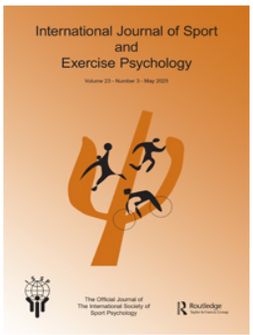

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Unravelling trickle-down effects in sports clubs: a multi-informant and multi-level exploration of the interplay between leadership styles, coaching styles, and members' motivation

Tom De Clerck, Nele Van Doren, Annick Willem and Leen Haerens

Faculty of Medicine and Health Sciences, Department of Movement and Sport Sciences, Ghent University, Ghent, Belgium

ABSTRACT

In this study, we adopted a multi-informant and multi-level approach to investigate whether sports club leaders can influence members via the coaches (i.e., trickle-down effect). Grounded in Self-Determination Theory, we focused on two parts of this effect: (1) the relation between (de)motivating leadership styles and the (de)motivating coaching styles, and (2) the relation between the (de)motivating coaching styles and sports club members' motivation. Our study involved 564 sports club members who participated in team sports such as football, basketball, and volleyball. These athletes were organised into sports teams coached by 106 coaches across 33 Flemish sports clubs. Regarding the first part of the trickle-down effect, our findings revealed that the relation between the (de)motivating leadership and coaching styles varied depending on the perspective. Specifically, coaches' own perceptions of their controlling and chaotic style related to controlling leadership, yet members' perceptions of the coaching styles were significantly different and not associated with leadership. Regarding the second part of the trickle-down effect, members' individual perceptions of coaching styles related significantly to their motivation, with relations varying by coaching approach (i.e., autonomy support, structure, control, chaos) and motivational regulation type (i.e., intrinsic motivation, identified regulation, introjection regulation, external regulation, amotivation). Lastly, when examining both parts simultaneously, our findings failed to support a linear trickle-down effect from (de)motivating leadership to members' motivation through (de)motivating coaching styles. This challenges our hypothesis and common assumptions found in the literature, emphasising the need for further exploration of individual and contextual factors that influence trickle-down effects in sports.

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A wealth of studies have drawn upon Self-Determination Theory (SDT; Deci & Ryan, 2000; Standage & Ryan, 2020) to shed light on the pivotal role that the motivation of athletes plays within sports clubs. Sport club members' motivation does not only influence their

CONTACT Tom De Clerck Tom.Declerck@UGent.be Faculty of Medicine and Health Sciences, Department of Movement and Sport Sciences, Ghent University, Watersportlaan 2, 9000 Ghent, Belgium

performance and overall well-being (e.g., Lonsdale & Hodge, 2011), but also their persistence in sports (e.g., O'Neil & Hodge, 2020). To better understand sports club members' motivation, a wide array of SDT studies have investigated its influencing factors (Mageau & Vallerand, 2003). Within this extensive body of research, particular attention is directed toward the crucial role of the coaches' motivating or demotivating styles in members' motivation (e.g., Bartholomew et al., 2011; Mossman et al., 2024). Beyond coaches, SDT research also acknowledges the important role of sports club leaders such as board members (Morbée et al., 2020: Stebbings et al., 2012). Although their impact may not always be manifest directly on individual members, their style has been related to coaching behaviours (Morbée et al., 2020; Stebbings et al., 2012). In particular, SDT research stipulates that the (de)motivating style exhibited by sports club leaders (i.e., the (de)motivating leadership style) relates to the (de)motivating style coaches adopt when interacting with their athletes.

Given the observed relation between the (de)motivating leadership and coaching styles (e.g., Morbée et al., 2020) as well as the connection between the coaching style and sport club members' motivation (e.g., Mossman et al., 2024), it is intriguing to explore the potential for leaders to indirectly influence the motivation of sports club members through their impact on coaches – a phenomenon referred to as the "trickle-down effect" (Mageau & Vallerand, 2003). Theconcept of trickle-down effects has a long-standing history in leadership theory, with numerous studies illustrating how leadership styles at higher organisational levels cascade down to lower levels (e.g., Bass et al., 1987; Byun et al., 2020). Drawing on social learning theory (Pierce & Bandura, 1977), these studies show that individuals at lower hierarchical levels often emulate the behaviours of those at higher levels to align with acceptable norms. Although traditional hierarchical leadership structures are generally absent in sports clubs, recent research by De Clerck et al. (2022) suggests that a similar effect may occur, with coaches acting as intermediaries between leaders and sports club members, modelling the behaviours of leaders in their interactions with members.

Yet, there remains a gap in understanding the trickle-down effect in sports clubs. Specifically, the focus has largely been on members' perceptions of leadership and coaching styles (De Clerck et al., 2022), overlooking a critical aspect: how do coaches themselves perceive the leadership within their sports club?, and importantly, to what extent do these perceptions shape their interactions with the team and individual members? A thorough examination of this issue necessitates a more refined approach, integrating perspectives from multiple informants (including both members and coaches) and adopting a multilevel framework to explore relations across club, team, and individual levels. This approach can pave the way for the development of tailored leadership programmes aimed at educating leaders about the significance of their motivational behaviours in influencing coaches' approaches toward their athletes. Hence, our study adopts a multi-informant, multi-level perspective to investigate trickle-down effects in sports. We focus on (1) the link between (de)motivating leadership and (de)coaching styles and (2) the connection between (de)motivating coaching styles and crucial member outcomes (i.e., their motivation). Finally, we identify key gaps and understudied areas in existing trickle-down research.

(De)motivating styles: a Self-Determination Theory perspective

SDT provides insight into the (de)motivating styles social agents across various life domains including sports (e.g., sports club leaders, coaches) can adopt to impact other individuals' behaviours, attitudes, and feelings (Deci & Ryan, 2000; Mageau & Vallerand, 2003). Recent SDT research distinguishes two important motivating styles: autonomy-supportive and structuring (Delrue et al., 2019). An autonomy-supportive style involves adopting a curious and open attitude, thereby empathising with the others' interests, preferences, and feelings. A structuring style refers to a process-oriented approach, providing clarity and information about what needs to be done and how to achieve the desired outcome. According to SDT, an autonomy-supportive and structuring style promote the other individual's personal growth, well-being, optimal functioning, and positive behaviours.

Apart from motivating styles, recent SDT studies also differentiate between two distinctive demotivating styles: controlling and chaotic (Bartholomew et al., 2011; Delrue et al., 2019). A controlling style involves exerting pressure on others to think, feel, and act in a prescribed way, hereby adopting externally controlling strategies (e.g., threatening with sanctions, yelling, intimidating) and internally controlling strategies (e.g., guilt-indication, shaming). A chaotic style refers to an attitude of permissiveness and a "laissez-faire" mentality, leaving others to their own devices without offering much guidance. SDT suggests that both a controlling and chaotic style hamper the other individual's optimal functioning, potentially leading to ill-being, malfunctioning, and negative feelings.

