

Motivational beliefs and subjective effort in adolescent athletes

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The study explored motivational antecedents of subjective effort in adolescent competitive athletes using an integrative approach inspired by the expectancy-value model of achievement motivation as the theoretical framework. In total, 1019 athletes (mean age of 16.5 years) who engaged in various sports from all regions of the Czech Republic participated in the large-scale questionnaire study. We hypothesized two groups of motivational variables as predictors of subjective effort: 1) sport motivation and achievement goal orientations, representing athletes' valuation of sport participation, and 2) self-efficacy and mindset, representing the athletes' expectancies of success. We analyzed the questionnaire data within a multiple regression model. The model was significant ($F(19, 990) = 19.788, p < .001$) and explained 27.5 % of the variance in subjective effort the participants reported exerting in their practice. In the model, subjective effort was significantly predicted by integrated regulation ($\beta = .156$), amotivation ($\beta = -.143$), task orientation ($\beta = .117$), and self-efficacy, both directly ($\beta = .243$) and in interaction with inborn talent beliefs ($\beta = -.129$). These results suggest that the subjective effort of adolescent athletes may be associated with sport-related identity rather than experiences of enjoyment or external rewards and with a focus on skills development rather than on competition. The results provide further evidence for a complex approach to athletes' motivation, suggesting that motivational variables related to task value as well as expectancies of success should be taken into account to create motivational climates supporting effortful practice and subsequent athletic outcomes of adolescent athletes.

KEY WORDS: Achievement motivation, Achievement goal orientation, Adolescent athletes, Deliberate practice, Social cognition, Self-determination, Subjective effort.

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Introduction

Adaptive achievement motivation represents a key personal resource that determines successful development in various domains, including sports (Elliot, Dweck, & Yeager, 2017; Mudrak, Zabrodská, & Machovcova, 2020). Motivational characteristics predict psychological outcomes that shape the development of athletic performance, both positive, such as athletes' engagement (Hodge, Lonsdale, & Jackson, 2009) or passion for sports (Vallerand & Miquelon, 2007), as well as negative, including burnout (Gustafsson et al., 2008; Lemyre et al., 2008) or a decision to drop out (Boiché & Sarrazin, 2009; Calvo et al., 2010; Fraser-Thomas, Cote & Deakin, 2008). Importantly, achievement motivation relates to athletes' effort, i.e., a key component of effective athletic practice (Baker & Young, 2014). Studies that explored relationships between motivational variables and perceived effort incorporated perspectives of the self-determination theory (Montenheiro et al., 2018; Pope & Wilson, 2012), achievement goal theory (Sarazin, 2002) and social-cognitive theory (Hutchinson et al., 2008), relating the higher levels of effort to autonomous motivation and satisfaction of basic psychological needs (Montenheiro et al., 2018; Pope & Wilson, 2012), task orientation (Sarrazin, 2002) or higher self-efficacy (Hutchinson et al., 2008).

A fruitful conceptualization of the relationships between motivational processes and effort exerted in practice has been provided within the framework of deliberate practice theory (Baker & Young, 2014; Ericsson & Charness, 1994; Ericsson, Hoffman, Kozbelt, & Williams, 2018). From this perspective, a high level of effort is an integral part of "deliberate practice", i.e., arguably the most effective form of preparation that can be defined as "an effortful activity motivated by the goal of improving performance" (Ericsson & Charness, 1994, p. 738). The importance of deliberate practice for the successful development of competence has been extensively studied and argued for in various contexts, including sports (e.g., Baker & Young, 2014; Fort et al., 2015; Helsen et al. 1998; Starkes et al., 1996). Based on the definition, the authors argue that prolonged engagement in effortful practice stems from specific motivation, as it is, unlike play, not necessarily intrinsically motivating, and, unlike work, does not have to generate social and monetary rewards (Ericsson, Krampe, & Tesch-Romer, 1993, p. 368). While participation in deliberate practice accounts for a substantial portion of the variance in athletes' performance (Baker, Cote, & Deakin, 2005; Macnamara, Moreau, & Hambrick, 2016; Vink, Raudsepp, & Kais, 2015), recent studies and meta-analyses have suggested that a complex approach focusing on interactions between deliberate practice and other factors, including motivational factors, could better capture the process related to the development of

athletic performance (Baker, Cote & Deakin, 2005; Macnamara, Moreau & Hambrick, 2016; Vink, Raudsepp, & Kais, 2015).

Furthermore, to understand the links between achievement motivation, effort exerted in practice and athletic performance, we need to incorporate a developmental perspective. In a classic study, Bloom (1985) proposed a three-stage model of the development of high achievement. In the context of athletic development, these stages were later referred to as the “sampling years”, “specializing years”, and “investment years” (Baker & Cote, 2006; Cote, 1999; Cote, Baker, & Abernethy, 2003), each stage characteristic by a different approach to effective practice. Elite athletes described that during the early “sampling years”, they were generally engaged in a large number of semistructured playful activities, or “deliberate play”, rather than structured and effortful deliberate practice (Cote, 1999; Cote, Baker, & Abernethy, 2003). Early specialization and large amounts of deliberate practice in this initial stage of athletic development were even related to subsequent dropout from competitive sports (Baker, 2003; Mudrak, 2010; Crane & Temple, 2015; Frazer-Thomas, Cote, & Deakin, 2008; Wall & Cote, 2008). The importance of effort and effortful deliberate practice for optimal athletic development increases during adolescence, i.e., in the “specializing” and “investment” years (Baker & Cote, 2006; Cote, 1999; Cote, Baker & Abernethy, 2003). The shift from playful to effortful practice during adolescence appears to be a critical step towards athletic competence, as adolescents generally reduce their participation in physical activity (Dumith, Gigante, & Domingues, 2011), with a large portion of adolescent athletes dropping out of competitive sports during this developmental period (Mudrak, 2010; Frazer-Thomas, Cote & Deakin, 2008; Wylleman, Alferman, & Lavallee, 2004).

