

**THE DEVELOPMENTAL TRAJECTORIES OF TASK VALUES
AND ACHIEVEMENT STRATEGIES AMONG DUAL CAREER
ATHLETES IN HIGH SCHOOL**

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Tiivistelmä

Tämän tutkimuksen tarkoituksena oli tutkia, millaisia motivaatioprofiileja on löydettävissä kaksoisurheilijoilla niin koulussa kuin urheilussa lukion aikana, sekä kuinka koulutukseen liittyvät motivaatioprofiilit ovat yhteydessä urheiluun liittyviin motivaatioprofiileihin. Motivaatiomuuttujina olivat tehtäväkohtaiset arvot ja saavutusstrategiat. Saavutusstrategiat sisälsivät onnistumisodotukset ja tehtävän välttelyn. Tutkimuksen lopullinen otoskoko koostui 510 opiskelijaurheilijasta seitsemästä eri urheilulukioda Suomessa. Jokaisena lukiovuonna tutkittavat täyttivät kyselyn urheilun ja koulun osalta koskien tehtäväkohtaisia arvoja ja saavutusstrategioita. Latentti profiilianalyysi suoritettiin erilaisten motivaatioprofiilien tunnistamiseksi. Motivaatiomuuttujien pysyvyyttä ja muutosta sekä eroja eri motivaatioprofiilien välillä tutkittiin Waldin testillä. Lopuksi kouluun liittyvien motivaatioprofiilien yhteyttä urheiluun liittyvien motivaatioprofiilien välillä tutkittiin latentilla siirtymäanalyysillä (LTA; Lanza & Collins, 2008). Koulukontekstista löytyi viisi motivaatioprofiilia: (a) Matalat arvot koulussa; (b) Maladaptiiviset strategiat koulussa; (c) Keskinkertainen koulumotivaatio; (d) Korkea koulumotivaatio; sekä (e) Matala koulumotivaatio. Myös urheilukontekstista löytyi viisi profiilia: (a) Korkea urheilumotivaatio; (b) Keskinkertainen urheilumotivaatio; (c) Matalat arvot urheilussa; (d) Vakaa urheilumotivaatio; sekä (e) Matala urheilumotivaatio. Opiskelija-urheilijat näyttivät olevan enemmän motivoituneita urheilussa kuin koulussa, sillä tehtäväkohtaiset arvot olivat korkeampia sekä tehtävän välttely matalampaa urheilussa kuin koulussa. Yleisesti motivaatiossa tapahtui vain pieniä muutoksia ajan kuluessa, ja nämä muutokset liittyivät tehtäväkohtaisten arvojen laskuun ja tehtävän välttelyn kasvamiseen sekä koulussa että urheilussa. Onnistumisodotukset pysyivät suhteellisen vakaina koko lukion ajan. Latentti siirtymäanalyysi osoitti, että opiskelijaurheilijat olivat hyvin motivoituneita urheiluun huolimatta koulumotivaation tasosta, kun taas opiskelijaurheilijat, jotka edustivat tiettyä motivaatioprofiilia urheilussa, kuuluivat myös todennäköisemmin samankaltaiseen profiiliin koulussa. Tämä tutkimuksen perusteella näyttäisi siltä, että tehtäväkohtaiset arvot ja tehtävän välttely saattaisivat olla enemmän kontekstiin liittyviä motivaatiotekijöitä, kun taas onnistumisodotukset olisivat enemmän yhteydessä yksilön piirteenomaisiin taipumuksiin.

Avainsanat

Tehtäväkohtaiset arvot, saavutusstrategiat, kaksoisura, opiskelijaurheilija, henkilökeskeinen lähestymistapa.

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JÄRVINEN, JULIA & KANKO, RUUT: The Developmental Trajectories of Task Values and Achievement Strategies among Dual Career Athletes in High School

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Abstract

The aim of the present study was to investigate what kind of motivational profiles can be found among dual-career athletes during high school in both educational and sport contexts, and how are the school-related motivational profiles associated with the sport-related motivational profiles. Task values and achievement strategies, including success expectations and task avoidance, were used as criteria variables of motivation. A total of 510 student-athletes from seven sport high schools in Finland participated in the study by filling out a self-report questionnaire during each year of high school. The questionnaire included items considering task values and achievement strategies in both school and sport contexts. A latent profile analysis was then performed to identify different motivational profiles and the stability of and changes in motivational variables, as well as the differences between motivational profiles, were examined with Wald's test. Finally, the association of school-related and sport-related motivational profiles was examined by using a latent transition analysis (LTA; Lanza & Collins, 2008). To summarize the results, five motivational profiles were found in school: (a) Low value for school; (b) Maladaptive strategies for school; (c) Moderate school motivation; (d) High school motivation; and (e) Low school motivation. Five profiles were also found in sport: (a) High sport motivation; (b) Moderate sport motivation; (c) Low values for sport; (d) Stable sport motivation; and (e) Low sport motivation. Student-athletes were typically more motivated in sport than in school, which was illustrated by higher task values and lower task avoidance in sport than in school. In general, only small changes occurred in motivation over time, which was reflected in a decrease in task values and an increase in task avoidance in both domains. Success expectations remained relatively stable over time. The latent transition analysis revealed that student-athletes appeared to be in general highly motivated for sport regardless of the level of motivation for school. Furthermore, student-athletes representing a certain kind of motivational profile in sport were likely to show a similar one in school. Considering the findings, the present study suggests that task values and task avoidance may be rather context-related motivational factors, whereas success expectations seem to be more related to an individual's trait-like tendencies.

Keywords

Task values, achievement strategies, dual career, student-athlete, person-oriented approach

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INTRODUCTION

The European Commission has acknowledged the challenge of combining education and competitive sports in constructing a dual career (EU Guidelines, 2012). In adolescence, athletes face increasing demands in both educational and sport contexts as their transition to high school at age 15-16 is accompanied by a transition from junior to senior level in competitive sports (Stambulova & Wylleman, 2019). The increased demands in two different contexts may be followed by changes in motivation. As motivation plays a crucial role in achievement situations (Eccles & Wigfield, 2002; Wigfield & Cambria, 2010), it is important to investigate the development of motivation among dual career athletes, also referred to as student-athletes, in the context of education and sport as well as the challenges in combining the two. However, previous research on motivation has mainly focused on the school and sport contexts separately. In this study, the development of motivation is investigated in both school and sport contexts through two separate motivational constructs: subjective task values and achievement strategies. Subjective task values refer to the personal importance and value of the activity (Eccles, 2005), whereas achievement strategies refer to the cognitive and behavioral processes that people engage in when approaching and responding to achievement situations (Onatsu-Arviolommi & Nurmi, 2000), and they both have been shown to be central to achievement motivation and performance (Wigfield & Cambria, 2010; Nurmi et al., 2003; Pintrich & DeGroot De, 1990). Furthermore, a common factor relevant for both task values and achievement strategies is the individual's expectancies for success (Eccles, 2005; Nurmi, Aunola, Salmela-Aro, & Lindroos, 2003). Although both task values and achievement strategies are central in achievement situations, and it would be important to investigate these theoretical perspectives simultaneously to better understand their mutual connections and developmental trajectories, it has not been done so far. There is, moreover, a need to understand whether the phenomena are context-related, and whether they could be similar in school and sport contexts. Therefore, the aim of the present study is to compare the developmental trajectories of task values and achievement strategies in both school and sport among Finnish dual career athletes during high school. Conducting a person-centered approach provides for a better understanding of the profiles that can be identified, in terms of the developmental trajectories, instead of observing merely mean-level changes in the sample. This study is part of a Finnish research project *Winning in the Long Run* (Ryba, Aunola, Kalaja, Selänne, Ronkainen, & Nurmi, 2016).

