



The role of gender and coaching styles in adolescent student-athletes' motivational orientations in sport and school

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Abstract

Research indicates that the dominant discourses of gender are ingrained in dual career (DC) practices critically influencing athletes' motivation to construct a DC pathway. While it is important to ensure that all athletes have an equal access to construct a DC pathway despite their gender, there is a gap in the literature examining the role that coaches play in gendering of athletes' DC pathways. The present study longitudinally examined the gender differences in student-athletes' motivational orientations in sport and academics throughout high school and the role of coaching style in these orientations. The gender differences in coaching styles in terms of student-athletes' gender, coaches' gender, and their interaction were also investigated. The sample consisted of 248 student-athletes from six upper secondary sport schools across Finland. The participants filled in questionnaires at the beginning of the first year and at the end of the third year of upper secondary sport school. The results showed that female student-athletes demonstrated higher levels of mastery orientation than males in both sport and school domains. Affective coaching style predicted male student-athletes' mastery orientation in sport and both male and female student-athletes' mastery orientation in school. Finally, female coaches were reported using more of an affective coaching style than male coaches. The results suggest that athletes benefit differently from an affective coaching style based on their gender and that it is beneficial to educate coaches how to use an affective coaching style with their DC athletes.

Keywords Coaching · Motivational orientation · Gender · Dual career · Athlete

Introduction

Talented adolescent athletes in Nordic countries are increasingly expected to combine their sporting careers with academic and/or work to create a dual career pathway (DC). Previous research on dual careers in sports and academics has demonstrated that during adolescence, succeeding in both is a challenging developmental task due to, for

example, increasing demands, conflicting goals, and overlapping schedules (see Stambulova & Wylleman, 2019). Recent research has found that dominant discourses of gender are ingrained in DC policies and practices which influences athletes' motivation, and career aspirations (Ryba et al., 2021). While the current DC policy documents highlight the importance of equality and anti-discrimination in DC practices (European Commission, 2012, 2014), coaches' role in gendering of athletes' DC pathways has received limited scholarly attention. This is a critical void in the literature because coaches are central socializing agents for young athletes (Smith et al., 2016) whose gender views may be transmitted to athletes in coach-athlete interactions, thus shaping the way athletes construct their DCs.

Recent studies have found that female athletes often experience cultural pressure to invest in educational and DC goals and to excel in multiple roles simultaneously, whereas male athletes have been found to be more relaxed about their career aspiration (Kavoura & Ryba, 2020). Recent scholarship indicates that we may even be witnessing a femininization of DCs; that is, the DC discourses and practices are

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gendered, and seem to be particularly important for young female athletes (Skrubbeltrang, 2019). While the increased pressure for female athletes to be so-called ‘superwomen’, who can succeed at everything, may support female athletes’ athletic and academic excellence, it also positions them as inferior to men and vulnerable to psychological distress (Ryba et al., 2021). Although previous studies have shown that there may be gender differences in adolescent athletes’ achievement motivation both in the domains of sports (Hanrahan & Cerin, 2009) and academics (Arens & Watermann, 2021), few studies thus far have specifically examined gender differences in student-athletes’ motivational orientations in DC contexts (as an exception, see Viljaranta et al., 2022). Moreover, while the role of coach in athletes’ sport motivation has been extensively investigated (e.g., Amorose & Anderson-Butcher, 2015; Knight et al., 2018; Smith et al., 2016), only a few earlier studies have aimed to understand the role that coaches play in athletes’ school motivation and whether the role of coaches is gendered (Saarinen et al., 2020). Examining this is important as in Finnish athletic high schools where the present study was carried out, coaches are considered members of the school staff and are expected to support their athletes’ academic performance as well. Earlier studies have also shown that in DC context the domains of sports and academics are interlinked: for example, Into and colleagues (Into et al., 2020) recently reported that student-athletes’ perceptions of performance-oriented and controlling coaching climates predicted athletes’ symptoms of burnout, not only in sports, but in school as well. To support athletes’ active engagement in the DC and life design, as well as to better understand the gender dynamics in a DC context, it is important to deepen current understandings of how coaching interaction styles influence their athletes’ motivational orientations not only in sports but in school as well.

Motivational orientations

One theoretical framework that offers a social-cognitive approach to understanding and studying motivational orientations is Achievement Goal Theory (AGT; Ames, 1992; for a review, see also Anderman, 2020; Urdan & Kaplan, 2020). AGT is based on two assumptions: individuals act rationally, and the adopted achievement goals guide future achievement decisions and behaviors. In the AGT framework, the main goal of action is the demonstration of competence (Anderman, 2020; Nicholls, 1989). Furthermore, AGT outlines two primary goal orientations: mastery (or task) and performance (or ego). In mastery orientation, students’ motivation comes from developing competence or gaining a mastery of a task, such as learning new skills, improving their performance, and doing their best. In this construction of competence, the perception of ability is self-referenced.