Theoretical Framework

On this basis, we consider subjective effort to be a key component of high-quality athletic practice leading to successful athletic development through and beyond adolescence (Baker & Cote, 2006). The main aim of our study is to further understand the ways in which motivational processes relate to subjective effort and, consequently, to the quality of athletic practice (Crozier & Spink, 2017; Vink, Raudsepp & Kais, 2015) during this developmental stage. As a theoretical framework, we adopted an integrative approach based on the expectancy-value model of achievement motivation (Eccles, 2005; Eccles & Harold, 1991; Mudrak et al., 2019; Wigfield & Cambria, 2010; Wigfield & Eccles, 2000). Within this integrative framework, we expect that achievement motivation variables can be divided into two general

categories, depending on how they relate to one of the two “motivational questions”: 1) “Can I do the activity?” and 2) “Do I want to do the activity and why?” (Eccles, 2005). From this perspective, developing individuals need to believe that they can achieve their activity-related goals and value the activity or its outcomes (Eccles, 2005; Eccles & Harold, 1991; Wigfield & Cambria, 2010; Wigfield & Eccles, 2000).

To conceptualize these two broad motivational dimensions, we integrated several theoretical approaches in our study. First, we assumed that a positive answer to the first motivational question (“Can I do the activity?”) partially stems from athletes’ self-efficacy, i.e., task-specific beliefs about a capability to successfully achieve expected outcomes (Bandura, 1997). Positive effects of a high level of self-efficacy on various performance-related variables in the context of sports, including subjective effort, have been well documented (Bandura, 1997; Hutchinson et al., 2008; Moritz et al., 2000; McAuley & Blissmer, 2000). While self-efficacy conceptualizes the perceived level of the capability to achieve expected outcomes, the concept of mindset focuses on beliefs about the nature of such capability (Dweck, 2000, 2010). From this perspective, people may adopt a “growth mindset” in which they perceive their capabilities as malleable qualities or a “fixed mindset” in which they perceive their capabilities as stable, relatively unchangeable entities. Furthermore, self-efficacy and mindset appear to interact in how they relate to achievement development; within these interactions, especially the “fixed mindset” and low level of self-efficacy may negatively affect performance-related outcomes (Dweck, 2000).

Regarding the second motivational question (“Do I want to do the activity and why?”), different conceptualizations of the reasons why adolescent athletes value different aspects of their sport participation have been provided within the frameworks of self-determination theory (Mallet et al., 2007; Ryan & Deci, 2000; Vallerand & Losier, 1999) and achievement goal theory (Mallet et al., 2007; Ryan & Deci, 2000; Vallerand & Losier, 1999). Self-determination theory persuasively documents that more “self-determined” sources of motivation stemming from enjoyment (“intrinsic motivation”), identity (“integrated regulation”) or development of competence (“identified regulation”) are associated in athletes with positive outcomes, including higher levels of effort and engagement and lower levels of burnout and drop-out. Opposite relationships were found on the other side of the “self-determination continuum”, in which the activity is performed to maintain a sense of self-worth (“introjected regulation”), obtain external incentives and meet expectations of other people (“external regulation”), or the perceived control over the activity is missing altogether (“amotivation”). Relatedly, the achievement goal orientation framework suggests that athletes

give various subjective preferences to goals related to self-development (“task orientation”) or outperform others (“ego orientation”), with “task orientation” generally relating to more positive outcomes and well-being (Gustafsson, DeFreese & Madigan, 2017; Kavussanu & Roberts, 2001; Nichols, 1984; Roberts, et al. 1998).

Aims Of The Study

Therefore, we integrated the motivational concepts introduced above into an integrative model of achievement motivation (see Figure 1) that we used as a theoretical background based on which we formulated hypotheses tested in our study. In this way, we aimed to explore the complex relationships between motivational variables related to the perceived value of sport participation, expectancies of success, and subjective effort. Furthermore, we expected our results to bring research evidence to the hypotheses stemming from the deliberate practice theory about possible motivational facilitators and constraints of effortful practice.

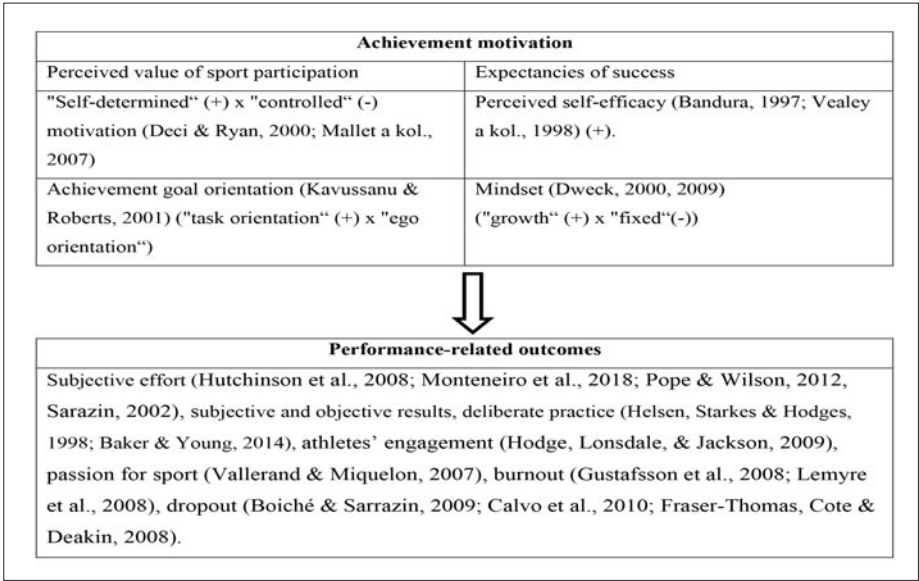


Fig. 1. - Theoretical framework – integrative model of achievement motivation. +/- refer to expected direction of relationships.

Based on this framework, we hypothesized the following relationships between motivational variables and perceived effort that we tested in our study. 1) Higher self-efficacy and a “growth” mindset (i.e., a belief that one’s capabilities can be developed by practice, Dweck, 2010) are positively related to subjective effort, whereas a “fixed” mindset (i.e., a belief that one’s capabilities are a stable entity that does not respond to training, Dweck, 2010) is negatively related to subjective effort. 2) Furthermore, the negative effect of a “fixed” mindset would be moderated by self-efficacy (i.e., the effect will be stronger when self-efficacy is low, Dweck, 2010). 3) A task orientation is more strongly related to subjective effort than is an ego orientation, especially in activities that are perceived as effortful (Duda, 1996; Duda & Ntoumanis, 2005; Newton & Duda, 1993; Sarazin et al., 2002). 4) More self-determined forms of motivation are positively related to subjective effort, whereas less self-determined forms of motivation (i.e., introjected regulation, extrinsic motivation and amotivation) are negatively related to subjective effort (Vallerand, 2007). 5) Based on deliberate practice theory (Ericsson, Krampe, & Tesch-Romer, 1993), we hypothesize further that subjective effort relates predominantly to “introjected” and “identified” forms of regulation rather than intrinsic motivation. 6) Based on the developmental model of athletes’ engagement in deliberate practice/play (Baker & Cote, 2006; Cote, 1999; Cote, Baker, & Abernethy, 2003), we also expect that history of sport participation relates to subjective effort in adolescence, especially that earlier entry into competitive sport is negatively associated with subjective effort in adolescence.