Task values

According to Eccles' Expectancy-value Model (Eccles, 2005), an individual's achievement-related choices are determined by expectations for success and the subjective task value attached to the task by the individual. These factors are influenced by perceptions of competence, the difficulty of the task, individual goals and self-schema shaped by previous experiences and the interpretation of them, and by social context such as cultural norms, and the behaviors and goals of others (e.g., parents, educators, and peers) (Eccles 2005; Eccles & Wigfield, 2002; Wigfield & Cambria, 2010). Expectations for success and subjective task values are assumed to contribute directly to performance, persistence, and task choice (Eccles, 2005; Eccles & Wigfield, 2002; Trautwein, Marsh, Nagengast, & Lüdtke, 2012; Wigfield & Cambria 2010). More specifically, expectations for success predict performance and task values predict task choice (Wigfield & Eccles, 2000).

In the Expectancy-value Model, subjective task value is defined as the personal importance or value of the activity (Eccles, 2005). It consists of four components. Attainment value refers to the degree to which the task is consistent with one's self-schema, which is defined as generalizations about the self that are relative to the identities salient to the individual (Cox & Whaley, 2004; Markus, 1977). Intrinsic or interest value refers to the enjoyment one gets or expects to get from task engagement. Utility value refers to the usefulness of the task in pursuing future goals. Finally, cost of participation in the activity represents the negative consequences of task engagement (Buehl & Alexander, 2005; Flake, Barron, Hulleman, McCoach, & Welsh, 2015; Wigfield & Eccles, 1992), which encompasses the effects of possible failure on one's self-worth, feeling of competence, fear of social consequences, anticipated anxiety, and loss of time for other activities (Covington, 1992).

The definitions of task values are close to concepts from other motivational theories, such as Self-Determination Theory (Deci & Ryan, 1985), which distinguishes motivation as either intrinsic or extrinsic. Intrinsic motivation is similar to intrinsic value, since it emphasizes engaging in a task out of interest and enjoyment (Eccles & Wigfield, 2002; Lee, Bong, & Kim, 2014; Wigfield and Eccles, 2000). However, intrinsic motivation emphasizes the decision to engage in a task rather than the value of the task itself (Eccles, 2005). Extrinsic motivation is similar to utility value, since engaging in the activity is not an end itself (Eccles, 2005; Eccles & Wigfield, 2002; Lee et al., 2014; Wigfield & Eccles, 1992). Furthermore, the individual's external motivation regulation may become internalized through a process of internalization attempting to fulfill a basic psychological need for social relatedness (Deci & Ryan, 1985). From this perspective, utility value is similar to introjected regulation, the feeling that the task engagement is needed, and with identified regulation, where one

notices the utility of a behavior in pursuing other internalized goals (Eccles, 2005). Finally, attainment value is similar to integrated motivation regulation, where the individual notices the personal importance and value of the task that is originally externally motivated (Eccles, 2005). From the task value components, the definition of interest value is close to the idea of flow (Eccles, 2005), which is characterized as a holistic feeling of immersion in an activity, fusion of action and awareness, complete focus on the activity, lack of self-consciousness, and feeling control over one's actions (Csikszentmihalyi, 1988). Task values also share common features with theories of interest, which are commonly divided into situational interest, an emotional state facilitated by task features, and individual interest, a more stable orientation towards a task (Eccles, 2005). Wigfield and Cambria (2010) suggested that interest value contains both situational and individual aspects of interest and although the value of the task can vary between tasks and situations, high levels of interest value may facilitate long-lasting task engagement.

Research findings concerning the development of task values are mostly from educational contexts. It has been shown that children have a clear understanding of what they are good at and what they value already in the early school years (Eccles, 2005; Wigfield, 1994; Wigfield & Cambria, 2010; Wigfield & Eccles, 2000). During the early grades in elementary school, children differentiate between interest and utility values. In fifth grade and above, attainment, interest and utility values are differentiated. The findings suggest that the interest component differentiates first, and that attainment and utility values follow later. Findings concerning the mean-level of task values are more inconsistent, and to our knowledge, there are only a few studies focusing on the changes in high school. The valuing of mathematics, language skills and physical education have been shown to generally decline from grade one to twelfth (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Wigfield & Eccles, 2000), although it has been found that whereas valuing mathematics was lower in high school, valuing English was higher than in the late elementary school (Wigfield, 1994; Wigfield & Eccles, 2000). In a study conducted in Australia, interest value in mathematics declined over the school years, and stabilized around age 16, whereas utility value in mathematics decreased without stabilizing (Watt, 2004). Among dual career athletes, motivational profiles concerning task values (interest, attainment and utility) in school and sport showed high stability during the first two years in high school, although the percentage of athletes valuing both school and sport decreased over the time period (Aunola, Selänne, Selänne, & Ryba, 2018).

The existing knowledge of the associations between task value components seem to be scarce. According to Eccles (2005), research suggests that attainment and interest value are strongly correlated, and it seems that they both promote optimal motivation. Furthermore, a task may have

both utility and attainment value if the task fulfills individual short-term and long-term goals that are relevant to the individual's identity and needs. However, Simons and colleagues (2004) found among nursing students that perceiving utility of a course in terms of their future job was associated with motivational factors and success more strongly than perceiving utility merely in terms of their training, which would suggest that as future goals become more distal, their association with the individual's identity increases.

Within the subjective task value framework, the cost of participating in an activity has mostly been overlooked in previous research (Wigfield & Cambria, 2010), since there is no cost scale in the original Expectancy-value theory by Eccles and colleagues (Barron & Hulleman, 2015). However, more recent attempts to conduct a cost measure exist (Battle & Wigfield, 2003; Buehl & Alexander, 2015; Chen & Liu, 2009; Cox & Whaley, 2004; Flake et al., 2015; Jiang, Rosenzweig, & Gaspard, 2018; Luttrell et al., 2010). The role of cost in predicting student motivation has also attracted growing interest (Barron & Hulleman, 2015). Cost is especially important in task choice (Eccles, 2005; Wigfield & Cambria, 2010), and whereas other task values promote approach-behavior, cost is associated with maladaptive behaviors and choices related to achievement, such as avoidance behavior (Jiang et al., 2018). Thus, cost might demotivate taking part in achievement-related activities (Viljaranta, Lazarides, Aunola, Rääkkönen, & Nurmi, 2015). Among female college athletes, cost negatively predicted intentions to pursue graduate study (Battle & Wigfield, 2003). In college, cost has also been shown to be in a negative relationship with the level of course participation (Luttrell et al., 2010). Among middle and high school students, Jiang and colleagues (2018) found that adding cost into an expectancy-value model explained additional variance in classroom affect and achievement goals, and cost predicted these outcomes more strongly than values. In another study of theirs, among eighth graders in middle school, cost predicted maladaptive outcomes in mathematics by uniquely predicting procrastination and avoidance intentions, whereas other task values had no predictive power on these outcomes. Cost also explained additional variance in student's mathematics achievement, which suggests that cost has a role in predicting adolescents' mathematics achievement in addition to self-efficacy perceptions. Trautwein and colleagues (2012) reported the significance of the interaction between high school students' perceptions of their competence in mathematics and cost in predicting their mathematics achievement. The findings suggest that cost should be studied separately from other task values in expectancy-value models in predicting outcomes (Barron & Hulleman, 2015; Flake et al., 2015; Jiang et al., 2018; Trautwein et al., 2012). Other researchers have also pointed out the need for studying the role of cost among other task values (Viljaranta et al., 2015).

In summary, research findings on task values are mostly derived from educational contexts, and less is known about task values in sport, as illustrated above. Moreover, there is a need to further study the role of cost, which has received attention only recently (Barron & Hulleman, 2015; Flake et al., 2015; Jiang et al., 2018; Trautwein et al., 2012; Viljaranta et al., 2015). The present study responds to the deficits of empirical research on task values by investigating the development of task values simultaneously in both school and sport among dual career athletes in high school. The role of cost in influencing avoidance-behavior in achievement situations is discussed through achievement strategies.

