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Identifying profiles of parental (de)motivating behaviors in youth sports: A multi-informant approach

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Abstract

Based on the perceptions of 331 youth athletes (M_{age}=14.33) and their most involved parent in sports (M_{age} = 45.96), this study examined whether different profiles of parental behavior (i.e., autonomy-, competence-, and relatedness-supportive and thwarting in the context of sports) could be identified, the extent to which these profiles align between the perceptions of athletes and parents, and how these profiles relate to youth athletes' need-based experiences, (a)motivation, (dis)engagement, and anxiety regarding their sports participation. Independent cluster analyses on parent and athlete reports provided evidence for a similar cluster solution for both informants. Specifically, in the case of both informants, the cluster analyses identified four similar parental profiles: parents who are relatively (1) need-supportive, (2) need-thwarting, (3) predominantly controlling, and (4) distant when it comes to their child's sports participation. In general, parents rated themselves as more motivating and less demotivating compared to athletes' perceptions. Furthermore, parent reports had little to no predictive power with regard to the athletes' sports experiences. However, athletes who perceived their parents as need-supportive showed the most adaptive outcomes, while the opposite was true for the need-thwarting profile. The other two profiles fell in between, with athletes in the predominantly controlling profile scoring high on both the adaptive and maladaptive outcomes, and athletes in the distant profile scoring low on the maladaptive outcomes but not necessarily high on the adaptive outcomes.

Keywords Self-determination theory · Basic psychological needs · Motivation · Engagement · Anxiety

Introduction

In youth sports, parents often play a key role in athletes' sports experiences, as they introduce children to certain sports and serve as important motivators for their long-term participation (MacPhail & Kirk, 2006). Although most youth athletes experience parental involvement as positive (Knight et al., 2010), some youth athletes also report pressure from their parents (Lindstrom Bremer, 2012). While positive parental involvement promotes athletes' well-being (Rouquette et al., 2021) and sustained motivation for sports (Kolayiş et al., 2017), parental pressure is associated with athletes' ill-being (Dasinger, 2014) and amotivation (Sánchez-Miguel et al., 2013). Many parents show a mixture of both motivating and demotivating practices, being supportive in some moments and in some situations, but critical or even harsh on other moments and in other situations. Although previous studies have already shed light on *specific* (de)motivating parental behaviors, few have thoroughly considered the possibility that parents rely on *multiple* behaviors when interacting with their sporting children. To provide a more holistic picture of parents' interaction style with their children, the current study draws on the self-determination theory (SDT; Ryan and Deci, 2017) to examine the combinations of motivating and demotivating parental behaviors (i.e., parenting profiles) and their association with youth athletes' adaptive and maladaptive sports experiences.

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Parental need-supportive and need-thwarting behaviors

According to SDT, parents can promote the motivation, engagement, and well-being of youth athletes by supporting their child's three basic psychological needs for autonomy (i.e., feelings of volitional engagement), competence (i.e., experiences of efficacy and skill), and relatedness (i.e., feelings of value and emotional support) (Vansteenkiste et al., 2020). Specifically, parents who provide choices and meaningful rationales for requests and who are interested in children's perspectives, support their child's need for autonomy. In contrast, parents who thwart athletes' need for autonomy (thereby engaging in controlling behaviors) pressure their children to act, think, or feel in specific, prescribed ways (Holt et al., 2009). When controlling, parents are demanding, setting standards that are excessively high and conditioning their appreciation and disappointment on their children's ability to meet those standards. Second, parents can support the need for competence by providing guidance and supporting their children's development (e.g., by clarifying goals and providing process-oriented feedback) (Aelterman et al., 2017). In contrast, parents who undermine competence leave their children to their own devices when it comes to their sports participation, or they provide unwanted help and even show distrust in their children's ability to perform well in sports (Soenens et al., 2017). Third, parents who support the need for relatedness adopt an empathetic attitude and provide emotional support in stressful situations (e.g., poor sports performance, losing a game) (Skinner et al., 2005). In contrast, parents can thwart the need for relatedness when they are cold and unresponsive, or when they show little interest in their children's sports activities (Rocchi, Pelletier, & Desmarais, 2017). By supporting or thwarting these three basic psychological needs, parents can either contribute to or undermine athletes' sports experiences (De Muynck et al., 2021).

Athletes' sports experiences

Parents can have a significant impact on the quality of athletes' motivation (e.g., Kolayiş et al., 2017). More specifically, through their need-supportive behaviors, parents can foster children's autonomous motivation for sports (Gagné, 2003), whereas parents' need-thwarting behaviors are associated with controlled motivation and even amotivation (De Muynck et al., 2021; Lienhart et al., 2020; Sánchez-Miguel et al., 2013). These three types of motivation can be placed on a continuum that represents a process of increasing internalization of the reason for engaging in sports (Deci & Ryan, 2002)[1]. On the far left of the continuum is amotivation, which represents a complete lack of internalization and intention to act (Ryan & Deci, 2000). Athletes are amotivated when they do not value the activity or feel incapable of successfully completing the activity (Ntoumanis et al., 2004). The second type of motivation on the continuum is controlled motivation, which is characterized by a lack or partial internalization. Controlled motivated athletes engage in sports because of external pressures, such as the threat of punishment, rewards, or social approval (i.e., external regulation); or internal pressures, such as feelings of shame, guilt, and ego-involvement (i.e., introjected regulation) (Hodgins & Knee, 2002). Finally, the process of internalization can lead to an autonomous regulation of behavior, in which the behavior is volitionally enacted. Autonomously motivated athletes engage in sports activities because they are perceived as personally relevant (i.e., identified regulation) or in harmony with other aspects of life (i.e., integrated regulation). Alternatively, they find sports inherently interesting or enjoyable (i.e., intrinsic motivation) (Hodgins & Knee, 2002).

While motivation refers to athletes' reasons for participating in their sports (i.e., "why"), engagement refers to the way they experience their sports participation (i.e., "how"; Podlog et al., 2015; Vink and Raudsepp, 2018). Specifically, engagement within sports is defined as the active involvement of athletes in a sports activity (Reeve et al., 2004) and consists of four dimensions: emotional (e.g., displaying emotions of interest and enjoyment; Skinner et al., 2009), behavioral (e.g., demonstrating effort and perseverance; Skinner et al., 2009), cognitive (e.g., using learning and self-regulation strategies; Wolters and Taylor, 2012), and agentic (e.g., asking questions, communicating preferences; Reeve and Tseng, 2011). In contrast, athletes can also become disengaged. In this case, they no longer make efforts and give up (i.e., behavioral disengagement) or show feelings of discouragement, boredom, or frustration (i.e., emotional disengagement). Disengagement often occurs in conjunction with anxiety (Wadey et al., 2014), an outcome that has received considerable attention in sports (see Rocha and Osório, 2018 for a systematic review), and that has a somatic (i.e., physiological) and a cognitive (i.e., negative thoughts and worries) component (Martens et al., 1990). Anxiety in sports can have detrimental effects on athlete outcomes, such as underperformance (Woodman & Hardy, 2003) and ill-being (e.g., burnout; Gomes et al., 2017). Research has shown that need-supportive parenting is associated with engagement, whereas need-thwarting parenting increases the risk of

[1] For a visual representation of the continuum, see Deci, E. L., and Ryan, R. M., (Eds.), 2002, Handbook of self-determination research, p.16.

disengagement (De Muynck et al., 2021) and sports anxiety (Bois et al., 2009).

The importance of a comprehensive, person-centered approach

The current study builds on previous research by addressing four major shortcomings in the existing literature. First, most previous studies have used a variable-centered strategy to examine how parental (de)motivating behaviors predict outcomes separately or in interaction. However, in real life, parents combine various need-supportive and need-thwarting behaviors, resulting in specific parenting profiles. Thus, to better understand the complexity of parenting in sports, there is a strong need to identify combinations of different need-supportive and need-thwarting styles by using a person-centered strategy. This analytic technique allows us to examine whether we can identify subpopulations of parents based on how they combine different styles to varying degrees, and how such combinations affect athlete outcomes. Specifically, person-centered analysis examines how variables group within individuals, thereby relying on the assumption that the associations between variables are not necessarily the same for each individual. Although this is a powerful technique for identifying different parental profiles, only a handful of studies in youth sports have used such a person-centered approach in the SDT-literature.