In performance orientation, students’ source of motivation is normative competence, such as winning and outperforming others, doing normatively well, and managing to accomplish a given task with less effort than others. Thus, in performance orientation, the perception of ability is normatively or socially referenced (Anderman, 2020; Urdan & Kaplan, 2020).

In the literature, motivational orientations have been related to various achievement outcomes in the domains of both sports and school. Sport mastery orientation has been associated with positive outcomes, such as positive emotions and motivation for skill development, whereas performance orientation has been associated with more maladaptive behaviors, cognitions and emotions, particularly when the perceived level of competence is low (Lochbaum et al., 2016). Additionally, in the academic context, mastery orientation has been associated with positive outcomes, such as students’ intrinsic motivation and higher engagement in learning (Maehr & Zusho, 2009; Wigfield & Cambria, 2010). The findings concerning performance orientation, in turn, have been less consistent: performance orientation has been associated with both adaptive achievement behaviors, such as high levels of self-efficacy and task persistence, as well as with maladaptive behaviors, such as low levels of self-efficacy and task engagement (Tuominen-Soini et al., 2012; Urdan & Kaplan, 2020). Importantly, in studies conducted among student-athletes, it has been found that mastery goals in sports and school are negatively associated with cynicism and feelings of inadequacy within the same domain, whereas performance goals in school may be positively associated with school-related cynicism (Sorkkila et al., 2018).

According to literature on goal orientation theory (Ames, 1992; Nicholls, 1989; Urdan & Kaplan, 2020) individuals develop different motivational orientations based on their experiences with the significant others, such as with coaches. More specifically, female athletes and students have been found to exhibit higher levels of mastery-oriented motivation both in the sport (Hanrahan & Cerin, 2009) and school (Arens & Watermann, 2021) domains compared to males. Performance orientation, in turn, is more typical for male athletes and students in both sport (Ong, 2019) and school (Arens & Watermann, 2021) domains.

Coaching styles

Earlier coaching literature has mostly examined the role of a coach in student-athletes’ motivation in sports in consideration of two coaching styles: the role of autonomy-supportive versus controlling coaching style (Amorose & Anderson-Butcher, 2015; Smith et al., 2016). Based on Self-Determination Theory (SDT; Deci & Ryan 1985; Ryan & Deci, 2002; Urdan & Kaplan, 2020), the autonomy-supportive

coaching style is characterized by coaches recognizing athletes' preferences and taking their perspectives into consideration, acknowledging the athletes' feelings and providing them with meaningful choices, and welcoming their input in decision-making (Mageau & Vallerand, 2003). Controlling coaching, in turn, is characterized by coaches behaving in pressuring, coercive, and intimidating ways toward their athletes (Amorose & Anderson-Butcher, 2015; Urdañ & Kaplan, 2020).

Moreover, parents have been considered the most important gender-role socializers for their children. Therefore, to better understand the gender dynamics in coach-athlete relationships, the present study approached coaching from a novel theoretical perspective previously employed in parenting literature in consideration of affection and psychological control. As in the parenting literature (e.g., Wouters et al., 2013), affection refers to the degree to which coaches emotionally support the student-athletes and provide them with warmth. In the parenting literature, this style has been shown to have positive consequences for healthy adolescent development (Aunola et al., 2013) as well as educational and career success (Wang & Eccles, 2012). Psychologically controlling parenting style, in turn, refers to parents' attempts to control adolescent's emotions and behaviors by psychological means, such as guilt induction and withdrawal of affection (Barber, 1996; Aunola et al., 2013). In earlier studies psychological control has been associated with negative developmental outcomes, such as internal distress and problem behaviors (Aunola et al., 2013).

From the SDT perspective, the concepts of affection and psychological control can be seen similar to those of presented in the coaching literature, that is, to autonomy-supportive and controlling coaching styles. Drawing from both AGT and STD, earlier coaching literature (Amorose & Anderson-Butcher, 2015; Duda, 2013; Smith et al., 2009, 2016) has highlighted that mastery-oriented, autonomy-supportive, and socially supportive coaching behaviors (i.e., affective behaviors) contribute to the athletes' basic psychological needs satisfaction and are therefore important in athletes' developing a mastery-oriented conception of competence. Psychological control and the controlling coaching style, in turn, are assumed to thwart adolescents' psychological needs satisfaction (Amorose & Anderson-Butcher, 2015; Duda, 2013) and are, therefore, linked to athletes' developing a performance-oriented conception of competence.