Achievement strategies

Another approach to motivation besides task values is achievement strategy framework (Pintrich, 2003). The term achievement strategies has been used to refer to the behavioral-cognitive patterns that the individual engages in when approaching and responding to achievement situations (Onatsu-Arviolommi & Nurmi, 2000). These behavioral-cognitive patterns are suggested to consist of successive psychological processes that are manifested in three stages (Cantor, 1990; Jones & Berglas, 1987; Nurmi, Salmela-Aro, & Ruotsalainen, 1994; Onatsu-Arviolommi & Nurmi, 2000). In the first stage, facing a challenging situation activates the individual's past experiences and the affects that have been formed in a similar kind of situation previously (Cantor, 1990; Diener & Dweck, 1978). These experiences and related affects will influence the goals and plans people construct, and the effort they will invest in the task. The constructed plans and goals direct the behavior, which appears in the second stage. If an individual believes that she or he will master the upcoming task or situation, task-oriented behavior follows, which includes constructing goals and plans related to the task and showing a higher level of effort (Norem, 1989; Nurmi et al., 1994). In comparison, failure expectations are associated with task-irrelevant behavior, whereby the individual avoids a challenging task or situation (Diener & Dweck, 1978) or changes their behavior to provide reasons for a potential failure (Jones & Berglas, 1987; Nurmi et al., 1994). Finally, in the third stage, the individual interprets the cause of the outcome of actions based on the feedback given by others; and this reasoning is referred to as making causal attributions (Cantor, 1990; Diener & Dweck, 1978; Taylor & Brown, 1988).

Researchers have approached achievement strategies from several perspectives and many different concepts have been used (Nurmi, Salmela-Aro, & Haavisto, 1995). Some researchers have

classified strategies into specific types such as self-handicapping strategy and learned helplessness or defensive pessimism (Diener & Dweck, 1978; Jones & Berglas, 1987; Norem & Cantor, 1986). Other researchers have approached these strategies by describing the different successive psychological processes (Nurmi et al., 1995; Anderman & Midgley, 1997). From this perspective, these behavioral, cognitive, and motivational processes are typically separated into two kinds of dimensional patterns according to how people approach and response in a given situation or task (Salmela-Aro, Tolvanen, & Nurmi, 2009). However, the difference between achievement strategies and many other closely related concepts on achievement-related behavior is that the achievement strategy approach is more integrative and holistic (Määttä, 2007).

In this study, we engage in concepts referred to as success expectations and task avoidance, wherein the former refers to adaptive strategies and the latter refers to maladaptive strategies. Therefore, success expectations describe an achievement strategy characterized by optimism, high level of effort, perseverance in facing obstacles, active behavior management, planning, and problem-solving (Cantor, 1990; Diener & Dweck, 1978), whereas task avoidance is manifested by fear of prospective failure, low expectancies, passive behavior, and lack of effort (Aunola, Stattin, & Nurmi, 2000). Despite the different strategy types and concepts, research has consistently shown that adaptive strategies (task-focused behavior or success expectations) are associated with better academic performance, higher engagement, and satisfaction (Nurmi et al., 2003). In contrast to adaptive strategies, maladaptive strategies (task-avoidant behavior or failure expectations) have been found to reduce satisfaction and lower performance (Nurmi, Onatsu, & Haavisto, 1995; Nurmi et al., 2003). Despite the rarity of research on achievement strategies, findings support the dichotomy of adaptive and maladaptive strategies among Goal Orientation literature considering achievement goals, which is closely related to achievement strategies (Anderman & Midgley, 1997; Määttä, 2007). According to the achievement goal research, individuals tend to settle in between an approach-avoidance dimension, wherein the extremes are represented by two goal orientations: mastery orientation and performance orientation (Midgley, Kaplan, Middleton, & Maehr, 1998). Mastery orientation is characterized by similar kind of terms as adaptive strategies whereas performance orientation resembles maladaptive strategies (Anderman & Midgley, 1997; Määttä, 2007).

Concerning achievement strategies, adaptive and maladaptive strategies have raised concerns since Nurmi's and colleagues' (2003) results showed that achievement strategies are self-perpetuating, as they are associated with student's school achievements and satisfaction that further predict and direct the use of later achievement strategies (Nurmi et al., 2003). Although this result seem to indicate that achievement strategies are an individual's trait-like tendencies and connected to individual's personality, the effect of the environment on achievement strategies is in theory

considered to be greater than on other personality traits (Salmela-Aro et al., 2009). However, little is known about the development of achievement strategies since there are only a few cross-lagged longitudinal studies. The few existing studies on the development of achievement strategies have focused on outcomes, but less is known about the antecedent factors preceding achievement strategies (Määttä, 2007). For example, it has been found that achievement strategies predict more literacy performance than vice versa, leading to the emergence of cumulative cycles (Aunola, Nurmi, Niemi, Lerkkanen, & Rasku-Puttonen, 2002). Despite the predictive and stable nature of the achievement strategies, Syal's and Torppa's (2018) longitudinal study of dyslexia and task avoidance showed that task avoidance is unstable, increasing from the second grade until the ninth grade but decreasing from the ninth grade until the age of 20. The change in task avoidance after the ninth grade is attributed to increased freedom of choice in education and other future-related plans according to the individual's strengths and weaknesses (Syal & Torppa, 2018). Similar results have been found in goal orientation theory, as Anderman, Austin and Johnson (2002) found that pre-school children are more mastery-oriented, but that performance orientation increases soon after starting school (Anderman et al., 2002), which is supported by the idea that younger children equalize effort and ability whereas older children differentiate between the concepts (Nicholls, 1990). It seems that an environment that emphasizes competition and evaluation can play a significant role in the development of achievement strategies (Covington, 1992; Lee et al., 2014).

In the academic context, achievement strategies have been studied extensively (Midgley, Arunkumar, & Urdan, 1996; Nurmi, et al., 2003; Salmela-Aro et al., 2009). In contrast to the academic context, there are only a few studies on achievement strategies in the sport context. Among young hockey players, adaptive strategies, parallel to success expectations, increased satisfaction, which includes the likelihood of staying engaged in the hobby (Juntumaa, Keskivaara, & Punamäki, 2005). In turn, self-handicapping strategy, parallel to maladaptive strategies, is associated with low self-esteem and competence (Finez & Sherman, 2012). Adaptive strategies have also been found to be associated with more positive mental health and less distress than maladaptive strategies among basketball players and gymnasts (Cumming, Smith, Crossbard, Smoll, & Malina, 2012).

Even though there is a lack of research related to achievement strategies in the sport context, other closely related concepts, such as achievement goals (Lochbaum, Kazak Çetinkalp, Graham, Wright, & Zazo, 2016), coping strategies (Bardel, Woodman, Colombel, & Le Scanniff, 2012) and self-handicapping strategy (Finez & Sherman, 2012) have been studied abundantly. For example, in the late 1990s, The Achievement Goal Theory (AGT) emerged as a dominant framework in the study of sport psychology (Lochbaum, et al., 2016). In their meta-analysis review in competitive sport, Lochbaum's and colleagues' (2016) findings suggested that task goal orientation (i.e., mastery

orientation) was positively related to adaptive success expectations (e.g., effort, adaptive perfectionism, approach coping, competitiveness), positive emotions, intrinsic motivation, and self-esteem. The ego orientation (i.e., performance orientation) was also associated with the same factors as task goal orientation, but in practice, the connections were insignificant (Lochbaum et al., 2016).