Such a person-centered approach has been adopted more frequently within the configurational approach in the parenting literature (Baumrind, 1967; Maccoby & Martin, 1983; Steinberg, 2001). These studies typically identified four parenting configurations based on two underlying dimensions of control and responsiveness, namely (a) authoritarian (high control and low responsiveness), (b) authoritative (high control and high responsiveness), (c) permissive (low control and high responsiveness), and (d) neglectful (low control and low responsiveness). There are two important differences between the typical configurational approach to parenting and the current person-centered analysis based on SDT. First, whereas the configurational approach relied on only two parenting dimensions (i.e., responsiveness and control), the SDT perspective on parenting distinguishes between six dimensions of parenting. One reason for this is that SDT distinguishes between structure and control (Grolnick & Pomerantz, 2009; Soenens & Vansteenkiste, 2010), with the term control being reserved only for parenting that is pressuring and domineering in nature. Another reason why the SDT model of parenting is more differentiated is that it defines a bright and a dark side for each parenting domain. Thus, by using the six SDT-based parenting dimensions, the current study provides a more fine-grained and complete insight into the different ways in which parents support or thwart their children's needs than was the case with the configurational approach. Second, whereas the typological approach to parenting simply assumed the existence of four parenting styles, our person-centered approach allows for the empirical identification of profiles that emerge naturally from the data. In contrast to the typical configurational approach, in which parents were assigned to one of the four parenting profiles on an a priori basis (e.g., Lamborn et al., 1991), our study used a more empirically driven approach to see which profiles could be identified in the data. The advantage of our person-centered approach is that other (less commonly studied) parenting profiles may emerge in addition to the already-known parenting styles.

As for the studies being done from a SDT-perspective, the study by Lienhart et al., (2020) and the study by O'Neil and Amorose (2021) both showed that the profile of high-to-moderate autonomy-support combined with low-to-moderate control had the most adaptive outcomes (e.g., psychological needs satisfaction and autonomous motivation). Although informative, an important limitation of these studies is that they did not simultaneously consider all three need-supportive and need-thwarting parental behaviors as conceptualized within SDT, resulting in an incomplete picture of parenting profiles in the domain of sports. Indeed, most variable- and person-centered research has focused rather exclusively on the benefits of parental support (or thwarting) of the need for autonomy (e.g., Gagné, 2003; Sánchez-Miguel et al., 2013). None of the person-centered studies, and only a few variable-centered studies, examined the role of parents in youth athletes' needs for competence and relatedness in the context of sports (but see Babkes and Weiss, 1999; Jowett and Cramer, 2010; Ullrich-French and Smith, 2006). These studies have shown that when parents support their child's needs for competence (e.g., Babkes and Weiss, 1999) and relatedness (e.g., Ullrich-French and Smith, 2006), children feel more competent and enjoy their sports more, whereas when parents thwart these needs, athletes' physical self-concept is negatively affected (e.g., Jowett and Cramer, 2010). Furthermore, the studies that have measured all six styles as conceptualized within SDT often examine their relation to athletes' outcomes using a composite measure of "need-supportive" and "need-thwarting" behaviors (e.g., De Muynck et al., 2021). As a result, little is known about the unique predictive validity of each style in terms of emotional, motivational, and behavioral outcomes. By considering the six interpersonal styles as conceptualized by SDT, the current study allows for a deeper understanding of which combinations of the six differentiated types of interpersonal behaviors are important and desirable in relation to athletes' sports experiences.

Third, little is known about how the quality of parental involvement compares to its quantity. The quantity of parental involvement can be measured by the amount of time and effort parents invest in their child's participation

in sports, such as the number of practices and games they physically attend, or the extent to which they discuss their child's participation in sports before and after games. On the other hand, the quality of parental involvement (i.e., the six styles as conceptualized in SDT) reflects the ways in which parents are involved. Although involvement and relatedness support may go hand in hand, this is not the case by definition. To illustrate, parents may be involved because they want to make sure that their child performs well and meets the standards that the coach or the parents have set for the child, which is likely to result in a controlling involvement style (i.e., poor quality). As the quality of involvement in particular is considered critical from an SDT-perspective (Soenens et al., 2017), the current study uses relatedness support in conjunction with competence and autonomy support as a determining variable to identify parenting profiles, while the quantity of involvement serves as an outcome to validate the obtained profile solution.

Finally, most of the previous studies were based solely on the perceptions of the athletes. This runs the risk of athletes' motivation and well-being coloring their perceptions of parental behavior, while drawing conclusions in the opposite direction. The use of a multi-informant perspective is important because previous research has shown that athletes often perceive their parents to be more controlling than the parents themselves report, and that a high parent-child agreement regarding parental behaviors is important for creating positive experiences in youth athletes (Kanters et al., 2008).

The present research

The overall aim of this study is to identify profiles of parents who share a similar pattern of need-supportive and need-thwarting behaviors, to compare these profiles between athlete and parent perceptions, and to examine the predictive power of these different profiles in relation to several critical athlete outcomes (i.e., basic need experiences, motivation, (dis)engagement, and anxiety). Based on the theory and previous parenting literature within SDT (e.g., Lienhart et al., 2020; O'Neil & Amorose, 2021) and based on previous parenting literature using a configurational approach (Maccoby & Martin, 1983), we expect to find four profiles. We expect a profile with high levels of need support and low levels of need thwarting and a profile with the opposite pattern (i.e., high levels of need thwarting and low levels of need support). The former parent profile would resemble the authoritative typology from the configurational approach, while the latter would resemble the authoritarian or permissive typology. In addition, we expect a profile with moderate to high levels of both need-supportive and need-thwarting parenting, or with a unique combination of specifically elevated parenting dimensions. Finally, we might also expect a profile characterized by low levels of both need support and need thwarting; which would correspond to the neglectful typology (Hypothesis 1). Furthermore, we expect that the profile with relatively high scores on need-supportive behaviors would be associated with the most adaptive pattern of outcomes (i.e., need satisfaction, autonomous motivation, engagement) for both athlete and parent perceptions, whereas the need-thwarting profile would exhibit the most maladaptive outcomes (i.e., need frustration, controlled motivation, amotivation, disengagement, anxiety). We expect the other profiles to fall in between the former profiles in terms of associations with athlete outcomes (Hypothesis 2a). In doing so, we expect the clusters based on athlete perceptions to have stronger predictive power than those based on parent perceptions (Hypothesis 2b).

Method

Procedure

At the beginning of the study, athletes were asked to identify who they thought was the most involved parent in their sports participation (O'Rourke et al., 2013). They were then asked if they would be willing to complete some paper-and-pencil questionnaires with this most involved parent in mind. This most involved parent was also asked to complete a questionnaire.

As part of the practical sessions of a sports psychology course at Ghent University, second-year psychology students were asked to recruit youth athletes and their most involved parents. In a one-hour session, the psychology students were taught about the ethical aspects of research, emphasizing the voluntary nature of participation and the informed consent of the underage athletes and their parents, as well as the confidentiality of personal data. Students worked together in groups of three. Both parents and youth athletes received an information letter prepared by the researchers that emphasized the purpose of the study and confidentiality. The researchers' contact information was provided at the end of the information letter. After reading the information letter, both parents and youth athletes were required to provide written informed consent before the questionnaires were administered. Questionnaires were administered at home or at the sports club, and students remained present while the participants completed the questionnaire for four reasons. First, the students needed to monitor that the athletes completed the questionnaires separately from their parents, so that they would report as honestly as possible about their parents' behaviors. Second, they remained available to answer any questions, ambiguities, or concerns that the

participants might have. Third, they immediately placed the completed questionnaires in a sealed envelope so that the other party (parent or athlete) could not see them. Finally, students were asked to record part of the data collection using a dictaphone provided by the university, which they were required to turn in after data collection. Approval was given by the Ethics Committee of the Faculty of Psychology and Educational Sciences of Ghent University (no. 2018/61).