The relation between the (de)motivating leadership and (de)motivating coaching styles

In sports, SDT studies have suggested that the (de)motivating leadership style adopted by board members serves as a precursor for coaches adopting similar behaviours towards sports club members (Mageau & Vallerand, 2003; Morbée et al., 2020). This connection stems from the belief that the interactions between board members and coaches serve as a template for the subsequent interactions between coaches and athletes (Mageau & Vallerand, 2003; Morbée et al., 2020). Researchers have extensively utilised self-report questionnaires to establish this link between the leaders' and coaches' (de)motivating styles. They mostly focused on the dark side of leadership, particularly the role of a controlling leadership style in coaching behaviours (hereby mostly ignoring the role of a chaotic leadership style). The results indicated that coaches who felt continuously monitored, evaluated, and judged by their leaders were more likely to refrain from an autonomy-supportive style when interacting with sports club members (Iachini, 2013: Rocchi et al., 2013). Additionally, they may resort to a controlling style such as pressuring members to do things their way (Morbée et al., 2020; Rocchi & Pelletier, 2017; Stebbings et al., 2012) or a chaotic style like questioning members' abilities to overcome challenges (Rocchi & Pelletier, 2017). A limited number of SDT studies also focused on the bright side of leadership, revealing that coaches perceiving their leaders as autonomy-supportive (e.g., giving them the freedom to conduct and design sports programmes), and structuring (e.g., assisting in monitoring athletes' progress), were more likely to exhibit an

autonomy-supportive and structuring style themselves (Rocchi & Pelletier, 2017; Stebbings et al., 2012). These coaching styles encompassed actions like empowering members to make their own choices (autonomy support) or telling members they can accomplish things (structure).

The relation between the (de)motivating coaching styles and sports club members' motivation

While the previously mentioned SDT studies have focused on the role of leadership in the coaches' (de)motivating style, a separate and more elaborate line of research has explored the consequences of the coaches' (de)motivating style during their interactions with sports club members, particularly concerning their motivation (e.g., Hodge & Lonsdale, 2011). Before delving into the relation between the coaches' (de)motivating style and members' motivation, it is important to clarify the concept of motivation according to SDT.

SDT identifies qualitatively different types of motivation based on the degree of self-determination or volition (Standage & Ryan, 2020). Intrinsic motivation represents the highest form of self-determination, where members participate in sports out of genuine interest and enjoyment. Identified regulation is also a self-determined form of motivation, where members engage in sports because they value the outcome and understand its importance. Both intrinsic motivation and identified regulation are considered autonomous forms of motivation due to their shared attribute of volition. SDT also distinguishes controlled, less volitional forms of motivation: introjected regulation, where members take part in sports activities due to internal pressures such as the desire to avoid feelings of guilt or shame, or to enhance their self-esteem; and external regulation, where members are driven by external pressures such as avoiding punishment or criticism, or obtaining rewards or appreciation. Finally, amotivation indicates a complete lack of volition and motivation, stemming from not valuing the activity, low confidence, or unmet expectations.

Empirical research has related autonomous motivation to several positive member outcomes including prosocial behaviours (Hodge & Lonsdale, 2011), performance (Gillet et al., 2010), and long-term intention to continue in sport (O'Neil & Hodge, 2020). Conversely, controlled motivation has been linked to less favourable outcomes including antisocial behaviours (Hodge & Lonsdale, 2011) and shorter-term intentions to continue in sport (O'Neil & Hodge, 2020). Finally, amotivation has been associated with unfavourable member outcomes such as burnout (Lonsdale & Hodge, 2011) and strong intentions to drop out (Fabra et al., 2023).

Recognising the importance of motivation, prior SDT studies have explored the factors influencing sports club members' motivation, with particular emphasis on the role of the coaches' (de)motivating style. Traditionally, these studies have focused on the role of an autonomy-supportive and controlling coaching style. An autonomy-supportive coaching style has been found to relate positively to members' autonomous motivation, as well as their general well-being and optimal performance (see Mossman et al., 2024 for a review). Conversely, coaches' reliance on a controlling style has been shown to engender less adaptive and even maladaptive outcomes including controlled motivation, amotivation (Haerens et al., 2018; Hodge & Lonsdale, 2011), and burnout (Bartholomew et al., 2011). More recent SDT research has broadened its scope to explore the role of a

structuring and chaotic coaching style. The findings revealed a positive relation between a structuring coaching style and beneficial member outcomes including autonomous motivation (Delrue et al., 2019; Reynders et al., 2020) and behavioural engagement (Reynders et al., 2020). In contrast, a chaotic coaching style has been related to members' controlled motivation and amotivation (Delrue et al., 2019).

Gaps and understudied issues in literature

Our literature review revealed several critical gaps that warrant further investigation. First, most studies relied solely on coaches' or members' perspectives. Integrating both views would provide a deeper understanding of each part of the trickle-down effect. Such an approach would not only illuminate how the leadership styles as perceived by coaches relate to the coaching styles as perceived by both coaches and members, but also how coaching styles, as perceived by members and coaches, relate to member outcomes. Second, previous research has predominantly focused on individual-level perspectives, ignoring the multi-level structure of sports clubs (with Reynders et al., [2019] being a notable exception). Analysing data across different levels (member, coach, club) is crucial to identify factors influencing coaching styles and member motivation (Reynders et al., 2019). Third, many SDT studies focused on one or two (de)motivating styles, primarily autonomy-supportive and controlling styles. There is a need for comprehensive research on the role of various leadership and coaching styles, including structuring and chaotic approaches (De Clerck et al., 2021; Delrue et al., 2019). Fourth, in most SDT research, intrinsic and identified regulation were combined into an autonomous motivation scale, while introjected and external regulation constituted a controlled motivation scale. However, this approach lacks strong theoretical and empirical support (Howard et al., 2020). Notably, the relation between (de)motivating coaching styles and introjected and external regulation differs. For example, Zhao and Zhou (2022) found that excessive personal control by coaches strongly correlated with external regulation but not with introjected regulation. Finally, the fifth and arguably most important gap in the extant literature lies in the separate examination of the two key parts of the trickle-down effect: the relation between (de)motivating leadership styles as perceived by coaches and their (de)motivating coaching styles (e.g., Rocchi & Pelletier, 2017) and the relation between (de)motivating coaching styles and member outcomes (e.g., Mossman et al., 2024). Investigating both components of the trickle-down effects within one model would allow us to gain deeper insight into how coaches perceive leadership styles and convey them to the members of their team.

The present study

In light of the existing gaps in the literature, the present study aims to provide a detailed and comprehensive insight into the trickle-down effect in the sports context. To thoroughly examine this trickle-down effect, we first focus on examining the two parts of the trickle-down effect, that is the relation between the leadership and coaching styles (first part), and the relation between the coaching styles and members' motivation (second part). For this purpose, we adopt (a) a multi-informant perspective, considering insights from both coaches and members, (b) a multi-level perspective, examining the

dynamics within the trickle-down model at the member-, coaches- and club-level, and (c) a holistic perspective, considering a broad range of (de)motivating styles (autonomy support, structure, control, and chaos) and types of motivation (intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation).

Building upon previous research, we anticipate observing effects within both parts of the trickle-down model. More precisely, within the first part of the trickle-down model, we expect consistent with previous research (e.g., Rocchi & Pelletier, 2017) that adaptive leadership styles (i.e., autonomy support, structure) will primarily relate positively to adaptive coaching styles (Hypothesis 1a), while maladaptive leadership styles (i.e., control, chaos) will relate positively to maladaptive coaching styles (Hypothesis 1b). Within the second part of the trickle-down model, we hypothesise consistent with previous research (e.g., Delrue et al., 2019; Hodge & Lonsdale, 2011) that adaptive coaching styles (i.e., autonomy support, structure) will primarily relate positively to adaptive forms of motivation (i.e., intrinsic motivation and identified regulation; Hypothesis 2a), while maladaptive coaching styles (i.e., control, chaos) will relate positively to less adaptive and maladaptive forms of motivation (i.e., introjected regulation, external regulation, amotivation; Hypothesis 2b). Since our study introduces a novel multi-informant and multi-level perspective on these associations, we refrain from formulating specific hypotheses regarding the precise manifestation of these effects.

