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Original research

Will the real leaders please stand up? The emergence of shared leadership in semi-professional soccer teams

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ABSTRACT

Objectives: High-quality leadership is often regarded as one of the main sources of competitive advantage. Especially within sport teams, a team's leadership structure has historically been considered to be stable across the season, with the coach and team captain as the formal, and often sole, leaders. In line with recent organizational research, the present study aims to broaden this perspective by also taking informal leaders into account and exploring how leadership structures among athletes within sport teams evolve over the course of a season.
Design: Using social network analysis, we analyzed the leadership structure of 20 semi-professional soccer teams ($N = 460$ players, $M_{age} = 23.50$ years; $SD = 4.55$) at the start of the season and then again halfway through the season. More specifically, for each team we constructed a leadership network for four leadership roles (task, motivational, social, and external leadership) at these two time points.
Results: Findings suggest that leadership structures in sport teams can change considerably over the course of the competitive season, thereby challenging the classic view of stable, vertical leadership structures. The transition to more shared forms of leadership can be attributed to the emergence of informal leaders over time as players engage more strongly in leadership roles. Furthermore, our results suggest that as teams evolve towards shared leadership their functioning and performance benefits from these changes.
Conclusions: Based on these findings, we recommend that coaches actively implement a structure of shared leadership and seek to develop the leadership qualities of formal and informal athlete leaders.
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Practical implications

- Leadership structures in sport teams are not stable, but tend to evolve towards more shared leadership structures due to the emergence of informal leaders over time.
- A growth in shared leadership appears to be positively associated with increases in both team functioning and team performance.
- Based on our findings, we would advise coaches to actively implement a structure of shared leadership by encouraging players to take on leadership roles.

1. Introduction

"The strength of the group is the strength of the leaders."

This statement by the legendary NFL coach Vince Lombardi captures the perceived importance of leadership for optimal team sport performance. Indeed, in line with this sentiment, most of the research on leadership in sport (in an on-field context) has investigated the impact of the coach on athletes.[1] In particular, the leadership styles and behaviors of coaches have been linked to a range of key outcomes including athletes' motivation, self-esteem, and performance.[2]

Yet in recent years, research has shown that leadership can also emanate from sources other than the coach. In particular, athletes within sport teams have been observed to take on leadership roles in ways that make a significant contribution to team success.,[1,3] Loughead et al.,[4,p. 144] defined an athlete leader as an "athlete occupying a formal or informal leadership role influencing team members toward a common goal." Formal athlete leaders are those players who are officially appointed in their leadership role (e.g., the team captain), while informal athlete leaders are players

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who emerge as leaders through interactions with their teammates, even though their leadership status is not formally recognized.

Besides this distinction based on formal vs. informal leadership status, athlete leaders can also be categorized according to the different roles that they occupy.[5] Building on a line of previous research investigating athlete leader roles,[6–8] Fransen et al.[9] surveyed 3193 players and 1258 coaches, and extended the athlete leadership role classification established by Loughead et al.[7] from three to four distinct leadership roles — two that are primarily performed on the field and two that are primarily performed off the field. The two on-field leadership roles encompass the task leader (who provides technical and tactical instructions) and the motivational leader (who motivates team members on the field); the two off-field roles include the social leader (who promotes good relations in the team and seeks to create a positive team atmosphere) and the external leader (who represents the team towards other stakeholders such as media, fans, club management, and sponsors; for detailed descriptions of these roles, see Fransen et al.[9]). While the four leadership roles can be occupied by different people, it is also possible for a single player to occupy multiple leadership roles within a team.[7,10] However, based on previous work,[9,10] the odds of one player being perceived as occupying multiple roles are relatively low, as only 19% of players are seen to fulfill two leadership roles in the same team, and only 2% of teams is perceived as having a player who is seen to fulfil all four leadership roles.

Previous research suggests that in teams where these four leadership roles are enacted, team members identify more strongly with their team, are more motivated, and have more confidence in their team's abilities, in ways that ultimately lead to better performance.[1,9,10] Furthermore, it has been shown that teams with high-quality athlete leaders on and off the field are characterized by a stronger task-involving climate (in which athletes cooperate to master the task at hand) and a weaker ego-involving climate (in which athletes try to outperform other team members), in ways that ultimately contribute to better team performance.[11,12]

Over the course of the last decade, the importance of athlete leaders has inspired a shift in sport leadership research such that the traditional focus on models of vertical leadership (in which the coach is typically seen as the only leader) has given way to an approach which recognizes the value of shared leadership. This approach of shared leadership proposes that leadership is most effective when it is performed not by one individual alone but instead is shared among various members of the team.[13] This shift also accords with findings from research in organizational contexts, which indicates that shared leadership tends to be a better predictor of team effectiveness than vertical leadership.[14,15] Furthermore, in the context of sport management, an emerging body of work has explored the nature of shared leadership. Consistent with the idea that shared leadership structures distribute leadership responsibilities across an organization,[16] previous research shows that shared leadership allows leaders to emerge on different levels in a sport organization (e.g., athletes, coaches, governance, fans). Specifically, Welty Peachey et al.[17] encourage the implementation shared leadership to resolve problems associated with 'top-heavy and heroic leadership' in sport management, thereby filling the gap in the extant sport management literature by capturing entire leadership structures, including the network of relationships between team members rather than focusing only on the traits of individual leaders.[18,19] Building on this growing body of work, in the present research, we examine sport leadership through the lens of shared leadership as provided by coaches and athletes within a team.

As noted above, previous research indicates that leadership is likely to be more effective if it is shared across different leadership roles so that different people occupy the roles of task, motivational, social, and external leader. Beyond this, there is also evidence that leadership is more likely to be effective when it is shared, not only across, but also within the different leadership roles so that more than one person has responsibility for a particular leadership role.[20,21] Here, it is important to note that shared leadership can encompass a range of leadership structures that vary in their form and degree of sharedness. In this way, shared leadership can refer to sharing the lead across individuals (e.g., where two or more team members perform a given leadership role), across roles (e.g., where team members perform different leadership roles), or a combination of these two. The extent of shared leadership can also vary. For example, while in a maximal case shared leadership involves the equal distribution of leadership across all team members, in a minimal case it involves leadership being shared by just two team members (e.g., the coach and the captain). Previous research has argued that neither one of these (i.e., maximal or minimal sharedness) is optimal. On the one hand, it is likely that not all team members will have the requisite skills and/or the motivation to lead.[22] More importantly, if all team members assume leadership roles, then the difficulty of coordinating their messages increases the likelihood of miscommunication.[6,12,23] As Gockel and Werth[24] observe "it might be good to share the burden of leading, but too many cooks might spoil the broth". On the other hand, minimal shared leadership structures that involve only two team members (e.g., coach and team captain) do little to address problems associated with leadership role overload.[25] Here, then, individuals will tend to have more roles than they have the time, energy, or resources to perform, and this is likely to put them under considerable strain.[9] Consistent with these assumptions, there is evidence that the relationship between the number of appointed leaders in a shared leadership structure and team outcomes is curvilinear.[6,23,24] Together, these studies suggest that optimal leadership sharedness can be found somewhere between the minimal and maximal extremes.