Sample

A total of 331 athletes (57.4% male, $M_{age} = 14.33$, $SD = 2.18$, range = 9–18 years) participated in this study. They participated in 43 different sports (mainly soccer 23.87%, tennis 17.52%, and dance 9.37%), of which 49.7% were team sports and 50.3% were individual sports. Athletes had a mean of 7.25 ($SD = 3.15$) years of experience in their sport and had been with their current coach for a mean of 3.02 ($SD = 2.37$) years. They were active at different levels of competition (i.e., 11.3% recreational, 67.7% competitive, and 21% highly competitive). Finally, 59.2% of the athletes reported their mother as the most involved parent, while 40.8% reported their father. Parents had a mean age of 45.96 years ($SD = 5.41$, range = 32–78).

Materials

Parents reported only on the sports-related quality of parental involvement (i.e., need-supportive and need-thwarting behaviors). Athletes reported on the sports-related quality (i.e., need-supportive and need-thwarting behaviors) and quantity of parental involvement, as well as on their experiences of need satisfaction and frustration, motivation, (dis) engagement, and anxiety.

Unless otherwise noted, items were to be rated on a 7-point Likert scale ranging from 1 (*Totally disagree*) to 7 (*Totally agree*). Before starting the data collection, we presented the questionnaire to a 9-year-old to see if everything was clear and if it did not contain too difficult words. The reliability of the study variables was measured in two ways. First, we calculated Cronbach's alpha. A Cronbach's alpha below 0.70 indicates that the measure should be used with caution (McMillan & Schumacher, 2001). However, because we used several short scales (≤ 6 items) for practical purposes, and because Cronbach alpha values are sensitive to the number of items in the scale (Pallant, 2011), we additionally calculated average inter-item correlations, with values between 0.15 and 0.50 indicating adequate internal consistency (Clark & Watson, 1995).

Need-supportive and need-thwarting parental behaviors

Perceptions of parental sports-related need-supportive and need-thwarting behaviors were assessed using the Interpersonal Behaviours Questionnaire (IBQ; Rocchi et al., 2017), which has been shown to be valid in the context of sports (Rocchi et al., 2017a, b). Both athletes and their most involved parent responded to questions exploring their perception of parental sports-related autonomy support (4 items; e.g., "He/she gives me the freedom to make my own choices", "I give my child the freedom to make his/her own choices"), competence support (4 items; e.g., "He/she encourages me to improve my skills", "I encourage my child to improve his/her skills"), relatedness support (3 items; e.g., "He/she is interested in what I do in the sports club", "I am interested in what my child does in the sports club"), autonomy thwarting (4 items; e.g., "He/she limits my choices regarding my sports participation", "I limit my child's choices regarding his/her sports participation"), competence thwarting (4 items; e.g., "He/she points out that I am likely to fail", "I point out to my child that he/she is likely to fail"), and relatedness thwarting (4 items; e.g., "He/she does not care about me as an athlete", "I do not care about my child as an athlete"). Regarding athletes' perceptions, Cronbach's alpha was adequate only for autonomy support (0.73), while the other Cronbach's alphas ranged from 0.55 for autonomy-thwarting to 0.69 for relatedness-supportive behaviors. However, we assumed sufficient internal consistency because the average inter-item correlations ranged from 0.24 for autonomy thwarting to 0.45 for relatedness support. For parental reports, Cronbach's alpha ranged from 0.50 for relatedness-thwarting to 0.65 for autonomy-thwarting. Again, adequate internal consistency was assumed based on the average inter-item correlations ranging from 0.19 for relatedness-thwarting to 0.44 for relatedness support.

Degree of parental involvement

Five items were developed to capture the perceived level of parental sports-related involvement (e.g., "How often does your mother/father watch the training sessions?"). The response scale ranged from 1 (*Never*) to 7 (*Always*). As this is a newly developed scale, we also conducted a confirmatory factor analysis to examine its validity. The two similar items "How often does your mother/father discuss a game with you beforehand?" and "How often does your mother/father discuss a game with you afterward?" were allowed to be correlated. The model fit the data well ($\chi^2(4) = 10$, $p < .001$; CFI = 0.97, RMSEA = 0.07, SRMR = 0.03). The Cronbach's alpha was acceptable (0.67) and the average inter-item correlation was good (0.29).

Need satisfaction and need frustration

To capture athletes' feelings of need satisfaction and need frustration during sports, we used the Basic Psychological Need Satisfaction Need Frustration Scale (Chen et al., 2015).

Specifically, we used the shortened and adapted version from Delrue and colleagues (2019). In this version, the original scale was shortened to 12 items and the items were slightly adapted to make them more amenable to the sport context. After the stem "At the sports club…", participants answered 6 items for need satisfaction, with 2 items for each of the three needs, that is, autonomy (e.g., "I feel a sense of choice and freedom in the things I do"), competence (e.g., "I feel I could successfully complete the exercises and games"), and relatedness (e.g., "I feel connected to others") satisfaction. The Cronbach's alpha for the total scale was 0.63, and the average inter-item correlation was 0.23. Similarly, there were 6 items measuring need frustration, with 2 items for each need, that is, autonomy (e.g., "I feel forced to do exercises I would not choose to do"), competence (e.g., "I feel unsure about my abilities"), and relatedness (e.g., "I feel excluded") frustration. The total score for need frustration yielded a good Cronbach's alpha (0.72) and average inter-item correlation (0.31).

Sports motivation

Sports motivation was measured using the revised version of the Behavioral Regulation in Sport Questionnaire (BRSQ-Revised2; Assor et al., 2009; Delrue et al., 2019), which is based on the BRSQ of Lonsdale and colleagues (2008). The scale consisted of three subscales. After the stem "I put effort into my sport…", participants answered 16 items for autonomous motivation (composite scale of 8 items for identified regulation, 4 items for integrated regulation, and 4 items for intrinsic motivation; e.g., "because I enjoy it"; $\alpha = 0.84$; average inter-item-correlation = 0.26) and 16 items for controlled motivation (composite scale of 8 items for introjected and 8 items for external regulation; e.g., "because I would be ashamed if I didn't"; $\alpha = 0.88$; average inter-item-correlation = 0.33). Finally, amotivation was measured with 4 items (e.g., "but I actually wonder why"; $\alpha = 0.74$; average inter-item-correlation = 0.43).

Engagement

The cognitive engagement subscale was based on the Metacognitive Strategies Questionnaire of Wolters (2004). The behavioral and emotional engagement subscales were both based on the Engagement Versus Disaffection with Learning measure of Skinner and colleagues (2009). Both scales were already successfully translated to the sports context and used among athletes by Reynders and colleagues (2019) and De Muynck and colleagues (2021). After the stem "At the sports club…", participants rated 12 items that tap into cognitive (4 items; e.g., "I try to find a link between what I learn and my own experiences"), behavioral (4 items; e.g., "I listen very attentively to others"), and emotional (4 items; e.g., "I am interested") engagement. The total set of 12 items yielded a good Cronbach's alpha (0.83) and average inter-item correlation (0.30).

Disengagement

Items from the Engagement Versus Disaffection with Learning measure (Skinner et al., 2009) were used to measure athletes' levels of disengagement, as already successfully used among athletes by De Muynck and colleagues (2021). After the stem "At the sports club…", participants rated 7 items that measured their behavioral (3 items; e.g., "I don't really do my best") and emotional (4 items; e.g., "I am bored") disengagement. The total set of 7 items yielded a good Cronbach's alpha (0.74) and average inter-item correlation (0.33).