Methods

DESIGN OF THE STUDY

The present paper is based on a large-scale questionnaire study focusing on sport motivation and risk behavior in Czech adolescents (e.g., Mudrak et al., 2016, 2018); the study was conducted at Czech elementary and high schools and sport institutions in 2014-2015. In total, 60 schools and 7 sport associations participated in the research. Based on the preferences of the participating institutions, the questionnaires were administered either on paper or through identical electronic questionnaires. The questionnaires were administered at schools or training camps of sport associations by the research team members and research assistants, who were PhD students of the Faculty of Physical Education and Sport, Charles University. Before data collection began, the research was approved by the ethics committee of the Faculty of Physical Education and Sport, Charles University. Participation was voluntary and anonymous, and the questionnaire was constructed in a way that prevented the identification of individual schools or respondents.

SAMPLE

In total, 1019 adolescent athletes involved in competitive sports were included in the study. The research sample represented a subsample selected from 2851 adolescents who fully

completed our questionnaire battery, as we excluded participants who reported only recreational or no involvement in sports. On average, the participants were 16.5 years old ($SD=1.9$), predominantly male (64.5%), coming from all regions of the Czech Republic. They were engaged in various sports, most frequently soccer (23% of the sample), floorball (11.5%), track and field (8.3%), canoeing (7.9%), dance (4.3%), volleyball (4.2%), combat sports (4.1%), and others including basketball, hockey, handball, triathlon, tennis, or swimming. The description of the sample is provided in Tables I and II.

MEASURES

In the first part of the questionnaire, the respondents were asked about demographic variables such as gender, age, family variables, and history of sport participation (see Table I). In the following section, participants were asked to estimate the effort they put into their sports as a percentage ("Estimate the effort you put into preparation for your sport as a percentage; 0 % means 'I don't try at all', and 100 % means 'I put everything in my sport'"). To assess self-efficacy beliefs related to sport preparation (Bandura, 2006), we included a measure in which the participants were asked to estimate their beliefs in their capabilities to achieve success in competitive sports ("Estimate your predisposition to succeed in competitive sports as a percentage; 0 % means 'I

TABLE I
Demographic Variables (n=1019)

Gender	Male Female	64.5% 35.5%
Fathers' education	Elementary Vocational Lower secondary Higher secondary College/university	1.1% 22.2% 12.5% 40.0% 23.9%
Mothers' education	Elementary Vocational Lower secondary Higher secondary College/university	1.5% 15.7% 8.0% 49.4% 25.4%
Fathers' involvement in sports	Not involved Recreational Competitive Elite	10.9% 31.6% 49.0% 8.5%
Mothers' involvement in sports	Not involved Recreational Competitive Elite	22.7% 46.7% 26.3% 4.4%
Economic status	Poor Rather poor Rather well-off Well-off	1.0% 22.1% 68.6% 8.2%
Placement at a competition	None Local level Regional level National level International level	5.4% 14.5% 34.4% 37.8% 7.8%

TABLE II
Descriptive Statistics And Correlations

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.
1. Gender (1, male; 2, female)																			
2. Age	.114																		
3. Parents education																			
4. Parents – involvement in sports			.181																
5. Economic status			.205	.138															
6. Comencement of sporting activity	.114	.109		.133															
7. First participation in competition	.144	.125		.179	.808														
8. Placement in a competition	.123	.194	.164		.192	.294													
9. Amotivation																			
10. External r.	.127				.99		.114	.259											
11. Introjected r.					.115		.117	.559											
12. Identified r.							.198	.159	.535	.607									
13. Integrated r.	.123							.460	.570	.598									
14. Intrinsic m.					.97			.103	.294	.638	.659								
15. Task o.					.110				.315	.328	.336	.396							
16. Ego o.	.126	.169	.110	.100	.125		.98	.154	.274	.212	.264	.237	.341						
17. Self-efficacy					.129		.274	.201	.104	.153	.221	.180	.112						
18. Belief in inborn talent							.074	.130	.182				.229						
19. Perceived effort					.124		.229	.213	.101	.205	.230	.317	.247	.232	.134	.350	.098		
M (SD)	1.35 (.47)	16.50 (1.90)	3.73 (.91)	2.33 (.63)	2.84 (.56)	7.65 (3.04)	8.68 (2.91)	3.28 (.99)	1.73 (.81)	2.65 (.94)	3.32 (.87)	3.58 (.94)	3.45 (.85)	4.33 (.60)	3.66 (.80)	61.64 (24.06)	55.40 (24.00)	86.68 (16.93)	

Reported correlations are significant at the p<.001 level. Nonsignificant correlations were not included.

don't have any predispositions to succeed in competitive sports', and 100 % means 'I have everything I need to succeed in competitive sports'). Furthermore, we included a measure assessing participants' mindsets (Dweck, 2000, 2010), i.e., beliefs about whether success in competitive sports is determined predominantly by inborn talent (a "fixed" mindset) or by practice (a "growth" mindset) ("Estimate the degree to which you consider success in sports to be determined by inborn talent as a percentage; 0 % means 'inborn talent is not important at all; success in competitive sports is determined only by practice', and 100 % means 'success in competitive sports is completely determined by inborn talent'").

To assess motivational constructs related to the value of sport participation, we used scales from two questionnaires: the Perception of Success Questionnaire (PSQ) (Roberts et al., 1998) and the Sport Motivation Scale-6 (SMS-6) (Mallett et al., 2007). Both questionnaires were translated from their original version using a standard back-translation procedure. The questionnaires were translated from English by a professional translator, revised by the authors of the study, and back-translated by another professional translator to verify the accuracy of the translation. The quality of the back-translation (i.e., the similarity between both English versions) was evaluated by a native speaker, an expert in the field of sport psychology.