Furthermore, prior limited studies examining the gender construct in coaching settings have found that coaches' gender and athletes' gender may shape the adoption of a specific coaching style. For example, Hovden and Tjønnedal (2019) and Norman (2016) suggest that female coaches typically display a coaching style characterized by empathy, communication and cooperation, whereas male coaches are more likely to demonstrate a coaching style characterized by

controlling features and an authoritarian leadership style. The results are similar in the parenting literature since females, specifically mothers, have often been found to exhibit a warmer, more affective parenting style toward their children. Fathers, in turn, have often been prone to demonstrate parenting styles characterized by controlling features (for a review, see Endendijk et al., 2016). Furthermore, there is also some evidence that parents may be more likely to show affective and autonomy-supportive parenting toward their daughters than toward their sons (Endendijk et al., 2017). In the present study, longitudinal data was utilized to investigate gender differences in young athletes' motivational orientations (i.e., mastery versus performance) in athletics and academics across high school and specifically the role of coaching styles (affection/warmth and psychological control) in these orientations. Gender differences in coaching styles in terms of athletes' gender, coaches' gender, and their interaction were also investigated. The primary research questions were:

- (1) Are there gender differences, across high school, in athletes' motivational orientations (i.e., mastery versus performance orientation) in sports and school? H0: There are no gender differences in student-athletes' motivational orientations in sport or in school. H1: Female athletes exhibit higher mastery orientation than males and male athletes exhibit higher performance orientation than females both in sport (Hanrahan & Cerin, 2009; Ong, 2019) and in school (Arens & Watermann, 2021).
- (2) To what extent do coaches' coaching styles, in terms of affection and psychological control, play a role in athletes' mastery and performance orientations at the end of high school (T2) in sports and school? Are there gender differences in these associations? H0: Coach affection and psychological control are not associated with athletes' mastery and performance orientations in sports or school at T2. H1a: Coach affection is positively associated with athletes' mastery orientation in sports at T2 (Ryan & Deci, 2002; Urdañ & Kaplan, 2020). H1b: Coach psychological control is positively associated with athletes' performance orientation in sports at T2 (Ryan & Deci, 2002; Urdañ & Kaplan, 2020). H1c: Female student-athletes benefit more than male student-athletes from coach affection in terms of their mastery orientation in sports (Amorose & Horn, 2000; de Haan & Knoppers, 2020).
- (3) To what extent do athletes' gender, coaches' gender, and their interaction (*athletes' gender X coaches' gender*) play a role in coaching styles with respect to affection and psychological control? H0: There are no gender differences in coaching styles in terms of athletes' and coaches' gender. H1a: Coaches demonstrate higher levels of affection toward female than male athletes,

and higher levels of psychological control toward male than female athletes (Endendijk et al., 2017). H1b: Female coaches demonstrate higher levels of coach affection than male coaches, and male coaches demonstrate higher levels of coach psychological control than female coaches (Hovden & Tjønnndal, 2019; Norman, 2016). H1c: Female coaches demonstrate higher levels of affection toward female athletes than toward male athletes, and male coaches demonstrate higher levels of psychological control toward male athletes than toward female athletes (Endendijk et al., 2016; Norman, 2016).

Materials and methods

The present study was conducted in Finland. In the Finnish educational system, after completing nine years of compulsory education, adolescents have to make a decision concerning their secondary education. Secondary education comprises either upper secondary school (considered to be the academic track preparing students to apply for higher education in university) or vocational school (professional preparation for transitioning to the labor market or continuing in polytechnic schools, also referred to as universities of applied sciences (UAS)). In Finland, talented or advanced young athletes most often pursue a secondary education within the national talent development program, structurally enabling the construction of a dual career pathway. Sports high school (*urheilulukiot* in Finnish) collaborate with sports academies and athletic clubs to arrange daily training for athletes, offer the possibility of extending the three-year academic curriculum to 3.5 or 4 years, give study credits for sports, and assist with dual career planning. Currently there are 15 upper secondary schools in Finland that have been labelled upper secondary sport schools by the Ministry of Education and Culture.

