggestions according to the two central concepts of this PhD thesis: athlete leadership and team confidence.

#### 8.1 Practical implications with respect to athlete leadership

A lack of leadership skills was cited by coaches as the sixth most frequent problem among adolescent athletes (Gould, Chung, Smith, & White, 2006). In addition, the present PhD thesis pointed to the inability of the team captains to conform to the high expectations of their teammates and coaches regarding their leadership abilities. Some athletes are offered the position of team captain but are not equipped with the tools necessary to fulfill it, while others, having the necessary tools, may not be given the opportunity.

Voelkler, Gould, and Crawford (2011) conducted interviews with 13 former high school captains. Their results revealed that not one of them was trained or prepared by their coaches to optimally fulfill their leadership roles. As such, rather than situating the problem within the captain, it makes more sense to situate the problem in the inadequate training of captains on how to become a good leader. We recommend coaches and sport psychologists to allocate adequate time and effort to identify the athlete leaders within the team and further develop their leadership abilities (Bucci et al., 2012; Price & Weiss, 2011).

# 8.1.1 Recognition of the formal and informal athlete leaders

The first step in this leadership development process is to identify the athlete leaders within the team. One of the important lessons that can be drawn from this PhD thesis is that informal leaders often take the lead in sport teams. Looking only at the team captain as formal leader would therefore limit our view on the leadership structure within the team. Identifying the informal leaders within the team is thus a crucial step that cannot be ignored. As Medina (2011) stated, the best way to learn how to lead is by doing, by walking the talk. In this regard, an alternating system to assign leadership roles in the beginning of the season might give athletes the opportunity to fulfill a leadership

role. Feedback from the coach and other athletes will soon reveal athletes' leadership potential on a particular role.

The present PhD thesis demonstrated that Social Network Analysis (SNA) is a viable diagnostic tool to identify the key leaders on the different leadership roles within the team. Instead of only providing information on the best leader of a team, SNA provides insight in the perceived leadership qualities of the complete team. In this way, also the presence of cliques can be detected. For example, it is possible that in a particular team, half of the team perceives one athlete as best task leader, whereas the other half of the team clearly rates another team member as best task leader. In such a situation, it might be beneficial for the team atmosphere to appoint two task leaders who cooperate on this leadership function. This network approach thus provides very detailed, team-specific leadership information, which can be evaluated on different time points in the season.

Bailey (2001, p. 187) stated that "the man who correctly understands how a particular structure works, can make it work differently with much less effort than a man who does not know these things". The same could be said for sport teams: coaches who are equipped with a full insight in the leadership structure of their team can more effectively lead their team to success. For example, Marc Lammers, former coach of the Dutch national hockey team pointed at the importance of natural leadership when he asked his players to designate their team captain (Lammers, 2007).

One could argue that the quest for high-quality athlete leadership even begins before the start of the season, namely when composing the team. As noted before, although leadership is a process that can be learned and leadership is situation-specific, some individuals are more suitable than others to occupy leadership positions. In this regard, it is important to take into account a player's leadership abilities when discussing potential transfers. This was illustrated by Ivan De Witte, club manager of AA Gent, a first division soccer team in Belgium, who reported in the media after a disappointing first season half: "I realize that in the past transfer period too few strong personalities are acquired to strengthen the core of the team. Our team lacks athlete leaders" (V., 2012).

Not only for selecting new players, also for restructuring the team, leadership can be a decisive factor. This was illustrated by Marc Lammers, former coach of the Dutch national hockey team, who dismissed Dillianne van den Boogaard, one of the more experienced players in the team. As a reason, he noted: "During training, Dillianne did not go in front and take the lead, which you would expect of such an experienced player, but instead she lagged behind on the others. That behavior held a dangerous signal to the other team members. Therefore, I had to interfere" (Lammers, 2007, p. 59).