The PSQ measures achievement goal orientations with a 5-point Likert scale that respondents use to indicate which types of sport-related outcomes are perceived as "success". The PSQ is based on a two-dimensional approach to achievement goal orientations and distinguishes between an experience of success stemming from mastering a task ("task") and success in comparison with others ("ego"). Respondents indicate on a scale ranging from 1 ("strongly disagree") to 5 ("strongly agree") the sports in which they perceive themselves to be most successful. Both these dimensions are measured by six items. An example of a "task" item is "When playing sport, I feel most successful when I really improve", and an example of an "ego" item is "When playing sport, I feel most successful when I am the best". The "task" and "ego" dimensions are computed as the means of all corresponding items. Additionally, the PSQ showed good reliability in our study (Cronbach's alphas = .857 (complete questionnaire), .846 ("task" dimension), .865 ("ego dimension")).

To determine the reasons why respondents participated in sports, we employed motivational constructs from self-determination theory (Mallett et al., 2007). Specifically, we used the dimensions of intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation from the SMS-6 (Mallett et al., 2007), which is a revised version of the Sport Motivation Scale (Pelletier et al., 1995). Each of these dimensions was measured by four items with a 5-point Likert scale ranging from 1 ("Does not correspond at all") to 5 ("Corresponds completely"). Respondents were prompted by the statement, "Using the scale below, please indicate to what extent each of the following items corresponds to one of the reasons for which you are presently practicing your sport", based on which the respondents indicated their reasons for their sport participation. The items used to measure each dimension included the following: "For the excitement I feel when I am really involved in the activity" (intrinsic motivation), "Because participation in my sport is an integral part of my life" (integrated regulation), "Because training hard will improve my performance" (identified regulation), "Because I must do sports to feel good about myself" (introjected regulation), "Because it allows me to be well regarded by people I know" (external regulation), and "I don't know anymore; I have the impression of being incapable of succeeding in this sport" (amotivation). The SMS-6 questionnaire showed good psychometric properties (Cronbach's alphas = .888 (complete questionnaire), .769 (intrinsic motivation), .829 (integrated regulation), .759 (identified regulation), .689 (introjected regulation), .786 (external regulation), .743 (amotivation)) and has been widely used in sport psychology research (Mallett et al. 2007).

Analysis

In the analysis, we used the statistical software SPSS 20, in which we computed the descriptive statistics, correlations (Spearman correlation coef-

ficient), and multiple regression model including demographic variables, history of sport participation, motivational variables related to the value of sport participation (including measures of controlled/self-determined sport motivation and task/ego achievement goal orientations), and expectancies of success (including self-efficacy, mindset, and the interaction between these two variables). As we included only data from complete questionnaires, there were no missing values. We did not identify any outliers in the data. All the reported regression coefficients from our analyses were standardized, i.e., the variances of all variables were considered equal to one, and the regression coefficients indicated the portion of standard deviation by which the dependent variable changed per standard deviation change in the predictor variable.

Results

We observed weak to moderate correlations between the variables included in the models (see Table II), which mostly corresponded to our hypotheses. Subjective effort showed correlations with all included motivational variables that ranged from weak (.098 with belief in inborn talent and .101 with extrinsic regulation) to moderate (.317 with integrated regulation and .350 with self-efficacy). We also observed correlations between the variables related to expectancy of success and value of activity. Specifically, self-efficacy correlated with almost all other motivational variables, and belief in inborn talent correlated with external regulation and amotivation.

To obtain better insight into the ways in which the motivational variables are related to subjective effort, we explored the effects of all these variables in a multiple regression model. In Table III, we report the results of the regression model, including individual effects of the demographic variables, history of sport participation, value of sport participation, and expectancies of success. The results of the multiple linear regression showed a collective significant effect between these variables on subjective effort ($F(19, 990) = 19.788, p < .001$). In the model, we observed significant effects for motivational variables that partially corresponded to our hypotheses. Subjective effort was negatively related to amotivation, i.e., the least self-determined type of sport motivation ($\beta = -.143$), and to integrated regulation ($\beta = .156$). These findings indicate that the athletes who reported higher subjec-

TABLE III
Predictors Of Subjective Effort In Adolescent Athletes (F(19, 990) = 19.788, $p < .001$)

Gender (1, male; 2, female)	
Age	-.069*
Parents' education	
Parents' involvement in sports	
Economic status	.075**
Commencement of sporting activity	
First participation in competition	
Placement in a competition	.139***
Amotivation	-.143***
External regulation	
Introjected regulation	
Identified regulation	
Integrated regulation	.156***
Intrinsic motivation	
Task orientation	.117***
Ego orientation	
Self-efficacy	.234***
Belief in inborn talent	
Interaction of self-efficacy x inborn talent	-.129***
Variance explained (R^2)	.275

* $p < .05$, ** $p < .01$, *** $p < .001$. Nonsignificant correlations were not included.

tive effort engaged in their sport because they perceived such engagement stemming from their identities. However, they did not necessarily participate in their sport more because of enjoyment (i.e., intrinsic motivation), higher psychological rewards (identified regulation), maintaining the sense of self-worth (introjected regulation) or extrinsic rewards (external regulation), as there was no significant effect of these sport motivation variables in the model. Furthermore, subjective effort was significantly related to task orientation (i.e., to a preference for goals related to self-development) ($\beta = .117$) but not to ego orientation (i.e., to a preference for goals related to outperforming others).

Regarding the expectancies of success, we observed a significant effect of self-efficacy on subjective effort within the model ($\beta = .234$). In addition, we observed an effect of interaction between self-efficacy and mindset, i.e., subjective effort appeared to be lower in participants with low self-efficacy and "fixed" mindsets ($\beta = -.129$). With regard to the history of sport participation, neither the age at which the athletes

commenced their sporting activities nor the age at which they started participating in competitions related to subjective effort. However, we observed a significant effect of previous success in competition ($\beta=.139$). Overall, the regression model explained 27.5 % of the variance in subjective effort reported by the participants.

Discussion

In summary, subjective effort was higher in adolescent athletes who reported higher self-efficacy (i.e., who expressed beliefs that they were predisposed to succeed in competitive sports) or who reported lower self-efficacy but “growth” mindsets (i.e., who believed that success in sports is more determined by practice than by inborn talent), who focused on self-development (i.e., reported higher task orientation), and who engaged in their sports because they perceived them as to be part of their identities (i.e., reported higher levels of integrated regulation). On the other hand, subjective effort was not related to a preference for goals aimed at winning and outperforming others (i.e., ego orientation), to more extrinsic forms of motivation (such as doing a sport for recognition from others or a sense of self-worth) or to intrinsic motivation (i.e., doing a sport for an experience of enjoyment).