Anxiety

Anxiety was measured with items based on the Competitive State Anxiety Inventory–2 (Martens et al., 1990). After the stem "At the sports club…", participants answered a total of 10 items regarding cognitive anxiety (5 items; e.g., "I am concerned that I will not play at my best") and somatic anxiety (5 items; e.g., "My stomach hurts"). The final set of 10 items yielded a good Cronbach's alpha (0.87) and average inter-item correlation (0.41).

Plan of analysis

All analyses were performed using R in Rstudio (R Core Team, 2020).

Preliminary analyses

Associations between continuous demographic variables (i.e., age, years of sports experience, and years with current coach) and all study variables were examined using bivariate Pearson correlation analyses. For categorical demographic variables, a multivariate analysis of variance (MANOVA) was conducted to examine differences in study variables by gender (2 levels; female versus male), sport type (2 levels; individual versus team), competition level (3 levels; recreational, competitive, or highly competitive), and most involved parent (2 levels; mother versus father). We followed up on the significant multivariate effects by performing univariate tests of between-subjects effects and multi-comparison Tukey post hoc tests. We also reported effect sizes using partial eta-squared (η_p^2). Finally, we conducted paired t-tests to examine whether the ratings of the six sports-related parental behaviors differed significantly between athlete and parent reports.

Primary analyses

For our first objective, which was to identify parental profiles, we used a two-step procedure to perform a hierarchical K-means cluster analysis on both athlete and parent reports (HKMA; Gore, 2000). Prior to conducting the cluster analysis, we tested the null hypothesis that missing values were not related to any observed or unobserved variables in the data using Little's MCAR test. Next, because K-means clustering cannot handle missing data, we performed multivariate mean imputation based on the Fully Conditional Specification, where each incomplete variable was imputed by a separate model (Van Buuren & Groothuis-Oudshoorn, 2011). Next, we screened for outliers by using a Q–Q plot to plot the Mahalanobis distances against the expected values of a $\chi 2$ distribution. Cases were identified as outliers if their Mahalanobis distance was notably greater than the $\chi 2$ quantile value. Because outliers can bias the solution obtained from cluster analysis, all cases identified as outliers were deleted from the sample (Hautamäki et al., 2005). A final step before conducting the cluster analyses was to standardize the six parental need-supportive and need-thwarting behaviors.

The first step in the clustering procedure uses hierarchical cluster analysis to provide the optimal and least biased starting points for the K-means clustering algorithm (Arai & Barakbah, 2007). Based on the squared Euclidean distances, a comparison was made between the agglomerative coefficients for different linkage methods of hierarchical cluster analysis. Next, the Hartigan and Wong algorithm was used for K-mean cluster analysis (Hartigan, 1979). The clustering procedure was explored for a range of 2 to 10 clusters. To avoid "cluster hacking", where the optimal number of clusters is determined based on subjective criteria, we used the NbClust function in R from the NbClust package, which provides 30 indices for determining the number of clusters (Charrad et al., 2014). Based on the majority rule, it proposes the best clustering scheme from the different results obtained by varying all combinations of the number of clusters, distance measures, and clustering methods. In addition, we examined the ratio of between-cluster and within-cluster variance (Cui, 2020) and calculated the R^2 (i.e., the proportion of the variation in parental behavior that can be predicted by the cluster solution) to identify the best cluster solution.

After selecting the final cluster solution, we assessed the stability of these clusters by using a "double split cross-validation" technique. First, we split the data into two random subsamples in which we performed the hierarchical K-means procedure. This time, however, the centroids of the other subsample are used as the initial values of the K-means clustering step. Second, we checked the stability by calculating Cohen's kappa-index for the correspondence between the subsample-clustering results and the clustering results coming from the original clustering. Agreement is considered acceptable when $k > 0.60$ (Asendorpf et al., 2001).

Next, for both athlete and parent reports, we examined the retrieved clusters to determine (a) how much of the variance in the parental behaviors could be explained by the retrieved cluster solution and (b) for which parental behaviors the clusters were significantly different from each other by conducting a MANCOVA with the cluster solution as the independent variable, the parental (de)motivating behaviors as the dependent variables, and all demographic variables as covariates. When significant, we performed follow-up univariate analyses and post hoc comparisons using the Tukey HSD test. As an additional validation measure, we examined how the clusters (i.e., quality) differed in their level of involvement (i.e., quantity). Therefore, for both athlete and parent reports, we conducted an ANCOVA with the cluster solution as the independent variable, the perceived level of parental involvement as the dependent variable, and the demographic characteristics as covariates. Finally, we used χ^2 analyses to examine the degree of agreement between the two informants regarding the assignment to a particular cluster.

To test Hypothesis 2, regarding the predictive value of the clusters with respect to the athletes' (mal)adaptive outcomes, we conducted a MANCOVA with the athlete- and parent-based cluster solutions included as predictors, along with the demographics which were included as covariates.

Results

Preliminary analyses

The bivariate Pearson correlations (see Table 1, placed in bold) showed that athletes' and parents' perceptions of the corresponding sports-related parental behaviors were significantly positively correlated with each other, except for autonomy support. However, the results of the paired samples t-tests showed that parents rated themselves as more motivating and less demotivating compared to the perceptions of their children. These differences were significant ($p < .001$) for all parental behaviors except competence thwarting ($p = .979$).

Focusing on the athlete perspective, Pearson correlations revealed that all experienced sports-related need-supportive styles were consistently positively correlated with all adaptive athlete outcomes, whereas all experienced sports-related need-thwarting styles were consistently positively correlated with all maladaptive athlete outcomes. However, when we look at the associations with parent-reported behaviors, it is notable that only a few sports-related need-supportive behaviors are positively associated with adaptive athlete outcomes,

Table 1 Means, standard deviations, and correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
M	14.33	7.25	3.01	45.96	5.90	5.40	5.49	2.87	1.82	1.98	6.10	5.69	6.01	2.43	1.81	1.59	4.43	5.28	5.64	5.75	2.36	3.21	1.85	1.75	2.77
SD	2.18	3.15	2.37	5.41	0.86	0.97	1.09	1.04	0.83	0.87	0.66	0.78	0.90	1.02	0.84	0.66	1.21	0.85	0.71	5.75	0.96	1.02	0.96	2.77	1.17
Demographic variables (A)																									
1. Age																									
2. YE	.48**																								
3. YCC	−.02	.18**																							
Demographic variables (P)																									
4. Age	.33**	.11	−.08																						
Clustering dimensions (A)																									
5. AS	−.03	−.00	.01	−.02																					
6. CS	−.22**	−.01	.04	−.10	.38**																				
7. RS	−.22**	.04	.04	−.07	.40**	.56**																			
8. AT	−.15**	−.02	−.03	−.11*	−.25**	.11	.08																		
9. CT	.07	.03	−.10	.03	−.29**	−.23**	−.19**	.37**																	
10. RT	.09	.00	−.06	.05	−.42**	−.37**	−.41**	.28**	.52**																
Clustering dimensions (P)																									
11. AS	.13*	−.00	.02	.04	**.06**	.05	.04	−.04	−.05	−.05															
12 CS	−.03	.00	.07	.00	.09	**.24****	.23**	.04	−0.15**	−.13*	.18**														
13. RS	−.03	.09	.07	.02	.11	.24**	**.39****	.11	−.01	−.20**	.26**	.44**													
14. AT	−.09	−.08	.04	−.09	−.08	.07	.02	**.18****	.07	.03	−.28**	.06	.04												
15. CT	−.03	−.09	−.02	.01	−.09	−.05	−.12*	.06	**.23****	.11	−.16**	−.14*	−.20**	.33**											
16. RT	.03	−.08	−.03	.11*	−.13*	−.19**	−.29**	.00	.14*	**.19****	−.17**	−.40**	−.48**	.12*	.40**										
Validation measure (A)																									
17. PI	−.10	.13*	.06	.03	.16**	.51**	.53**	.17**	.00	−.25**	.07	.25**	.41**	.02	−.06	−.22**									
Adaptive outcomes (A)																									
18. NS	−.10	.08	.09	−.04	.33**	.28**	.20**	−.14*	−.25**	−.24**	.05	.08	.04	−.02	−.05	−.10	.06								
19. AM	−.01	.14*	.05	.01	.28**	.33**	.30**	.04	−.12*	−.07	.12*	.21**	.11	−.04	−.10	−.10	.27**	.31**							
20. ENG	−.18**	−.02	.00	−.04	.35**	.33**	.37**	−.11*	−.18**	−.23**	.13*	.13*	.13*	−.07	−.10	−.11*	.27**	.46**	.48**						
Maladaptive outcomes (A)																									
21. NF	.12*	.07	−.07	.02	−.23**	−.20**	−.19**	.22**	.35**	.39**	−.07	−.13*	−.10	−.03	.09	.11	−.04	−.46**	−.07	−.33**					
22. CM	.03	.12*	.01	−.05	−.07	.04	.07	.32**	.25**	.21**	.02	−.01	.08	−.02	−.04	.00	.14*	−.08	.37**	−.05	.37**				
23. AMOT	.05	.10	.04	−.01	−.11*	−.13*	−.08	.24**	.27**	.15**	−.02	−.06	−.03	.02	.01	.01	−.04	−.21**	−.24**	−.39**	.41**	.33**			
24. DIS-ENG	.01	.02	−.02	.01	−.26**	−.22**	−.19**	.34**	.37**	.36**	−.16**	−.15*	−.08	.10	.11	.10	−.12*	−.36**	−.33**	−.53**	.56**	.20**	.49**		
25. ANX	.16**	.10	−.10	.03	−.17**	−.16**	−.14*	.20**	.30**	.25**	−.09	−.15**	−.03	−.02	.08	.12*	.03	−.30**	.03	−.23**	.70**	.41**	.29**	.40**	