In the context of achievement strategies and especially in sport context, it may be challenging to compare these existing studies, because different concepts, different types of strategies and different instruments have been used (Martin & Brawley, 1999; Wigfield & Cambria, 2010). For example, on the one hand, there is evidence that a self-handicapping strategy might be a domain specific instrument giving different results in academic and sport contexts (Martin & Brawley, 1999). On the other hand, many previous studies have used instruments that measure a certain type of achievement strategy rather than the underlying psychological processes. Since achievement strategies are very specific and emphasize the underlying psychological processes differently, Nurmi, Salmela-Aro and Haavisto (1995) designed a questionnaire to measure these psychological processes rather than a single specific strategy (Nurmi et al., 1995). Overall, the need for further research on the underlying psychological processes in achievement strategies in both school and sport is evident. Moreover, the use of the same instrument in both school and sport is also needed to enhance the comparability of the phenomena in two different contexts.

The interactions between task values and achievement strategies in school and in sport

Both task values and achievement strategies are constructs that are related to achievement motivation and performance (Wigfield & Cambria, 2010; Nurmi et al., 2003; Pintrich & De Groot, 1990). There is a significant amount of research on both task values and achievement strategies, but it has mainly focused on the academic context and the two constructs have been studied separately so far. Thus, there is little knowledge about the relationship between task values and achievement strategies. Wigfield and Cambria (2010) postulated that Social cognitive models of achievement motivation differ by using a variety of constructs and emphasizing them in different ways. The reason for this is that these models have different theoretical backgrounds and therefore the perspective in these constructs varies. They describe the task value approach on motivation as stressing the individual's experienced worth of a task or activity, which is a mixture of cognition and affect arousing inherently in the task or activity (Wigfield & Cambria, 2010). On the contrary, achievement strategies describe the individual's tendency to approach and respond to achievement situations (Onatsu-Arvilommi &

Nurmi, 2000). They are cognitive constructs that take the individuals' aims or purposes that precede or potentially guide the task or activity into consideration (Wigfield & Cambria, 2010). Despite slightly differing perspectives, there is empirical and theoretical evidence suggesting that task values and achievement strategies are closely intertwined (Covington, 1992; Eccles, 2005; Lee et al., 2014).

The individual's expectations for success is a common factor that appears in Eccles' Expectancy-value Model as well as in achievement strategies (Eccles, 2005; Nurmi et al., 2003). The expectations for success are reflected in previous achievement outcome experiences and they are a significant part of an individual's self-esteem (Covington, 1992; Eccles, 2005; Harter 1990). It is important to note that although many theories have engaged in different terminology between self-efficacy, self-concept, and expectation of success, the concepts can be considered consistent in practice. For example, the success expectations in Eccles' theory and the concept of Bandura's self-efficacy can be differentiated in theory but empirical evidence supports consistency of the concepts (Eccles & Wigfield, 2002). When an individual interprets the outcome of his or her performance, the environment influences that individual's interpretation of his or her abilities and self-concept or success expectations, which is why values and strategies are more broadly related to the social and cultural milieu (Covington, 1992; Eccles, 2005; Wigfield & Cambria, 2010).

Covington's self-worth theory (1992) illustrates a possible connection between an individual's values and strategies as it combines success expectations with the individual's values and strategies. According to Covington's theory, the tendency to maintain a positive self-concept is determined by a motive for self-worth (Covington, 1992). Covington suggests that especially school is a domain that challenges an individual's self-worth through high demands, competitions, and assessments, and therefore, it is a characteristic of an individual to use maladaptive strategies in order to protect their sense of self-worth. In addition to school domain, other domains have also been found to be critical to self-worth. The more an individual values a particular domain, the more competence beliefs will influence their self-worth (Harter, 1998). This has also raised the question of what happens when one has high values and low expectancies simultaneously in a domain (Lee et al., 2014). Lee, Bong and Kim (2014) have assumed two possible consequences: According to Eccles' Expectancy-value Model, it is expected that the individual will lower his or her values in this domain (Eccles & Wigfield, 2002). However, Lee's and colleagues' (2014) findings supported another possible consequence. Instead of lowering values, high values, regardless of the component of value (both intrinsic and utility) accompanied by low expectations, were associated with engaging in maladaptive strategies (Lee et al., 2014).

A large body of literature has consistently shown that both task values and achievement strategies are related to various outcomes of achievement motivation such as choice, effort,

satisfaction, and performance (Eccles, 2005; Nurmi et al., 2003). However, there is little knowledge of the developmental dynamics of these two constructs and no previous research has been done on the developmental dynamics between task values and achievement strategies based on psychological processes. Many questions are open regarding how task values and achievement strategies develop, and how the developmental paths of the two motivational constructs are interconnected. Is there divergence in how some constructs or their components influence the different stages of development and is their relationship different over time? Studies examining the relationship between task values and achievement goals have provided suggestions to the possible developmental dynamics, but conclusions are difficult to make due to inconsistent findings. Some researchers have theorized that achievement goals would create a broader framework for the purpose and direction of actions and that the strength of an action is determined by task values (Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Wigfield & Cambria, 2010). Hulleman and colleagues (2008) found that among high school football players and college students, mastery goals, which are parallel to adaptive strategies, predicted subsequent interest through task values while performance-approach goals, parallel to maladaptive strategies and accompanied by utility value, predicted performance (Hulleman et al., 2008).

In contrast, other research findings suggest that task values predict achievement goals (Liem, Lau, & Nie, 2008; Uzuntiryaki-Kondakci & Senay, 2015). Liem and colleagues (2008) found that task values predicted mastery goals, and self-efficacy predicted both mastery, performance-approach, and negatively performance-avoidance goals (Liem et al., 2008). In addition, task values have been shown to positively predict performance-approach goals and mastery-avoidance goals (Uzuntiryaki-Kondakci, & Senay, 2015). Findings concerning the cost component among task values have also shown that cost negatively predicts academic choices (Battle & Wigfield, 2003; Jiang et al., 2018). An explanation for the findings supporting task values preceding achievement goals has been that values reflect an individual's valued future goals more broadly, whereas achievement goals are thought to be more task-specific (Miller & Brickman, 2004; Wigfield, 1994). Altogether, the inconsistent findings may be resulting from the use of different measures that overlap and focus on multiple aspects of constructs (Wigfield & Cambria, 2010). However, achievement strategies represent a broader concept than achievement goals (Määttä, 2007) and therefore the relationship between achievement strategies and task values might be different. Indeed, further research is needed to clarify these theoretical motivational constructs and their associations with each other (Eccles & Wigfield, 2002).

Aims of the study

The aim of the study was to investigate how dual career athletes' motivational factors, such as task values and achievement strategies, develop during high school in both school and sport contexts. The intention was also to compare the developmental trajectories found in school to those found in sport. To identify subgroups of student-athletes, a person-oriented approach was applied, which further enables the examination of the different types of homogenous motivational profiles that can be found in the sample and how typical they are. Compared to the variable-oriented approach, where the focus is on the average among participants, the person-oriented approach provides for visualizing motivation from the perspective of the individual student-athlete. In addition, this approach provides for a better understanding of the relationship between motivational profiles in two different contexts (i.e., sport and school). A longitudinal study that utilizes the same data simultaneously in two different contexts allows one to investigate whether strategies and values are stable individual trait-like tendencies or rather unstable and context-specific. There is evidence that both task values and achievement strategies become relatively stable at an early stage (Aunola, 2000; Burhans & Dweck, 1995; Onatsu-Arviolommi & Nurmi, 2000) and appear to form either adaptive or maladaptive, cumulative cycles (Aunola, Leskinen & Nurmi, 2006; Nurmi et al., 2003). Gaining a better understanding of the typical development of two different motivational constructs in sport and school contexts enables the investigation of these possible cumulative cycles, and therefore, possible interventions may be developed based on the results in order to support the motivation and well-being of the student-athletes.