In this analysis, we strove to test the somewhat contradictory assumptions regarding the key motives for participation in effortful practice that stem from deliberate practice theory (Ericsson, Hoffman, Kozbelt, & Williams, 2018; Fort et al., 2015) and self-determination theory (Mallet et al., 2007; Ryan & Deci, 2017). Our results partially support our hypothesis based on the deliberate practice theory that sport-related identity and not necessarily intrinsic enjoyment motivate effortful practice. Based on self-determination theory, an activity is perceived to be intrinsically motivating when it satisfies the basic needs for competence, relatedness, and autonomy (Ryan & Deci, 2017). We may argue that the needs for autonomy and relatedness may not be fully satisfied by activities that require high levels of effort in a relatively constrained context of competitive sports. Furthermore, experience of practice as effortful partially stems from making and correcting mistakes (Ericsson & Charness, 1994; Ericsson, Hoffman,

Kozbelt, & Williams, 2018). While regular mistakes may provide feedback that is conducive to further learning, they may also disturb psychological processes leading to an “autotelic” state during which skills and challenges are perceived to be in harmony and result in experiences of intrinsic enjoyment (Swann et al., 2012). Additionally, effortful athletic preparation is often repetitive and does not always include “playful” aspects that are characteristic of an optimal experience, for example, that occur during competition when favorable conditions, such as the challenge-skills balance, clear goals, and unambiguous feedback, are present (Swan et al., 2012).

We also observed that a “task” orientation towards self-improvement is associated more strongly with perceived effort than an “ego” orientation towards winning and outperforming others. This may be because task-oriented athletes perceive different purposes of sport participation, including beliefs that they should “try their best”, while ego-oriented athletes often perceive their sport participation as a way to enhance their social status, which may not be as effective in supporting long-term effortful engagement in athletic practice (Cetinkalp & Turksoy, 2011; Duda, 1989). In general, athletes’ task orientation is more strongly associated with process goals than outcome goals; in this way, a task orientation may provide stronger incentives to exert higher effort, especially when athletes encounter obstacles during their preparation (Duda, 1996; Kavussanu et al., 2011). On the other hand, an ego orientation has been related to less self-determined forms of motivation (Ntoumanis, 2001), which, as we discussed above, are generally less conducive to engagement in sport (Vallerand, 2007; Vallerand & Losier, 1999). An ego orientation has also been associated with lower moral functioning, such as cheating or doping (Kavussanu & Ntoumanis, 2003; Mudrak et al., 2018), through which athletes implicitly endorse behaviors aimed at high-level athletic outcomes without the corresponding effort.

Our results support the hypothesis that successful practitioners believe that they can succeed in reaching their achievement goals (Eccles, 2005; Wigfield & Eccles, 2000; Wigfield & Cambria, 2010; Bandura, 1997; Dweck, 2010). In the regression model, the relationship between our measure of self-efficacy and subjective effort was the strongest of all the relationships with the included motivational variables, which is in line with other studies that found self-efficacy to be

a key predictor of effortful sport participation (McAuley & Blisner, 2000; Pender et al., 2002; Hutchinson et al., 2008). Some authors have argued that the effects of self-efficacy are strongest during the initiation phase of exercise and less important during the maintenance phase, which tends to be more habitual (McAuley & Blisner, 2000). However, self-efficacy represents an important prerequisite of ongoing participation in effortful physical activity, which is most effective in terms of ongoing development (Pender et al., 2002; Hutchinson et al., 2008). Self-efficacy may also partially mediate the relationship between mastery experiences, such as previous success in a competition, and an increasing level of effort (Bandura, 1997; Hutchinson et al., 2008). Our results also support the hypothesis that the importance of a “growth” mindset increases in individuals who have not developed sufficient efficacy beliefs because the “growth” mindset provides them with a meaningful framework for encouraging effortful practice despite their current perceptions that their abilities are low or insufficient (Dweck, 2006).

All these findings have important implications regarding the development of adolescent athletes towards higher levels of athletic competence. In comparison to earlier stages of development, adolescence is generally a stage when individuals reduce their participation in sporting activities (Dumith et al., 2011), and a large portion of adolescent athletes tend to drop out from competitive sports for reasons such as lack of enjoyment, low perceptions of competence, injuries, social pressures, and changing priorities (Crane & Temple, 2015). Therefore, it is important to search for effective strategies that would enhance adolescents’ sporting effort and engagement. Based on our results, we may argue that a motivational climate and coaching practices that promote a focus on self-improvement and the development of an identification with sports may be especially effective in supporting the adherence and effort of adolescent athletes. We may add, based on our results, that such a motivational climate should include an explicit focus not only on why adolescent athletes engage in sports but also on whether they believe they can achieve their sport-related goals, as represented by their sport-related self-efficacy and mindset.

Our study has some limitations that should be considered. Most importantly, the study employed a cross-sectional design that limits causal interpretations of the proposed relationships. We based our

hypotheses on a review suggesting that the proposed direction of the relationships would be at least partially valid; however, it is necessary to acknowledge that these relationships may be bidirectional, and we must interpret our results with caution. Additionally, although we recruited a large number of respondents from all regions of the Czech Republic and the response rate was high, our sample differed in some attributes from the general population of Czech adolescents. However, we believe that the sample showed sufficient diversity for the performed regression analyses. We also used a self-report measure of effort that should be viewed as a subjective indicator of motivational strength rather than an objective measure of effort exerted on a specific task (cf. Sarazin et al., 2002). Furthermore, some of the variables in our study (subjective effort, self-efficacy, mindset) were measured by single-item measures. This presents a limitation regarding an estimation of the psychometric properties of these measures, although single-item measures have been considered acceptable alternatives to multiple-item measures in cases when they were used to measure global constructs and in situations in which respondents fatigue may be an issue, which was the case in our study (Gardner et al., 1998; Wanous & Reichers, 1996). Finally, because our model explained a moderate portion of the variance in subjective effort, other variables not included in our study may contribute equally or even more to explaining the subjective effort of adolescent athletes.