Participants and procedure

Data of the participants in the present study were drawn from the Winning in the Long Run research project (Ryba et al., 2016) in which talented student-athletes from six athletic high schools across Finland (two each from the Northern, Central, and Southern regions of Finland) were followed throughout their high school years. The Ethics Committee of the relevant university approved the procedure of the study in June 2015. The sample of the present study consisted of 248 (51% female) 15–16 years old ($M = 16.00$, $SD = 0.17$) Finnish-speaking student-athletes who answered questionnaires both at the beginning of the

first year in upper secondary athletic school (fall, T1), and at the end of the third year (spring, T2). Prior to the data collection, all of the participants were informed about their rights and they provided written consent indicating their voluntary participation in the study. All of the invited student-athletes agreed to participate in the study. At both of these measurement points (T1 and T2), the participants filled in a self-report questionnaire. Data concerning motivational orientations were collected at Time 1 (T1) and Time 2 (T2). Data concerning coaching styles were collected at T2. Ethical guidelines were followed throughout the data collection process.

Measurements

Motivational orientation in sports Student-athletes' motivational orientation in sports were measured using the Perceptions of Success Questionnaire (POSQ) (Roberts et al., 1998). The POSQ scale consists of 10 items, six of which measure mastery orientation in sports and four that measure performance orientation in sports. All items were rated on a five-point Likert scale (1 = completely disagree, to 5 = completely agree). The Cronbach alpha reliability coefficients for the mastery orientation subscale were 0.74 and 0.89 and for performance orientation subscale 0.86 and 0.92 in T1 and T2.

Motivational orientation in school Student-athletes' motivational orientation in school were measured using the student self-rated Perceptions of Success Questionnaire (POSQ) (Roberts et al., 1998) modified for the academic context. The modified POSQ scale consists of 10 items, six of which measure mastery orientation in school and four that measure performance orientation in school. All items were rated on a five-point Likert scale (1 = completely disagree, to 5 = completely agree). The Cronbach alpha reliability coefficients for the mastery orientation subscale were 0.88 and 0.89 and performance orientation subscale 0.91 and 0.92 in T1 and T2.

Coaching styles Student-athletes' perceptions of coaches' affection and psychological control were measured using a questionnaire tailored for the coaching context, based on the Finnish version (Aunola & Nurmi, 2005) of Block's Child Rearing Practices Report (CRPR) (Roberts et al., 1984). The questionnaire includes items assessing coaching attitudes, values and behaviors. The score for affection included four items reflecting the coach's positive relationship with the athlete. The score for psychological control included five items that reflect the coach's attitudes appealing to guilt and expressing disappointment (Barber, 1996). Student-athletes' responses were rated on a five-point

Likert scale (1 = not like me at all, to 5 = very much like me). The Cronbach alpha reliability coefficients for coaches’ affection and psychological control were 0.78 and 0.78, respectively.

Analysis strategy

The statistical analyses were performed using Structural Equation Modeling (SEM). Separate models were conducted for the domains of sports and school. The measurement portion of the models included latent factors for mastery (6 observed items as indicators) and for performance (4 observed items as indicators) orientation scales at two measurement points, T1 and T2. The measurement structure for motivational orientations was assumed to be invariant across time and, therefore, factor loadings, intercepts of the observed variables, and residual variances of observed variables were set equal across time (T1, T2) for both constructs. Furthermore, latent factors for coach affection (4 observed items as indicators) and for coach psychological control (5 observed items as indicators) were specified (T2). The structural part of the model included the following regression paths: (1) paths from the mastery orientation factor and performance orientation factor at T1 to the corresponding factors at T2; (2) paths from coach affection and psychological control factors at T2 to mastery orientation and performance orientation factors at T2; and (3) paths from student-athletes’ gender to each factor (T1, T2). Additionally, (4) coach affection and psychological control were regressed on coaches’ gender. In the model, coach affection and psychological control factors were allowed to correlate with each other. Similarly, mastery orientation and performance orientation factors at T1 were allowed to correlate with each other, and also with coach affection and psychological control factors at T2. Finally, the residual

covariance between mastery orientation and performance orientation factors at T2 were allowed to correlate.

After testing the basic model, we moved forward to test whether the associations of coaching styles with motivational orientations would be different for females and males. For this purpose, a multigroup method was applied. If the regression coefficient paths from coach affection and/or psychological control factors to mastery orientation and/or performance orientation factors differed between gender, the multigroup method was used. The analyses were conducted using Mplus statistical software (version 8; Muthén & Muthén, 1998–2017). The parameters of the models were estimated using full information maximum likelihood estimation with standard errors that are robust to non-normality (MLR estimator; Muthén & Muthén, 1998–2017). The model fit of the data was estimated using three indicators: chi-square (χ^2) test, Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). A nonsignificant χ^2 -test value, a value below 0.06 for RMSEA, and a value below 0.08 for SRMR was considered to indicate a good fit between the hypothesized model and the observed data.

