Psychology of Sport and Exercise 13 (2012) 257–262

Contents lists available at SciVerse ScienceDirect

Psychology of Sport and Exercise

journal homepage: www.elsevier.com/locate/psychsport

Youth athletes' perception of autonomy support from the coach, peer motivational climate and intrinsic motivation in sport setting: One-year effects

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ARTICLE INFO

Article history:
Received 19 July 2011
Received in revised form
8 December 2011
Accepted 8 December 2011
Available online 15 December 2011

Keywords:
Coach and peer influence
Motivation
Self-determination theory
Achievement goal theory

ABSTRACT

Objectives: Grounded in self-determination theory (SDT; Deci & Ryan, 1985) and achievement goal theory (AGT; Nicholls, 1989), the present study examined the temporal stability and reciprocal relationships among three key variables related to motivation: perceived autonomy support from the coach, task-involving peer motivational climates, and athletes' intrinsic motivation.
Design: A prospective longitudinal design with data collected on two occasions one year apart over the course of a youth training season.
Method: Young athletes ($N = 362$, age range 11–16 years) completed measures of the Sport Climate Questionnaire and the Peer Motivational Climate in Youth Sport Questionnaire. One-year later participants completed these questionnaires again along with the Sport Motivation Scale.
Results: Structural equation modeling indicated that perceived autonomy support from the coach and task-involving peer motivational climates exhibited comparatively high stability over a one-year period. In cross-lagged analyses, perceived autonomy support from the coach positively predicted task-involving peer climate one-year later but not vice versa. In addition, both social factors demonstrated a significant direct effect on athletes intrinsic motivation measured concurrently in sport contexts. Further, an alternative structural model supported a longitudinal direct effect of autonomy support from the coach and task-involving peer climate measured on the first occasion on subsequent intrinsic motivation.
Conclusion: Results demonstrated the value of perceived autonomy support from the coach and task-involving peer motivational climate in predicting athletes' intrinsic motivation over a training year. Findings also suggest that perceived autonomy support from the coach can facilitate later task-involving peer motivational climate.

Over the past two decades studies have identified the social psychological factors associated with athletes' motivation in sport contexts (for reviews see Mageau & Vallerand, 2003; Moreno, San Roman, Galiano, Alonso, & Gonzalez-Cutre, 2008; Ntoumanis, Vazou, & Duda, 2007). Foremost among these constructs are athletes' perceptions of the influence of social agents, particularly coaches and parents, on their motivation. Despite research demonstrating the impact of such social agents in shaping athletes' motivation in sport, comparatively little research has investigated the influence of perceptions regarding the role of peers (Brustad & Partidge, 2002; Hagger & Chatzisarantis, 2009; Smith, Balaguer, & Duda, 2006; Ullrich-French & Smith, 2006) in predicting young athletes' participation motivation, which is relatively independent of adult influence (Ntoumanis et al., 2007). The present study aims to address this gap in the literature by examining the temporal relationships between motivational variables (Chatzisarantis, Hagger, Smith, & Phoenix, 2004; Hagger, Chatzisarantis, Biddle, & Orbell, 2001), like perceived autonomy support from the coach, peer motivational climate, and intrinsic motivation. Adopting a self-determination theory (SDT, Deci & Ryan, 1985) and achievement goal theory (AGT; Nicholls, 1989) perspective, this research is expected to identify the influential factors affecting athletes' intrinsic motivation in sport participation over a training year.

In sport contexts, studies have shown that athletes' beliefs and perceptions regarding social agents, like coaches and peers, influence athletes' various motivational outcomes (Keegan, Harwood, Spray, & Lavallee, 2009; Vazou, Ntoumanis, & Duda, 2006). These factors include coaches and peers' autonomy support, perceptions and behaviors that affect sense of belongingness to others, and

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doi:10.1016/j.psychsport.2011.12.001