Next, we investigate the effect of the (de)motivating leadership style on the (de)motivating coaching style, and in turn members' motivation within a trickle-down model. Based on theory (Mageau & Vallerand, 2003), we expect that when the two parts of the trickle-down model are modelled together, we will find a "bright" trickle-down pathway from adaptive leadership styles towards adaptive coaching styles, and in turn adaptive forms of motivation (Hypothesis 3a), and a "dark" trickle-down pathway from maladaptive leadership styles towards maladaptive coaching styles, and in turn maladaptive forms of motivation (Hypothesis 3b).

Method

Participants

Our study included 564 sports club members (67% male; 33% female; $M_{age} = 18.59$; $SD = 5.82$), participating in team sports (e.g., football, volleyball, basketball) within nonprofit sports clubs located in Flanders (Belgium). These athletes competed at a non-professional level in leagues organised by the Flemish sports federations. They were nested within sports teams trained by 106 coaches (93% male; 7% female; $M_{age} = 39.34$; $SD = 11.64$). On average, coaches had 12.75 years of experience ($SD = 9.03$). The coaches were, in turn, nested within 33 sports clubs. The number of participating coaches varied by club size: in 8 smaller clubs, 1–2 coaches completed the questionnaire, while in 25 larger clubs, 3 or more coaches participated.

Procedure

The number of coaches was determined based on literature indicating that a minimum of 100 participants at Level 2 (coaches) is required to detect meaningful effects at this level

(Maas & Hox, 2004). This sample size is also adequate for the early analyses of the trickle-down model's components, including the relation between leadership and coaching styles as perceived by coaches (Hair et al., 2010; Kline, 2016; Memon et al., 2020). Each coach was solely responsible for one team, and the number of participating members per team ranged from 3 to 12. This team size aligns with previous research on trickle-down effects, which suggests that three individuals per team are sufficient for aggregation at the team level (e.g., Ling et al., 2015). Given the extensive demands placed on participating sports clubs – requiring data collection from both members and coaches – this study utilised convenience sampling. Participants were primarily recruited through university students who reached out to the board of directors of sports clubs – the entity responsible for managing the organisation. Additionally, the authors of this paper personally approached the boards of various sports clubs. When a board expressed interest in the study, its content and procedure were presented during a board meeting. Following the presentation, all boards agreed to participate. Upon obtaining their consent, the boards were requested to distribute an online questionnaire, available in Dutch, to the coaches within their clubs. This questionnaire invited coaches to evaluate the board's (de)motivating leadership style and to reflect on their own (de)motivating coaching style. Coaches were then requested to share a separate online questionnaire with the members of their teams. Sports club members were asked to assess their coach's leadership style and their own motivation. For teams with multiple coaches, members were instructed to assess their head coach (the one who distributed the questionnaire) to ensure consistency, with all team members evaluating the same individual. The research was conducted according to the ethical rules presented in the General Ethical Protocol of the Faculty of Psychology and Educational Sciences of Ghent University. All participants actively agreed that they were informed about the purpose of the research and gave permission to the researchers to use their answers for research purposes.

Measures

All measures in the study were derived from validated scales. For each scale, internal consistency was evaluated using Cronbach's alpha (α), and internal validity was assessed relying on Confirmatory Factor Analysis (CFA). To minimise the risk of correlated residuals and dual loadings in the CFA, item parcels were created for scales containing eight or more items (Little et al., 2013). These parcels were formed by pairing high-loading items with low-loading items within each scale. Detailed CFA results, including model fit indices for each scale, are reported below. Model fit was evaluated using the root mean square error of approximation (RMSEA), comparative fit index (CFI), and standardised root mean square residual (SRMR; Asparouhov & Muthén, 2018). An acceptable model fit was indicated by a CFI value of .90 or higher, and RMSEA and SRMR values of .08 or lower. A good model fit was obtained with a CFI value of .95 or higher, and RMSEA and SRMR values of .05 or lower (Asparouhov & Muthén, 2018).

(De)motivating leadership styles

To assess the (de)motivating leadership styles, we used a validated questionnaire originally developed in Dutch by De Clerck et al. (2021). This questionnaire describes seven specific management situations coaches may encounter within the sports club. For each

situation, coaches were asked to rate the board's autonomy-supportive (8 items), structuring (5 items), controlling (8 items), and chaotic (8 items) styles on a 7-point Likert scale, ranging from 1 (*does not describe my board at all*) to 7 (*does describe my board extremely well*). For instance, coaches were presented with a situation in which the board organises a meeting with coaches to evaluate the sports clubs' activities. Subsequently, coaches were asked to what extent the board "creates opportunities for them to provide input during the meeting" (autonomy support), "clarifies what the purpose of the meeting is, so that you know what to expect" (structure), "makes a list of the topics and decides by itself in what way they will be discussed during the meeting" (control), and "does not spend much time preparing since this costs a lot of energy" (chaos). The reliability of the scales, as assessed by Cronbach's Alpha's (α), was acceptable, with values of .84 for autonomy support, .77 for structure, .75 for control, and .76 for chaos (Hair et al., 2010). The CFA of the (de)motivating leadership styles, where four 2-item parcels for autonomy-supportive, controlling, and chaotic leadership styles, and 5 original items for a structuring leadership style served as indicators for their respective higher-order factor, showed an acceptable model fit: RMSEA = .08; CFI = .90; SRMR = .08.

(De)motivating coaching styles

To measure the (de)motivating coaching styles, we employed the validated Situations-in-Sport Questionnaire (Delrue et al., 2019), which was originally developed in Dutch. This questionnaire outlines the coaches' (de)motivating style in a diverse range of concrete situations throughout the sports season. The situations pertain to the training context (5 situations), the competition context (5 situations), and the pedagogical role of coaches (5 situations). Each situation presents either a problematic scenario necessitating coach intervention, or a non-problematic scenario requiring proactive coach behaviour. For each of the 15 situations, both coaches and sports club members were presented with four distinct coach responses, aligning with an autonomy-supportive (α = .86 [coaches], .85 [members]), structuring (α = .88 [coaches], .88 [members]), controlling (α = .82 [coaches], .86 [members]), and chaotic (α = .83 [coaches], .77 [members]) coaching style. The wording of the items depended on whether coaches or members completed the questionnaire. For example, the following responses were related to the situation "The training session begins": "I am interested/The coach is interested to hear which specific skill my athletes/you would like to practice and provides the necessary space to do so" (autonomy-support), "I provide/The coach provides a clear and easy to follow structure and communicate/communicates the goals of the training" (structure), "I take/The coach takes a strong stance that my athletes/you need to learn what I bring/(s)he brings to the training session. It is my/his/her duty to give the training and it is my athletes'/your duty to do their/your best" (control), and "I do not/The coach does not plan too much. I wait/(S)he waits and take/takes things as they come" (chaotic). Members and coaches were asked to respond on a 7-point Likert scale, ranging from 1 (*does not describe me/my coach at all*) to 7 (*does describe me/my coach extremely well*). The CFA involving the (de)motivating coaching styles as perceived by coaches, where five 3-item parcels for autonomy-supportive, structuring, controlling, and chaotic coaching styles loaded onto their respective higher-order factor, demonstrated an acceptable model fit: RMSEA = .06, CFI = .95, and SRMR = .07. Similarly, the CFA of the (de)motivating

coaching styles as perceived by members showed an acceptable model fit: RMSEA = .06, CFI = .94, and SRMR = .05.