Results

Structural equation modeling for the sport domain

The results of structural equation modeling (SEM) for the athletic domain are depicted in Fig. 1 (standardized estimates). Factor loadings of the related measurement models are shown in Table 1. The tested model fit the data well: $\chi^2(431) = 754.65$; RMSEA = 0.051; SRMR = 0.082. The results showed (see Fig. 1) that gender was associated with student-athletes’ mastery orientation in sports:

Fig. 1 Motivational orientation in sport and the role of coaching styles in this. Note. *** $p < .001$; ** $p < .01$; * $p < .05$

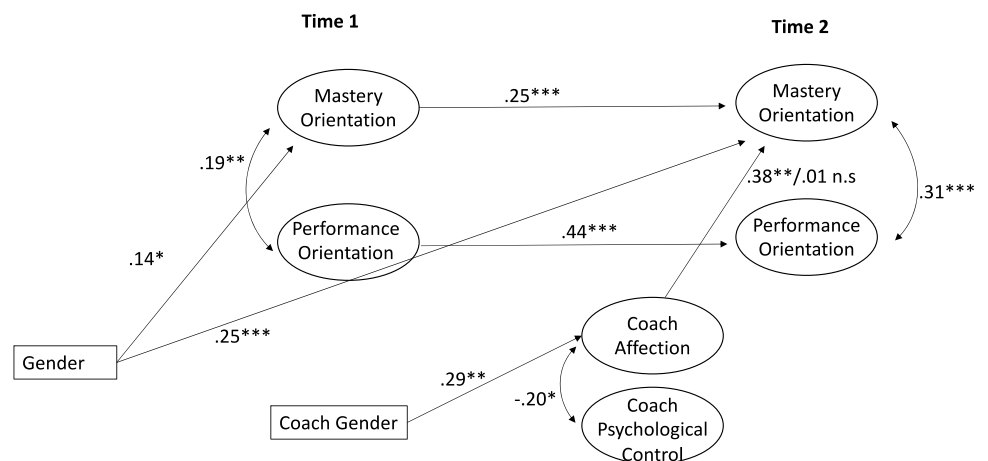


Table 1 Standardized factor loadings for the model of motivational orientation in sport and the coaching styles

	Mastery orientation T1	Mastery orientation T2	Performance orientation T1	Performance orientation T2	Coach affection T2	Coach psychological control T2
Q18_2	0.41					
Q18_3	0.72					
Q18_5	0.75					
Q18_6	0.70					
Q18_8	0.42					
Q18_9	0.47					
Q11_2		0.52				
Q11_3		0.61				
Q11_5		0.84				
Q11_6		0.80				
Q11_8		0.53				
Q11_9		0.59				
Q18_1			0.80			
Q18_4			0.89			
Q18_7			0.63			
Q18_10			0.75			
Q11_1				0.82		
Q11_4				0.91		
Q11_7				0.65		
Q11_10				0.77		
Q12_3					0.71	
Q12_6					0.59	
Q12_11					0.91	
Q12_14					0.55	
Q12_7						0.80
Q12_8						0.56
Q12_9						0.91
Q12_12						0.40

All factor loadings are statistically significant at $p < .001$ level

female student-athletes demonstrated higher levels of mastery orientation in sports both at T1 and at T2 than did male student-athletes. No gender differences were found in the levels of performance orientation in sports.

The results demonstrated that coach affection was associated with student-athletes' mastery orientation in sports at T2, when mastery orientation at T1 was controlled for. The follow-up analyses demonstrated that this result was true specifically for male student-athletes: among males, the higher the level of experienced coach affection/warmth, the higher the level of mastery orientation in sports at T2. Coach psychological control was not associated with the motivational orientations.

Finally, the results showed that coaches' gender was associated with their affection: student-athletes described female coaches as having shown higher levels of affection than male coaches. Neither student-athletes' gender

nor the interaction term *student-athletes' gender X coaches' gender* were statistically significantly associated with the coaching style in terms of affection and psychological control.

Structural equation modeling for the school domain

The results of structural equation modeling (SEM) for the school domain are depicted in Fig. 2 (standardized estimates). Factor loadings of the related measurement models are shown in Table 2. The tested model fit the data well: $\chi^2(435) = 756.92$; RMSEA = 0.051; SRMR = 0.070. The results (Fig. 2) revealed, first, that gender was associated with student-athletes' mastery orientation: females demonstrated higher levels of mastery orientation in school at T2 than did male student-athletes. No gender differences were found in the levels of performance orientation in school.