Yet, while the benefits of shared leadership are well-documented for sport teams (e.g., see Cotterill & Fransen, 2016 for a review[1]), little is known about how these leadership structures evolve over time. As Brass and Krackhardt[26] have highlighted, leadership research has largely overlooked the importance of the structure of interpersonal relationships relevant to leadership. Nevertheless, in recent years, sport leadership research has started to pursue a social network approach which captures a team's leadership structure as a whole as well as the relations between team members.[10] This approach involves measuring interpersonal concepts, phenomena, and experiences that people are able to form ideas about (e.g., closeness or liking)[27] and this provides an ideal way of assessing leadership within teams in a way that captures people's experiences of others' leadership qualities. Specifically, the analysis estimates two team-level variables that are important features of leadership structures: network density and network centralization.[27] Leadership network density reflects the average leadership quality in the team, while leadership network centralization captures the distribution of leadership ranging from a maximally centralized network in which one team member is at the center of the network and no other team members are perceived as a high-quality leader, to a minimally centralized network, in which the leadership quality is equally distributed between all team members (i.e., all team members are, on average, perceived as equally good or bad athlete leaders).

Furthermore, social network analysis also addresses some of the limitations of more traditional peer-nominations approaches which can severely restrict the number of other team members that a person can identify as a leader. While this method might be helpful when appointing leaders, it fails to provide insight in the team's overall leadership structure (as shared vs. hierarchical), and provides no information about the leadership quality of individuals who are not formally nominated as leaders.

While social network analysis has been used to provide insight in the current state of leadership structures,[10] previous research provides little insight into how (or whether) these structures change over time. Is the leadership structure in a sport team stable over the course of a season? Do dominant leaders lose their leadership status as the season progresses? Do new leaders come to the fore? In sport teams, such questions have gone largely unanswered, but research in other domains provides some clues as to how leadership structures may transition over time. First, Small and Rentsch[28] and Smith et al.[29] examined the stability of leadership structures in self-managing teams (i.e., leaderless groups) and found that these tended to change substantially over time. More specifically, these authors observed a tendency for leadership to become more shared and less hierarchical. However, the applicability of research findings in leaderless groups to team sport can be questioned as sport teams typically identify a coach and a team captain as formal leaders.

Second, Fransen et al.[23] investigated the natural evolution of leadership structures in 27 newly formed university student project teams — each of which had a formal leader — over the course of a 24-week project. Initially, these groups had a vertical leadership structure in which one fourth-year student was assigned to be the leader of a group of four to six first-year students. Findings indicated that the vertical leadership structure of the teams paved the way for increasing levels of shared leadership throughout the project. More specifically, the overall level of leadership within the team increased over time and more team members tended to become better leaders over time (i.e., reflected by a combination of an increasing leadership network density and a decreasing leadership network centralization). Interestingly too, those teams that reported higher average perceptions of leadership quality across team members performed best, suggesting that the evolution of a shared leadership structure is associated with better team performance.

To date, most research on athlete leadership has also been cross-sectional in nature, limiting our understanding of potential changes over time. To our knowledge, the only exception is a study by Duguay et al.,[30] which investigated the evolution of leadership in a youth ice hockey team. The findings here revealed that the overall level of task leadership in that specific ice hockey team increased, while the extent to which task leadership was shared among the team members did not change. For social leadership, however, the researchers observed that the average social leadership qualities in the team not only increased over time, but also became more shared among the team members. But unlike previous studies in organizational contexts,[23,28] in this study these changes in leadership structures were not related to team effectiveness or performance.

Yet given the observed fluctuations in a team's leadership, there is a clear need to gain more insight into the evolution of leadership over time.[31] In the present study, we seek to address this lacuna by building on the case study by Duguay et al.[30] More specifically, we test the validity of the study's findings in a broader sample of 20 semi-professional teams (rather than just one youth team) and we examine the longitudinal evolution of the four leadership roles defined by Fransen et al.[9] (rather than just the task and social leadership roles). In addition to providing insight in the evolution of the leadership structures throughout the season, our goal is also to gain deeper insight into the nature of these changes by identifying the underlying mechanisms responsible for them. Moreover, we will also investigate the implications of these changes for team functioning, in ways that build upon the previous research of Fransen et al.[23]

In line with previous research from organizational domains, we expect that leadership structures in sport teams will not be stable, but rather prone to changes over time.[23,28,32] More specifically, we hypothesize that:

H1. Leadership structures for each of the four leadership roles (i.e., task, motivational, social, and external leadership) will change substantially over time. More specifically, the average leadership quality in each of the four roles will increase (i.e., an increase in leadership network density; H1a), while leadership will become more distributed over time (i.e., a decrease in leadership network centralization; H1b).

H2. Changes in leadership structures at the network level (i.e., density and centralization; as described in H1) can be accounted for by an increase in the perceived leadership quality of informal leaders (i.e., so that players within the team other than the captain step up and take the lead).

Furthermore, in light of evidence that teams with shared forms of leadership are seen to function and perform better,[1,15,33] we also explore the relationship between leadership structures (as measured in terms of leadership network density and centralization) and team functioning and performance. As the leadership structure in a team is a team-level construct, we will explore this relationship at the team level, aggregating the outcome variables that were all measured at the individual level. Here we hypothesize:

H3. The evolution towards more shared forms of leadership (as anticipated by H1) will be positively related to (a) increased team identification (H3a), (b) increased team confidence (H3b), (c) increased intrinsic motivation (H3c), and (d) increased task-involving climate (H3d), as well as (e) a weakened ego-involving climate (H3e), and (f) improved performance (H3f), as observed at the team level.

2. Methods

Twenty-three semi-professional male Belgian soccer teams were contacted to participate in the study and 20 agreed to do so (response rate = 87%). The main reason for non-participation of the remaining three teams was the reluctance of the respective head coach to have the team complete the required questionnaires due to the investment of time this would require. The participating teams competed in the third-, fourth- and fifth-highest divisions of the Belgian soccer league and trained between 8 and 16 h each week. Nineteen teams were semi-professional (i.e., at least one player played as their main occupation), while one team was a fully professional club.

Team sizes varied between 18 and 28 players ($M = 23$, $SD = 2.66$). In total, 460 individual players participated. These players were on average 23.5 years old ($SD = 4.55$) and had played for 3.4 years for their current team ($SD = 3.96$). Full data sets were obtained from 415 players at T1 (response rate = 91%), 384 players at T2 (response rate = 84%), and 370 players completed both surveys (response rate = 81%). Thirty-one players dropped out during the study with the main reason being that they were injured, sick, or not present at the moment of the second assessment. In addition to the players, the head coach of each team was also surveyed ($N = 20$; $M_{age} = 46.8$; $SD = 8.20$). On average, these coaches had been working for 4.1 years for their current club ($SD = 8.20$).

We gathered data by administering questionnaires at two time points. The first round of data collection (T1) took place in July, when the teams had started their preparation for the competitive season (i.e., the teams had already played multiple practice and cup games, but had not yet started the regular competitive season). Data were collected a second time (T2) in November just before the mid-season and the beginning of the 'transfer window'. In soccer, this window is a period in which players are able to change clubs. In Belgian soccer, this can be a turbulent phase, as many teams change their composition at this point. Given that we were interested in the evolution of leadership networks, a period during which play-

ers frequently change teams would disrupt this process and distort our findings. Accordingly, we focused on the evolution of leadership during the first half of the season. All players participated voluntarily in the study and were assured that their data would be treated confidentially. The research design was approved by the ethical committee of the first author's university (G-201711996). Upon termination of the study, we provided the head coach of each team with a detailed report on the leadership analysis of their own team.

The questionnaires, containing all measurements described below, were available in Dutch, French, and English to ensure that every participant had the opportunity to complete the questionnaire in their preferred language.