Sports club members' motivation

To assess the sports club members' motivation, we utilised the Behavioural Regulation in Sport Questionnaire (BRSQ; Lonsdale et al., 2008). We employed the Dutch version of the questionnaire, which has been validated and applied in previous research (Assor et al., 2009). In this questionnaire, the stem "I put effort into my sport because … " was used to measure intrinsic motivation (4 items, $\alpha = .70$; e.g., "..I enjoy it"), identified regulation (4 items, $\alpha = .68$; e.g., " … I find it personally meaningful"), introjected regulation (8 items, $\alpha = 81$; e.g., " … I am supposed to prove myself that I am good at it"), external regulation (8 items, $\alpha = 85$; e.g., " … then others appreciate me more"). Amotivation was measured with 4 items ($\alpha = .85$, e.g., "But the reasons why I do sport are no longer clear to me these days"). Members were asked to assess each of the 28 items using a 7-point Likert scale from 1 (*does not describe me at all*) to 7 (*does describe me extremely well*). The CFA involving the motivational regulations, where four 2-item parcels for introjected regulation and external regulation, and 4 original items for intrinsic motivation, identified regulation, and amotivation represented their respective higher-order factor, showed an acceptable model fit: RMSEA = .08; CFI = .90; SRMR = .08.

Plan of analyses

We initiated our analyses by calculating descriptive statistics and correlations for our study variables (i.e., leadership styles, coaching styles, motivational regulations) in IBM SPSS Statistics version 27. Additionally, we assessed skewness and kurtosis in the distribution of our study variables. We considered the distribution reasonably normal if the absolute values of skewness and kurtosis were ≤ 2 (George & Mallery, 2019). Next, we addressed our research aims, employing a multi-level analytical approach in MlWin and Mplus (Muthén & Muthén, 2017) to appropriately manage the hierarchical structure of our data. Specifically, our dataset comprised sports club members organised within teams, and these teams, along with their respective coach(es) were further organised within the context of sports clubs.

To investigate the (multi-level) relation between the leadership styles and the coaching styles (i.e., first part of the trickle-down model), we adopted a systematic approach. First, we introduced the outcome variables (i.e., autonomy support, structure, control, and chaos as perceived by coaches and members) within eight separate multi-level null models. These null models allowed us to partition the variance of each of the coaching styles at the between-coach and between-club level (pertaining to the coaching styles as perceived by coaches), and at the between-member, between-coach, and between-club levels (pertaining to the coaching styles as perceived by members). Next, consistent with previous research (e.g., Morbée et al., 2020), we considered the role of socio-demographic variables in influencing coaching styles, entering the coaches' age, gender, and experience within each of the coaching styles models. In a subsequent step, we introduced the predictors (i.e., coaches' perceptions of the leadership styles) within each of the models. Finally, we assessed all relations between the leadership styles and the coaching styles simultaneously within a multi-level path model.

Shifting focus to the relation between the coaching styles and members' motivation (i.e., the second part of the trickle-down model), we followed a similar systematic approach akin to the first part. In the final step of the multi-level analyses, we synthesised the relations of the two parts of the trickle-down models. We explored two distinct multi-level path models: one centred on coaches' perceptions of their coaching styles, elucidating the relationship between leadership styles as perceived by coaches, coaching styles as perceived by coaches, and subsequently members' motivation (first model). The other model focused on members' perceptions of coaching styles, examining the connection between leadership styles as perceived by coaches and coaching styles as perceived by members, and subsequently members' motivation (second model). These multi-level path models were developed using the Maximum Likelihood method and based on observed measures, with the same model fit thresholds as those used in the CFA (see Measures).

Finally, to gain deeper insights and better explain the results in relation to the central study aims, we compared the average perceptions of team members regarding the autonomy-supportive, structuring, controlling, and chaotic coaching styles with the evaluations provided by their coaches, relying on one-way repeated measures multivariate analyses of variance (MANOVA).

Results

Descriptive statistics and correlations among the study variables are presented in Table 1. Descriptive analyses revealed that our sample contained some missing data (see the second column), though these were within acceptable limits (i.e., less than 5% missing values per indicator; Hair et al., 2021). Consistent with prior research, missing values were addressed using listwise deletion (Luo et al., 2021). Regarding the normality test, the absolute skewness and kurtosis values for all study variables were below 2, except for the autonomy-supportive and structuring styles as perceived by coaches, which exhibited kurtosis values slightly above 2 (2.74 and 2.89, respectively). However, the skewness for these two variables was below 2. Furthermore, non-parametric tests (i.e., Spearman's rank correlation) yielded results similar to the parametric equivalents (i.e., Pearson's correlation), suggesting that the slight deviation from normality did not significantly impact the results (Hair et al., 2010).

First part of the trickle-down model

In Table 2, the null models display the variance distribution of each outcome variable (i.e., the coaching styles as perceived by coaches and members). Regarding the coaching styles as perceived by coaches, Table 2 indicates that the majority of the variance was at the coach level. The variance at the club level was minimal, with intraclass correlation coefficients (ICC) for the coaching styles ranging from .02 to .10, none of which were significantly different from zero. Regarding the coaching styles as perceived by members, Table 2 shows that most of the variance was at the member level. Variance at the coach level was also significantly different from zero, with ICC values ranging from .16 to .31. At the club level, the variance was relatively small, with ICC values ranging from .05 to .13. Only the variance for a structuring style was significantly different from zero.

Table 1. Descriptive statistics and bivariate correlations between coaches' perceptions of leadership and coaching styles and members' perceptions of coaching styles and motivation.

Measure	*n*	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coaches' perceptions																			
1. Leaders' autonomy-support	106	4.49	1.23																
2. Leaders' structuring style	106	4.76	1.09	.75**															
3. Leaders' controlling style	106	3.16	1.02	−.42**	−.22**														
4. Leaders' chaotic style	106	2.96	1.12	−.36**	−.52**	.48**													
5. Coaches' autonomy support	105	4.88	0.75	.−03	.05	−.03	.07												
6. Coaches' structuring style	103	5.53	0.85	<.01	.11	−.14	−.15	.79**											
7. Coaches' controlling style	101	3.34	1.03	.09	.17	.27**	.08	.15	.22*										
8. Coaches' chaotic style	102	2.23	0.68	−.06	−.07	.33**	.19	−.36**	−.49**	.14									
Members' perceptions																			
9. Coaches' autonomy support	561	4.37	0.94	.04	.07	.10	.01	.08	.08	.06	−.03								
10. Coaches' structuring style	560	5.16	0.89	.02	.07	.09	.03	.11**	.17**	.12**	−.09*	.78**							
11. Coaches' controlling style	556	3.64	0.99	−.01	.05	.05	−.01	.07	.12**	.16**	−.11**	.08	.18**						
12. Coaches' chaotic style	561	2.66	0.83	−.08	−.06	−.06	−.06	−.04	−.07	−.02	−.04	−.41**	−.52**	.26**					
13. Intrinsic motivation	564	4.61	0.45	−.03	−.02	.06	.03	−.01	.01	<.01	−.01	.26**	.25**	.01	−.23**				
14. Identified regulation	564	4.10	0.60	−.09*	−.05	.01	−.02	.02	.05	.04	.03	.19**	.20**	.02	−.10**	.46**			
15. Introjected regulation	564	3.00	0.76	.03	.02	−.04	.01	.03	.09*	.05	−.08	.09*	.11*	.22**	.08	.04	.25**		
16. External regulation	564	1.91	0.64	.04	.05	−.09*	−.02	.04	.04	−.01	−.09*	−.04	−.04	.17**	.13**	−.29**	−.12**	.53**	
17. Amotivation	564	1.60	0.71	.03	.06	−.09*	−.05	<.01	.03	.02	−.07	−.24**	−.25**	.07	.30**	−.54**	−.34**	.04	.34**

Note. *$p < .05$, **$p < .01$.