## 8.1.2 Role clarification

It is likely that formally appointing the athletes who will occupy the different leadership roles already constitutes the first step in the leadership development process. If athletes already fulfill their leadership role optimally, a formal appointment might not be necessary. However, if athletes don't dare to take up leadership responsibilities (e.g., to stay out of the team captain's perceived territory), a formal appointment can help the athletes realize that the other team members perceive them as a leader on a particular role. This recognition will strengthen their feeling of responsibility, and will probably motivate them to fulfill their leadership role even better.

It is generally accepted that the successful execution of individual role responsibilities will offer greater opportunities for positive group outcomes (Kleinert et al., 2012). Kleinert et al. (2012) further noted that the facilitation of effective and transparent communication among coaches and athletes to clarify the role expectations of all group members is a starting point towards enhanced performance. For instance, Jürgen Gröbler, coach of the British rowing team, stated that every rower in the team had a particular role: "Matt for his physical capacities, Steve for his experience and being a mastermind at reading races, Tim for the feel of the boat and his ability to give feedback afterwards, and James who nearly killed himself with effort every day" (Redgrave, 2009, p. 182). The clarity of each athlete's role highlighted their unique contribution, as was illustrated by one of the team members: "It would be quite easy for Tim to have got depressed because he was a weaker athlete than the rest of us. Yet he brought a technical excellence to the crew and it was important for his confidence and self-esteem that he thought that he brought more of that quality than anybody else. It was the same for the rest of us. We all made different contributions" (Redgrave, 2001, pp. 311-312). The appointment of the athlete leaders in the team and the clarification of their leadership roles will thus improve the role clarity within the team, thereby also enhancing the effectiveness of the role fulfillment (Crozier et al., 2013; Martens, 1987).

Paper 1 of the present PhD thesis demonstrated that in almost half of the teams (44%), the captain did not take the lead on any of the four leadership roles. The unpublished qualitative study, as outlined in Section 2.1.2, revealed that the choice of team captain had often nothing to do with leadership abilities. The present findings can help coaches to elect their team captain in a more well-considered way, depending on the particular needs of their specific team. It is important to note that we do not argue for a team captain who occupies all four leadership roles. In contrast, shared leadership within the team has proven to be the most beneficial for optimal team functioning. If the team captain does not occupy any of the roles, but informal leaders emerge who successfully fulfill all leadership roles, the team will be able to function optimally. However, when all team members expect the team captain to take up his/her responsibility on the four leadership roles and because of that do not dare to take the lead themselves, the team functioning will seriously deteriorate if the captain is not able to meet the high expectations of his/her teammates. Therefore, we recommend a well-considered selection of the athletes who will fulfill the different athlete leadership roles in a particular team and a transparent communication on the corresponding responsibilities of each team member.

## 8.1.3 Leadership development

Joop Alberda, former coach of the Dutch national volleyball team, posited that he did not share the approach of most top-level coaches who only focused on athletes' weaknesses (Westerbeek & Smith, 2005, p. 41). According to Alberda, at the elite level it is not the sport-specific abilities that distinguish a player from the others. Instead, the real talent is the unique contribution that a player can add to the team, such as effective leadership. Therefore, rather than focusing on the weaknesses, Alberda argued to improve athletes' strengths. Likewise, Gert Vande Broek, head coach of the national Belgium volleyball team, stated: "When coaches complain that they don't have leader figures within their team, they actually say that they have failed as a coach" (Van Baelen, 2013).

Because the quality of the athlete leaders within a team can make or break a season, coaches and sport psychologists should not rest on one's laurels after having identified the athlete leaders within the team. Instead, investing time and energy in strengthening the leadership abilities of the appointed leaders is crucial in developing

high-quality athlete leadership within the team. Coaches and sport psychologists would highly benefit from well-designed leadership workshops, focusing on how to optimally fulfill the function of athlete leader. However, to date, only sparse research explored the development of such programs (Blanton, Sturges, & Gould, 2014; Cotterill, 2014).