recognition for effort and improvement (see Reeve & Jang, 2006). According to AGT, the social context can be perceived by individuals as task-involving (i.e., emphasizing learning processes, improvement, and effort) or ego-involving (i.e., emphasizing competition, winning, and social comparison) (Ames, 1992; Duda, 2001). Individuals perceiving the pervading climate to be predominantly task-involving are assumed to be more likely to derive satisfaction from personal progress and their actions are associated with more positive motivational, affective, and behavioral patterns compared to ego-involvement (Ntoumanis & Biddle, 1999). In particular, if athletes perceive social agents' support as task-involving, they are more likely to be intrinsically motivated toward their participation in sport (Ames, 1992; Duda, 2001). Furthermore, athletes that perceive the pervading motivational climate as task-involving are more likely to be self-aware, and to better resist, having their motivation undermined by failure and adversity (Absesa, 2009). Although studies have considered perceptions of coaches' behavior to be one of the most important in youth sport participation (Mageau & Vallerand, 2003), it is just one part of the motivational climate in which activities take place (Conroy & Coatsworth, 2007). More recently, concern has also been raised as to how athletes' perceptions of the supportive behaviors of coaches could affect their social relationships with peers (Keegan et al., 2009; Ntoumanis & Vazou, 2005). Keegan et al. (2009) have indicated that there are variety of conceptually and qualitatively distinct types of interactions between an athlete and their coach and/or peers, which is likely to be the result of a variety of possible social goals. The authors have noted that peer social relations among children are comparatively equal whereas the young athlete–coach relationships may often be characterized by an imbalance of power (Keegan et al., 2009). To attain coaches' approval, peers often transmit behaviors that are consistent with coaches' expectations (Vazou et al., 2006). According to AGT (Nicholls, 1989) and SDT (Deci & Ryan, 1985), individuals may view social-contextual factors as precursors to the formation of motivational climate. Coaching behavior, as one of the social factor and which provides informational or task-involving feedback, leads to subsequent intrinsic motivation for sport participation (Ryan, 1982). Such kind of the behavior may be perceived as autonomy-supportive behavior and is inherent to task-involving climate (Nordin-Bates, Quested, Walker, & Redding, 2011). In line with SDT, it is reasonable to propose that perceived autonomy support from the coach that fosters collaboration, improvement, and effort might play a role in shaping a task-involving peer motivational climate which, in turn, is likely to develop the athletes' intrinsic motivation toward activities. Although Vazou et al. (2006) have documented the notion that the behavior of peers and coaches has a pervasive influence on team motivation and behavioral outcomes, there is limited evidence about the stability and interplay between the behaviors of coach and peer over time. In youth sport, only Ntoumanis, Taylor, and Thøgersen-Ntoumani (in press) have examined the concurrent predictive effects of coach and peer motivational climate on moral attitude, emotional well-being, and indices of behavioral investment over a 12-month period. In addition, considering the very limited work that has investigated the role peer-created motivational climate on athletes' motivation to date, there is little evidence explaining how such a climate is created and how it develops over time (Ntoumanis & Vazou, 2005; Ntoumanis et al., 2007). A recent study by Jõesaar, Hein, and Hagger (2011) corroborated the important role of task-involving peer climate as a source of influence on athletes' intrinsic motivation and further behavioral persistence in sport. These authors also highlighted that it is important for researchers to appraise the importance of peer climate for obtaining better knowledge about task-involving peer climate as an important predictor of continuing participation in sport.

Social environments created by significant others that promote a sense of choice and self-mastery tend to nurture intrinsic motivation (Deci & Ryan, 2000). Moreover, research has generally shown a positive effect of social environments, created by social agents and perceived as task-involving by recipients, on intrinsic motivation (Duda, 2001; Duda & Hall, 2000; Ntoumanis & Biddle, 1999). In addition, many investigations, based on SDT, have also supported the positive impact of perceived autonomy support from the coach or parents on either intrinsic motivation and self-determined forms of motivation (Fortier, 2000; Pelletier, Fortier, Vallerand, & Brière, 2001). More precisely, the perceived behavior of the athletes' coaches, which is directed toward improving skills to accomplishing tasks, will encourage athletes to try their hardest and to cooperate with team members. In addition, over time these relationships between athletes and coaches as well as between peers will give rise to the formation of stable and strong motivational climate. This, in turn, will lead to the development of intrinsic motivation, because an athlete invests time and effort in an activity to acquire the necessary skills for its own sake (Nicholls, 1989). Although Ames (1992) has indicated that the behavior of significant others has an impact to the formation of motivational climate, there is still a lack of evidence of this effect and stability over time. Also, as noted by Ntoumanis et al. (in press) more accurate research in this field may have important implications for youth sport participation, stressing the origins of peer motivational climate and how coaches' behavior might set the tone for peer interactions. Most notably, to date, no studies have examined the stability and cross-lagged relationships between two social constructs like perceived autonomy support from the coach and task-involving peer motivational climate over time on youth athletes' intrinsic motivation.