Table 2. Multi-level model examining the relations between the leaders' (de)motivating style and coaches' (de)motivating styles.

	Autonomy-supportive coaching As perceived by coaches/ As perceived by members			Structuring coaching As perceived by coaches/ As perceived by members			Controlling coaching As perceived by coaches/ As perceived by members			Chaotic coaching As perceived by coaches/ As perceived by members		
	Model 0a	Model1a	Model2a	Model0b	Model1b	Model2b	Model0c	Model1c	Model2c	Model0d	Model1d	Model2d
Fixed part												
Intercept	4.88 (.07)/ 4.35 (.08)	4.75 (.43)/ 5.38 (.32)	5.13 (.71)/ 4.75 (.54)	5.53 (.09)/ 5.16 (.08)	4.90 (.49)/ 6.00 (.29)	5.55 (.83)/ 5.57 (.48)	3.35 (.11)/ 3.65 (.07)	3.13 (.62)/ 3.79 (.40)	0.26 (0.96)/ 3.58 (.68)	2.22 (.08)/ 2.66 (.06)	2.78 (.41)/ 2.66 (.06)	1.27 (.65)/ 2.80 (.05)
Coaches' socio-demographics												
Age	.	.01 (.01)/ −.01 (0.1)	.01 (.01)/ −.01 (.01)		−.02 (.01)/ −.01 (.01)	.01 (.01)/ −.01 (.01)		.02 (.01)*/ −.01 (.01)	.02 (.01)*/ <.01 (.01)		.01 (.01)/ −.01 (.01)	<.01 (.01)/ −.01 (.01)
Gender		.13 (.29)/ −.34 (.22)	.14 (.29)/ −.24 (.22)		.22 (.33)/ −.35 (.20)	.20 (.33)/ −.27 (.20)		−.28 (.43)/ −.22 (.27)	.01 (.40)/ −.22 (.28)		−.13 (.28)/ .09 (.19)	.01 (.27)/ .05 (.19)
Experience		−.02 (.01)*/ −.02 (.01)*	−.02 (.01)*/ −.02 (.01)*		−.02 (.01)/ −.02 (.01)*	−.02 (.01)/ −.02 (.01)*		−.03 (.01)*/ −.01 (.01)	−.03 (.01)*/ −.01 (.01)		.01 (.01)/ .01 (.01)	.01 (.01)/ .01 (.01)
Coaches' perceptions of the leadership styles												
Autonomy-support			−.12 (.11)/ .01 (.08)			.18 (.13)/ .01 (.07)			.16 (.14)/ −.08 (.10)			.12 (.09)/ −.06 (.07)
Structure			.11 (.11)/ .05 (.08)			.18 (.13)/ .05 (.08)			.12 (.15)/ .11 (.11)			−.05 (.10)/ −.03 (.08)
Control			−.04 (.09)/ .09 (.06)			−.12 (.10)/ .10 (.07)			.35 (.12)**/ .01 (.08)			.27 (.08)**/ −.05 (.06)
Chaos			−.06 (.09)/ −.09 (.07)			−.05 (.10)/ −.08 (.06)			.03 (.11)/ .02 (.08)			.02 (.07)/ −.02 (.06)
Random Part	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Club-Level	.01 (.01)/ .10 (.05)	.01 (.01)/ .05 (.04)	.01 (.01)/ .07 (.04)	.07 (.07)/ .11 (.05)***	.06 (.07)/ .10 (.04)***	.06 (.07)/ .11 (.04)**	.04 (.10)/ .04 (.05)	.02 (.09)/ .05 (.05)	.08 (.09)/ .04(.05)	.05 (.05)/ .04(.03)	.04 (.05)/ .03 (.03)	.07 (.05) .03 (.03)
Coach-Level	.55 (.08)***/ .18 (.05)***	.53 (.08)***/ .14 (.04)***	.51 (.07)***/ .12 (.04)***	.64 (.11)***/ .13 (.04)***	.63 (.10)***/ .08 (.03)***	.60 (.10)***/ .06 (.03)***	1.02 (.17)**/ .30 (.07)***	.97 (.16)***/ .29(.07)***	.79 (.13)***/ .29 (.07)***	.41 (.07)***/ .11 (.04)**	.41 (.07)***/ .09 (.03)**/	.32 (.05)***/ .08 (.03)**
Member-Level	−/ .60 (.04)***	−/ .60 (.04)***	−/ .60 (.04)***	−/ .56 (.04)***	−/ .56 (.04)***	−/ .56 (.04)***	−/ .64 (.04)***	−/ .64 (.04)***	−/ .64 (.04)***	−/ .54 (.04)***	−/ .54 (.04)***	−/ .54 (.04)***
Deviance test	235.47/ 1429.92	230.51/ 1408.16	227.47/ 1400.29	256.52/ 1374.83	253.24/ 1354.60	247.34/ 1346.75	292.14/ 1470.77	286.12/ 1469.24	270.86/ 1467.96	209.38/ 1335.76	206.10/ 1324.19	190.51/ 1320.44
Chi-square (df)		4.96 (3)/ 21.76(3)***	3.04 (4)/ 7.87 (4)		3.28 (3)/ 20.23(3)***	5.9 (4)/ 7.85 (4)		6.02 (3)/ 1.53 (3)	15.26 (4)**/ 1.28 (4)		3.28 (3)/ 11.57(3)**	15.57 (4)**/ 3.75 (4)

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

We relied on multi-level analyses to delve into the role of coaches' socio-demographic factors (i.e., age, gender, experience) in shaping coaching styles (as outlined in models 1, Table 2). The results show that the coaches' experience was negatively related to their autonomy-supportive style as perceived by both themselves (B = −.02; $p < .05$) and members (B = −.02; $p < .05$). In addition, the coaches' experience unveiled a negative relation with the structuring coaching style as perceived by members (B = −.02; $p < .05$), and a similar negative connection to the controlling coaching style as perceived by coaches themselves (B = −.03; $p < .05$). The coaches' age was also positively related to the coaches' perceptions of their own controlling style (B = .02; $p < .05$). Next, we explored the role of the leadership styles in predicting the coaching styles (i.e., models 2 – between-coaches effects). In contrast to hypothesis 1a, we did not find a relation between the coaches' perceptions of an autonomy-supportive and structuring leadership style and their own reliance on these motivating styles. However, we found, consistent with hypothesis 1b, a positive relation between the controlling leadership style as perceived by the coaches and their own perceptions of both their controlling (B = .35; $p < .01$) and chaotic (B = .27; $p < .01$) coaching style. The multi-level path model that assessed all relations between the leadership styles and coaching styles as perceived by coaches simultaneously showed an acceptable model fit after the exclusion of gender, which did not correlate with the study variables. The model fit was as follows: RMSEA = .06; CFI = .96; SRMR (within) = .03. The findings confirmed the role of coaches' perceptions of a controlling leadership style as antecedents of a controlling and chaotic coaching style. Table 2 further indicates that the novel multi-informant perspective on the relation between the leadership styles as perceived by coaches and the coaching styles as perceived by members did not uncover any significant relations.