Bolded numbers indicate correlations between athlete and parent perceptions

M mean, *SD* standard deviation, *A* reported by athletes, *P* reported by parents, *YE* years of experience, *YCC* years of current coach, *AS* autonomy support, *CS* competencesupport, *RS* relatedness support, *AT* autonomy thwarting, *CT* competence thwarting, *RT* relatedness thwarting, *PI* parental involvement, *NS* need satisfaction, *AM* autonomous motivation, *ENG* engagement, *NF* need frustration, *CM* controlled motivation, *AMOT* Amotivation, *DISENG* disengagement, *ANX* anxiety

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

and almost none of the sports-related need-thwarting behaviors are associated with maladaptive athlete outcomes.

Regarding the continuous demographic variables, older athletes perceived less competence and relatedness support, and less autonomy-thwarting parental sports-related behaviors. In addition, older athletes experienced more need frustration and anxiety, and less engagement. As experience increased, athletes reported a higher levels of parental involvement and both more autonomous and controlled motivation. Finally, the older the parent, the less autonomy-thwarting behaviors the athletes experienced and the more relatedness-thwarting the parents themselves reported when it comes to their child's sports participation.

The MANOVA, examining the effects of the categorical demographic variables on the study variables revealed significant multivariate effects for level of competition (Wilks' $\lambda = 0.72$; $F(2, 384) = 1.60$, $p < .05$; $\eta_p^2 = 0.15$) and most involved parent (Wilks' $\lambda = 0.84$; $F(1, 191) = 1.73$, $p < .05$; $\eta_p^2 = 0.16$). Gender (Wilks' $\lambda = 0.88$; $F(1,191) = 1.21$, $p = .249$; $\eta_p^2 = 0.12$) and type of sport (Wilks' $\lambda = 0.85$ $F(1, 191) = 1.57$, $p = .061$; $\eta_p^2 = 0.15$) did not have a multivariate effect. Follow-up test results are presented in Appendix A (Tables A1-2). Overall, recreational (as opposed to [highly] competitive) athletes reported fewer adaptive and more maladaptive experiences. Regarding the most involved parent in sports, fathers were perceived by their children as more competence-supportive and involved, whereas mothers were perceived by their children as more autonomy-supportive and less autonomy and competence thwarting.

Primary analyses

Little's test indicated that the missing data for the six sports-related parental behaviors as reported by both athletes and parents (considered together with all demographic data) can be assumed to be missing completely at random (MCAR; $\chi^2(608) = 635$, $p = .220$). Missing values were imputed using multivariate mean imputation. Next, two cases that were identified as outliers based on the inspection of the Mahalanobis distance values were deleted. Finally, we standardized all parental sports-related behaviors.

In the first step of the clustering procedure, a comparison of the agglomerative coefficients for the different linkage methods revealed that Ward's minimum variance method indicated the strongest clustering structure for both athletes (average = 0.86, single = 0.76, complete = 0.89, Ward = 0.96) and parent reports (average = 0.84, single = 0.69, complete = 0.89, Ward = 0.96).

For athlete reporting, the majority rule suggested a two-cluster solution (supported by 7 out of 30 indices) or a four-cluster solution (supported by 6 out of 30 indices). However, the ratio of within-cluster to between-cluster variance was more balanced for the four-cluster solution than for the two-cluster solution (Appendix B, Figure B1), and the four-cluster solution captured 45% of the total variance (versus 28% for the two-cluster solution). For parental reports, the majority rule suggested a two-, three- (both supported by 7 out of 30 indices), or four-cluster solution (supported by 5 out of 30 indices). Again, the ratio of within-cluster variance to between-cluster variance was better balanced for the four-cluster solution than for the two- or three-cluster solutions (Appendix B, Figure B2). In addition, the two-cluster solution captured 23%, the three-cluster solution captured 31%, and the four-cluster solution captured 40% of the total variance. Finally, a visual inspection of the clusters revealed that there was minimal overlap between the four clusters for both athlete (Appendix C, Figure C1) and parent report (Appendix C, Figure C2) in explaining the two largest principal components. Therefore, we retained the four-cluster solution as the best solution for both athlete and parent reports.

This choice was supported by the results of the cluster stability analysis, as the two random subsamples showed significant ($p < .001$) agreement for both athlete (Cohen's Kappa-values of 0.79 and 0.70) and parent reports (Cohen's Kappa-values of 0.57 and 0.79).

Figure 1 visualizes the four-cluster solutions for athletes (Fig. 1A) and parents (Fig. 1B). The cluster solution for both informants was similar, in that the same four types of groups could be distinguished. For both informants, the largest profile was labeled as "need-supportive" because these parents were rated relatively high on need-supportive sports-related behaviors and relatively low on need-thwarting sports-related behaviors. In contrast, the smallest group of parents was labeled as the "need-thwarting" profile, because this group was characterized by relatively high scores on need-thwarting sports-related behaviors and relatively low scores on need-supportive sports-related behaviors compared to the other profiles. The third profile in both the athlete and parent-cluster solutions was labeled as "predominantly controlling" because the scores on autonomy-thwarting sports-related behaviors were the most salient and more elevated compared to the other behaviors and profiles. Finally, a fourth profile was labeled as "distant" because this group of parents had relatively lower scores on all need-supportive and need-thwarting sports-related behaviors. It should be noted that the labels of the different clusters are based on the relative z-scores rather than absolute scores, since the inherent goal of cluster analysis is to contrast different groups. However, in an absolute sense, even the "need-thwarting" profile engaged in more need-supportive behaviors than need-thwarting behaviors (see Table 2).

Results of the MANCOVA showed a multivariate effect for both the athlete (Wilks' $\lambda = 0.11$; $F(3,720) = 35.67$, $p < .001$) and parent (Wilks' $\lambda = 0.10$; $F(3,738) = 37.26$, $p < .001$) cluster solutions, and a significant univariate effect for each of the six parental sports-related behaviors. The

variance in each of the six sports-related parenting styles that could be explained by the obtained cluster solution ranged from 33% for autonomy-supportive behaviors to 55% for relatedness-supportive behaviors among athletes, and from 22% for autonomy-supportive behaviors to 51% for competence-thwarting behaviors among parents (Table 2).