Research questions:

1. What kind of developmental trajectories of school motivation are there among student-athletes in terms of task values, success expectations, and task avoidance across high school years? How typical are different trajectories?
2. What kind of developmental trajectories of sport motivation are there among student-athletes in terms of task values, success expectations, and task avoidance across high school years? How typical are different trajectories?

3. How are the developmental trajectories in school associated with developmental trajectories in sport?

METHODS

Participants and procedure

This study is part of a Finnish longitudinal research project *Winning in the Long Run* (Ryba et al., 2016). The participants in the research project are student-athletes that have had follow-ups from the beginning of the first grade in high school and subsequently every spring since then. This study focused on the measures conducted from four time points: the beginning of the first grade (Time 1), the end of the first grade (Time 2), the end of the second grade (Time 3), and the spring of the third grade (Time 4). The sample consisted of 510 student-athletes from seven sport upper secondary schools in Finland. However, there were only 391 participants from six sport upper secondary schools during the first year of the study, after which the number of participants in the research project increased while some of the initial participants dropped out. The sample sizes at different measurement points were 391 (Time 1), 449 (Time 2), 489 (Time 3), and 390 (Time 4). The missing data was randomly distributed (missing completely at random; MCAR) in terms of the measured variables in school ($\chi^2(118) = 137.50, p = .106$) and sport ($\chi^2(98) = 119.96, p = .065$). The participants filled out a self-report questionnaire at school during school hours. Among the participants, 49% were girls and 51% were boys. At the beginning of the study, the participants were 15-16-years old. The reported grade point average (GPA) at Time 1 was, on average, 8.85 (SD = 0.62) on a scale from 4 to 10. From the athletes, 47% represented individual sports and 53% team sports.

Measures

Task values in school. Task values in school were measured with a scale developed on the basis of the work by Eccles and colleagues (1983) and Niemivirta (2002). The scale consisted of 18 items concerning task values in school, including attainment (6 items: e.g., *How important is it for you to get good grades in math?*), interest (6 items; e.g., *How much do you like math?*) and utility (6 items; e.g., *How useful or necessary is learning math for your future plans?*). The questions focused on mathematics, foreign languages, and theoretical subjects. The answers were given on a 5-point Likert-scale (1 = not at all; 5 = extremely much). In further analyses, a mean-score consisting of all 18 items was used as an indicator of the school-related task value. Cronbach alpha reliabilities for the averaged task value variable at different time points were .87, .88, .89, and .91, respectively.

Task values in sport. Task values in sport were measured with a scale developed on the basis of the scale measuring task values in school (Ryba et al., 2016). The scale included 13 items concerning task values in the sport context, including attainment (4 items: e.g., *How important is it for you to do well in sport competitions?*), interest (5 items: e.g., *How much do you like doing your sport?*) and utility (4 items: e.g., *How useful or necessary is doing your sport for your future plans?*). The questions focused on different domains in sport, such as sport in general, sport practices, and sport competitions. The answers were given on a 5-point Likert-scale (1 = not at all; 5 = extremely much). In further analyses, a mean-score consisting of all 13 items was used as an indicator of the sport-related task value. Cronbach alpha reliabilities for the averaged task value variable at different time points were .85, .89, .89, and .90, respectively.

Achievement Strategies in School. Achievement strategies in school were measured by using a Strategy and Attribution Questionnaire (SAQ; Nurmi et al., 1995). It consisted of nine items, to which the student-athletes rated on a 4-point rating scale (1 = “Strongly disagree,” 4 = “Strongly agree”). The scale consisted of two subscales: (1) Success expectations (5 items; e.g. “*When I face a new task at school, I am often afraid it will go wrong*”) and (2) Task-avoidance (4 items; e.g. “*If something begins to go wrong with my schoolwork, I quickly disappear to some other place*”). Success expectations were measured at each measurement point, whereas task-avoidance was measured only for the first three measurements. The Cronbach alpha reliabilities for success expectations at different

time points were .77, .76, .78 and .78, and for task avoidance the reliabilities were .70, .74, and .70, respectively.

Achievement Strategies in Sport. Achievement strategies in sport were measured by using a modified version of the SAQ (Nurmi et al., 1995) for the sport context. It consisted of nine items, to which the student-athletes rated on a 4-point rating scale (1 = “Strongly disagree,” 4 = “Strongly agree”). The scale consisted of two subscales: (1) Success expectations (5 items; e.g. “*I often wonder how well I do in sports.*”) and (2) Task-avoidance (4 items; e.g. “*Sometimes I get sick if I know that there will be something difficult in training the next day.*”). Success expectations were measured at each time point, whereas task-avoidance was measured only for the first three measurements. The Cronbach alpha reliabilities for success expectations at different time points were .63, .66, .71 and .69, and for task-avoidance the reliabilities were .64, .81 and .80, respectively.

Analysis strategy

The analyses were accomplished with the following steps. First, a latent profile analysis was performed to identify different motivational trajectories (i.e., profiles) among student-athletes. The analyses were performed separately for school and sport domains by using mean scores of task values, success expectations, and task-avoidance from Time 1 to Time 4 as criteria variables. The models were estimated by using *Mplus* statistical software (Version 8.0; Muthén & Muthén, 1998-2017) and the maximum likelihood with robust standard errors estimation method (MLR). To decide the optimal number of different motivational profiles existing in the sample, the following four criteria were used: (1) model fit, (2) distinguishability of the latent groups, (3) latent class sizes, and (4) theoretical justification. The fit of the model was evaluated according to the following criteria: (a) Log likelihood value (Log L), (b) Akaike’s information criterion (AIC), (c) Bayesian information criterion (BIC), (d) the Adjusted Lo–Mendel–Rubin test (AdjLMR) and (e) the quality of classification by entropy. The higher values of the Log L and the lower values of AIC and BIC indicate the better model. In the Adjusted Lo-Mendel-Rubin tests (AdjLMR), in turn, a low p value ($p < .05$) indicates that a solution with k number of latent profiles fits the data better than the solution with $k-1$ latent profiles. The entropy ranges from 0 to 1, with values closer to 1 indicating a more clear classification of individuals.

Second, the stabilities and changes in different aspects of motivation (i.e., task values, success expectations, and task-avoidance) across time within latent profiles were investigated by obtaining mean differences between different time points for each motivation variable and testing their statistical significance with Wald's test. Third, differences between different motivation profiles in each motivation variable were examined by comparing these mean differences with Wald's test. Finally, the association of school-related motivational profile with sport-related motivational profile was examined by using a latent transition analysis (LTA; Lanza & Collins, 2008). LTA is a mixture model of longitudinal data that enables the examination and description of association (i.e., transition) between latent categorical variables (e.g., motivational profiles between two domains). The primary parameters of interest in LTA are transition probabilities, which reveal the probability of a student-athlete's belongingness in a certain kind of motivational profile in sport when representing a certain kind of motivational profile in school, and vice versa.

RESULTS

Developmental trajectories for school motivation

The first aim of the study was to find out what kind of developmental trajectories can be identified among student athletes during high school in terms of school motivation and how typical these developmental trajectories are in the sample. The model fit indices and class sizes of one- to seven-class solutions of latent profile analysis are shown in Table 1. The Log-L values increased and AIC, BIC and aBIC values decreased when the number of latent classes increased suggesting that even more than seven classes could be found in the sample. The entropy value increased until a six-class solution. According to AdjLMR, a two-class solution was better than a one-class solution, but a solution with three or more classes did not improve the fit compared to a two-class solution. Even though the two-class-model was suitable in theory, a model with five classes fit the data best by content since the five-class solution offered clearly distinct profiles in terms of content. Furthermore, although the Log-L, AIC, BIC, aBIC and entropy values were better in a six-class solution, the profile sizes were considered to be too small in order to make generalizations, and therefore, supported a five-class model with more reasonable profile sizes. The examination of BIC values further revealed

that although BIC values decreased when the number of latent classes increased, the decrease was notably smaller after a five-class solution compared to previous solutions, providing further support for the five-class solution. The means and standard deviations of different motivational variables for each profile are shown in Table 2 and standardized values are performed in Figure 1.