Aims and hypotheses

The aim of this study was to examine the temporal stability of perceived task-involving peer motivational climate and perceived autonomy support from the coach and the influence of these constructs on youth athletes' intrinsic motivation for sport participation over one year. The study will adopt a unique integrated theoretical perspective (see Chatzisarantis & Hagger, 2007; Hagger, 2009; Hagger et al., 2001; Jacobs, Hagger, Streukens, De Bourdeaudhuij, & Claes, 2011; Orbell, Hagger, Brown, & Tidy, 2006) adopting constructs and hypotheses from multiple theoretical approaches, namely AGT and SDT. It was hypothesized that athletes' perception of peer motivational climate and autonomy support from their coach would exhibit a high degree of stability. In addition, we anticipated that, over time, perceived autonomy support from the coach would have a greater influence on task-involving peer climate than motivational climate would have on autonomy support. It was also hypothesized that task-involving peer motivational climate and autonomy support from the coach would have direct and longitudinal effects on intrinsic motivation for sport participation.

Method

Participants and procedure

Participants were 362 athletes (252 boys and 110 girls; *M* age = 13.10, SD = 2.08) between the ages of 11 and 16 years. These participants participated in both individual (swimming, badminton) and team (basketball, soccer, volleyball) sports. Participants attended training sessions voluntarily as members of different sports schools or clubs in Estonia that were enrolled in competitions at national and provincial level, but were not members of professional sports teams. The general aim of the sports clubs is to offer children experiences in

different sports and to provide training for the development of young athletes.

Permission to carry out the study in each club was obtained from coaches. The athletes completed the questionnaire on two occasions over a one-year period. The first time (Time 1), perceived autonomy support from the coach and perception of the peer-created climate were assessed. One-year later (Time 2), these two measures were administered to the sample again along with measures of three types of intrinsic motivation for sport participation. Athletes were identified by date of birth. Participation was voluntary and all institutional ethical procedures (institutional approval, parent and coach consent, and participant assent) were followed in the course of data collection. In every sports club, the same coach trained the athletes during the follow-up period. Where available, validated Estonian instruments were used. Measures not previously translated from English to Estonian were submitted to a standard translation and back-translation procedure (Brislin, 1986).

Measures

Peer-created motivational climate

To assess athletes' perceptions of the peer-created motivational climate in their training group, three factors from task-involving subscale from the Peer Motivational Climate in Youth Sport Questionnaire (PeerMCYSQ; Ntoumanis & Vazou, 2005) were used. Participants were presented with a common stem ("In this team/training group, most athletes…") followed by four items measuring the improvement subscale (e.g., "…work together to improve the skills they do not do well"), three items measuring the relatedness/support subscale (e.g., "…make their teammates feel valued"), and five items measuring the effort subscale (e.g., "…encourage their teammates to keep trying after they make a mistake"). Participants rated their responses on seven-point scales anchored by "strongly disagree" (1) and "strongly agree" (7) Cronbach alpha reliability coefficients were satisfactory for the improvement, relatedness/support and effort factors at Time 1 ($\alpha = .76, .71, .79$, respectively) and Time 2 ($\alpha = .79, .72, .78$, respectively).

Autonomy support from the coach

Participants' perception of the autonomy-supportive behaviors exhibited by their coach was measured with a short form of the Sport Climate Questionnaire (Hagger et al., 2007). An example item is: 'I feel that my coach provides me with choices and options'. Participants gave their responses on a seven-point Likert-type scale anchored by strongly disagree (1) to strongly agree (7), with higher scores evidencing a more autonomy-supportive style. The reliability of the autonomy support from the coach was $\alpha = .80$ (Time 1) and $\alpha = .81$ (Time 2).

Intrinsic motivation

Participants' intrinsic motivation toward their activity was tapped by the Sport Motivation Scale (SMS; Pelletier et al., 1995). The athletes were asked how much they agreed or disagreed with the items based on the root question: "Why do you practice your sport?" using a seven-point scales anchored by "does not correspond at all" (1) and "corresponds exactly" (7). In the present study all three SMS intrinsic motivation subscales were used: Intrinsic Motivation to Experience Stimulation (e.g., "I like the feeling of being totally immersed in the activity"; $\alpha = .77$), Intrinsic Motivation to Accomplish (e.g., "For the pleasure I feel while improving some of my weak points"; $\alpha = .78$), and Intrinsic Motivation to Know (e.g., "For the pleasure it gives me to know more about activity"; $\alpha = .77$). Support for the validity and reliability of the intrinsic scales from SMS modified for a physical education context has been obtained in an Estonian sample (Hein, Müür, & Koka, 2004; Koka & Hein, 2006).