To provide evidence for the validity of the obtained profiles, we conducted two ANCOVAs to examine how the clusters differed in their level of parental involvement in sports. The results showed a significant difference in parental involvement across clusters, with the need-thwarting ($M_{athletes} = 3.87$, $M_{parents} = 3.78$) and distant profiles ($M_{athletes} = 3.74$, $M_{parents} = 3.90$) reported significantly lower scores than the need-supportive ($M_{athletes} = 4.99$, $M_{parents} = 4.74$) and predominantly controlling profiles ($M_{athletes} = 5.01$, $M_{parents} = 4.77$) ($F_{athletes} = 33.14$, $p < .001$, $\eta_p^2 = 0.28$; $F_{parents} = 14.67$, $p < .001$, $\eta_p^2 = 0.15$). [2]

The χ^2 analyses showed the degree of agreement between the two informants regarding the assignment to a particular type of cluster ($\chi^2(9) = 28.75$, $p < .001$; see Appendix E, Figure E1). Although a significant association between both informants emerged, it should be noted that cluster convergence between parents and their children occurred in less than half of the dyads. There was some variation noticeable across clusters. For example, 43% of parents who were perceived by their athletes to be predominantly controlling also fell in that cluster in the parent cluster solution. In contrast, in the case of need-thwarting cluster, only 24% of parents perceived to belong to this cluster according to their children fell in this group. In contrast, up to 32% of parents in this need-thwarting group rated themselves as need-supportive (32%).[3]

Finally, the results of the MANCOVA indicated that the cluster solution based on parental report did not predict any significance variance in the athlete outcomes (Wilks' $\lambda = 0.92$; $F(3,548) = 0.71$, $p = .843$). However, there were significant differences in athlete outcomes according to the different clusters based on athlete reports (Wilks' $\lambda = 0.65$; $F(3,548) = 3.68$, $p < .001$). Tests of between-subjects effects revealed significant differences between the four clusters on all athlete outcomes (Table 3). Overall, the need-supportive profile was the most preferred, as athletes in this profile had the highest scores on adaptive athlete outcomes and the lowest scores on maladaptive athlete outcomes. The need-thwarting profile showed the opposite (i.e., least preferable) pattern, with the lowest scores on adaptive athlete outcomes and the highest scores on maladaptive athlete outcomes. The other two profiles fell in between. First, the predominantly controlling profile did not differ significantly from the need-supportive profile in terms of adaptive outcomes. On the other hand, the predominantly controlling profile scored higher than the need-supportive profile on all maladaptive outcomes and as high as the need-thwarting profile on controlled motivation, amotivation, and anxiety. Second, the distant profile also appeared to be a mixed blessing: athletes in this profile scored as low as athletes in the need-supportive profile on controlled motivation, amotivation, and anxiety. On the other hand, they scored as low on all adaptive outcomes as athletes with parents in the need-thwarting cluster.

Discussion

The purpose of this study was twofold. First, wanted to identify parenting profiles in the context of sports using a person-centered approach. We hereby included all six dimensions of sports-related need-supportive and need-thwarting parenting behaviors as defined in SDT, as reported by both athletes and their most involved parent. Second, we examined how the clusters were differentially related to levels of experienced parental involvement in sports and to adaptive and maladaptive athlete outcomes.

We identified four parental profiles characterized by varying levels of sports-related need-supportive and need-thwarting behaviors. These profiles were pretty stable as they were obtained across informants (i.e., parents and athletes) and through an internal cross-validation procedure. The need-supportive profile consisted of athletes and parents who reported that the parent engaged in relatively high need-supportive and relatively low need-thwarting sports-related behaviors, whereas the need-thwarting profile was characterized by the opposite pattern. As expected, athletes who perceived their most involved parent to be in the need-supportive group reported the most adaptive and the least maladaptive pattern of outcomes compared to the need-thwarting profile. These findings are consistent with what would be expected based on theory (Ryan & Deci, 2017) and previous variable- (e.g.,Sánchez-Miguel et al., 2013) and person-centered (e.g.,O'Neil & Amorose, 2021)

[2] In a subset of 103 athletes, we asked to what extend the athletes were satisfied with the quantity of experienced parental involvement in their sports. Results showed that the need-supportive group was significantly more satisfied with the degree of parental involvement when compared to the distant and need-thwarting groups. Athletes with parents in the need-thwarting group reported that they perceived their parents as significantly too much involved compared to the need-supportive and predominantly controlling group. Because this measure of satisfaction was only included in a subsample, the full results are presented in an Appendix D.

[3] In an exploratory manner, we used χ^2 analyses (for categorical variables; i.e., gender, type of sport, level of competition, and most involved parent) and MANOVAs (for continuous variables; i.e., age of athletes and parents, years of sports experience, years under their current coach) to examine whether there were differences between the profiles in terms of the demographics. Results are presented in an Appendix F.

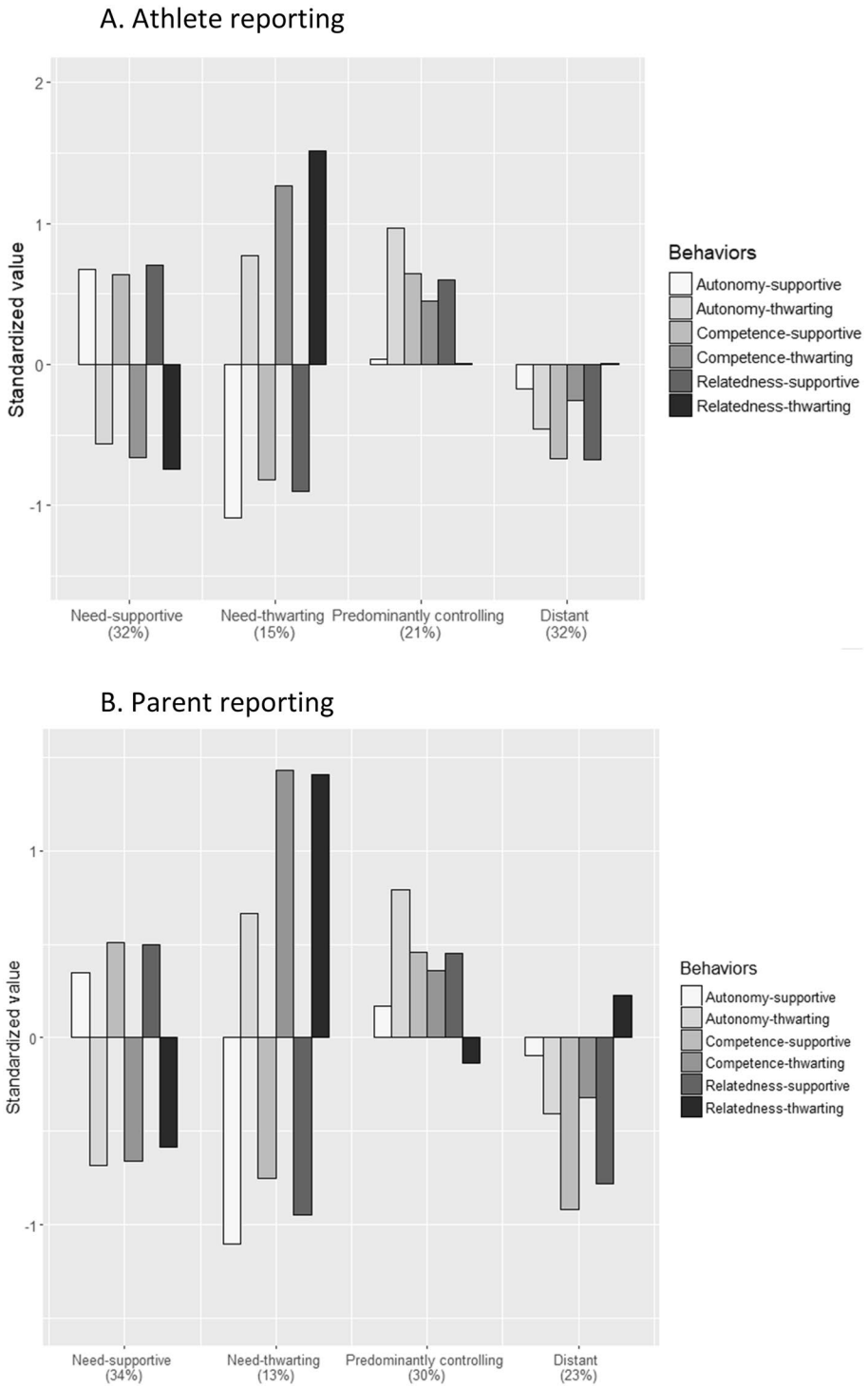

Fig. 1 Four-cluster solution based on z-scores for parental need-supportive and need-thwarting behaviors. **A** Athlete reporting, **B** Parent reporting

studies within the Self-Determination Theory-literature, which have repeatedly shown that need-supportive behaviors promote athlete motivation and well-being, while need-thwarting behaviors undermine it.