We assessed players' leadership quality in the four leadership roles (i.e., task, motivational, social, and external leader), instead of focusing on players' general leadership quality. After carefully reading the definitions of each role (as defined by Fransen et al.[9]), we asked participants to rate the leadership quality of each of their team members (including the head coach) on an 11-point Likert scale ranging between 0 (*very bad leader*) and 10 (*very good leader*) in each of the four roles. Using this approach, we were able to construct four leadership networks for each team, one for each leadership role. These networks are evaluative because the strength of the ties between team members ranges from 0 to 10. Furthermore, the networks are directional because team member A's perception of team member B's leadership qualities is not necessarily the same as team member B's perception on team member A's leadership qualities. Social network analyses resulted in three specific network parameters for each of the leadership roles — one parameter at the individual level (i.e., indegree centrality) and two parameters at the team level (i.e., network density and network centrality).[27]

At the individual level, the indegree centrality of each team member reflects the extent to which that individual is perceived to be a good leader in a specific leadership role. Indegree centrality therefore constitutes an appropriate measure of a leader's influence on other members of their team.[10,34] In line with the guidelines of Borgatti et al.,[27] we computed the indegree centrality of each team member by averaging the strength of all incoming ties for that specific team member (i.e., the average leadership quality as perceived by other team members). This calculation results in a measure that can be compared across different teams, regardless of their team size.

The density of a network is a team-level variable and describes the overall strength of connections between team members. In leadership networks, the density reflects the average leadership quality in the team; high density scores for a particular leadership role characterize teams with, on average, high-quality leadership, while low density scores characterize teams with, on average, low-quality leadership in that specific role.[27,35] Following the procedure for valued networks suggested by Sparrowe et al.,[36] we calculated the density of all teams for all four leadership networks at both time points by computing the average strength of all leadership perceptions in the network.

Network centralization is a team-level variable that reflects the extent to which a network is dominated by a single individual.[27] The present study focused on indegree centralization by analyzing the incoming ties (i.e., the degree to which team members are perceived by others as leaders) instead of the outgoing ties (i.e., the degree to which a particular team member perceives other team members to be a leader). More specifically, with respect to the leadership networks used in this study, leadership network centralization can range between a maximally centralized network in which one team member is at the center of the network receiving only high ties while no other team members are perceived as high-quality leaders, to a minimally centralized network, in which the leadership quality is equally distributed between all team members (i.e., all team members are, on average, perceived as equally good or bad athlete leaders).[27,28,37] We computed network centralization using the definition as suggested by Freeman[34]: $\text{indegree centralization} = 100 \times \frac{\sum_{i=1}^{n}(C^{*}-C_i)}{Max\sum_{i=1}(C^{*}-C_i)}$, where C_i is the indegree centrality of team member i and C^{*} the indegree centrality of the team member who is perceived as best leader by his teammates (for more details, see Borgatti et al.[27]). Both network density and network centralization are measures that can be compared across different teams, regardless of team size.

With respect to team identification, we used a five-item measure, following Doosje et al.[38] (e.g., "Being a member of the team is very important for me"). This scale has previously been shown to have a high internal consistency in sport settings e.g.[39] Participants rated each team member on a scale from 1 (*completely disagree*) to 7 (*completely agree*). In line with previous research the scale showed high internal consistency at both data collection points (α_{T1} = .88, α_{T2} = 0.90).

We used a shortened form of the Collective Efficacy Questionnaire for Sports (CEQS), to assess team confidence (following Fransen et al.[40] and Mertens et al.[41]), including the five highest loading items on each of the subscales: ability, effort, unity, persistence, and preparation [42] (e.g., "My team has the ability to demonstrate a strong work ethic"). Participants indicated their agreement with these items on scales ranging from 1 (*completely disagree*) to 7 (*completely agree*). This measure showed high internal consistency at both data collection points (α_{T1} = .88, α_{T2} = .88).

With respect to intrinsic motivation, we included the two highest loading items of the relevant subscale of the Behavioral Regulation in Sport Questionnaire,[43] in line with previous research.[41] We chose to include only this subscale because intrinsic motivation is the hallmark of volitional functioning[44] and to ensure that the questionnaire would not become too long for athletes to remain focused. The subscale items that we included were: "I play soccer because it is fun" and "I play soccer because I like it" (1 = *completely disagree*, 7 = *completely agree*). This measure had high internal consistency at both data collection points (α_{T1} = .78, α_{T2} = .81).

We used the Peer Motivational Climate in Youth Sport Questionnaire, a 21-item measure to assess participants' perceptions of the team's motivational climate.[45] This scale encompassed two types of motivational climates. The measure of task climate included 12 items (e.g., "Most players of my team help each other improve"), while the measure on ego climate included nine items (e.g., "Most players of my team encourage each other to outplay their teammates"). Participants rated their agreement on scales ranging from 1 (*completely disagree*) to 7 (*completely agree*). The internal consistency of the task climate scale was good (α_{T1} = .93, α_{T2} = .94), while that of the ego climate scale was lower but still acceptable (α_{T1} = .67, α_{T2} = .64).

As a subjective measure of performance, we asked both players and coaches to rate their team's performance since the start of the season on an 11-point Likert scale ranging from 0 (*very poor*) to 10 (*very good*) at both T1 and T2. As an objective measure of team performance, we used the position of each team in their league at T2. Because we collected the data at T1 before the start of the season, we did not have the team's ranking at this point.

3. Results

Means, standard deviations, and correlations between all variables at the team level are presented in Appendix A. Appendix B presents the same information at the individual level.

In order to test Hypothesis 1 (i.e., the evolution of leadership networks over time), we conducted paired samples *t*-tests to compare both the density and centralization of all leadership networks (across all four leadership roles) at both T1 and T2 at the team level. In contrast with H1a, we observed no significant changes in leadership networks' densities for task leadership (T1: $M = 5.30$, $SD = .49$; T2: $M = 5.39$, $SD = .58$; $t = -1.07$, $p = .30$), motivational leadership (T1: $M = 5.58$, $SD = .49$; T2: $M = 5.67$, $SD = .60$; $t = -1.19$, $p = .25$), and social leadership (T1: $M = 5.87$, $SD = .50$; T2: $M = 5.91$, $SD = .63$; $t = -0.60$, $p = .56$). For external leadership, however, a significant increase was observed in the *density* of the leadership networks between T1 ($M = 4.98$, $SD = .71$) and T2 ($M = 5.26$, $SD = .70$; $t = -3.38$, $p = .003$). These results suggest that, in line with H1a, the overall external leadership quality in the team increased throughout the first half of the season.

Furthermore, there was a significant drop in the *centralization* of the task leadership networks between T1 ($M = .32$, $SD = .08$) and T2 ($M = .26$, $SD = .09$; $t = 3.06$, $p = .006$). A similar decrease in centralization was observed in the external leadership networks (T1: $M = .29$, $SD = .08$; T2: $M = .25$, $SD = .05$; $t = 4.79$, $p < .001$). We can conclude that, in line with H1b, both for task and external leadership more team members became better leaders. In contrast with H1b, no significant changes were observed in the centralizations of the teams' motivational (T1: $M = .27$, $SD = .09$; T2: $M = .23$, $SD = .07$; $t = 1.34$, $p = .20$) and social leadership networks (T1: $M = .24$, $SD = .06$; T2: $M = .22$, $SD = .04$; $t = .98$, $p = .34$).