Cotterill (2014) designed one of the first athlete leadership development programs and thereby distinguished between three levels of leadership development: (1) captaincy development, (2) leadership skill development, and (3) personal growth and leadership development. The first level of captaincy development only focused on a small group of athletes, who were identified as having captaincy potential. These athletes were provided a book on captaincy. Furthermore, they received the opportunity to fulfill the role of captain in practice games. Feedback on their captaincy performance was provided through different channels, such as the coach, sport psychologist, and performance director. Furthermore, specific sessions were offered to the participants on topics such as conflict management and the role of the captain. The second part of the program (i.e., leadership skill development) was designed for all the athletes. In this part, athletes were provided with the opportunity to fulfill specific leadership roles; an approach that resembles the suggestion that we gave in the previous section to identify athlete leaders. The third and last part of the program (i.e., personal growth and leadership development) focused on a personal development program that was initiated outside the sport context.

Although this athlete leadership development program is promising, Cotterill (2014, p. 22) noted that future research is needed to further explore the implementation of evidence-based intervention programs aimed to develop leadership capabilities. In this regard, the findings of the present PhD thesis emphasize the importance to stimulate athlete leaders to express confidence in their team's abilities, to assure that teammates feel connected with them, to encourage their teammates, and to show their enthusiasm, even when their team is losing. Because our findings revealed that the different leadership roles require different leader attributes and behaviors, future research should tailor a specific leadership program for each of the identified leadership roles. This strengthened athlete leadership has the potential to create a more optimal team functioning, which, in turn, may result in an improved team performance.

#### **8.2** Practical implications with respect to team confidence

#### 8.2.1 An individualized approach to create a stable and high team confidence

Paper 12 revealed that higher levels of team confidence are related to a better performance. A logical conclusion for coaches would be to strive for the highest team confidence possible. Johnson and Fowler (2011, p. 317) formulated some reservations concerning this suggestion: "Confidence is an essential ingredient of success in a wide range of domains ranging from job performance and mental health to sports, business, and combat. Some authors have suggested that not just confidence but overconfidence believing you are better than you are in reality—is advantageous because it serves to increase ambition, morale, resolve, persistence, or the credibility of bluffing, generating a self-fulfilling prophecy in which exaggerated confidence actually increases the probability of success. However, overconfidence also leads to faulty assessments, unrealistic expectations, and hazardous decisions, so it remains a puzzle how such a false belief could evolve or remain stable in a population of competing strategies that include accurate, unbiased beliefs."

Overconfidence might thus be beneficial, but may also imply considerable risks. Instead of maximizing athletes' team confidence, it might thus be more advantageous to strive for a realistic and stable team confidence over time, as was outlined in Section 7.2.1. Paper 10 demonstrated that athletes' team confidence before the game was not related to their performance during the first half. An unstable and unrealistic overconfidence at the start of the game holds the risk of a confidence collapse when the game does not unfold as expected. In this regard, it might be better for coaches to create a stable, realistic team confidence before the game, for instance based on scouting information of the opponent. However, during the game, Paper 10 demonstrated that athletes' team confidence does predict the subsequent team performance. Therefore, it is important for coaches to strive for stable, high levels of team confidence throughout the game, for example by strengthening athletes' confidence in the own tactical game plan.

Paper 10 demonstrated that the variance of team confidence during the game is mainly explained at the individual level. When striving to enhance an athlete's team confidence, it is thus important to adopt an individual-tailored approach, rather than a motivational speech for the whole team. Techniques to strengthen team members' team confidence include verbal persuasion (Vargas-Tonsing et al., 2004) and the expression of team confidence by the coach or other team members (Paper 8, Paper 9, Paper 12, Moritz & Watson, 1998; Vargas-Tonsing et al., 2004; Zaccaro, Rittman, & Marks, 2001). Hence, not only coaches, but also athlete leaders in the team play a key role in optimizing team members' team confidence, thereby preventing downward efficacy—performance spirals (Lindsley et al., 1995). Therefore, it is important for coaches to get their athlete leaders to understand their potential and responsibility as role models in the team.