In addition to these two more "extreme" profiles, we identified two intermediate profiles that were both characterized by a mixed pattern of outcomes: the predominantly controlling and the distant profiles. First, parents who were classified by their children or by themselves as belonging

Table 2 Results of the univariate analyses of covariance with the parental behaviors as dependent variables

A. Athlete reports						
Variables	Need-supportive (32%)	Need-thwarting (15%)	Predominantly controlling (21%)	Distant (32%)	*F*	η_p^2
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*		
Autonomy support	6.45_c (0.48)	5.06_a (0.83)	5.99_b (0.66)	5.70_b (0.75)	42.61^{***}	0.33
Competence support	5.98_b (0.62)	4.59_a (0.95)	6.07_b (0.64)	4.74_a (0.70)	83.49^{***}	0.49
Relatedness support	6.23_b (0.57)	4.41_a (1.05)	6.17_b (0.64)	4.71_a (0.80)	104.83^{***}	0.55
Autonomy thwarting	2.31_a (0.71)	3.58_b (0.92)	3.89_b (0.86)	2.39_a (0.67)	75.14^{***}	0.47
Competence thwarting	1.31_a (0.38)	2.84_d (0.93)	2.16_c (0.71)	1.56_b (0.56)	69.06^{***}	0.44
Relatedness thwarting	1.34_a (0.42)	3.19_c (0.73)	1.93_b (0.66)	1.97_b (0.58)	90.29^{***}	0.52
B. Parent reports						
Variables	Need-supportive (34%)	Need-thwarting (13%)	Predominantly controlling (30%)	Distant (23%)	*F*	η_p^2
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*		
Autonomy support	6.31_b (0.51)	5.37_a (0.82)	6.18_b (0.56)	6.12_b (0.55)	25.12^{***}	0.22
Competence support	6.12_b (0.48)	5.04_a (0.71)	6.03_b (0.49)	5.02_a (0.71)	69.26^{***}	0.44
Relatedness support	6.44_b (0.56)	5.13_a (1.10)	6.39_b (0.53)	5.35_a (0.83)	55.36^{***}	0.39
Autonomy thwarting	1.69_a (0.55)	3.14_b (0.91)	3.18_b (0.85)	1.94_a (0.70)	78.30^{***}	0.47
Competence thwarting	1.25_a (0.36)	3.02_d (0.70)	2.05_c (0.79)	1.53_b (0.52)	89.93^{***}	0.51
Relatedness thwarting	1.18_a (0.31)	2.50_c (0.82)	1.47_b (0.46)	1.75_b (0.51)	67.21^{***}	0.44

A distinct subscript means that groups significantly differ from each other

$^*p < .05$, $^{**}p < .01$, $^{***}p < .001$

Table 3 Results of the univariate analyses of covariance with the athlete outcomes as dependent variables and the athlete-based cluster solution as a predictor

Variables	Need-supportive (32%)	Need-thwarting (15%)	Predominantly controlling (21%)	Distant (32%)	*F*	η_p^2
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*		
Adaptive outcomes						
Need satisfaction	5.67_c (0.84)	4.79_a (0.77)	5.40_{bc} (0.82)	5.12_{ab} (0.76)	12.97^{***}	0.13
Autonomous motivation	5.91_b (0.62)	5.49_a (0.67)	5.84_b (0.70)	5.38_a (0.66)	11.76^{***}	0.12
Engagement	6.08_b (0.58)	5.35_a (0.61)	5.93_b (0.68)	5.49_a (0.59)	21.04^{***}	0.20
Maladaptive outcomes						
Need frustration	1.99_a (0.75)	2.92_c (1.05)	2.40_b (0.95)	2.36_b (0.91)	9.85^{***}	0.10
Controlled motivation	3.07_a (0.94)	3.46_{ab} (0.90)	3.73_b (0.97)	3.01_a (0.97)	8.45^{***}	0.09
Amotivation	1.55_a (0.73)	2.11_b (1.18)	2.01_b (1.11)	1.89_{ab} (0.88)	4.52^{**}	0.05
Disengagement	1.44_a (0.52)	2.16_c (0.97)	1.77_b (0.60)	1.74_b (0.58)	11.48^{***}	0.12
Anxiety	2.41_a (1.05)	3.11_b (1.17)	3.03_b (1.15)	2.83_{ab} (1.19)	5.05^{**}	0.06

A distinct subscript means that groups significantly differ from each other

$^*p < .05$, $^{**}p < .01$, $^{***}p < .001$

to the "predominantly controlling" profile scored remarkably high on sports-related autonomy-thwarting behaviors. They also scored relatively high on sports-related competence thwarting, but also on sports-related competence

and relatedness support. These parents are perceived to be as involved in sports as those in the need-supportive profile, but their children showed significantly higher levels of need frustration, controlled motivation, amotivation, disengagement, and anxiety. Previous research has also shown that a pitfall for highly involved parents is that they put pressure on youth athletes (Hellstedt, 1990), which in turn leads to feelings of amotivation (Sánchez-Miguel et al., 2013), disengagement (Fraser-Thomas et al., 2008), and anxiety (Bois et al., 2009; Dasinger, 2014). By being closely involved in their children's sports participation, these parents appear to be both supportive and quite controlling. It is possible that these parents have high (perhaps even perfectionist) standards for their children's achievements, displaying warmth and competence support as long as the standards are met, but becoming quite critical and demanding when the child encounters obstacles or failure. Such a demanding and conditionally approving style may explain the mixed results associated with this profile. This profile was indeed associated with high scores on all adaptive outcomes (i.e., need satisfaction, autonomous motivation, and engagement), but it was also associated with high scores on all maladaptive athlete sports experiences (i.e., need frustration, controlled motivation, amotivation, disengagement, and anxiety).

Finally, parents who were classified by their child or themselves in the "distant" profile scored rather low on all types of sports-related need-supportive and need-thwarting behaviors. Thus, parents in this profile exhibited an overall lack of involvement, perhaps due to a lack of interest in their child's sports participation or disappointment with past performance, after which parents withdrew their involvement. In fact, parents in the distant profile exhibited the same level of involvement in sports as those in the need-thwarting profile, but the children of parents in the need-thwarting profile experienced significantly more need frustration and disengagement. As such, the distant profile was also a mixed blessing. The positive side of parents being perceived as distant was that athletes reported little controlled motivation, amotivation, and anxiety (similar to athletes in the need-supportive group). However, athletes also reported relatively low need satisfaction, autonomous motivation, and engagement (similar to athletes in the need-thwarting group).