One might wonder, though, whether these changes would be similar for newly-formed teams and teams that have already played together for a long time. To investigate this, we performed an exploratory post-hoc analysis of the influence of a team's overall player tenure on the team-level leadership network constructs. Specifically, we first separated our data in two categories using a median split for the average team tenure of all players on the team ('high team tenure' ranged from 3.25 to 5.91 years, 'low team tenure' ranged from 1.79 to 3.09 years). Next, paired sample *t*-tests comparing T1 and T2 values of both categories indicated that in teams with a relatively higher team tenure, the evolution to a structure of shared leadership in the first half of the season is more prevalent than in teams with lower team tenure (i.e., a there is a larger decrease in leadership network centralization; see Appendix C). This finding might be explained by previous research on athlete leadership and tenure.[7,46] More specifically, this literature argues that athletes' expectations about team member's leadership are contingent on those team members' tenure in the team. Thus players with longer tenure in a team might feel more comfortable taking on leadership roles as the season progresses given the implicit expectations of their team members. Additionally, we note that the present study collected data from the first half of teams' competitive season. At the start of a new season, players might look towards their formal leaders for leadership. However, as the season continues, players look to more tenured players for leadership.[46] These expectations may, in turn, inspire those players who have been in the team for longer to take on leadership roles. Again, though, we would stress the exploratory nature of this post-hoc analysis, and note that definitive conclusions are unwarranted in the absence of further research. However, our data seem to suggest that, when no active measures are taken to stimulate or repress athlete leadership, teams which include players who have longer tenure tend to shift more towards shared structures of leadership throughout the first half of the competitive season than teams which include players that have shorter tenure.

To obtain more insight into the processes underpinning the above changes in network density and centralization, we analyzed the changes in the perceived leadership quality (i.e., indegree centrality) of coaches, team captains, and players over time (i.e., Hypothesis 2). An important remark is that players are nested within different teams, in contrast to coaches and team captains, of which there is only one of each for every team. Therefore, we needed a differentiated approach for these groups. First, starting with the non-nested data (i.e., coach and team captain), we used a Wilcoxon Signed-Rank test. This revealed a significant decrease over time in *coaches*' perceived leadership quality for task, motivational, and social leadership (task: $M_{T1} = 8.63$, $SD_{T1} = .58$, $M_{T2} = 8.03$, $SD_{T2} = .78$; $Z = -3.33$, $r = -.75$, $p = .001$; motivational: $M_{T1} = 8.24$, $SD_{T1} = .44$, $M_{T2} = 7.68$, $SD_{T2} = .85$; $Z = -2.85$, $r = -.64$, $p = .004$; social: $M_{T1} = 7.53$, $SD_{T1} = .64$, $M_{T2} = 7.22$, $SD_{T2} = .65$; $Z = -2.59$, $r = .58$, $p = .01$). However, for external leadership, coaches were perceived as better external leaders as the season progressed ($M_{T1} = 7.70$, $SD_{T1} = 1.80$, $M_{T2} = 7.73$, $SD_{T2} = .80$; $Z = -2.29$, $r = -.51$, $p = .022$). For the indegree centrality scores of the *captains*, we found no significant changes for the four leadership roles over time. Second, to account for the clustered data of the players, we used a multilevel regression model using indegree centrality as our outcome measure, while including time as a level-1 predictor (T1 = 0, T2 = 1). To control for team differences, we included a level-2 random intercept, resulting in the subtraction of variance that is due to differences between teams. These results and the relevant ICC calculations are presented in Table 1. In contrast to coaches and captains, for *players*, their indegree centrality scores increased significantly over time for all four leadership roles (task: $\beta = .10$, $p = .001$; motivational: $\beta = .16$, $p < .001$; social: $\beta = .10$, $p = .001$; external: $\beta = .34$, $p < .001$). In other words, players were, on average, perceived as better leaders at T2 than at T1.

In the next phase of analysis, we examined whether the observed changes in indegree centrality over time (i.e., T1 vs. T2) were different for coaches, captains, and players. To account for the clustered nature of our data, we used a multilevel regression model, presented in Table 2. Using indegree centrality as our outcome measure, we included time as a level-1 predictor (T1 = 0, T2 = 1) and the individual's category (i.e., coach, captain, or player) as a level-2 predictor. Our aim was to investigate the cross-level interaction effects between a level-1 predictor and a level-2 predictor (time X category). As our player data (level 2) is also nested within teams, we included a level-3 random intercept to control for team differences. More specifically, this third level in our multilevel model ensures that our result is corrected for the potential variance that is due to the differences between teams. Furthermore, we included all ICC calculations in Table 2.

When comparing the coaches' and captains' changes in indegree centrality scores, the analyses revealed no significant cross-level interaction effect for any leadership role. However, after comparing players' and coaches' indegree centrality scores, our results showed a significant cross-level interaction effect for all leadership roles (task: $\beta = -.65$, $p < .001$; motivational: $\beta = -.75$, $p < .001$; social: $\beta = -.45$, $p = .001$; external: $\beta = -.45$, $p = .03$). Simple slope analyses revealed that the increase in players' indegree centrality scores was significantly larger than the observed changes in coaches' indegree centrality scores (task; players: $\beta = .75$, $p < .001$; coaches: $\beta = .10$, $p = .003$ | motivational; players: $\beta = .91$, $p < .001$; coaches: $\beta = .15$, $p < .001$ | social; players: $\beta = .55$, $p < .001$; coaches: $\beta = .01$, $p < .001$ | external; players: $\beta = .79$, $p < .001$; coaches: $\beta = .33$, $p < .001$). Furthermore, when comparing players' and captains' indegree centrality scores, significant cross-level interaction effects were found for athletes in task, motivational, and social leadership roles (task: $\beta = -.36$, $p = .031$; motivational: $\beta = -.35$, $p = .012$; social: $\beta = -.28$, $p = .03$). Simple slope analyses revealed that the increase in players' indegree centrality scores was also significantly larger than the observed changes in captains' indegree centrality scores (task; players: $\beta = .33$, $p = .011$; captains: $\beta = .10$, $p = .003$ | motivational; players: $\beta = .50$, $p < .001$; captains: $\beta = .15$, $p = .029$ | social; players: $\beta = .38$, $p < .001$; captains: $\beta = .10$, $p < .001$). For external leadership, no significant differences between the players' and the captains'

Table 1
The results of the multilevel regression modelling, including time as a level 1-predictor, and a level 2 random intercept, to test the changes in indegree centrality of players for each of the four leadership roles (i.e., task, motivational, social, and external).

	Intra-class correlations (ICC)		*M* at T1 (*SD*)	*M* at T2 (*SD*)	Multilevel regression model	
	Between-subject	Between-team			Time effect (β)	Standard error (*SE*)
Players' indegree centrality						
Task leadership	.89	.07	5.14 (1.57)	5.23 (1.44)	.10**	.03
Motivational leadership	.89	.11	5.41 (1.45)	5.55 (1.34)	.16***	.03
Social leadership	.89	.16	5.69 (1.33)	5.77 (1.29)	.10***	.03
External leadership	.77	.18	4.79 (1.48)	5.10 (1.35)	.34***	.04

Note: We can control for team differences by including a second level in the multilevel models, as the random intercept at level 2 results in the subtraction of variance that is due to differences between teams. We also calculated the proportion of between- versus within-subject variance of the outcome variables (i.e., intra-class correlation, or ICC) based on a random-intercept only model. An ICC of, for example,.91 indicates that 91% of the variance is due to between-subject variance, and 9% to within-subject variance. We calculated these ICC values for both between-subject (i.e., players) variances and between-team variances, for all leadership roles indegree centralities.
*$p < .05$.
** $p < .01$.
*** $p < .001$.

indegree centrality scores were found. On this basis we can conclude that informal leaders gained leadership status throughout the season in all leadership roles, while coaches' perceived leadership quality only increased with respect to external leadership.