Table 1. Comparison of the Latent Profile Analysis Solutions with One to Seven Classes for School (selected solution in bold).

Classes	Log L	AIC	BIC	aBIC	adjLMR (<i>p</i>)	Entropy	n
1	-3671.607	7387.214	7479.625	7409.797	-	-	493
2	-3155.808	6379.616	6522.433	6414.517	.0103	0.81	208/285
3	-2969.923	6031.846	6225.069	6079.065	.1092	0.80	157/88/248
4	-2873.749	5863.498	6107.128	5923.035	.4913	0.80	59/87/208/139
5	-2797.209	5734.419	6028.454	5806.274	.2460	0.81	52/109/141/52/139
6	-2736.882	5637.764	5982.204	5721.937	.4702	0.84	10/171/51/151/48/62
7	-2681.596	5551.192	5946.040	5647.683	.4833	0.82	10/80/41/134/33/129/66

Note. Log L = log-likelihood value; AIC = Akaike's information criterion; BIC = Bayesian information criterion; aBIC = adjusted Bayesian information criterion; adjLMR = adjusted Lo-Mendell-Rubin likelihood ratio test.

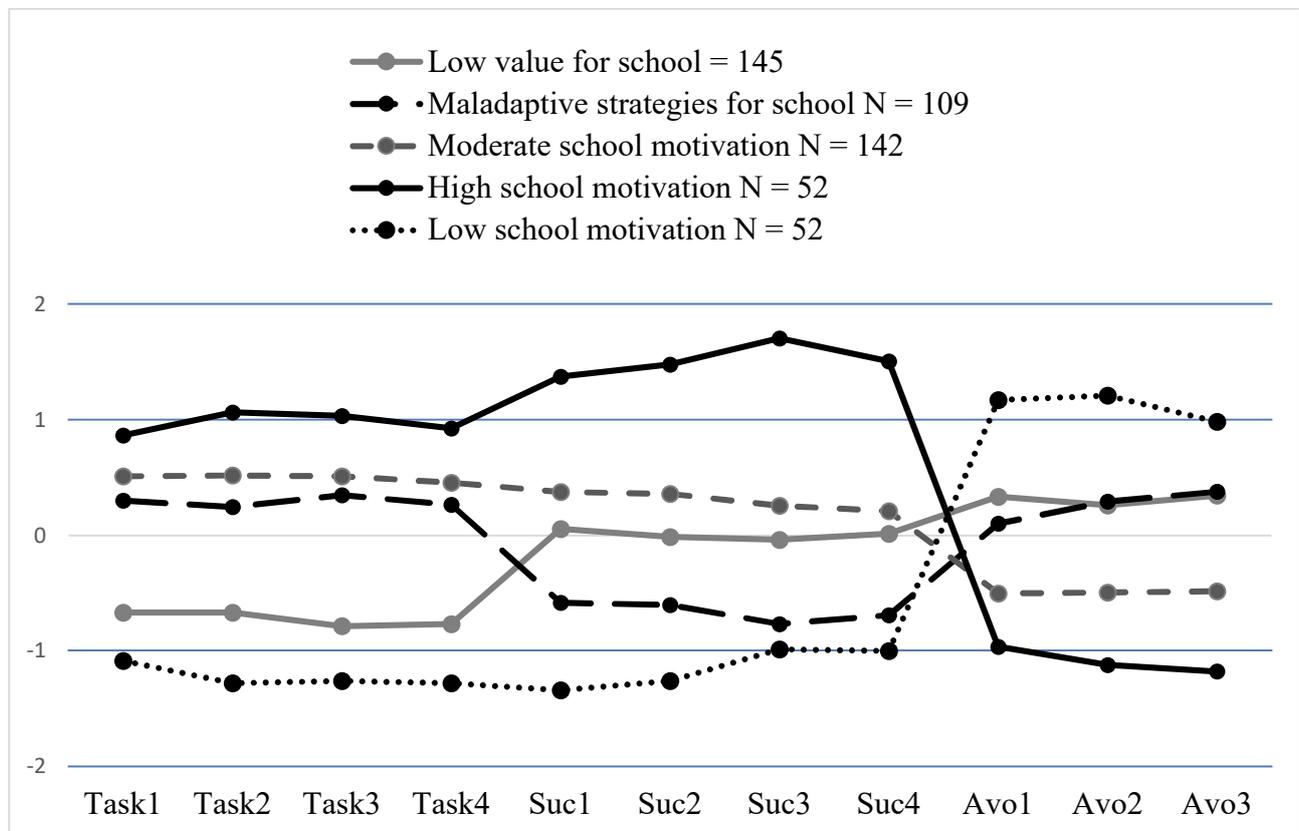
Table 2. Means and Standard Deviations (S.D.) of Task Values, Success Expectations and Task Avoidance in Each Measurement Point (T1-T4) for the Motivational Profiles in School, and Statistically Significant Differences Between Groups.

		Motivational profiles in school					
		1	2	3	4	5	(S.D.)
		(n = 145)	(n = 109)	(n = 142)	(n = 52)	(n = 52)	
Task values							
T1		3.45 ^a	3.91 ^b	4.01 ^{bd}	4.17 ^d	3.26 ^a	(0.35)
T2		3.35 ^a	3.80 ^b	4.01 ^b	4.20 ^c	3.05 ^d	(0.35)
T3		3.16 ^a	3.80 ^b	3.89 ^{bc}	4.18 ^c	2.90 ^a	(0.37)
T4		3.13 ^a	3.75 ^b	3.86 ^b	4.15 ^c	2.82 ^a	(0.43)
Success expectations							
T1		2.62 ^a	2.28 ^b	2.79 ^a	3.31 ^c	1.88 ^d	(0.37)
T2		2.61 ^a	2.31 ^b	2.79 ^a	3.36 ^c	1.98 ^d	(0.35)
T3		2.59 ^a	2.18 ^b	2.75 ^a	3.57 ^c	2.06 ^b	(0.36)
T4		2.66 ^a	2.26 ^b	2.77 ^a	3.51 ^c	2.08 ^b	(0.41)
Task avoidance							
T1		2.07 ^a	1.95 ^a	1.62 ^b	1.36 ^c	2.53 ^d	(0.44)
T2		2.20 ^a	2.22 ^a	1.76 ^b	1.40 ^c	2.75 ^d	(0.46)
T3		2.34 ^a	2.36 ^{ad}	1.81 ^b	1.36 ^c	2.75 ^d	(0.41)

Note 1. 1 = Low value for school; 2 = Maladaptive strategies for school; 3 = Moderate school motivation; 4 = High school motivation; 5 = Low school motivation.

Note 2. Subscripts: Means with the same subscript do not differ statistically significantly from each other.

Figure 1. Standardized Responses for Task Values, Success Expectations and Task Avoidance at Different Measurement Points in School. The lines represent the motivational profiles and their developmental trajectories in terms of the measured variables in school.



Note 1. Task = Task values; Suc = Success expectations; Avo = Task avoidance

Note 2. 1 = Time 1 (the Fall of the first grade); 2 = Time 2 (the Spring of the first grade); 3 = Time 3 (the Spring of the second grade); 4 = Time 4 (the Spring of the third grade).