Conclusions

As the main findings, our study showed that the effort adolescent athletes experienced in their preparation was related to several key achievement motivation variables. Specifically, in our multiple regression model, subjective effort was predicted by integrated regulation, task achievement goal orientation, and self-efficacy, both directly and in interaction with mindset. In this way, we partially confirmed our hypotheses regarding the relationships between the subjective effort and achievement motivation variables related to the task value and expectancies of success. To summarize, participating adolescent athletes perceived themselves as exerting higher levels of effort when they reported higher identification with their sport, focused more on self-develop-

ment, believed that they could succeed in their sport or that their abilities could be developed by practice. Based on these results, we may argue that coaches should consider these motivational factors to develop motivational climates supportive of an optimal development of full athletic potential in adolescent athletes. Regarding future research directions, more studies should focus on the motivational antecedents of effort athletes exert during their practice, as effort remains a relatively underresearched motivational outcome with a potentially crucial impact on the successful development of athletic performance.

REFERENCES

- Appleton, P. R., Ntoumanis, N., Quested, E., Viladrich, C., & Duda, J. L. (2016). Initial validation of the coach-created Empowering and Disempowering Motivational Climate Questionnaire (EDMCQ-C). *Psychology of Sport and Exercise*, 22, 53-65. DOI: <https://doi.org/10.1016/j.psychsport.2015.05.008>
- Baker, J. (2003). Early specialization in youth sport. A requirement for adult expertise?. *High Ability Studies*, 14 (1), 85-94. DOI: 10.1080/13032000093526
- Baker, J., Côté, J., & Deakin, J. (2005). Expertise in ultra-endurance triathletes early sport involvement, training structure, and the theory of deliberate practice. *Journal of applied sport psychology*, 17(1), 64-78. DOI: <https://doi.org/10.1080/10413200590907577>
- Baker, J., & Côté, J. (2006). Shifting training requirements during athlete development: Deliberate practice, deliberate play and other sport involvement in the acquisition of sport expertise. In D. Hackfort & Tennenbaum, G. (Eds.) *Essential processes for attaining peak performance* (pp. 92-109). Oxford: Meyer & Meyer.
- Baker, J., & Young, B. (2014). 20 years later: deliberate practice and the development of expertise in sport. *International Review of Sport and Exercise Psychology*, 7(1), 135-157. DOI: <https://doi.org/10.1080/1750984X.2014.896024>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. London: Macmillan.
- Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.) *Self-efficacy beliefs of adolescents* (pp. 307-337). Greenwich: IAP.
- Bloom, B. S. (1985). *Developing talent in young people*. New York: Ballantine.
- Boiché, J. C., & Sarrazin, P. G. (2009). Proximal and distal factors associated with dropout versus maintained participation in organized sport. *Journal of sports science & medicine*, 8(1), 9.
- Calvo, T. G., Cervelló, E., Jiménez, R., Iglesias, D., & Murcia, J. A. M. (2010). Using self-determination theory to explain sport persistence and dropout in adolescent athletes. *The Spanish journal of psychology*, 13(2), 677-684.
- Cetinkalp, Z. K., & Turksoy, A. (2011). Goal orientation and self-efficacy as predictors of male adolescent soccer players' motivation to participate. *Social Behavior and Personality: an international journal*, 39(7), 925-934. DOI: <https://doi.org/10.2224/sbp.2011.39.7.925>
- Crozier, A. J., & Spink, K. S. (2017). Examining the effects of normative messages on perceived effort in sport. *The Sport Psychologist*, 31(1), 56-64. DOI: <https://doi.org/10.1123/tsp.2015-0097>
- Côté, J. (1999). The influence of the family in the development of talent in sport. *The sport psychologist*, 13(4), 395-417. DOI: <https://doi.org/10.1123/tsp.13.4.395>
- Côté, J., Baker, J., & Abernethy, B. (2003). From play to practice. In J. Starkes & K. A. Ericsson (Eds.). *Expert performance in sports: Advances in research on sport expertise* (pp. 89-113). Champaign: Human Kinetics.

- Crane, J., & Temple, V. (2015). A systematic review of dropout from organized sport among children and youth. *European physical education review*, 21(1), 114-131. DOI: <https://doi.org/10.1177/1356336X14555294>
- Chase, M. A., Feltz, D. L., & Lirgg, C. D. (2003). Sources of collective and individual efficacy of collegiate athletes. *International Journal of Sport and Exercise Psychology*, 1(2), 180-191. DOI: <https://doi.org/10.1080/1612197X.2003.9671711>
- Duda, J. L. (1989). Relationship between task and ego orientation and the perceived purpose of sport among high school athletes. *Journal of sport and exercise psychology*, 11(3), 318-335. DOI: <https://doi.org/10.1123/jsep.11.3.318>
- Duda, J. L. (1996). Maximizing motivation in sport and physical education among children and adolescents: The case for greater task involvement. *Quest*, 48(3), 290-302. DOI: <https://doi.org/10.1080/00336297.1996.10484198>
- Duda, J. L. (2013). The conceptual and empirical foundations of Empowering Coaching™: Setting the stage for the PAPA project. *International Journal of Sport and Exercise Psychology*, 11(4), 311-318. DOI: <https://doi.org/10.1080/1612197X.2013.839414>
- Duda, J. L., & Ntoumanis, N. (2005). After-school sport for children: Implications of a task-involving motivational climate. In J. L. Mahoney, R. W. Larson & J. S. Eccles (Eds.). *Organized activities as contexts of development: Extracurricular activities, after school and community programs* (pp. 311-330). Mahwah, NJ: Erlbaum.
- Dumith, S. C., Gigante, D. P., Domingues, M. R., & Kohl, H. W. (2011). Physical activity change during adolescence: a systematic review and a pooled analysis. *International journal of epidemiology*, 40(3), 685-698. DOI: 10.1093/ije/dyq272
- Dweck, C.S. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia, PA: Taylor & Francis.
- Dweck, C. (2006). *Mindset: The new psychology of success*. New York, NY: Random House Digital.
- Dweck, C. S. (2009). Developing Talent Through a Growth Mindset. *Olympic Coach*, 21(1), 4-7.
- Dweck, C. (2010). The perils and promises of praise. In K. Ryan & J. M. Cooper (Eds.). *Kaleidoscope* (pp. 52-61). Belmont: Wadsworth.
- Eccles, J. S. (2005). Subjective task value and the Eccles et al. Model of achievement related choices. In C. S. Dweck & A. J. Elliot (Eds.), *Handbook of competence and motivation* (pp. 105-121). New York: Guilford Press.
- Eccles, J. S., & Harold, R. D. (1991). Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of applied sport psychology*, 3(1), 7-35. DOI: <https://doi.org/10.1080/10413209108406432>
- Elliot, A. J., Dweck, C. S., & Yeager, D. S. (Eds.). (2017). *Handbook of competence and motivation: Theory and application*. New York: Guilford Publications.
- Ericsson, K. A., Krampe, R.T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100, 363-406. DOI: <https://doi.org/10.1037/0033-295X.100.3.363>
- Ericsson, K. A., & Charness, N. (1994). Expert performance: Its structure and acquisition. *American Psychologist*, 49, 725-747. DOI: <https://doi.org/10.1037/0003-066X.49.8.725>
- Ericsson, K. A., Hoffman, R. R., Kozbelt, A., & Williams, A. M. (2018). *The Cambridge handbook of expertise and expert performance*. Cambridge: Cambridge University Press.
- Escarti, A., & Guzman, J. F. (1999). Effects of feedback on self-efficacy, performance, and choice in an athletic task. *Journal of Applied Sport Psychology*, 11(1), 83-96. DOI: <https://doi.org/10.1080/10413209908402952>
- Feltz, D. L., Short, S. E., & Sullivan, P. J. (2008). *Self-efficacy in sport*. Champaign, IL: Human Kinetics.
- Ford, P. R., Coughlan, E. K., Hodges, N. J., & Williams, A. M. (2015). Deliberate practice in sport. In J. Baker & D. Farrow (Eds.) *Routledge Handbook of Sport Expertise* (pp. 373-388). London: Routledge.
- Ford, P. R., Ward, P., Hodges, N. J., & Williams, A. M. (2009). The role of deliberate practice and play in career progression in sport: the early engagement hypothesis. *High ability studies*, 20(1), 65-75. DOI: <https://doi.org/10.1080/13598130902860721>
- Frazer-Thomas, J., Cote, J., & Deakin, J. (2008). Examining adolescent sport dropout and