The next step was to explore how changes in leadership networks relate to team-level outcomes (i.e., Hypothesis 3). Previous research has used either high network density or low network centralization as a measure of effective shared leadership. However, it can be argued that only the combination of both measures provides adequate insight into the team's leadership structure. [15,37] For example, when a team with a high network density also has a high network centralization, this team's leadership will be centered on a few very good leaders, and thus does not reflect more distributed forms of shared leadership. Along the same lines, a team with a low network centralization and with a low network density is likely to have no good leaders at all. Again, this is not a structure that represents high-quality shared leadership. Instead, we would argue that only networks with a combination of a high density and a low/medium centralization are characteristic of structures of shared leadership.

To allow for an adequate comparison across all combinations of density and centralization, we dichotomized both variables. First, with respect to density, we created two equal groups by assigning the 10 teams with the lowest network density at T2 to a 'low density' group (average overall density = 4.80; with values ranging between 3.98 and 5.23 on a scale from 1 to 10), and the 10 teams with the highest network density at T2 to a 'high density' group (average overall density = 6.04; with values ranging between 5.34 and 7.09 on a scale from 1 to 10). We did not create an intermediate group in light of previous literature indicating that density has a linear relation with team outcomes, which implies that a higher density relates to more beneficial outcomes.[14,15,23]

Second, with respect to centralization, previous studies have suggested that the relationship between centralization and team outcomes might be curvilinear, rather than linear.[23,35] Accordingly, we aimed to create three equal centralization groups: a 'low centralization' group consisting of seven teams (average overall centralization = .13; ranging from .05 to .17 on a scale from 0 to 1), an 'average centralization' group consisting of six teams (average overall centralization = .24; ranging from .19 to .29 on a scale from 0 to 1), and a 'high centralization' group consisting of seven teams (average overall centralization = .35; ranging from .31 to 45 on a scale from 0 to 1).

By combining the different categories, we obtained six combinations of density and centralization for each leadership role. We should note that on the team level our data do not have sufficient power to perform a meaningful inferential test (e.g., a moderated regression model). Accordingly, we will provide a descriptive analysis that explores how different leadership structures are related to team outcomes. More specifically, for each leadership role, we will examine which combination of density and centralization is associated with the most favorable outcomes (i.e., the highest observable means). Table 3 depicts the average team outcomes at T2 for each of these combinations. This exploration revealed that *high density* and *moderate centralization* were positively associated with more favorable outcomes. More specifically, these teams had the highest team identification, the strongest confidence in their team, were most intrinsically motivated, displayed a task-involving climate over an ego-involving climate, and felt best about their team's performance. With respect to objective performance, these same teams (i.e., those with leadership networks characterized by high density and moderate centralization) obtained the second highest performance, while teams with high network density and high network centralization were observed to display the highest performance. These findings held for motivational leadership, social leadership, and external leadership. For task leadership, however, teams with high density and high centralization surpassed teams with high density and moderate centralization in team identification, team confidence, and both players' and coaches' ratings of the team's performance. Our data exploration thus suggests that moderate levels of motivational, social, and external leadership centralization are (at least descriptively) associated with better team outcomes[1]. However, this curvilinear relationship was not observed for task leadership. More specifically, teams in which the task leadership was centered in a limited group of leaders performed better than teams in which the leadership was spread throughout the team.

4. Discussion

To our knowledge, the present study is the first to track the development of leadership structures within multiple high-level sport teams longitudinally over the course of a season. Our findings align with recent research in organizational psychology that challenges traditional models of leadership by moving beyond the

[1] Besides our initial descriptive overview, we have included an overview of the residualized change scores of team outcomes for each of the six combinations of density and centralization for each leadership role in Appendix D. This overview generally aligns with the descriptive overview provided by Table 3. More specifically, for task leadership, our data suggest that teams with *high density* and *high centralization* generally displayed the highest residualized change scores. With respect to motivational, social, and external leadership, our data suggest that teams with *high density* and *moderate centralization* tended to have the most favorable residualized change scores. Appendix D provides a full overview of all residualized change scores, formatted similarly as Table 3 for an easy comparison.

notion of stable, vertical leadership structures.[47] More specifically, we provide evidence that leadership in sport teams changes over the competitive season, with informal leaders emerging from the team to form an important source of leadership, in addition to the coach and the team captain. This growth in informal leadership was observed to be the key driver behind the transition of leadership structures in sport teams towards shared leadership. Overall, these findings are in line with previous work in newly formed student groups,[23] where an evolution of initially vertical leadership structures toward shared leadership structures has been observed over time.

It should be noted that the patterns for external leadership differed from those for task, motivational, and social leadership. More specifically, whereas the perceived task, motivational, and social leadership quality of coaches decreased throughout the season, their perceived external leadership qualities increased over time. This discrepancy suggests that, while task, motivational, and social leadership can be easily extended to the player group (as reflected by the increase in players' perceived leadership quality on these roles), coaches hold on more tightly to their role as external leader. One possible explanation for this is that coaches inevitably have a stronger link with the world around the team. For example, as the competitive season progresses, coaches often become the main link between a team and the club's management. Furthermore, they are often the key individuals who are interviewed after competitive games, which in turn reinforces their status as external leader.

To explore the optimal leadership structure for the four leadership roles, we categorized the leadership structures in terms of their leadership network density (high–low) and in terms of their leadership network centralization (high – moderate – low). For task leadership, teams with high density and high centralization (i.e., a few leaders having high leadership qualities) scored best on team identification, team confidence, and both players' and coaches' ratings of the team's performance. The second-best scoring teams were the ones with high density and moderate centralization scores (i.e., a larger group of leaders having high leadership qualities). It should be noted that the maximum centralization value in this study was .45 (on a scale of 0–1), indicating that even the highly centralized structures in our study do not represent vertical leadership structures (with the coach as single high-quality leader), but rather structures in which a limited number of athletes are perceived as high-quality athlete leaders. Leo et al.[21] recently provided more information on the exact number of athlete leaders that would be most optimal for the team's functioning. They specified this to be two task leaders, which was the maximum number of leaders observed in their study for male soccer teams. Their recommendation aligns with what our data suggest — namely that having a limited number of task leaders is more beneficial than having either the coach as the only leader or a larger number of athletes taking the lead.

Furthermore, with respect to motivational, social, and external leadership, our data suggest that teams with *high density* and *moderate centralization* (i.e., a larger group of leaders having high leadership qualities) tended to have the most favorable outcomes (i.e., the highest team identification, the strongest confidence in their team, the highest level of intrinsic motivation, displaying a task-involving climate over an ego-involving climate, and the highest satisfaction with their team's performance). Furthermore, it is worth noting that teams with a limited number of leaders (i.e., a small leadership team) appeared to be more effective than teams in which everyone takes on a leadership role (reflected by a low centralization).[23,35] This accords with Gockel and Werth's[35] observation that too many cooks can spoil the broth. This may be because, when all team members take the lead, regardless of their leadership skills or motivation to lead, miscommunication is likely to occur.[12]

Table 2
The results of the multilevel regression modelling in order to investigate whether the observed changes in indegree centrality over time (i.e., T1 vs. T2) were different for coaches, captains, and players. We included time as a level 1-predictor (coded 0 to 1), the individual's category (i.e., coach, captain, or player) as a level 2-predictor, and a level 3 random intercept.