Data analyses

Structural equation modeling (SEM) and confirmatory factor analyses (CFA) were conducted with LISREL 8.8 (Jöreskog, Sörbom, du Toit, & du Toit, 2001) using maximum likelihood estimation. In order to examine the hypothesized model, we followed Mulaik and Millsap's (2000) recommendations. Model fit was evaluated by examining the comparative fit index (CFI), non-normed fit index (NNFI), and root mean square error of approximation (RMSEA). Cut-off values greater than .95 for CFI and NNFI and values equal to or less than .08 for RMSEA were considered acceptable (Hu & Bentler, 1999).

Results

Analyses of the skewness and kurtosis values for the individual items revealed that not all data were normally distributed and violated assumptions of multivariate normality. Therefore the polychoric correlations and the asymptotic covariance matrices were used in subsequent CFA and SEM analyses.[1] The CFA model, which assumed discriminant validity among the study constructs, was conducted with five latent factors and 48 items. The resulting model conformed to published criteria for good fit (χ^2 (1070) = 1767.23; $p < .001$; $\chi^2/df = 1.65$; CFI = .99; NNFI = .99; RMSEA = .042; 90% CI of RMSEA = .039–.046) and was superior in fit to the congeneric model in which all items loaded on a single factor and did not assume discriminant validity (χ^2 (1080) = 6856.56; $p < .001$; $\chi^2/df = 6.35$; CFI = .83; NNFI = .82; RMSEA = .12; 90% CI of RMSEA = .12–.13).[2] Descriptive statistics and correlations among the study variables are presented in Table 1. The factor intercorrelations from the measurement CFA model showed moderate, positive relationships between all study variables.

After the adequacy of the discriminant validity was confirmed, the hypothesized structural model (Fig. 1) was tested. The SEM indicated that the proposed model satisfied multiple criteria of good fit (χ^2 (1071) = 1800.33; $p < .001$; $\chi^2/df = 1.68$; CFI = .98; NNFI = .98; RMSEA = .043; 90% CI of RMSEA = .040–.047). Focusing on the overall time-lagged model, task-involving peer motivational climate and autonomy support from the coach demonstrated autoregression over time. This tests the relative change in the distribution of the measured variables over time. A relatively high degree of stability was observed for both task-involving peer motivational climate ($\beta = .51$, confidence interval (CI_{95}) = .38–.64, $p < .01$) and perceived autonomy support from the coach ($\beta = .58$, $CI_{95} = .44–.73$, $p < .01$) from Time 1 to Time 2. In addition, the effects of task-involving peer climate (standardized coefficient = .37, $CI_{95} = .21–.52$, $p < .01$) and perceived autonomy support from the coach (standardized coefficient = .30, $CI_{95} = .14–.45$, $p < .01$) at Time 2 significantly predicted youth

[1] The results of the CFA produced high correlations between three dimensions of task-involving peer climate at Time 1 and also between the three types of intrinsic motivation at Time 2 (coefficients ranging from .79 to .93). Therefore, average of scores for the Effort, Improvement, and Relatedness/Support scales from the PeerMCYSQ inventory (Ntoumanis & Vazou, 2005) were used to indicate the task-involving peer motivational climate latent factor in the CFA and SEM. In addition, the mean scale scores of intrinsic motivation to experience stimulation, to accomplish, and to know were set to form a latent intrinsic motivation factor.

[2] The congeneric model did not assume discriminant validity because it forced the indicators of all items to load on the same factor (Mulaik & Millsap, 2000). The factor loadings and solution estimates for the CFA models are available upon request from the first author.

Table 1
Descriptive statistics, factor correlation among the study variables.

Variables	Mean	SD	1	2	3	4
1. Task-involving peer motivational climate, Time 1	5.25	.87				
2. Task-involving peer motivational climate, Time 2	5.22	.80	.59*			
3. Perceived autonomy support from the coach, Time 1	5.40	1.07	.50*	.38*		
4. Perceived autonomy support from the coach, Time 2	5.27	1.06	.32*	.55*	.59*	
5. Intrinsic motivation, Time 2	5.64	.91	.37*	.54*	.37*	.51*

Note. Variables with consequent "Time 1" assessed during the first data collection. Variables with consequent "Time 2" assessed during the second data collection, one-year later. *$p < .01$.

athletes' intrinsic motivation. In contrast, the direct effect of the climate and autonomy support measures at Time 1 on intrinsic motivation were not significant. Cross-lagged relationships indicated to the existence of significant path from perceived autonomy support from the coach to task-involving peer motivational climate (standardized coefficient = .16, CI_{95} = .03–.30, $p < .01$) but not vice versa. Consequently, autonomy support from the coach is not affected by previous task-involving peer climate in sport context. Overall, the autonomy support from the coach at Time 1 accounted for 37% of the task-involving peer climate at Time 2. In addition, the perceived social factors at Time 1 and Time 2 accounted for 34% of the variance in intrinsic motivation.