- prolonged engagement from a developmental perspective. *Journal of Applied Sport Psychology*, 20, 318-333. DOI: <https://doi.org/10.1080/10413200802163549>
- Gardner, D. G., Cummings, L. L., Dunham, R. B., & Pierce, J. L. (1998). Single-item versus multiple-item measurement scales: An empirical comparison. *Educational and psychological measurement*, 58(6), 898-915. DOI: <https://doi.org/10.1177/0013164498058006003>
- Gustafsson, H., DeFreese, J. D., & Madigan, D. J. (2017). Athlete burnout: Review and recommendations. *Current opinion in psychology*, 16, 109-113. DOI: <http://dx.doi.org/10.1016/j.copsyc.2017.05.002>
- Gustafsson, H., Hassmén, P., Kenttä, G., & Johansson, M. (2008). A qualitative analysis of burnout in elite Swedish athletes. *Psychology of sport and exercise*, 9(6), 800-816. DOI: <https://doi.org/10.1016/j.psychsport.2007.11.004>
- Harwood, C. G., Keegan, R. J., Smith, J. M., & Raine, A. S. (2015). A systematic review of the intrapersonal correlates of motivational climate perceptions in sport and physical activity. *Psychology of Sport and Exercise*, 18, 9-25. DOI: <https://doi.org/10.1016/j.psychsport.2014.11.005>
- Helsen, W. F., Starkes, J. L., & Hodges, N. J. (1998). Team sports and the theory of deliberate practice. *Journal of Sport and Exercise Psychology*, 20(1), 12-34. DOI: <https://doi.org/10.1123/jsep.20.1.12>
- Hodge, K., Lonsdale, C., & Jackson, S. A. (2009). Athlete engagement in elite sport: An exploratory investigation of antecedents and consequences. *The Sport Psychologist*, 23(2), 186-202. DOI: <https://doi.org/10.1123/tsp.23.2.186>
- Hutchinson, J. C., Sherman, T., Martinovic, N., & Tenenbaum, G. (2008). The effect of manipulated self-efficacy on perceived and sustained effort. *Journal of Applied Sport Psychology*, 20(4), 457-472. DOI: <https://doi.org/10.1080/10413200802351151>
- Kavussanu, M., & Ntoumanis, N. (2003). Participation in sport and moral functioning: Does ego orientation mediate their relationship?. *Journal of Sport and Exercise Psychology*, 25(4), 501-518. DOI: <https://doi.org/10.1123/jsep.25.4.501>
- Kavussanu, M., & Roberts, G. C. (2001). Moral functioning in sport: An achievement goal perspective. *Journal of sport and Exercise Psychology*, 23(1), 37-54. DOI: <https://doi.org/10.1123/jsep.23.1.37>
- Kavussanu, M., White, S. A., Jowett, S., & England, S. (2011). Elite and non-elite male footballers differ in goal orientation and perceptions of parental climate. *International Journal of Sport and Exercise Psychology*, 9(3), 284-290. DOI: <https://doi.org/10.1080/1612197X.2011.614854>
- Lemyre, P. N., Hall, H. K., & Roberts, G. C. (2008). A social cognitive approach to burnout in elite athletes. *Scandinavian Journal of Medicine & Science in Sports*, 18(2), 221-234. DOI: <https://doi.org/10.1111/j.1600-0838.2007.00671.x>
- Macnamara, B. N., Moreau, D., & Hambrick, D. Z. (2016). The relationship between deliberate practice and performance in sports: A meta-analysis. *Perspectives on Psychological Science*, 11(3), 333-350. DOI: <https://doi.org/10.1177/1745691616635591>
- Mallett, C., Kawabata, M., Newcombe, P., Otero-Forero, A., & Jackson, S. (2007). Sport motivation scale-6 (SMS-6): A revised six-factor sport motivation scale. *Psychology of Sport and Exercise*, 8(5), 600-614. DOI: <https://doi.org/10.1016/j.psychsport.2006.12.005>
- McAuley, E., & Blissmer, B. (2000). Self-efficacy determinants and consequences of physical activity. *Exercise and Sport Science Reviews*, 28(2), 85-88.
- Monteiro, D., Teixeira, D. S., Travassos, B., Duarte-Mendes, P., Moutão, J., Machado, S., & Cid, L. (2018). Perceived effort in football athletes: the role of achievement goal theory and self-determination theory. *Frontiers in psychology*, 9, 1575. DOI: <https://doi.org/10.3389/fpsyg.2018.01575>
- Mudrak, J. (2010). Sprinters in the course of a marathon: Withdrawal from elite competitive sport in adolescence. *Gifted and Talented International*, 25(2), 125-136. DOI: <https://doi.org/10.1080/15332276.2010.11673576>
- Mudrák, J., Slepicka, P., & Slepicková, I. (2016). Doping u eských adolescent : Prevalence a postoje. *eskoslovenská psychologie.*, 60(5), 441 - 454.
- Mudrak, J., Slepicka, P., & Slepickova, I. (2018). Sport motivation and doping in adolescent