	Intra-class correlations (ICC)		Coaches and captains		Coaches and players		Captains and players	
	Between-subject	Between-team	Interaction effect (β)	Standard error (*SE*)	Interaction effect (β)	Standard error (*SE*)	Interaction effect (β)	Standard error (*SE*)
1. Task leadership	.91	.05	−.20	.15	−.65***	.16	−.36*	.21
2. Motivational leadership	.90	.08	.40	.21	−.75***	.15	−.35*	.14
3. Social leadership	.90	.13	.17	.15	−.45**	.14	−.28*	.13
4. External leadership	.83	.13	.31	.25	−.45*	.20	−.15	.20

Note: We can control for team differences by including this third level in the multilevel models, as the random intercept at level 3 results in the subtraction of variance that is due to differences between teams. We also calculated the proportion of between- versus within-subject variance of the outcome variables (i.e., intra-class correlation, or ICC) based on a random-intercept only model. An ICC of, for example,.91 indicates that 91% of the variance is due to between-subject variance, and 9% to within-subject variance. We calculated these ICC values for both between-subject variances and between-team variances, for all leadership roles indegree centralities.

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

Table 3
An overview of the average team outcomes for each of the six combinations of density and centralization for each leadership role. The highest value for each team outcome at T2 is indicated in bold, with the exception of 'Ego-involving climate' and 'Ranking', for which we indicated the lowest value.

Density	High		High		High		Low		Low		Low	
Centralization	High		Moderate		Low		High		Moderate		Low	
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
	Task leadership											
	(*N* = 3)		(*N* = 3)		(*N* = 4)		(*N* = 4)		(*N* = 3)		(*N* = 3)	
Team identification	**6.02**	(.30)	5.96	(.37)	5.73	(.28)	5.66	(.10)	5.37	(.08)	5.67	(.49)
Team confidence	**6.08**	(.36)	5.86	(.65)	5.11	(.57)	5.35	(.37)	4.87	(.61)	5.13	(.36)
Intrinsic motivation	6.44	(.13)	**6.57**	(.19)	6.51	(.19)	6.19	(.33)	5.88	(.42)	6.13	(.32)
Task-involving climate	**5.54**	(.25)	**5.54**	(.38)	4.88	(.54)	5.03	(.25)	4.74	(.40)	5.00	(.33)
Ego-involving climate	4.65	(.21)	**4.41**	(.24)	4.63	(.30)	4.48	(.15)	4.68	(.12)	4.50	(.19)
Ranking	3.67	(2.52)	**2.67**	(4.28)	7.50	(3.79)	9.50	(5.97)	12.00	(2.50)	7.33	(4.55)
Subjective performance by players	**8.60**	(.47)	7.34	(1.32)	6.25	(1.03)	5.91	(1.18)	5.61	(.47)	6.55	(1.25)
Subjective performance by the coach	**8.33**	(.58)	7.50	(.71)	6.50	(1.29)	6.00	(1.73)	6.67	(1.89)	6.00	(.58)
	Motivational leadership											
	(*N* = 3)		(*N* = 2)		(*N* = 5)		(*N* = 4)		(*N* = 4)		(*N* = 2)	
Team identification	5.81	(.19)	**6.26**	(.29)	5.97	(.30)	5.66	(.12)	5.46	(.14)	5.33	(.23)
Team confidence	5.59	(.63)	**6.12**	(.58)	5.55	(.70)	5.37	(.39)	4.98	(.42)	4.75	(.52)
Intrinsic motivation	6.38	(.04)	**6.64**	(.26)	6.48	(.23)	5.98	(.54)	6.22	(.22)	6.14	(.34)
Task-involving climate	5.17	(.38)	**5.74**	(.38)	5.34	(.36)	5.18	(.20)	4.63	(.31)	4.58	(.20)
Ego-involving climate	4.75	(.05)	4.46	(.15)	**4.40**	(.26)	4.50	(.16)	4.68	(.17)	4.64	(.17)
Ranking	**2.33**	(1.53)	3.50	(4.04)	6.60	(4.17)	12.50	(4.21)	7.75	(3.78)	8.50	(3.16)
Subjective performance by players	7.56	(1.36)	**8.26**	(2.00)	7.09	(.94)	5.79	(1.14)	5.78	(.72)	5.98	(1.01)
Subjective performance by the coach	7.33	(1.15)	**8.50**	(.71)	7.50	(.71)	6.00	(1.73)	6.25	(1.67)	6.50	(.58)
	Social leadership											
	(*N* = 3)		(*N* = 3)		(*N* = 4)		(*N* = 4)		(*N* = 3)		(*N* = 3)	
Team identification	5.81	(.19)	**6.27**	(.07)	5.78	(.27)	5.51	(.21)	5.53	(.19)	5.59	(.41)
Team confidence	5.59	(.63)	**6.29**	(.41)	5.47	(.37)	4.97	(.58)	5.16	(.47)	4.92	(.40)
Intrinsic motivation	6.38	(.04)	**6.62**	(.06)	6.30	(.26)	5.97	(.54)	6.29	(.23)	6.32	(.35)
Task-involving climate	5.17	(.38)	**5.80**	(.14)	5.06	(.29)	4.92	(.36)	5.07	(.30)	4.69	(.41)
Ego-involving climate	4.75	(.05)	**4.37**	(.15)	4.57	(.27)	4.55	(.16)	4.48	(.09)	4.62	(.30)
Ranking	**2.33**	(1.53)	2.67	(2.89)	5.50	(3.06)	1.75	(4.21)	11.00	(4.08)	1.67	(2.05)
Subjective performance by players	7.56	(1.36)	**8.29**	(.85)	6.84	(.99)	5.38	(.84)	6.31	(.96)	5.86	(1.06)
Subjective performance by the coach	7.33	(1.15)	**8.50**	(.71)	7.00	(1.00)	6.00	(1.73)	7.00	(2.31)	6.00	(.84)
	External leadership											
	(*N* = 4)		(*N* = 2)		(*N* = 4)		(*N* = 3)		(*N* = 4)		(*N* = 3)	
Team identification	5.90	(.25)	**6.32**	(.27)	5.60	(.21)	5.62	(.14)	5.69	(.37)	5.54	(.37)
Team confidence	5.81	(.26)	**6.52**	(.19)	5.15	(.38)	5.26	(.36)	5.26	(.35)	4.67	(.46)
Intrinsic motivation	6.42	(.20)	**6.59**	(.05)	6.25	(.28)	5.84	(.60)	6.29	(.24)	6.46	(.31)
Task-involving climate	5.28	(.41)	**5.88**	(.30)	4.92	(.25)	5.11	(.17)	5.10	(.37)	4.61	(.39)
Ego-involving climate	4.64	(.15)	**4.31**	(.15)	4.68	(.10)	4.54	(.18)	4.50	(.25)	4.54	(.24)
Ranking	**2.25**	(1.50)	3.50	(4.51)	7.25	(3.36)	11.33	(4.51)	9.25	(5.85)	9.67	(2.14)
Subjective performance by players	7.59	(.99)	**8.73**	(.57)	6.34	(.78)	5.39	(.97)	6.58	(.75)	5.75	(.96)
Subjective performance by the coach	7.75	(.50)	**9.00**	(.00)	6.67	(1.15)	5.50	(2.12)	6.67	(.58)	6.33	(1.60)

In conclusion, our results seem to suggest that, at least for motivational, social, and external leadership tasks, teams benefit from having multiple leaders taking the lead in these roles. However, there comes a point at which there are diminishing returns for sharing leadership further (as indicated by the observed less favorable outcomes for teams with low centralization).