Fig. 2 Motivational orientation in school and the role of coaching style in this. *Note.* *** $p < .001$; ** $p < .01$; * $p < .05$

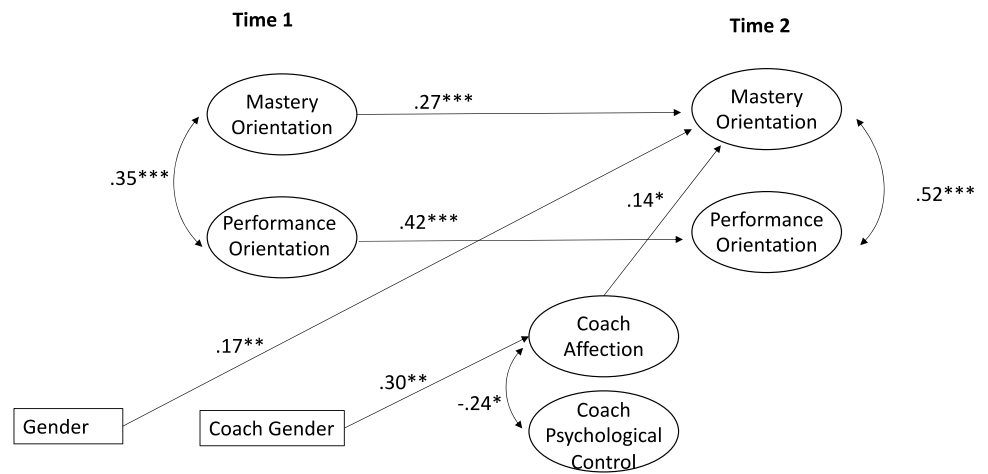


Table 2 Standardized Factor Loadings for the Model of Motivational Orientation in School and the Coaching Styles

	Mastery orientation T1	Mastery orientation T2	Performance orientation T1	Performance orientation T2	Coach affection T2	Coach psychological control T2
Q26_2	0.48					
Q26_3	0.79					
Q26_5	0.87					
Q26_6	0.89					
Q26_8	0.53					
Q26_9	0.77					
Q21_2		0.55				
Q21_3		0.84				
Q21_5		0.90				
Q21_6		0.92				
Q21_8		0.60				
Q21_9		0.83				
Q26_1			0.80			
Q26_4			0.89			
Q26_7			0.83			
Q26_10			0.88			
Q21_1				0.84		
Q21_4				0.92		
Q21_7				0.87		
Q21_10				0.90		
Q12_3					0.71	
Q12_6					0.58	
Q12_11					0.92	
Q12_14					0.55	
Q12_7						0.80
Q12_8						0.61
Q12_9						0.87
Q12_12						0.47

All factor loadings are statistically significant at $p < .001$ level

The results also demonstrated that coach affection was associated with student-athletes’ mastery orientation in school at T2, when mastery orientation at T1 was controlled

for (Fig. 2): the higher the level of coach affection, the higher the level of mastery orientation in school. Coach psychological control was not associated with the motivational

orientations. The follow-up analyses did not reveal any gender differences in these results.

Discussion

In this study, we examined (1) gender differences in adolescent athletes' motivational orientations in sport and school across the three years in upper secondary school; (2) the role of coaching styles regarding affection and psychological control in these motivational orientations; and (3) gender differences in these associations. Furthermore, (4) the role of athletes' gender, coaches' gender, and their interaction in coaching styles (i.e., affection and psychological control) was examined. The results show that on average, female athletes demonstrated higher levels of mastery orientation in sports and school than male student-athletes did. No gender differences were found in relation to performance orientation. Furthermore, a high level of coach affection was associated with male athletes' high levels of mastery orientation in sports, as well as both male and female athletes' high levels of mastery orientation in school. Female coaches were reported to show more affection in their coaching style than male coaches.

Our first research question focused on examining gender differences in student-athletes' motivational orientations in sports and school. Contradictory to null hypothesis and in accordance with alternative hypothesis (Research question 1, H1) and with previous literature, the findings demonstrated that female athletes demonstrated higher levels of mastery orientation than males in both the domains of sports (Hanrahan & Cerin, 2009) and school (Arens & Watermann, 2021). However, as no gender differences were found in relation to performance orientation, the null hypothesis concerning performance orientation in sports and school retains. Our findings suggest that, due to their mastery orientation, female athletes seem to invest into their DC and academic goals and are engaged to do well in both domains (see also Viljaranta et al., 2022). This can be explained by the fact that female athletes often experience cultural and societal pressure to excel in multiple roles simultaneously and are therefore more likely to invest in DC goals and identities compared to males (Ryba et al., 2021). Indeed, earlier studies have suggested that this pressure may be linked to the beliefs of how female athletes are inferior to male athletes and how pursuing a professional athletic career is not a real career option for them (Kavoura & Ryba, 2020; Ryba et al., 2021: female athletes have been found to feel less competent than male athletes in sport (Ronkainen et al., 2020), are less likely to aim for a professional athletic career (e.g., Kavoura & Ryba, 2020), and are at higher risk of dropping out of sports compared to males (Skrubbeltrang, 2019). Due to the