- athletes. *PLoS one*, 13(10), 205-222. DOI: <https://doi.org/10.1371/journal.pone.0205222>
- Mudrak, J., & Zabrodskaja, K. (2015). Childhood giftedness, adolescent agency: A systemic multiple-case study. *Gifted Child Quarterly*, 59(1), 55-70. DOI: <https://doi.org/10.1177/0016986214559602>
- Mudrak, J., Zabrodskaja, K., & Machovcova, K. (2020). Psychological constructions of learning potential and a systemic approach to the development of excellence. *High Ability Studies*, 31(2), 181-212. DOI: <https://doi.org/10.1080/13598139.2019.1607722>
- Munroe-Chandler, K., Hall, C., & Fishburne, G. (2008). Playing with confidence: The relationship between imagery use and self-confidence and self-efficacy in youth soccer players. *Journal of sports sciences*, 26(14), 1539-1546. DOI: <https://doi.org/10.1080/02640410802315419>
- Newton, M., & Duda, J. L. (1993). The relationship of task and ego orientation to performance: Cognitive content, affect, and attributions in bowling. *Journal of Sport Behavior*, 16(4), 209 - 220.
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological review*, 91(3), 328. DOI: <https://doi.org/10.1037/0033-295X.91.3.328>
- Ntoumanis, N. (2001). Empirical links between achievement goal theory and self-determination theory in sport. *Journal of Sports Sciences*, 19(6), 397-409. DOI: <https://doi.org/10.1080/026404101300149357>
- Pender, N. J., Bar-Or, O., Wilk, B., & Mitchell, S. (2002). Self-efficacy and perceived exertion of girls during exercise. *Nursing Research*, 51(2), 86-91.
- Pope, J. P., & Wilson, P. M. (2012). Understanding motivational processes in university rugby players: A preliminary test of the hierarchical model of intrinsic and extrinsic motivation at the contextual level. *International Journal of Sports Science & Coaching*, 7(1), 89-107. DOI: <https://doi.org/10.1260/1747-9541.7.1.89>
- Ryan, R. M., Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55 (1), 68-78. DOI: <https://doi.org/10.1037/0003-066X.55.1.68>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. London: Guilford Publications.
- Roberts, G. C., Treasure, D.C., Balague, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences*, 16(4), 337-347. DOI: <https://doi.org/10.1080/02640419808559362>
- Sarrazin, P., Roberts, G., Cury, F., Biddle, S., & Famose, J. P. (2002). Exerted effort and performance in climbing among boys: The influence of achievement goals, perceived ability, and task difficulty. *Research Quarterly for Exercise and Sport*, 73(4), 425-436. DOI: <https://doi.org/10.1080/02701367.2002.10609042>
- Starkes, J. L., Deakin, J. M., Allard, F., Hodges, N. J., & Hayes, A. (1996). Deliberate practice in sports: What is it anyway? In K.A. Ericsson (Ed.) *The road to excellence: The acquisition of expert performance in the arts and sciences, sports, and games* (pp. 81-106). London: Psychology Press.
- Swann, C., Keegan, R. J., Piggott, D., & Crust, L. (2012). A systematic review of the experience, occurrence, and controllability of flow states in elite sport. *Psychology of sport and exercise*, 13(6), 807-819. DOI: <https://doi.org/10.1016/j.psychsport.2012.05.006>
- Vallerand, R. J. (2007). Intrinsic and extrinsic motivation in sport and physical activity. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of sport psychology* (pp. 59-83). Hoboken, NJ: Wiley.
- Vallerand, R. J., & Losier, G. F. (1999). An integrative analysis of intrinsic and extrinsic motivation in sport. *Journal of applied sport psychology*, 11(1), 142-169. DOI: <https://doi.org/10.1080/10413209908402956>
- Vallerand, R. J., & Miquelon, P. (2007). Passion for Sport in Athletes. In S. Jowette & D. Lavallee (Eds.), *Social Psychology in Sport* (pp. 249-263). Champaign, IL, US: Human Kinetics.
- Vealey, R. S., Garner-Holman, M., Hayashi, S. W., & Giacobbi, P. (1998). Sources of sport-confidence: Conceptualization and instrument development. *Journal of Sport and Exercise psychology*, 20(1), 54-80.

- Vink, K., Raudsepp, L., & Kais, K. (2015). Intrinsic motivation and individual deliberate practice are reciprocally related: Evidence from a longitudinal study of adolescent team sport athletes. *Psychology of Sport and Exercise*, 16, 1-6. DOI: <https://doi.org/10.1016/j.psychsport.2014.08.012>
- Wall, M., & Côté, J. (2007). Developmental activities that lead to dropout and investment in sport. *Physical education and sport pedagogy*, 12(1), 77-87. DOI: <https://doi.org/10.1080/17408980601060358>
- Wanous, J. P., & Reichers, A. E. (1996). Estimating the reliability of a single-item measure. *Psychological Reports*, 78(2), 631-634. DOI: <https://doi.org/10.2466/pr0.1996.78.2.631>
- Wigfield, A., & Cambria, J. (2010). Expectancy-value theory: Retrospective and prospective. In T.C. Urdan & S. A. Karabenick (Eds.). *The decade ahead: Theoretical perspectives on motivation and achievement* (pp. 35-70). Bingley: Emerald.
- Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary educational psychology*, 25(1), 68-81. DOI: <https://doi.org/10.1006/ceps.1999.1015>
- Wise, J. B., & Trunnell, E. P. (2001). The influence of sources of self-efficacy upon efficacy strength. *Journal of Sport and Exercise Psychology*, 23(4), 268-280. DOI: <https://doi.org/10.1123/jsep.23.4.268>
- Wylleman, P., Alferman, D., & Lavallee, D. (2004). Career transitions in sport: European perspectives. *Psychology of Sport and Exercise*, 5, 7-20. DOI: [https://doi.org/10.1016/S1469-0292\(02\)00049-3](https://doi.org/10.1016/S1469-0292(02)00049-3)