The first motivational profile was labelled as “Low value for school”, and it was the most common profile of school motivation among the sample (N=145, 29%). This profile was characterized by low level of school-related task values and a moderate level of success expectations and task avoidance. Based on the Wald’s test, task values in this profile statistically significantly decreased from the beginning (Time 1) until the end (Time 4) of high school (Wald = - .327, $p < .001$). The level of task avoidance and success expectations remained stable across time.

The second profile was labelled as “Maladaptive strategies for school”, and it was the third biggest profile among the sample (N=109, 22%). It was characterized by moderately high and increasing school-related task avoidance (Wald = .413, $p < 0.005$), accompanied by low success

expectations, and moderately high task values, both stable over time. The third motivational profile was labelled as “Moderate school motivation”. It was characterized by moderately high task values, as was with the “Maladaptive strategies for school” profile, but also relatively adaptive achievement strategies, including moderately high success expectations and low task avoidance. It was the second biggest profile among the sample (N=142, 28%). Task values and success expectations remained stable across time, while task avoidance showed statistically significant increase from Time 1 to Time 3 (Wald = .192, $p < .015$).

The fourth profile was labelled as “High school motivation” and it was one of the smallest profiles among the sample (N=52, 10%). This profile was characterized by the highest school-related task values and most adaptive achievement strategies, that is, the highest success expectations and the lowest task avoidance, among the sample. Task values and task avoidance remained stable over time, whereas success expectations statistically significantly increased from Time 1 to Time 4 (Wald = .193, $p < .029$). Opposite to the High school motivation profile, the fifth profile was labelled as “Low school motivation”, as it was characterized by low task values, low success expectations and high task avoidance. This profile was as common as the High school motivation (N=52, 10%) profile, and therefore, it was also one of the smallest profiles among the sample. Task values statistically significantly decreased from Time 1 to Time 4 (Wald = - .440, $p < .003$), whereas achievement strategies remained stable over time.

Statistically significant differences in the criteria variables between different profiles are shown in Table 2. The differences were analyzed with the Wald’s test. The results showed that in general (with few exceptions) the High school motivation profile displayed a higher level of school-related task values and success expectations and a lower level of task avoidance than the other four profiles, whereas the Low school motivation profile showed a lower level of task values and success expectations and a higher level of task avoidance than the other four profiles.

Developmental trajectories for sport motivation

The second aim of the study was to find out what kind of developmental trajectories can be identified among student-athletes during high school in terms of sport motivation and how typical these developmental trajectories are in the sample. The model fit indices and class sizes of one- to seven-

class solutions of latent profile analysis are shown in Table 3. The Log- L values increased and AIC, BIC and aBIC values decreased when numbers of latent classes increased (see Table 3), suggesting that even more than seven classes could be found in the sample. The entropy value was the highest in the two-class solution supporting a different result than Log L, AIC, BIC and aBIC values. As well as the entropy value, the values of AdjLMR supported a different result as Log L, AIC, BIC and aBIC values. According to AdjLMR, a three-class solution was better than a two-class solution, and a solution with four or more classes did not improve the fit compared to the three-class solution. Even though the three-class-model was suitable in theory, a five-class solution fit the data best by content since the solution offered clearly distinct profiles. Furthermore, although the Log- L, AIC, BIC, and aBIC values were better in a seven-class solution, the group sizes were considered to be too small in order to make generalizations, and therefore, the five-class model with more reasonable group sizes was supported. The examination of the BIC values further revealed that although the BIC values decreased when the number of latent classes increased, the decrease was notably smaller after a five-class solution compared to previous solutions, providing support for the five-class solution. The means and standard deviations of different motivational variables for each profile are shown in Table 4 and standardized values are performed in Figure 2.

Table 3. Comparison of the Latent Profile Analysis Solutions with One to Seven Classes for Sport (selected solution in bold).

Classes	Log L	AIC	BIC	aBIC	adjLMR (<i>p</i>)	Entropy	n
1	-2366.595	4777.189	4869.601	4799.773	.0000	0.00	493
2	-1986.722	4041.445	4184.262	4076.346	.2432	0.90	92/401
3	-1803.208	3698.415	3891.639	3745.634	.0030	0.86	56/113/324
4	-1699.135	3514.270	3757.899	3573.807	.5442	0.80	89/159/224
5	-1598.620	3337.240	3631.276	3409.095	.6447	0.81	44/65/210/155/20
6	-1514.133	3192.265	3536.707	3276.438	.3822	0.84	44/213/154/48/15/19
7	-1424.209	3036.418	3431.266	3132.909	.1579	0.86	18/211/150/46/43/2/23

Note. Log L = log-likelihood value; AIC = Akaike's information criterion; BIC = Bayesian information criterion; aBIC = adjusted Bayesian information criterion; adjLMR = adjusted Lo-Mendell-Rubin likelihood ratio test.

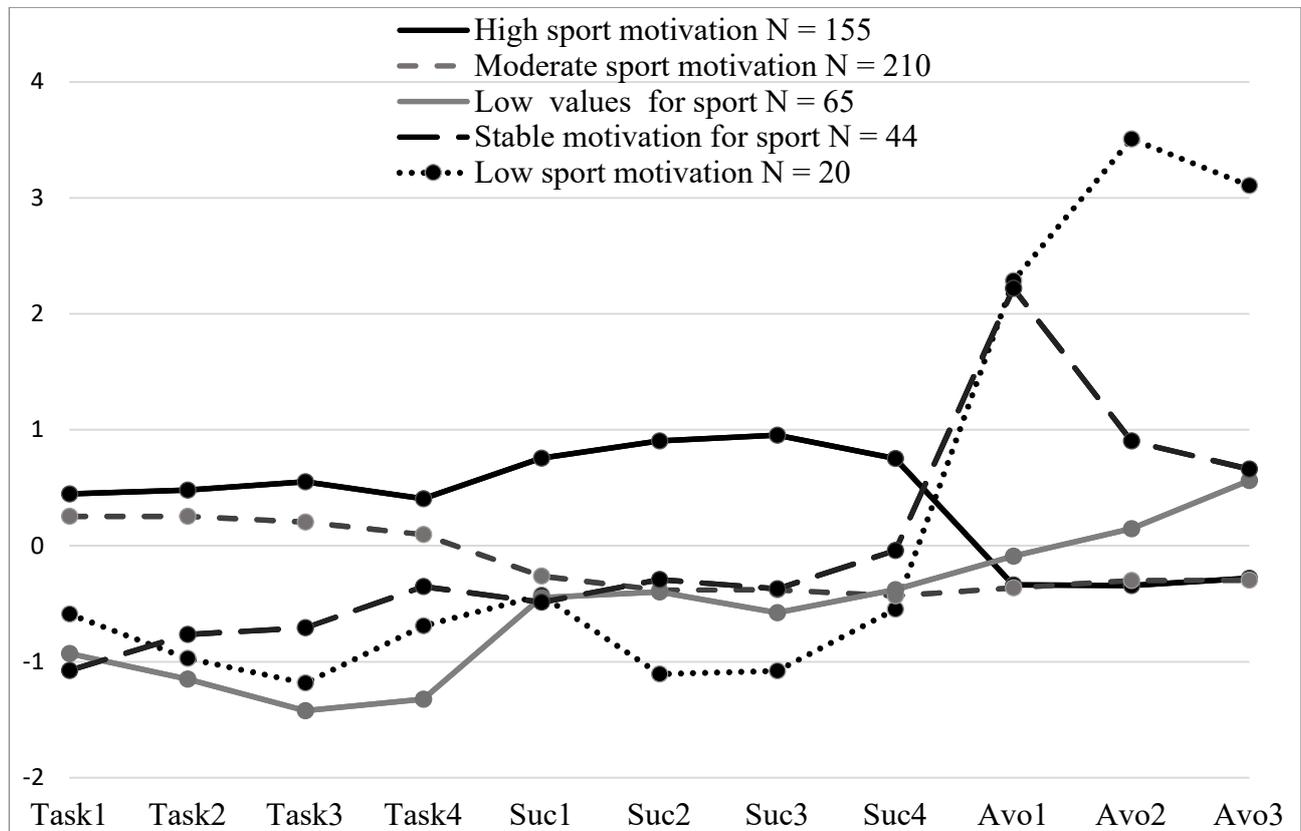
Table 4. Means and Standard Deviations (S.D.) of Task Values, Success Expectations and Task Avoidance in Each Measurement Point (T1-T4) for the Motivational Profiles in Sport, and Statistically Significant Differences Between Groups.