# 8.2.2 Strengthening team members' team identification

Several papers within the present PhD thesis have provided support for the applicability of the Social Identity Approach to Leadership (Haslam et al., 2011) to athlete leadership in sport settings. In other words, another technique to enhance team members' team confidence is to strengthen their identification with the team. In this regard, Haslam, Reicher, and Platow (2011) distinguished four dimensions of effective leadership. As outlined in Section 4, athlete leaders need not only to 'be one of us' (identity prototypicality), but also to 'do it for us' (identity advancement), to 'craft a sense of us' (identity entrepreneurship), and to 'embed a sense of us' (identity impresarioship). In order to adopt such an identity-based leadership style, athlete leaders would benefit from a profound understanding of the values and norms that constitute the identity of the team. By representing, creating, advancing, and embedding a shared sense of 'us' in the team (i.e., a shared social identity), athlete leaders will be able to strengthen team members' confidence in the team's abilities, and in turn the team performance.

#### 8.2.3 Focus on the process instead of the outcome

Paper 10, Paper 12, and the unpublished study on the national junior team revealed that high levels of team outcome confidence (i.e., confidence in winning the game) go hand in hand with a better performance. It is unfortunate, however, that because this team outcome confidence is rooted in the comparison with the opponent, athletes' confidence in winning the game or obtaining the goal is not fully controllable. Instead, external factors such as the quality of the opponent, dubious referee decisions, an injured teammate, or a lucky goal are likely to heavily impact this outcome-oriented type of team confidence. For instance, Marc Lammers, former coach of the Dutch hockey team, stated in an interview: "You cannot control the result for 100%. You never know how strong your opponent will be, which decisions the referee will make, and in which weather circumstances you have to play. You can exert the most control on yourself.

Therefore, you should focus on the process" (Breedveld, van den Brink, & van Dijk, 2009, p. 12).

Although team outcome confidence is linked with the team performance, it is noteworthy in this regard that Paper 11 and Paper 12 demonstrated that the processoriented collective efficacy impacts upon this outcome-oriented team outcome confidence. Because collective efficacy is rooted in the confidence in the own team, rather than in the comparison with the opponent team, collective efficacy is much more controllable than team outcome confidence.

Not only is collective efficacy much more controllable, Marc Lammers also illustrated the risk of focusing on the outcome instead of on the process (2007, p. 49): "Never defend your lead. It will kill you in the end. Defending the lead means that you are focused on the outcome while the game is still going on. That attitude will cause problems, whether you like it or not." It should be noted that this statement might specifically be related to the hockey context. Similar as in volleyball and basketball, you have to score in order to win a game. However, in soccer for example, in which scoring is much rarer, a more defensive strategy can sometimes be effective.

It can be concluded that, given the uncontrollability of team outcome confidence, coaches and athlete leaders should thus strive to enhance athletes' confidence that their team has the requested abilities to successfully complete the processes (e.g., communicating tactically well, encouraging each other, following the tactical game plan, etc.). These strengthened collective efficacy beliefs will, in turn, foster athletes' team outcome confidence and the team's performance.

# 9. Conclusion

We can conclude that the present PhD thesis contributes to the present knowledge in different research areas. First, we extended the conceptual knowledge of the two concepts of this thesis: athlete leadership and team confidence. Furthermore, we developed two methodological tools (i.e., OCESS, and ILI) and demonstrated that SNA is a pioneering but valuable tool to investigate athlete leadership. Third, the present PhD thesis was the first to use the Social Identity Approach to Leadership (Haslam et al., 2011) and the Theory on Shared Leadership (Pearce & Conger, 2003) as theoretical frameworks in a sport setting to discuss our findings on athlete leadership. We hope that this extended research endeavor, including conceptual, methodological, and theoretical aspects, will support further research in the different research areas.