Second part of the trickle-down model

Transitioning to the second part of the trickle-down model, we dissected the connection between the coaching styles and members' motivation (see Tables 3, 4). A three-level model was estimated for each type of motivation. Tables 3 and 4 indicate that the variance in motivation was mostly situated at the member level. The variance at both the coach and club levels was minimal and mostly not significantly different from zero, with ICC values at both levels ranging from .02 to .08.

Our multi-level analyses first gave more insight into the socio-demographic factors (i.e., age, gender) that influence members' motivation (as outlined in models 1), showing that the members' age related positively to identified regulation (B = .01; $p < .05$) and negatively to introjected regulation (B = −.02; $p < .01$) and external regulation (B = −.02; $p < .01$). No other relations were found. Subsequently, we focused on exploring the multi-level relations of the coaching styles with members' motivation (detailed in models 2). Testing within-team effects, the results indicated consistent with hypothesis 2a that the members' perceptions of an autonomy-supportive coaching style related positively to their intrinsic motivation (B = .08; $p < .05$), while a structuring coaching style related positively to members' identified regulation (B = .11; $p < .05$). In addition, consistent with hypothesis 2b, members' perceptions of a controlling coaching style related positively to their introjected regulation (B = .16; $p < .001$) and external regulation (B = .10; $p < .01$), while a positive relation surfaced between members' perceptions of a chaotic

Table 3. Multi-level model examining the relations between the coaches' (de)motivating styles and members' autonomous motivation.

	Intrinsic motivation			Identified regulation		
	Model 0a	Model1a	Model2a	Model0b	Model1b	Model2b
Fixed part						
Intercept	4.62 (.03)	4.57 (.09)	4.16 (.29)	4.11 (.03)	3.95 (.11)	2.91 (.37)
Members' socio-demographics						
Age	.	<.01 (<.01)	<.01 (<.01)		.01 (.01)*	.01 (.01)
Gender		−.05 (.05)	−.04 (.05)		−.02 (.01)	.01 (.06)
Members' perceptions of the coaching styles						
Autonomy-support			.08 (.03)*			.04 (.04)
Structure			<.01 (.04)			.11 (.05)*
Control			.03 (.02)			.01 (.03)
Chaos			−.10 (.03)**			−.03 (.04)
Coaches' perceptions of the coaching styles						
Autonomy-support			−.03 (.05)			−.03 (.06)
Structure			.01 (.05)			.06 (.06)
Control			−.01 (.03)			.01 (.03)
Chaos			<.01 (.05)			.05 (.05)
Random part	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Club-level	.01 (.01)	.01 (.01)	.01 (.01)	<.01 (<.01)	<.01 (<.01)	<.01 (<.01)
Coach-level	.01 (.01)	.01 (.01)	.01 (.01)	.03(.01)	.03 (.01)	.01 (.01)
Member-level	.18 (.01)***	.18 (.01)***	.17 (.01)***	.33 (.03)***	.33 (.02)***	.31 (.02)***
Deviance test	676.71	675.28	580.71	1017.18	1013.17	889.74
Chi-square (df)		1.43 (2)	94.57 (8)***		4.01 (2)	123.43***

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

coaching style and amotivation (B = .18; $p < .001$). Members' perceptions of a chaotic coaching style also related negatively to their intrinsic motivation (B = −10; $p < .01$). The multi-level path model that centred on investigating the relations between the members' perceptions of the coaching styles and members' motivation simultaneously (RMSEA = .03; CFI = .96; SRMR (within) = .03) reinforced the pivotal role of autonomy support and structure in fostering respectively intrinsic motivation and identified regulation as well as the importance of a controlling style for both introjected and external regulation. It also confirmed the substantial role played by a chaotic style in shaping amotivation and – in a negative manner – intrinsic motivation. Tables 3 and 4 further show that the novel multi-informant perspective on the relation between the coaching styles as perceived by coaches and members' motivation (i.e., between-coaches effects) did not reveal any significant relations.

Assessment of trickle-down effects

Finally, we assessed both parts of the trickle-down model simultaneously using two multi-level path models. The first model proposed a link between leadership styles and coaching styles as perceived by coaches, and, in turn, the (average) members' motivation. However, this model demonstrated poor fit indices (RMSEA = .17, CFI = .46, SRMR (within) = .10). The second model suggested a relation between leadership styles as perceived by coaches, coaching styles as perceived by members (on average), and members' motivation. This model also displayed poor fit indices (RMSEA = .36, CFI = .10, SRMR (within) = .10). These poor model fits indicated that the observed covariance matrices did not align with the implied covariance matrices, suggesting that the proposed trickle-down models did not adequately capture the patterns and relations within the

Table 4. Multi-level model examining the relations between the coaches' (de)motivating styles of members' controlled motivation and amotivation.

	Introjected regulation			External regulation			Amotivation		
	Model 0c	Model1c	Model2c	Model0d	Model1d	Model2d	Model0e	Model1e	Model2e
Fixed part									
Intercept	3.00 (.04)	3.42 (.14)	2.48 (.45)	1.91 (.03)	2.11 (.12)	2.04 (.39)	1.60 (.03)	1.32 (.14)	1.68 (.44)
Members' socio-demographics									
Age	.	−.02 (.01)**	−.02 (.01)**	.	−.02 (.01)**	−.02 (.01)**		.02 (.01)	.01 (.01)
Gender		−.05 (.08)	.03 (.08)		.01 (.06)	.04 (.06)		−.02 (.07)	−.03 (.07)
Members' perceptions of the coaching styles									
Autonomy-support			.10 (.06)			.01 (.05)			−.10 (.05)
Structure			−.07 (.07)			−.04 (.06)			−.05 (.06)
Control			.16 (.04)***			.10 (.03)**			.01 (.04)
Chaos			−.02 (.05)			.05 (.04)			.18 (.05)***
Coaches' perceptions of the coaching styles									
Autonomy-support			−.12 (.07)			.05 (.06)			−.07 (.07)
Structure			−.12 (.07)			−.07 (.07)			.06 (.07)
Control			.05 (.04)			.03 (.03)			.03 (.04)
Chaos			.03 (.06)			−.08 (.05)			−.07 (.06)
Random part	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)	σ^2 (S.E.)
Club-level	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)	.01 (.01)	<.01 (.01)	.04 (.02)*	.03 (.02)*	.01 (.01)
Coach-level	.04 (.03)	.03 (.02)	.01 (.02)	.01 (.01)	.01 (.01)	.01 (.01)	.02 (.02)	<.01 (.02)	.01 (.02)
Member-level	.54 (.04)***	.53 (.04)***	.51 (.04)***	.39 (.03)***	.39 (.03)***	.37 (.03)***	.46 (.03)***	.46 (.03)***	.43 (.03)***
Deviance test	1287.47	1276.53	1126.91	1091.13	1085.51	968.79	1198.14	1190.85	1061.78
Chi-square (df)		10.94 (3)*	149,62***		5.62 (3)	116.72 (8)***		7.29 (3)	129.07(8)***

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

data (Kline, 2016). To address this issue, we deleted unnecessary parameters from the model (i.e., path coefficients that are not significantly different from zero; Tomarken & Waller, 2003), focusing on parts of the trickle-down model that showed no significant relations. More precisely, in the first model, we removed the connections between coaching styles and members' motivation, retaining only the relations between leadership styles and coaching styles as perceived by coaches. This adjustment resulted in acceptable fit indices (RMSEA = .06, CFI = .96, SRMR (within) = .03 – see the first part of the trickle-down model). In the second model, we deleted the links between leadership styles and coaching styles as perceived by members, retaining only the relations between members' perceptions of coaching styles and their motivation. This model demonstrated good fit indices (RMSEA = .03, CFI = .96, SRMR (within) = .03 – see the second part of the trickle-down model). However, while both of these models achieved acceptable fits, they no longer included key components of the trickle-down effect. Consequently, our findings did not support Hypotheses 3a and 3b.