Longitudinal effects

To test the longitudinal direct effect of perceived autonomy support from the coach and task-involving peer climate at Time 1 on intrinsic motivation at Time 2, both effects of social factors at Time 2 on intrinsic motivation were fixed to zero. If the direct longitudinal coefficient in this restricted model was significant, then we have confirmation of the longitudinal direct effect of perceived autonomy support from the coach and task-involving peer climate on intrinsic motivation in youth sport. Change in the longitudinal direct path coefficient as a result of fixing the effect of measured social factors at Time 2 on intrinsic motivation is shown in parenthesis in Fig. 1. The results showed that both perceived autonomy support from the coach (standardized coefficient = .31, CI_{95} = .16–.45, $p < .01$) and task-involving peer climate (standardized coefficient = .24, CI_{95} = .11–.38, $p < .01$) at Time 1 had significant longitudinal direct effects on intrinsic motivation. This restricted model indicated an acceptable fit with the data (χ^2 (1072) = 1805.73; $p < .001$; $\chi^2/df = 1.68$; CFI = .98; NNFI = .98; RMSEA = .045; 90% CI of RMSEA = .041–.048). In addition, there was a significant total ($\beta = .25$, $p < .01$) and indirect effect ($\beta = .20$, $p < .01$) of task-involving peer motivational climate on intrinsic motivation. Results also revealed a significant total ($\beta = .27$, $p < .01$) and indirect ($\beta = .23$, $p < .01$) effect of autonomy support from the coach on intrinsic motivation.

Discussion

The purpose of this study was to evaluate the temporal stability of perceived autonomy support from the coach and task-involving peer motivational climate and the cross-lagged relationships between these motivational factors on intrinsic motivation toward sport a year later. The research advances thinking on motivation and self-regulation of sport activity by examining the stability and directionality of these key motivational variables from multiple theoretical perspectives (Chatzisarantis & Hagger, 2007; Hagger, 2009, 2010; Hagger, Wood, Stiff, & Chatzisarantis, 2010). Findings suggest a good fit of the proposed model with the data. Athletes' perception of autonomy support from the coach and task-involving peer climate demonstrated equal stability over the one-year period. This finding is consistent with Sage and Kavussanu's (2008) research that reported moderate stability in perceived motivational climates over a competitive football season. Longitudinal studies of peer motivational climate variables are scarce. There is one study to date by Ntoumanis and Vazou (2005) that also presented acceptable temporal stability over a period of four weeks for improvement, relatedness/support, and effort factors of task-involving peer climate. The temporal stability for task-involving peer climate in our study was comparable to these previous findings albeit moderate in