The consistency of the relationships in the overarching model (see Figure 1), as demonstrated across the different papers, testifies to the reliability of the findings of this PhD project. Creating a shared team identification and confidence in the controllable processes (i.e., players' collective efficacy) appears important for athlete leaders to foster athletes' team outcome confidence, and in turn their performance. It can thus be concluded that by showing that they believe in 'our team', athlete leaders are able not only to make 'us' a psychological reality, but also to transform 'us' into an effective operational unit. In this way, a team of champions can become a champion team.

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# Appendices

# Scientific Career – Katrien Fransen

2010 - 2014	PhD student
	Fellowship at Research Foundation – Flanders (FWO)
	KU Leuven
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	Department of Kinesiology
	Physical Activity, Sports & Health Research Group
2008 - 2010	Master's degree in Kinesiology
	Field of Training and Coaching in Volleyball
	Graduated summa cum laude
2006 - 2008	Bachelor's degree in Kinesiology
	Graduated magna cum laude
2006 - 2008	Teacher Qualification in Physics
	Graduated magna cum laude
2004 - 2006	Licentiate's degree in Physics
	Graduated magna cum laude
2002 - 2004	Candidate's degree in Physics
	Graduated cum laude

# 1. Papers in International Peer-Reviewed Journals

- Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., Ceux, T., De Backer, M., Boen, F. (2012). "Yes, we can!": Perceptions of collective efficacy sources in volleyball. *Journal of Sports Sciences, 30* (7), 641-649.
- Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). The myth of the team captain as principal leader: Extending the athlete leadership classification within sport teams. *Journal of Sports Sciences*, http://dx.doi.org/ 10.1080/02640414.2014.891291.
- Fransen, K., Kleinert, J., Dithurbide, L., Vanbeselaere, N., Boen, F. (2014). Collective efficacy or team outcome confidence? Development and validation of the Observational Collective Efficacy Scale for Sports (OCESS). *International Journal of Sport Psychology*, 45, 121-137. doi: 10.7352/IJSP 2014.45.121.
- Fransen, K., Coffee, P., Vanbeselaere, N., Slater, M., De Cuyper, B., Boen, F. (2014). The impact of athlete leaders on team members' team outcome confidence: A test of mediation by team identification and collective efficacy. *The Sport Psychologist*. http://dx.doi.org/10.1123/tsp.2013-0141
- Fransen, K., Decroos, S., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and team performance during soccer games. *Journal of Sports Sciences*, http://dx.doi.org/10.1080/02640414.2014.942689.
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  Leadership Inventory (ILI) to assess and validate a four-dimensional model. *The Leadership Quarterly*. http://dx.doi.org/10.1016/j.leaqua.2014.05.002

- Howell, J., Koudenburg, N., Loschelder, D., Weston, D., Fransen, K., De Dominicis, S., Gallagher, S., Haslam, A. (2014). Happy but unhealthy: The relationship between social ties and health in an emerging network. *European Journal of Social Psychology*. http://dx.doi.org/10.1002/ejsp.2030
- De Backer, M., Boen, F., Ceux, T., De Cuyper, B., Hoigaard, R., Callens, F., Fransen, K., Vande Broek, G. (2011). Do perceived justice and need support of the coach predict team identification and cohesion? Testing their relative importance among top volleyball and handball players in Belgium and Norway. *Psychology of Sport and Exercise*, 12 (2), 192-201.
- Fransen, K., Haslam, S. A., Steffens, N. K., Vanbeselaere, N., De Cuyper, B., & Boen, F. (2014). Believing in us: Exploring leaders' capacity to enhance team confidence and performance by building a sense of shared social identity. *Journal of Experimental Psychology: Applied*, Manuscript accepted for publication, pending revisions.
- **Fransen, K.**, Van Puyenbroeck, S., Loughead, T. M., De Cuyper, B., Vanbeselaere, N., Vande Broek, G., & Boen, F. (2014). *Who takes the lead? Social Network Analysis as pioneering tool to investigate shared leadership within sports teams*. Manuscript submitted for publication.
- Fransen, K., Van Puyenbroeck, S., Loughead, T. M., De Cuyper, B., Vanbeselaere, N., Vande Broek, G., & Boen, F. (2014). The art of athlete leadership: Identifying highquality leadership at the individual and team level through Social Network Analysis. Manuscript submitted for publication.
- **Fransen, K.**, Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). *When is a leader considered as a good leader? Perceived impact on teammates' confidence and social acceptance as key ingredients.* Manuscript submitted for publication.
- **Fransen, K.**, Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). On traffic-jams, speed bumps, and gas stations along the road to team confidence: Perceived sources of team confidence in soccer and basketball. Manuscript submitted for publication.