Differences in perceptions of the coaching Styles

In addition to our primary objectives, we explored differences in perceptions of the coaching styles between coaches and members. A repeated measures MANOVA revealed that across all styles, coaches exhibited significant dissimilarities in self-perceptions when compared to the average perceptions of the members of their team, Wilk's Lambda = .671, $F(4,96) = 11.64$, $p < 001$ ($n = 100$). Follow-up univariate ANOVA analyses revealed that coaches held stronger perceptions of their motivating styles as being more autonomy-supportive (M = 4.90 (0.76)) when compared to members' perceptions (M = 4.37 (0.63); F = 32.73 (1,99); $p < .001$), and as more structuring (M = 5.54 (0.86)) than members' perceptions (5.17 (0.57); F = 16.85 (1,99); $p < .001$). Additionally, coaches viewed their styles as less demotivating, perceiving them as less controlling (M = 3.33 (1.03)) in comparison to members (M = 3.61 (0.69); F = 6.59 (1,99); $p < .05$) and less chaotic (M = 2.22 (0.68)) relative to members (2.64 (0.51): F = 26.23 (1,99); $p < .001$).

Discussion

This study advances our understanding of trickle-down effects within sports clubs by adopting a multi-informant, multi-level approach. It provides valuable insights into the complex interactions between leadership styles, coaching practices, and club members' motivation, analysed from diverse perspectives and across hierarchical levels. These findings make a substantial contribution to the literature, as detailed below.

First part of the trickle-down model

First, our study enhances the scholarly discourse by offering a detailed and nuanced exploration of the relation between leadership and coaching styles. A key finding was that a significant proportion of the variance in coaching styles was attributable to the coach level. This underscores the pivotal role of coach-specific factors in shaping the coaching styles within sports clubs. However, our findings did not align with Hypothesis 1a and previous literature (e.g., Rocchi & Pelletier, 2017), which proposed a relation

between coaches' perceptions of autonomy-supportive and structuring leadership styles and their own reliance on these motivating styles. Thus, when the sports club board cultivates an open-minded approach towards their coaches (i.e., autonomy support) and provides guidance and clarity on tasks and achievement strategies (i.e., structure), this does not necessarily result in coaches exhibiting similar behaviours toward their athletes. In contrast, controlling and chaotic coaching styles were related to a controlling leadership style (as perceived by coaches). This implies that when the board exerts pressure on coaches to conform to a predetermined mindset, it may lead to coaches adopting similar controlling strategies toward their athletes. This could materialise through the use of guilt-inducing tactics or even yelling and intimidating (Bartholomew et al., 2011; Delrue et al., 2019; Morbée et al., 2020). Additionally, controlling leadership may result in chaotic coaching strategies, with coaches leaving athletes to their own devices with minimal guidance (Delrue et al., 2019). These findings are consistent with hypothesis 1b and prior literature but are based solely on coaches' perspectives. Notably, this study is the first to examine the relation between leadership and members' perceptions of coaching styles, revealing a striking contrast: members' perceptions of coaching styles were not linked to coaches' perceptions of leadership. This discrepancy can be analysed from different perspectives.

From a methodological perspective, there is a potential concern of single-source bias in the significant relations identified in the first part of the trickle-down model, as these are solely based on coaches' perceptions (Podsakoff et al., 2024). Coaches may provide socially desirable responses, especially when evaluating their own coaching styles (e.g., Delrue et al., 2019). Also the findings of this study indicated that coaches often present an overly optimistic view of their motivating style compared to members' perceptions, while downplaying their demotivating style. Alternatively, from a practical perspective, one might argue that the influence of leadership on coaching styles is simply in the eye of the beholder. Coaches might feel influenced by leaders in the style they adopt, aligning their coaching style with the leadership style, while members do not perceive this influence. For example, coaches might believe they adopt a more pressuring approach due to pressure from leaders, whereas members might not necessarily make this connection.

To gain deeper insight into this issue, alternative measures of coaching styles, such as observations, can be employed. This method has already been successfully used in educational contexts (e.g., Van Doren et al., 2024). Implementing observational techniques would provide a more objective understanding of coaching styles and their relation with leadership, addressing the limitations of subjective perceptions. Additionally, it is crucial to explore additional factors shaping coaching styles beyond leadership. Our findings highlight the role of coaches' experience, particularly in shaping motivating coaching styles as perceived by members. Interestingly, more experienced coaches were associated with less autonomy-supportive and structuring coaching styles. This finding contradicts existing sports literature (e.g., Morbée et al., 2020) and might seem counterintuitive at first glance. One possible explanation could be evolving coaching philosophies, where experienced coaches may become less attuned to emerging coaching trends. This shift might be rooted in longstanding coaching approaches that have historically yielded success, possibly overshadowing the significance of more recent motivating coaching practices (De Muynck et al., 2021).

Second part of the trickle-down model

Secondly, this study examined the relation between coaching styles and members' motivation. While this topic has garnered substantial scholarly attention, our research advances the literature by providing a more holistic and refined understanding of how perceptions of coaching styles influence motivation. A remarkable finding was that variance in motivation predominantly resided at the individual member level, suggesting that motivation is largely a personal phenomenon. This underscores the critical role of individual factors, rather than team or club climate, in shaping sports club members' motivation. Supporting hypothesis 2a, the findings further highlight the essential role of individual members' perceptions of motivating coaching styles in fostering positive forms of motivation. More precisely, they indicate that coaches who adopt a curious and open attitude towards their athletes (i.e., autonomy support) foster intrinsic motivation marked by sheer joy and pleasure. Concurrently, coaches providing clarity and information about the tasks and expected achievement (i.e., structure), significantly promote identified regulation with members' recognising the value and importance of their sports activity. These findings align with existing literature, which has already recognised the role of an autonomy-supportive and structuring coaching style in fostering autonomous motivation (e.g., Delrue et al., 2019; Reynders et al., 2020). The unique contribution of this study lies in its refined analysis, showing how each coaching style distinctly contributes to key aspects of autonomous motivation.