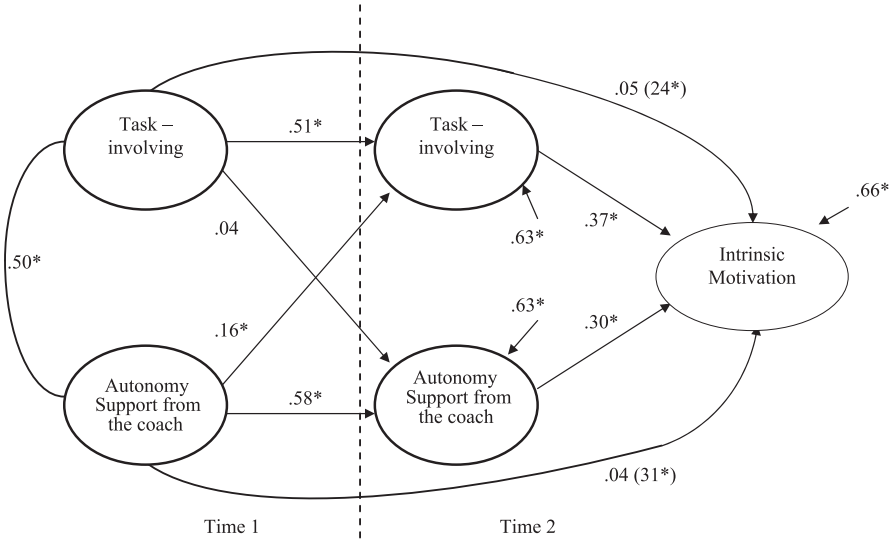

Fig. 1. Structural equation model illustrating relationships among the perceptions of task-involving motivational climate of peers, perceived autonomy support from the coach, and intrinsic motivation variables in sport over a year. Notes: task-involving – perceived task-involving motivational climate of peers; autonomy support from the coach – perceived autonomy support from the coach; change in the direct longitudinal path coefficient of task-involving peer motivational climate and autonomy support from the coach at Time 1 to intrinsic motivation at Time 2 after fixing to zero the effects of measured social factors at Time 2 on intrinsic motivation in parenthesis. *$p < .01$.

strength. It is important to emphasize that longitudinal studies typically reveal that relationship strength is inversely proportional to the time lag in the measurement of the constructs (Gollob & Reichardt, 1987; Hagger et al., 2001). Overall, the present study provided evidence to fill the gap in the literature highlighted by Ntoumanis and Vazou (2005), that task-involving peer climate perceptions do not change substantially over a training year and may serve as a starting point for future longitudinal studies investigating the temporal stability of motivational constructs related to self-regulation and motivation of sport involvement over time (Hagger, 2010; Hagger et al., 2010).

Consistent with expectations, while having moderate stability over training year, perceived autonomy support from the coach and task-involving peer climate at Time 2 had significant positive effects on athletes' intrinsic motivation toward sport participation. The results of the present study are consistent with the basic tenets of SDT, suggesting that individuals' motivation toward activity is enhanced when participants are given more control and choice and are encouraged to be task-involved by significant others within the activity environment (Deci & Ryan, 1985). In addition, the alternative longitudinal structural model supported a longitudinal direct effect of autonomy support from the coach and task-involving peer climate at Time 1 on later intrinsic motivation in sport. The results seems to suggest that the influence of previous autonomy support from the coach and task-involving peer climate (Time 1) on later intrinsic motivation was best explained via the same motivational factors at Time 2.

Also noteworthy is the unique cross-lagged relationship from perceived autonomy support from the coach at Time 1 to task-involving peer motivational climate at Time 2, but not vice versa. Previous studies have shown coaches' autonomy-supportive behavior to play a central role in shaping youth athletes' experience of sport (e.g., Mageau & Vallerand, 2003). In addition, the present finding is parallel to the results from research conducted by Sage and Kavussanu (2008). In their study using cross-lagged analyses they found that prosocial behavior at the beginning of the youth football season positively predicted task-involving climate at the end of the season. The present findings suggest that in the context of sport participation where the athletes perceive their coach to consider their perspective and provide choice, youth athletes report closer and mutually respectful relationships with their teammates. It appears that building athletes' perceptions of autonomy support from the coach can enhance perceptions of peer task-involving motivational climate. Therefore, we can argue that even a modest level of autonomy support from the coach may result in changes in peer relationships with respect to each other. However, additional experimental studies are required to substantiate any bi-directional relationships between perceived coach behavior and motivational climate variables.

In sum, the findings suggest that, over the training year, athletes showed moderate stability in perceptions of autonomy support from the coach and task-involving peer motivational climate. Results also illustrate the value of previous autonomy support from the coach in affecting later task-involving peer climate and that both motivational components from self-determination theory can enhance athletes' intrinsic motivation toward sport participation. Thus, the present study extends a growing body of evidence linking youth sport motivation and the impact of the perceived environment supported by peers and coach in shaping athletes' experience in sport. In terms of practical recommendations based on current results, it is important that coaches should aim to promote a task-involving peer climate and encourage collaboration, learning, and effort among their athletes, which will have an impact on athletes' intrinsic motivation to participate in sport in the long run.

However, the study is not without limitations. Although previous studies have provided evidence that autonomy support from parents also has an important role in forming motivational climate and motivation in physical activity (Hagger et al., 2009), the present research did not investigate the effect of autonomy support from parents over time. This means that we were unable to establish whether this form of autonomy support was also pervasive in affecting motivational climate and intrinsic motivation. Future work is needed to explore how parents' behavior influences peer interactions and the longitudinal effect of parental support on peer motivational climate and intrinsic motivation.

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