Theoretical implications

This study has several important theoretical implications. First, the identification of the "predominantly controlling" profile suggests that a parental profile characterized by the combination of relatively high levels of experienced sports-related need-supportive and need-thwarting behaviors appears to function as a double-edged sword, with athletes experiencing both the benefits of the need-supportive behaviors and the disadvantages of the need-thwarting behaviors. These findings further suggest that the presence of experienced sports-related need-supportive behaviors may not fully buffer against the negative consequences of an experienced sports-related need-thwarting style. Furthermore, based on the distant profile, the absence of sports-related need-thwarting behaviors is not sufficient to establish positive athlete experiences or to allow athletes to flourish and realize their potential (Ryan & Deci, 2017; Vansteenkiste & Ryan, 2013). To contribute to positive athlete experiences and personal growth, athletes also need to experience more sports-related need-supportive behaviors.

Second, although previous research on parenting profiles in the context of sports has typically not disentangled the quality and quantity of parental involvement (e.g., Lienhart et al., 2020), we also evaluated the profiles obtained in terms of the quantity of perceived parental involvement. The two observations that (1) a high level of perceived involvement in sports is not necessarily better when the style is of poor quality (predominantly controlling versus need-supportive cluster) and (2) a low level of perceived involvement in sports is particularly detrimental when its quality falls short of youth athletes' basic psychological needs (need-thwarting versus distant profile) suggest that, consistent with SDT, the quality of parental involvement is more important than its quantity (Ryan & Deci, 2017). And yet, the level of perceived involvement in sports is not entirely unimportant, as children who perceived their parents as highly involved (i.e., need-supportive or predominantly controlling profiles) outperformed children who perceived their parents as low involved (i.e., need-thwarting or distant profiles) on need satisfaction, autonomous motivation, and engagement.

Finally, this study is unique in that it uses a person-centered approach to compare athletes' perceptions of parental behavior with parent's self-reported behavior. Although the results of the current study indicated that these perceptions were correlated, we found that parents systematically rated themselves as more motivating and less demotivating than how they were perceived by their children (Kanters et al., 2008). Furthermore, parents' self-ratings had little to no predictive power with respect to the child's sports experience. This means that it is primarily the athletes' perception of how motivating or demotivating their most involved parent is that determines how they experience their sport, rather than the degree to which the parents themselves believe they are motivating or demotivating.

Practical implications

The clusters identified in the current study may help to identify parents who are most in need of training. These clusters have high ecological validity because, rather than

describing a parent based on a single dimension, they provide a more holistic description of parents' overall functioning. Specifically, sports clubs' board members, coaches, or practitioners (e.g., sports psychologists) may more easily recognize these parenting profiles, allowing them to more effectively identify parents at risk for suboptimal involvement in their child's sports participation. Consequently, they may be able to encourage parents to adopt more desirable (need-supportive) behaviors. In addition to guiding parents toward a more motivating approach, it is also important to help them reduce their reliance on demotivating behaviors. Although some previous parenting (e.g., Dorsch et al., 2017; Richards and Winter, 2013) interventions in the sports context have already been developed to train parents to adopt a more motivating style of interaction, it may be additionally instructive to focus on the reduction of need-thwarting behaviors (e.g., Richards and Winter, 2013). This choice is justified in light of the observation that parents' need-thwarting behaviors, in particular, predict maladaptive sport outcomes when compared to the role of coaches (De Muynck et al., 2021), and the fact that the need-thwarting profile identified in the current study was characterized by the least adaptive and most maladaptive functioning. Furthermore, this study shows that it is better for parents to be slightly less involved in their child's sports participation than to be more involved in a need-thwarting way when it comes to athletes' maladaptive sports experiences. This implies that if it is too big a step for parents to replace their need-thwarting behaviors with need-supportive behaviors, a desirable intermediate step may be to first allow them some distance from their child's sports participation.

However, one challenge that makes it difficult to put the above recommendation into practice is that the results of the current study suggest that parents rate themselves as more motivating and less demotivating than how they are perceived to be by their children. As a result, parents may be less willing and ready to acquire need-supportive parenting behaviors because they believe they are already using a motivational style. Yet, by juxtaposing parents' own reports with their child's reports and informing them that their ratings have little predictive validity for their child's sports experiences, they become more receptive to such training. Indeed, by increasing parents' awareness of how they appear to their children, this may reduce resistance to change and serve as a springboard for greater commitment to a (parental) coaching or intervention.

Limitations and directions for future research

The first limitation relates to the cross-sectional design of this study. Because one-time direct experimental manipulations of parenting behaviors would not be feasible, credible, or—especially in the case of need-thwarting behaviors—ethical (but for indirect approaches to inducing parenting behaviors, see Grolnick et al., 2002; Wuyts et al., 2017), a longitudinal design is recommended. Such a design (Lienhart et al., 2020) would provide a more rigorous test of the proposed associations between cluster membership and outcomes. Because any observed longitudinal associations may also be driven by third variables (e.g., personality traits), it is critical to control for such covariates.

A second limitation of the current study relates to the scale used. The Cronbach's alpha coefficients for some scales, especially those measuring parenting behaviors and need satisfaction, were rather low. However, it is important to note that Cronbach's alpha coefficients are known to be sensitive to the number of items in a scale (Pallant, 2011), and the scales used in this study contained less than six items. Despite the rather low alpha coefficients, the inter-item correlation for the scales was good. However, further research with longer scales may be warranted to confirm the reliability of the measures used.

Further, we should note that the measure of autonomy support and competence support did not include the full range of behaviors characteristic of these concepts. Autonomy-support was limited to offering choices and did not include autonomy-supportive behaviors such as supporting athletes' personal interests, acknowledging their negative affect and resistance, and offering a meaningful rationale (Mageau & Vallerand, 2003). Similarly, competence support was limited to believing in and supporting athletes' abilities, but did not include behaviors such as clarifying expectations and rules (Curran et al., 2013). Future research would do well to use a measure that captures the full spectrum of each dimension (see Delrue et al., 2019 for an example).

Fourth, because athletes only reported on their most involved parent in sports, the extent to which the present findings generalize to both parents is questionable. If one parent is significantly less involved, the effects may be more limited. However, it is also possible that both parents are relatively involved, with each exerting unique effects. Thus, it would be instructive to examine the behavior of both parents to see if they can play complementary, buffering, or synergistic roles in promoting children's motivation and engagement.

Fifth, it would be useful to include an objective measure of sports-related parental behavior in future research. The results of this study showed a discrepancy between athlete and parent perceptions, with parents rating themselves as more motivating and less demotivating. Alternatively, a trained observer may provide complimentary information to the parent and child reports. The fact remains, however, that athletes' perceptions in particular seem to be critical to their sports experiences, regardless of whether their perceptions are consistent with reality.

Finally, this study does not shed light on possible explanatory mechanisms. Therefore, follow-up research would do well to consider variables that could explain why sports-related parental behavior, as perceived by athletes, leads to certain sports outcomes. For example, previous research based on the Self-Determination Theory has shown that self-talk is a significant mediator between feedback received and athletes' sports experiences (e.g., De Muynck et al., 2017), and that the situation at hand attenuates the effects of a controlling approach on athletes' emotional and behavioral sports outcomes (Delrue et al., 2019).

Conclusion

Four parenting profiles were identified in this study: parents who are relatively need-supportive, need-thwarting, predominantly controlling, and distant when it comes to their child's sports participation. Results indicated that when athletes perceived their parents as mainly need-supportive, they reported the most adaptive athletic outcomes, while the opposite was true for the need-thwarting profile. The predominantly controlling and distant profiles were mixed blessings. Contrary to what parents may think, sports-related need-thwarting behaviors can be harmful to their children, even when combined with sports-related need-supportive behaviors. Furthermore, this study shows that it is not necessarily better to be more involved in the youth athlete's sports participation, as athletes report more maladaptive sports experiences when that involvement is controlling or pressuring in nature.

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Data availability All de-identified data and analysis code are available at Zenodo: https://doi.org/10.5281/zenodo.6460053.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Ethical approval This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of the Faculty of Psychology and Educational Sciences of Ghent University (no. 2018/61).

Informed consent Informed consent was obtained from all individual participants included in the study and their parents.

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