- Loughead, T. M., Fransen, K., Van Puyenbroeck, S., Hoffmann, M. D., Vanbeselaere, N., De Cuyper, B., & Boen, F. (2014). An examination of the relationship between athlete leadership and cohesion using social network analysis. Manuscript submitted for publication.
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- Hoigaard, R., De Cuyper, B., Fransen, K., Boen, F., & Peters, D. M. (2014). Coach's behavior as predictor of collective efficacy among female elite handball players. Manuscript submitted for publication.

## 2. Meeting Abstracts, Presented at International Conferences

- Fransen, K., Haslam, S. A., Steffens, N. K., Vanbeselaere, N., De Cuyper, B., & Boen, F. (2014). Believing in 'us': Leaders' capacity to enhance confidence and performance by strengthening players' team identification. *General meeting of the European Association of Social Psychology*, Amsterdam, the Netherlands, 9-12 July 2014 (pp. 63). Amsterdam, the Netherlands: University of Amsterdam
- Fransen, K., Vanbeselaere, N., De Cuyper, B., & Boen, F. (2013). When our leader is confident, so am I! An experiment on team confidence contagion in basketball. *Division of Sport & Exercise Psychology Conference*. Division of Sport & Exercise Psychology Conference. Manchester, UK, 16-17 December 2013 (pp. 31-32). Leicester, UK: The British Psychological Society.
- Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, & G., Boen, F. (2013). De aanvoerdersband Altijd aan de sterkste arm? Het belang van leidersfiguren binnen sportteams. Dag van het Sportonderzoek. Eindhoven, Nederland, 7 November 2013. Eindhoven, Nederland: Fontys Sporthogeschool.
- Fransen, K., Vanbeselaere, N., De Cuyper, B., & Boen, F. (2013). When our leader is convinced, so am I! An experiment on team confidence contagion in basketball. ISSP World Congress of Sport Psychology. Beijing, China, 21-26 July 2013 (pp. 63-64).

- Van Beirendonck, C., Boen, F., Fransen, K., Vanbeselaere, N., & De Cuyper, B. (2013).
  Social Loafing in professional cycling teams: Does the team leader make a difference?
  ISSP World Congress of Sport Psychology. Beijing, China, 21-26 July 2013.
- Fransen, K., De Backer, M., De Cuyper, B., Vande Broek, G., & Boen, F. (2012). Who takes the lead? The importance of perceived justice of the coach and athlete leadership. In Jannes, C. (Ed.), VVSP - 25 years - Days of Fundamentals in Sport Psychology. Ghent, 21-22 September 2012 Flemish Federation for Sport Psychology.
- Fransen, K. & Boen, F. (2012). Predicting performance in team sports with dynamic measures of collective efficacy: The moderating role of team identification and leadership. European Association of Social Psychology – Summer school. Limerick, Ireland, 6-19 August 2012.
- **Fransen, K.**, Vanbeselaere, N., Vande Broek, G., De Cuyper, B., & Boen, F. (2012). To lead or not to lead? Identifying athlete leadership roles in sport teams. Annual Congress of the European College of Sport Science. Bruges, Belgium, 4-7 July 2012.
- Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., Ceux, T., De Backer, M., & Boen, F. (2012). "Yes, we can!" Perceptions of collective efficacy sources in volleyball. Annual Congress of the European College of Sport Science. Bruges, Belgium, 4-7 July 2012.
- Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., De Backer, M., Ceux, T., & Boen, F. (2012). "Yes, we can!": Collective efficacy and athlete leadership in sports teams. *Journal of Sport & Exercise Psychology (34)*, S225-S226. North American Society for the Psychology of Sport and Physical Activity. Honolulu, Hawaï, 7-9 June 2012 (pp. S225-S226) Human Kinetics, Inc.
- Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., Ceux, T., De Backer, M., & Boen, F. (2012). United we stand, divided we fall? Group dynamics in interactive groups. Annual meeting of the Belgian Association for Psychological Sciences (BAPS) & Sociedad Española de Psicologiá Experimental (SEPEX). Université de Liège, 10 May 2012.