structural inequalities that limit female athletes' access to develop professional athletic careers, they also have a higher need to engage in DC goals compared to males. For example, in 2017, only 1.6% of Finland's professional athletes were women (Lämsä, 2018).

Our second research question examined the association between coaching styles and athletes' motivational orientation in sport and in school. In this study, we examined coaching styles from a novel theoretical perspective used earlier in parenting literature, particularly focusing on two dimensions of coach behavior: affection and psychological control. Based on the results, the null hypotheses suggesting no associations between coach affection and psychological control with athletes' mastery and performance orientations in sports or school at T2 were rejected. In accordance with alternative hypothesis (Research question 2, H1a) and earlier coaching literature (e.g., Amorose & Anderson-Butcher, 2015; Smith et al., 2009; 2016; Urdan & Kaplan, 2020) the results demonstrate that the higher the level of coach affection, the higher the level of male student-athletes' mastery orientation in sports at the end of the third year of high school. Interestingly, this association was only found to be true for male athletes. This finding partly contradicts previous research (e.g., de Haan & Knoppers, 2020) as well as alternative hypothesis (Research question 2, H1c), as it was expected that female student-athletes would benefit more from an autonomy-supportive coaching style in terms of their intrinsic motivation in sports. It is possible that, according to traditional views on masculinity, male athletes may have received acknowledgment from a performance-oriented approach in their previous interactions with coaches (de Haan & Knoppers, 2020; Ong, 2019) and subsequently benefit more from coaches' emotional support and warmth compared to females. It should also be noted that this gendered effect was found for coaches' affection, which is different from the concept of *autonomy support* that prior studies have used. It may be that male student-athletes spend more time in sports-related activities and therefore develop closer (i.e., more affective) relationships with their coaches compared to females. It is also noteworthy that our findings contradict with previous findings suggesting that female athletes would especially benefit from emotional support from the coaches (Amorose & Horn, 2000; de Haan & Knoppers, 2020).

The results concerning coaches' role in student-athletes' school motivation demonstrate that the affective coaching style predicted student-athletes' mastery orientation in school at the end of the third year for both female and male athletes (Urdan & Kaplan, 2020). This finding suggests that coaches' affection, referring to a warm and supportive relationship of student-athletes with their coach, supports student-athletes' mastery orientation, not only in the athletic domain, but in school as well (see also Into et al.,

2020; Nikander et al., 2022). Mastery orientation has been associated with several beneficial outcomes, such as higher intrinsic motivation and higher engagement in learning (Sorkkila et al., 2018) and may be helpful in athletes' sustainable DC construction. The results of the present study show that coaches can be significant motivational agents for young athletes in the school domain as well, and that by adopting an affective coaching style, they can support both female and male student-athletes' opportunity to pursue education alongside sports (Saarinen et al., 2020). This is an important finding as earlier studies have only focused on examining coaches' role in athletes' motivation in the athletic domain. In fact, affective coaching may provide a buffer against student-athletes' withdrawal from school and sports as it has been shown that talented adolescents with dual motivation, especially females, are likely to retire prematurely from sports at a time of increased tension between their two careers (Ryba et al., 2021).

The third research question of the present study examined the role of student-athletes' gender, coaches' gender, and their interaction in coaching styles in terms of affection and psychological control. The results reveal important and significant information. First, in accordance with alternative hypothesis (Research question 3, H1b, female coaches were reported to exhibit more affection in their coaching style in comparison to male coaches. Despite the limited earlier research examining gendered differences in the coaching context, the results show that the ways of performing femininity (such as women behaving in a more nurturing and caring way) and as identified in parenting context (Endendijk et al., 2016, 2017) appear to be similar in the coaching context. However, according to the null hypotheses (H0) no gender differences were reported in terms of coach psychological control. As a result of the affective coaching style being found to be related to higher mastery orientation among student-athletes and seeming to be used more often by the female coaches, female coaches' method of coaching may be more efficient at supporting student-athletes' DC construction (Smith et al., 2009). This suggests that despite the social perceptions of gender that typically marginalize female coaches and frame them as less capable for the coaching profession (Norman & Simpson, 2022), female coaches may actually be more efficient at providing holistic support for student-athletes.