Additionally, our findings shed detailed light on the role of members' perceptions of demotivating coaching styles in triggering suboptimal and negative forms of motivation. Supporting our hypothesis 2b, the findings indicate that coaches imposing pressure and constraints on their athletes (i.e., control) may induce sports participation driven by the avoidance of feelings of guilt or shame (i.e., introjected regulation) or to sidestep punishment, criticism, and to seek rewards or appreciation (i.e., external regulation). Additionally, coaches providing insufficient guidance (i.e., chaos) may result in athletes' engagement devoid of purpose and pleasure, fuelled by amotivation and a lack of intrinsic motivation. Thus, while previous research already showed that controlling and chaotic coaching styles were related to controlled motivation and amotivation (Delrue et al., 2019; Reynders et al., 2020), our study unveiled that each style has a distinct impact on sports club members' motivation. Though it may seem imperative to steer clear of a chaotic style given its pronounced association with amotivation, the enduring detrimental effects of controlling coaching styles should not be overlooked. This style strongly correlates with internal and external pressure, emphasising the importance of mitigating its negative influence (Bartholomew et al., 2011). Importantly, the relations identified between coaching styles and members' motivation are based solely on the members' perspectives, revealing a notable discrepancy between their perceptions of coaching styles and those held by the coaches. This highlights concerns about potential single-source bias. Incorporating observations could offer a more comprehensive understanding of this relation.

Assessment of trickle-down effects

The third contribution of this study lies in its assessment of trickle-down effects in sports. The findings did not substantiate the anticipated indirect influence of leadership styles on

members' motivation through coaching styles, suggesting that the trickle-down effect in sports is more intricate than previously theorised (Mageau & Vallerand, 2003) or observed in empirical research (De Clerck et al., 2022). Specifically, this result contrasts with the study of De Clerck et al. (2022), who relied on members' perceptions to establish a connection between leadership styles, coaching styles, and consequently, members' motivation. However, this single-informant study lacks insight into how the coaches view the leadership of their sports club, which is crucial as such perceptions are suggested to translate into their own coaching behaviours within the trickle-down model (Mageau & Vallerand, 2003; Morbée et al., 2020).

These study findings can be attributed to several factors. Firstly, the nature of sports teams, characterised by a relatively small number of athletes per coach, may have constrained our ability to thoroughly explore the team dynamics that influence athlete-coach interactions and, in turn, drive the trickle-down effect (Hox & McNeish, 2020). Secondly, intermediary factors, such as communication patterns, may mediate the relations in the trickle-down model, shaping how leadership and coaching styles are interpreted within the sports club environment (Kline, 2016). Thirdly, the relations within the model may be influenced by complex interactions between variables not captured in this study. For example, trust in leaders may affect how coaches translate leaders' behaviours into their interactions with athletes (Burke et al., 2007). Thus, while our findings challenge the notion of a simple, linear trickle-down effect, they do not rule out the possibility of more intricate dynamics at play. These complexities warrant further investigation in future research.

Practical implications

This study offers crucial practical implications, delivering valuable insights for both leaders and coaches. *As for leaders*, it appears that their behaviours towards coaches, whether motivating or demotivating, may not necessarily extend to sports club members. This challenges the assumed effectiveness of autonomy-supportive and structuring leadership styles in trickling down to athletes. However, it also suggests that controlling or chaotic leadership styles do not significantly impact coaches' approaches to their athletes, which may initially appear positive. Nevertheless, this does not diminish the importance of leaders in fostering a motivational club environment. Previous research has pointed towards the pivotal role of leaders in promoting coaches' well-being and optimal functioning (Bartholomew et al., 2011; Delrue et al., 2019). Additionally, our findings underscore a critical area where effective leadership could benefit athletes, revealing that more experienced coaches often demonstrate fewer motivating practices toward their athletes. Therefore, it becomes imperative for leaders to ensure that these experienced coaches – who serve as vital assets to many sports clubs – are well-informed about the latest advancements in coaching methods through effective interventions. These interventions should focus on training coaches to embrace need-supportive behaviours, with the trainers themselves exemplifying these principles of need-supportive coaching (Reynders et al., 2019). This entails empowering coaches with autonomy while offering essential structure. By adopting such an approach, coaches can confidently embrace motivating coaching methodologies, fostering a vibrant and productive coaching environment.

For coaches, recognising that motivation varies from one individual to another, rather than being determined by the team or club climate, is imperative. It becomes essential to provide a personalised mixture of autonomy and structure, aligning with members' characteristics, feelings, and expectations. Moreover, coaches should be aware that their athletes perceive their coaching style very differently. Engaging in open communication and providing clear guidelines are pivotal, allowing coaches to comprehend how their approaches are perceived and facilitating adjustments in their style accordingly.

Limitations and future directions

Our study did not support the existence of a linear trickle-down effect. Therefore, as outlined in the discussion, future research could delve into exploring mediating and/or moderating variables that impact the trickle-down model proposed in this study. Additionally, future studies could consider recruiting a larger sample of athletes within each team (Hox & McNeish, 2020). This approach would necessitate examining the trickle-down effect within a single sport characterised by larger team sizes, such as football. This approach would facilitate a more comprehensive examination of how intra-team dynamics shape athlete-coach relationships and how these relationships are influenced by leadership factors (e.g., Flemington et al., 2023; Loeys et al., 2024). It is also important to acknowledge that this study's cross-sectional design poses limitations in establishing causality. Adopting a longitudinal research design would provide a deeper understanding of the causal trickle-down effects. Specifically, it would be valuable to follow a club's change in leadership to see how coaches' and members' perceptions, behaviours, and outcomes change accordingly. Furthermore, in this study, coaches were asked to assess the leadership style of the board as a whole. However, a coach's access to and familiarity with individual board members may have skewed their perception of the entire board. Future studies could provide deeper insights into possible differences by collecting data on the perceived leadership styles of individual board members and comparing these with the assessment of the board's overall leadership style. Another limitation of the current study was the gender imbalance in the sample, which predominantly included male sports club members and coaches. Male coaches, in particular, constituted an overwhelming majority of the participants (93%), reflecting the broader male dominance in sports coaching (e.g., Anderson, 2009). As research suggests that female coaching leadership differs from male leadership (e.g., Schull & Kihl, 2018), future studies could include a more balanced representation of both genders to explore how the trickle-down effect manifests differently in men's versus women's coaching. Additionally, a more equitable representation of male and female sports club members would allow for an examination of potential gender differences in perceptions of coaching leadership. Collectively, such insights offer a meaningful contribution to advancing gender equity and inclusion in sports. Finally, integrating qualitative methods alongside the quantitative measures used in this study could provide a more holistic perspective on the influence of leadership on coaching styles and the resulting outcomes for team members.

Conclusion

This study employed a multi-informant and multi-level perspective to advance our understanding of the complex interplay between leadership styles, coaching styles, and

member motivation. The first part of the trickle-down showed that demotivating coaching was influenced by a controlling leadership style but only when perceived by coaches themselves. The second part emphasised that the motivating coaching styles as perceived by members fostered optimal forms of motivation, while demotivating styles led to suboptimal and negative forms. The results of the trickle-down models challenge the anticipated indirect influence of leadership styles on members' motivation via coaching styles, as suggested in the literature. This paves the way for further investigation into individual and contextual factors shaping trickle-down effects.

Disclosure statement

No potential conflict of interest was reported by the authors.

Data availability statement

The data that support the findings of this study are available from the corresponding author, TDC, upon reasonable request.

Compliance with ethical standards

This research involved human participants. The following informed consent was included in our research: "You are voluntary involved in our study and you can stop your involvement at any moment for any reason. All answers to the questions will be treated confidentially and will only be used for scientific purposes. This means that only researchers have access to your answers and that this information will not be passed on to other members of the organisation, nor to third parties. Please indicate whether or not you agree to these conditions and whether or not you wish to participate in the survey." Possible answers: yes or no. This research and informed consent followed the guidelines of the Ethical Committee of the Faculty of Psychology and Educational Sciences (Ghent University).

ORCID


Annick Willem http://orcid.org/0000-0003-3753-2919

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