- **Fransen, K.** (2011). "Yes, we can!": Collective efficacy in sport teams. PhD-workshop on Applied Sport Psychology. Copenhagen, Denmark, 8-11 November 2011.
- Fransen, K., Vanbeselaere, N., Exadaktylos, V., Vande Broek, G., De Cuyper, B., Berckmans, D., Ceux, T., De Backer, M., & Boen, F. (2011). "Yes, we can!": Perceptions of collective efficacy behaviours in volleyball. FEPSAC European Congress of Sport Psychology. Madeira, 12-17 July 2011.

## 3. Meeting Abstracts, Presented at Local Conferences

- Fransen, K., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2012). Who takes the lead? Identifying roles and characteristics of athlete leaders within sport teams. *Via bewegingsonderzoek naar bewegingsbeleid*. Symposium van de Vereniging voor Kinesiologie. Brussel, 7 December 2012 (pp. 19-19). Brussel: Vereniging voor Kinesiologie Winner of the VTS–award for the research with the best link to sport practice and performance improvement.
- Fransen, K., Berckmans, D., Exadaktylos, V., De Cuyper, B., Vande Broek, G., Vanbeselaere, N., & Boen, F. (2010). Predicting performance in team sports with dynamic measures of collective efficacy. Symposium van de Vereniging voor Kinesiologie. Antwerpen, 10 december 2010.

#### 4. External Reports

- Fransen, K., Van Puyenbroeck, S., Vanbeselaere, N., De Cuyper, B., Vande Broek, G., & Boen, F. (2014). "Als onze leider gelooft in winst, dan wij ook!" Het belang van teamvertrouwen uitgestraald door de leider, 20 pp. Leuven: K. Fransen.
- **Fransen, K.**, De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen volleybalteams*, 21 pp. Leuven: K. Fransen.
- Fransen, K., De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen voetbalteams*, 22 pp. Leuven: K. Fransen.
- **Fransen, K.**, De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen rugbyteams*, 21 pp. Leuven: K. Fransen.

- Fransen, K., De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen korfbalteams*, 19 pp. Leuven: K. Fransen.
- **Fransen, K.**, De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen ijshockeyteams*, 20 pp. Leuven: K. Fransen.
- Fransen, K., De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen hockeyteams*, 21 pp. Leuven: K. Fransen.
- **Fransen, K.**, De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen handbalteams*, 23 pp. Leuven: K. Fransen.
- **Fransen, K.**, De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). *Het belang van leidersfiguren binnen basketbalteams*, 21 pp. Leuven: K. Fransen.
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- Fransen, K., De Cuyper, B., Boen, F., Vanbeselaere, N., & Vande Broek, G. (2012). "Wat maakt dat mijn team in winst gelooft?" De bronnen van teamvertrouwen in voetbalteams, 10 pp. Leuven: K. Fransen.
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## 5. Science Popularisation