Second, in line with null hypotheses (Research question 3, H0) and contrary to alternative hypotheses (Research question 3, H1a and H1c), neither student-athletes' gender nor the interaction term *student-athletes' gender X coaches' gender* were associated with coaching styles in terms of affection and psychological control. Parents being typically warmer and autonomy-supportive toward their daughters than sons, indicated in the parenting literature (Endendijk et al., 2017), was therefore not replicated in the coaching

context. This may be due to parents, relative to coaches, having higher gender-role expectations of their children and thus being more likely to show parenting that reinforces gender-role consistent behaviors (Endendijk et al., 2016). Furthermore, due to the recent, increased gender-equality work carried out in the Finnish educational settings, coaches may also be more conscious of gender-neutral practices compared to parents. Coaching has typically been viewed as a masculine domain in which the majority of coaches working with top-level athletes are men (Norman, 2016; Norman & Simpson, 2022). Therefore, women who enter the coaching profession need to negotiate the gender norms and may, therefore, share more feminist approaches regarding stereotypical gender roles that are projected in the athletic field and aim to exhibit coaching that does *not* reinforce such stereotypes. Undoubtedly, further studies are needed to address the question of how student-athletes' gender and coaches' gender shape coaching styles, and how these might influence the ways athletes are motivated toward DC.

In conclusion, the present study was the first to examine gender differences in adolescent student-athletes' sport and school motivation and the role of gender and coaching styles in these orientations. Our findings suggest that the young female athletes' pressure to excel in multiple roles are also reflected in their motivational orientations. Furthermore, our findings demonstrate how via an affective coaching style coaches can contribute to the development of athletes' mastery-oriented motivation in the domains of sports and school. While female coaches have often been marginalized in coaching professions due to their believed incapability to operate in that field, this work highlights that female coaches may be more efficient at providing holistic support for athletes. Our findings highlight that many taken-for-granted gender stereotypes in sport are not supported by empirical evidence and that it is important to actively operate toward changing them.

Implications

Our study has several practical implications. First, it is important to educate coaches on the benefits of affective coaching in terms of student-athletes' mastery orientation in the domains of sports and school. Coaches could be taught in practice what affective coaching entails, such as what kind of language and interaction support positive relations with student-athletes and how athletic environments can be structured in a way that promotes the development of mastery orientation (Appleton & Duda, 2016; Smith et al., 2009, 2016). This suggestion fits well with the European Commission's (2012) guidelines concerning DC athletes, which states that coaches need to develop competencies to view student-athletes

from a holistic perspective. Moreover, we hope that the results of the present study could be used to empower women coaches and promote their careers in elite sports, as well as having the goal of increasing women's representation in coaching positions. Both suggestions are important contributions to the European Commission's (2014) proposal for strategic actions to increase gender equality in sports: there is a need for women to be increasingly recruited into elite-level coaching positions (European Commission, 2014).

Limitations

The novel findings of the present study need to be interpreted within an understanding of its limitations. First, only one measurement point was used to assess coaching behaviors, that is, the end of the third year in upper secondary school. Therefore, it was not possible to examine the possible changes in coaching styles over time, and the developmental dynamics of student-athletes' motivational orientations in relation to the coaching styles. It is possible, for example, that coaches may change the way they coach their student-athletes as a reflection of their perceptions of the student-athletes' motivation or achievement (Smith et al., 2016). Second, in the present study, we examined student-athletes' perceptions of coaching styles, and thus have only a partial view of the phenomenon. For example, it has been found that athletes' and coaches' interpretations of what constitutes supportive coaching behaviors may differ from each other. Therefore, future studies should investigate coaching styles further by including reports from coaches as well. Finally, the possibility of an impact by the sociocultural context in which the present study was conducted may limit the generalizability of the study findings. The current study was conducted in Finland and school systems, cultural values, and coaching education are likely to be different in different cultures. Therefore, we encourage conducting further studies in different sociocultural contexts to add to our understanding of the development of gendered differences in student-athletes' motivational orientations and the role of coaching styles in this process. Especially qualitative studies that explore how gendered discourses shape athletes' motivation to pursue a DC are needed to gain a more nuanced understanding of the phenomenon (Ryba et al., 2021).

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Data availability The data that support the findings of this study are available from the last author, Tatiana V. Ryba, upon reasonable request.

Declarations

Conflicts of interest The authors have no conflicts of interest to disclose.

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