Reflecting on the strengths of the present research, this study was the first to track the natural evolution of four different leadership structures in sub-elite soccer teams. Importantly, this design allowed us to obtain insight into the dynamic nature of leadership structures in team sport, thereby advancing on previously obtained cross-sectional evidence in this setting[10,12] and on the longitudinal single-case study of Duguay et al.[30] Furthermore, differentiating between the four different leadership roles in ways suggested by Fransen et al.[9] allowed us to gain richer insight into the dynamics of leadership activity. This nuanced view is important as our findings indicate that different types of leadership change in different ways over time. In addition, the nature of the most beneficial leadership structure differed between the leadership roles.

Another strength of this study is that we used evaluative and directional social network analysis to capture leadership structures, thereby allowing us to track the leadership quality not only of the coach and the captain, but of all team members.[10] Furthermore, in contrast to previous studies that have focused exclusively on network density[31] or on network centralization,[28] we combined measures of both overall leadership quality (i.e., density) and measures of the distribution of leadership (i.e., centralization) to obtain more comprehensive insights in the leadership structures.

Despite these strengths, the study also had some limitations. First, while our findings show that the leadership structure in sport teams changes over time as informal leaders assume leadership status, the present research provides no insight in the underpinning mechanisms that cause players to increase their leadership status. For example, in organizational contexts, Fransen et al.[23] showed that team members who were perceived as competent and warm were likely to gain leadership status. Similarly, in a sport context, future research could identify the predictors underpinning athletes' acquisition of leadership status. Here the selection of potential predictors to investigate should be informed by previous research on the characteristics of good leaders.[48] These predictors might also differ according to the specific leadership role under investigation and could include both individual characteristics (e.g., competence, experience, team tenure, and age) and specific behaviors (e.g., expressing confidence in teammates, encouraging them, etc.).

Second, we acknowledge that while we provided a transparent comprehensive exploration of how leadership structures relate to team outcomes, our design lacked the power to perform meaningful inferential tests (e.g., a moderated regression model). Furthermore, the present design is not able to determine the direction of effect (e.g., does high quality leadership result in higher team confidence, or does higher team confidence inspire stronger perceptions of leadership quality?). To address these issues, there would be value in future research that examines the present relationship within a larger sample, preferably in an experimental setting, with a view to establishing the generalizability and direction of the patterns observed in this article.

Third, this study was conducted only with male soccer teams. Further research should explore the generalizability of these study findings in other sports and in female teams. Leo et al.[21] recently showed that the optimal leadership structure can indeed differ between male and female teams. More specifically, their research showed that both male and female teams benefited from having multiple task leaders in their teams. However, for social and external leadership, the most optimal leadership structure differed (motivational leadership was not assessed in this study). More specifically, whereas male teams performed best in a structure that had few social but multiple external leaders, female teams performed best when there were more social leaders, but a single external leader. Future studies should examine whether such changes between male and female teams also emerge with respect to the evolution of leadership structure over time.

Fourth, the present research focused on the assessment of players' perceived leadership quality. Doing this using social network analysis (SNA) had its advantages, as this allowed us to look beyond the categorical distinction between leaders and non-leaders (i.e., "Do athletes show leadership?"). Nevertheless, while SNA is an ideal tool for investigating key aspects of leadership structures, leadership quality is clearly only one aspect of leadership. The present research did not, for example, take the *quantity* of team members' leadership into account, nor the expectations for someone to take up one or more leadership roles. While investigating these constructs would be possible, we opted to focus on perceived leadership quality because it has been found to be a good predictor of leadership effectiveness,[1] and because we were mindful of questionnaire length. Nevertheless, an expanded analysis that encompassed other dimensions of leadership would provide an interesting focus for future research.

Fifth, in the present research we made a conscious decision to administer our first measurements at the end of the preparation phase (once the teams had already played multiple practice and cup games, but had not yet started the regular competitive season), in order to obviate against the likelihood of team members not knowing everyone in their team. While a requirement of SNA is that every team member has some knowledge of all others, future research should still establish the generalizability of our findings when taking the actual beginning of the season as starting point, as well as potential differences in the second half of the season.

As a final remark, even though the scope of the present study is limited to leadership interactions between coaches and athletes, we hope that the present study will serve to encourage future research in different settings to investigate shared leadership structures over time. Here, research could also examine changes in leadership structures at a higher managerial level within sport organizations (e.g., among the coaching staff or in club management; see also Jones et al.[19]).

5. Conclusion

The present work provides evidence that semi-professional soccer teams tend to develop more shared leadership structures over the course of a season. This trend towards shared leadership can be attributed to the emergence of informal leaders over time as players take on leadership roles. Furthermore, this growth in shared leadership appears to be positively associated with increases in both team functioning and team performance. On this basis we would recommend that coaches encourage players to take on leadership roles of this form. Moreover, coaches can formally implement a structure of shared leadership by identifying the best leaders in every leadership role (i.e., the leaders with a broad support base in the team[10,49]); and then formally appointing them as part of the leadership team. By further developing the leadership potential of these appointed leaders, the coach can then maximize the team's functioning.

In conclusion, then, as the observation from Vince Lombardi that we quoted at the start of this paper suggests, it appears that the strength of a team is indeed closely tied to the strength of its leaders. At the same time, though, it needs to be recognized that this strength does not necessarily reside solely in those team members who are assigned formal leader roles. Instead, leadership can change over time, and can be enacted by multiple members of the team. Moreover, it appears that the development of shared leadership is itself an important pathway to team strength and success. The key lesson from Lombardi's quote is thus not that a team needs a strong coach but that it needs to have a coach who is interested in cultivating the leadership of the athletes within their team.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.jsams.2020.09.007.

References

1. Cotterill ST, Fransen K. Athlete leadership in sport teams: cCurrent understanding and future directions. *Int Rev Sport Exerc Psychol* 2016; 9(1):116–133.
2. Horn TS. Coaching effectiveness in the sport domain. *Adv Sport Psychol* 2008; 3:239–267.
3. Fransen K, McEwan D, Sarkar M. The impact of identity leadership on performance and well-being in team sport: Is psychological safety the missing link? *Psychol Sport Exerc* 2020:51, in press j.psychsport.2020.
4. Loughead TM, Hardy J, Eys MA. The nature of athlete leadership. *J Sport Behav* 2006; 29:142–158.
5. Bales RF. *Interaction process analysis: a method for the study of small groups*, Cambridge, Addison-Wesley, 1950.
6. Eys MA, Loughead TM, Hardy J. Athlete leadership dispersion and satisfaction in interactive sport teams. *Psychol Sport Exerc* 2007; 8(3):281–296.
7. Loughead T, Hardy J, Eys M. The nature of athlete leadership. *J Sport Behav* 2006; 29(2):142–158.
8. Todd SY, Kent A. Perceptions of the role differentiation behaviors of ideal peer leaders: a study of adolescent athletes. *Int Sports J* 2004; 8(2):105–118.
9. Fransen K, Vanbeselaere N, De Cuyper B, Vande Broek G, Boen F. The myth of the team captain as principal leader: Extending the athlete leadership classification within sport teams. *J. Sports Sci* 2014; 32(14):1389–1397.
10. Fransen K, Van Puyenbroeck S, Loughead TM et al. Who takes the lead? Social network analysis as pioneering tool to investigate shared leadership within sports teams. *Soc. Networks* 2015; 43:28–38.