- Fransen, K. & Boen, F. (In press). Hoe een ploeg van kampioenen een kampioenenploeg wordt: Leidersfiguren van doorslaggevend belang voor teamprestaties. Ortho-Reumato: Tijdschrift voor reumatologie, fysische geneeskunde, orthopedie en sportgeneeskunde. Kraainem: Reflexion Medical Network
- **Fransen, K.** (2014). Invited lecture on athlete leadership on request of the Belgium hockey federation.
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- **Fransen, K.** (2014). Invited lecture on athlete leadership on request of Bloso Expert Platform of Sport Psychology (BES).
- Fransen, K. & Meganck, J. (2013). Jong geleerd is oud gedaan: Leiderschapsstijlen in ploeg en klas. Invited lecture for the 'Studiedag Bond voor Lichamelijke Opvoeding (BVLO)'. Leuven, 14 November 2013. Gent: BVLO.
- Fransen, K. & Cox, S. (2013). De impact van leiderschap in sport. Veto, 39 (21), 6.
- **Fransen, K.** & Boen, F. (2013). De aanvoerdersband Altijd aan de sterkste arm? Het belang van leidersfiguren en teamvertrouwen binnen een sportteam. *VTS-Redactioneel*, 10.
- Fransen, K. (2013). Captain, maar geen leider. Eos Magazine, 2, 38-39.
- Fransen, K., De Cuyper, B., Vanbeselaere, N., Vande Broek, G., & Boen, F. (2012). Het belang van leidersfiguren binnen een sportteam. Overtime, Magazine van de Vlaamse Basketbalcoaches Vereniging, 5 (21), 3-23.

# **Apposition 1**

An autonomy-supportive coaching style stimulates athlete leadership, thereby enhancing the team's effectiveness. Based on my own experience, this assumption does not only hold in sport settings, but also in the academic world.

#### **Apposition 2**

In research, even more resilience is needed than in sport settings to cope with frequent setbacks, caused by the review process. However, the review process is similar to the corrective feedback of a coach: although the feedback sometimes feels out of your control, comes unexpectedly, and hits you hard, in the end, it fosters a higher quality of play and an increased satisfaction after the final victory.

# **Apposition 3**

Teamwork in sport teams makes the difference between a team of talented players and a champion team. Also in research teams, the cooperation between team members with different backgrounds is the key to an optimal performance. The objective and detached perspective of the theoretically-oriented researcher together with the passionate and involved viewpoint of the coach and applied sport psychologist is more likely to result in well-grounded research that is closely attuned to the needs of the field. It is precisely this optimal team functioning that leads to better results than any single individual would have achieved.

# **Bijstelling 1**

Een autonomieondersteunende coachingsstijl moedigt atleetleiderschap aan waardoor de effectiviteit van het team wordt verhoogd. Uit eigen ervaring geldt dit idee niet enkel in een sportcontext maar ook in de academische wereld.

# **Bijstelling 2**

De onderzoekscontext vereist nog meer doorzettingsvermogen dan de sportcontext om om te gaan met de herhaaldelijke tegenslagen, veroorzaakt door het reviewproces. Toch is het reviewproces gelijkend aan de correctieve feedback van een coach: ook al lijkt de feedback soms buiten je controle en komt deze onverwacht en hard aan, aan het einde zorgt deze feedback voor een hoger spelniveau en een sterkere voldoening na de uiteindelijke overwinning.

# **Bijstelling 3**

Teamwork in sportteams maakt het verschil tussen een team van getalenteerde spelers en een kampioenenploeg. Ook in onderzoeksteams vormt de samenwerking tussen teamleden met verschillende achtergronden de sleutel tot een optimale prestatie. Het objectieve en afstandelijke perspectief van de theoretischgeoriënteerde wetenschapper, samen met de gepassioneerde en betrokken invalshoek van de coach en toegepaste sportpsycholoog leiden tot goed onderbouwd onderzoek dat sterk aanleunt bij de noden van het veld. Het is precies dit optimaal teamfunctioneren dat leidt tot betere resultaten dan elk individu afzonderlijk had kunnen bereiken.