11. Fletcher D, Arnold R. A qualitative study of performance leadership and management in elite sport. *J Appl Sport Psychol* 2011; 23(2):223–242.
12. Fransen K, Haslam SA, Mallett CJ, Steffens NK, Peters K, Boen F. Is perceived athlete leadership quality related to team effectiveness? A comparison of three professional sports teams. *J Sci Med Sport* 2017; 20(8):800–806.
13. Pearce CL, Sims HP. Vertical versus shared leadership as predictors of the effectiveness of change management teams: an examination of aversive, directive, transactional, transformational, and empowering leader behaviors. *Group Dyn Theory Res Pract* 2002; 6(2):172–197.
14. Nicolaides VC, LaPort KA, Chen TR et al. The shared leadership of teams: a meta-analysis of proximal, distal, and moderating relationships. *Leadersh Q* 2014; 25(5):923–942.
15. D'Innocenzo L, Mathieu JE, Kukenberger MR. A meta-analysis of different forms of shared leadership–team performance relations. *J Manag* 2016; 42(7):1964–1991.
16. Pearce CL, Conger JA. *Shared leadership: reframing the hows and whys of leadership*, Thousand Oaks, CA, Sage, 2003.
17. Welty Peachey J, Zhou Y, Damon ZJ, Burton LJ. Forty years of leadership research in sport management: a review, synthesis, and conceptual framework. *J Sport Manage* 2015; 29(5):570–587.
18. Ferkins L, Skinner J, Swanson S. Sport leadership: a new generation of thinking. *J Sport Manage* 2018; 32(2):77–81.
19. Jones GJ, Wegner CE, Bunds KS, Edwards MB, Bocarro JN. Examining the environmental characteristics of shared leadership in a sport-for-development organization. *J Sport Manage* 2018; 32(2):82–95.
20. Fransen K, Department of Kinesiology. Doctoral dissertation *Athlete leaders as key figures for optimal team functioning: the mediating role of players' team confidence and their team identification*, Leuven, KU Leuven, 2014. p. 611.
21. Leo FM, García-Calvo T, González-Ponce I, Pulido JJ, Fransen K. How many leaders does it take to lead a sports team? The relationship between the number of leaders and the effectiveness of professional sports teams. *PLoS One* 2019; 14(6):e0218167.
22. Seibert SE, Sparrowe RT, Liden RC. A group exchange structure approach to leadership in groups, in *Shared leadership*, Pearce CL, Conger JA, editors, Thousand Oaks, CA, Sage, 2003.
23. Fransen K, Delvaux E, Mesquita B, Van Puyenbroeck S. The Emergence of shared leadership in newly formed teams with an initial structure of vertical leadership: a longitudinal analysis. *J Appl Behav Sci* 2018; 54(2):140–170.
24. Gockel C, Werth L. Measuring and modeling shared leadership: traditional approaches and new ideas. *J Pers Psychol* 2010; 9(4):172–180.
25. Turner RH. Role theory, in *Handbook of sociological theory*, Turner JH, editor, New York, Kluwer Academic/Plenum, 2002.
26. Brass DJ, Krackhardt D. Social capital for twenty-first century leaders, in *Out-of-the box leadership challenges for the 21st century army*, Hunt JG, Phillips RL, editors, 1999.
27. Borgatti SP, Everett MG, Johnson JC. *Analyzing Social Networks*, London, Sage Publications, 2013.
28. Small EE, Rentsch JR. Shared leadership in teams: a matter of distribution. *J Pers Psychol* 2010; 9(4):203–211.
29. Smith P, Haslam SA, Nielsen JF. In search of identity leadership: an ethnographic study of emergent influence in an interorganizational R&D team. *Organ Stud* 2018; 39(10):1425–1447.
30. Duguay AM, Hoffmann MD, Guerrero MD, Loughead TM. An examination of the temporal nature of shared athlete leadership: a longitudinal case study of a competitive youth male ice hockey team. *Int J Sport Exerc Psych* 2019:1–15.
31. Carson JB, Tesluk PE, Marrone JA. Shared leadership in teams: an investigation of antecedent conditions and performance. *Acad Manag J* 2007; 50(5):1217–1234.
32. Aime F, Humphrey S, DeRue DS, Paul JB. The riddle of heterarchy: power transitions in cross-functional teams. *Acad Manag J* 2014; 57(2):327–352.
33. Wang D, Waldman DA, Zhang Z. A meta-analysis of shared leadership and team effectiveness. *J Appl Psychol* 2014; 99(2):181–198.
34. Freeman LC. Centrality in social networks: conceptual clarification. *Soc Networks* 1979; 1(3):215–239.
35. Gockel C, Werth L. Measuring and modeling shared leadership. *J Pers Psychol* 2011.
36. Sparrowe RT, Liden RC, Wayne SJ, Kraimer ML. Social networks and the performance of individuals and groups. *Acad Manag J* 2001; 44(2):316–325.
37. Mayo M, Meindl JR, Pastor J. Shared leadership in work teams: a social network approach, in *Shared leadership: reframing the hows and whys of leadership*, Pearce CL, Conger JA, editors, Sage, 2003.
38. Doosje B, Ellemers N, Spears R. Perceived intragroup variability as a function of group status and identification. *J Exp Soc Psychol* 1995; 31(5):410–436.
39. De Backer M, Boen F, Ceux T et al. 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. *Psychol Sport Exerc* 2011; 12(2):192–201.
40. Fransen K, Decroos S, Vanbeselaere N et al. Is team confidence the key to success? The reciprocal relation between collective efficacy, team outcome confidence, and perceptions of team performance during soccer games. *J Sports Sci* 2015; 33(3):219–231.
41. Mertens N, Boen F, Steffens NK, Cotterill ST, Haslam SA, Fransen K. Leading together towards a stronger' us': an experimental test of the effectiveness of the 5R Shared Leadership Program (5R(S)) in basketball teams. *J Sci Med Sport* 2020; 23(8):770–775.
42. Short SE, Sullivan P, Feltz D. Development and preliminary validation of the collective efficacy questionnaire for sports. *Meas Phys Educ Exerc Sci* 2005; 9(3):181–202.
43. Lonsdale C, Hodge K, Rose EA. The behavioral regulation in sport questionnaire (BRSQ): instrument development and initial validity evidence. *J Sport Exerc Psychol* 2008; 30(3):323–355.
44. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol* 2000; 55(1):68–78.
45. Ntoumanis N, Vazou S. Peer motivational climate in youth sport: measurement development and validation. *J Sport Exerc Psychol* 2005; 27(4):432–455.
46. Duguay AM, Loughead TM, Munroe-Chandler KJ. Investigating the importance of athlete leadership behaviors and the impact of leader tenure. *J Sport Behav* 2018; 41(2).
47. Pearce CL, Conger JA, Locke EA. Shared leadership theory. *Leadersh Q* 2008; 19(5):622–628.
48. Fransen K, Boen F, Haslam SA, Steffens NK, Vande Broek G. Standing out from the crowd: identifying the traits and behaviors that characterize high-quality athlete leaders on and off the field. *Scand J Med Sci Sports* 2020; 30:766–786. http://dx.doi.org/10.1111/sms.13620.
49. Fransen K, Haslam SA, Steffens NK et al. All for us and us for all: introducing the 5R Shared Leadership Program. *Psychol Sport Exerc* 2020; 51, doi:j.psychsport.2020.101763.