		Motivational profiles in sport					
		1	2	3	4	5	(S.D.)
		(n = 155)	(n = 210)	(n = 65)	(n = 44)	(n = 20)	
Task values							
T1		4.79 ^a	4.73 ^{ab}	4.35 ^b	4.30 ^b	4.46 ^b	(0.26)
T2		4.78 ^a	4.69 ^a	4.13 ^{ab}	4.28 ^{ab}	4.20 ^b	(0.32)
T3		4.72 ^a	4.56 ^b	3.80 ^c	4.14 ^c	3.91 ^c	(0.35)
T4		4.62 ^a	4.47 ^{ac}	3.81 ^b	4.26 ^b	4.10 ^{bc}	(0.40)
Success expectations							
T1		3.22 ^a	2.76 ^b	2.67 ^b	2.65 ^b	2.68 ^b	(0.40)
T2		3.31 ^a	2.72 ^b	2.71 ^{bc}	2.76 ^b	2.39 ^c	(0.35)
T3		3.30 ^a	2.62 ^b	2.52 ^{bc}	2.62 ^{bc}	2.27 ^c	(0.38)
T4		3.16 ^a	2.60 ^b	2.63 ^b	2.79 ^{ab}	2.55 ^b	(0.39)
Task avoidance							
T1		1.06 ^a	1.06 ^a	1.13 ^a	1.80 ^b	1.82 ^b	(0.16)
T2		1.08 ^a	1.20 ^b	1.28 ^c	1.58 ^{abc}	2.63 ^d	(0.24)
T3		1.12 ^a	1.11 ^a	1.47 ^a	1.51 ^a	2.53 ^b	(0.31)

Note. 1= High sport motivation; 2 = Moderate sport motivation; 3 = Low values for sport; 4 = Stable sport motivation; 5 = Low sport motivation.

Note 2. Subscripts: Means with the same subscript do not differ statistically significantly from each other.

Figure 2. Standardized Responses for Task Values, Success Expectations and Task Avoidance in Sport. The lines represent the motivational profiles and their developmental trajectories in terms of the measured variables in sport.



Note 1. Task = Task values; Suc = Success expectations; Avo = Task avoidance

Note 2. 1 = Time 1 (the Fall of the first grade); 2 = Time 2 (the Spring of the first grade); 3 = Time 3 (the Spring of the second grade); 4 = Time 4 (the Spring of the third grade).

The first motivational profile was the second most common profile in sport motivation among the sample (N=155, 31%) and was labelled as “High sport motivation”. As the name illustrates, this profile showed the highest motivation, as sport-related task values were the highest and achievement strategies were the most adaptive, characterized by high sport-related success expectations and low task avoidance. Despite the high motivation, Wald’s test showed that task values in this profile statistically significantly decreased throughout high school (Wald = - .171, $p < .005$).

The second profile was labelled as “Moderate sport motivation” and it was the most common profile among the sample (N=210, 43%). This profile was characterized by high sport-related task values and an average level of achievement strategies including moderate success expectations and low task avoidance. In this profile, task values and success expectations statistically significantly decreased from Time 1 to Time 4 (Wald = - .152, $p < .003$), whereas task avoidance was stable over

time. The third profile, “Low values for sport” (N=65, 13 %), was characterized by low sport-related task values and stable moderate achievement strategies which was manifested by moderate success expectations and a relatively low task avoidance. According to the results of the Wald’s test, task values in this profile statistically significantly decreased from Time 1 to Time 4 (Wald = - .253, $p < .001$), whereas the level of achievement strategies remained stable over time.

The fourth developmental profile was the second smallest profile among the sample (N=44, 9%). It was characterized by stable and moderate sport-related task values, and achievement strategies, and for this reason, the profile was labelled as “Stable sport motivation”. Even though there was no difference in the level of task values between this and the Low values for sport profile, Wald’s test showed that there was a statistically significant difference in the developmental trend of these two profiles from the beginning until the end of high school (Wald = .218, $p < .037$). Task avoidance was statistically higher in these two profiles than in the three former profiles in the autumn of the first year, but no differences were found afterwards.

The smallest profile of the sample (N=20, 4%) was characterized by the lowest motivation and, thus, it was labelled as “Low sport motivation”. In this profile, the low motivation was evident because of the low sport-related task values and the most maladaptive achievement strategies, that is, the lowest level of success expectations and the highest level of task avoidance. Both task values (Wald = - .255, $p < .034$) and success expectations (Wald = - .291, $p < .020$) statistically significantly decreased from Time 1 to Time 2, but after that their level remained stable. Compared to other profiles, this profile was the only one displaying statistically significant changes in task avoidance, as there was an increase in task avoidance from Time 1 to Time 3 (Wald = .711, $p < .001$).

Statistically significant differences in the criteria variables between different profiles tested with the Wald’s test are shown in Table 2. The results showed that in general (with few exceptions) the High sport motivation profile displayed a higher level of sport-related success expectations than the other four profiles. However, there was no difference between the High sport motivation and the Moderate sport motivation profiles in sport-related task values and task avoidance. The Low sport motivation profile did not differ from the Low values for sport profile in sport-related task-values, although this profile showed a lower level of sport-related success expectations and a higher level of sport-related task avoidance than the other profiles.

The association of school-related motivational profiles with sport-related motivational profiles

The association of school-related motivational profiles with sport-related motivational profiles was investigated with a latent transition analysis. The transition probabilities and statistically significant differences in paired comparisons between different profiles from school to sport are shown in Table 5. Because of the large number of paired comparisons, significance level $p < .01$ was used instead of $p < .05$ when reporting statistically significant results. The paired comparisons showed that, in general, the likelihood of student-athletes showing High sport motivation or Moderate sport motivation profiles was statistically significantly ($p < .01$) higher than the probability of showing other sport-related motivational profiles. Even among the student-athletes representing the Low school motivation profile, it was more probable of them to show the Moderate sport motivation (42%) profile than any other sport-related motivational profiles. However, for this profile, the differences found were slightly less significant than in other profiles ($p < .05$). In addition, among the student-athletes representing the High school motivation profile, the probability to show High sport motivation (82%) profile was very high and, thus, probabilities to show any other sport-related motivational profiles were only minor.

Table 5. Transition Probabilities when Predicting Sport-related Motivational Profiles with School-related Motivational Profiles (Latent Transition Analysis).

	<i>Sport-related profiles</i>				
	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
<i>School-related profiles</i>					
Low value for school	0.398 ^a	0.285 ^a	0.137 ^b	0.134 ^b	0.046 ^b
Maladaptive str. for school	0.027 ^a	0.729 ^b	0.117 ^a	0.080 ^a	0.046 ^a
Moderate school motivation	0.008 ^{ac}	0.326 ^a	0.453 ^c	0.512 ^b	0.061 ^b
High school motivation	0.815 ^a	0.148 ^b	0.038 ^b	0.000 ^b	0.000 ^b
Low school motivation	0.127 ^a	0.415 ^b	0.158 ^a	0.165 ^a	0.135 ^a

Note 1. Profile = High sport motivation; Profile 2 = Moderate sport motivation; Profile 3 = Low value for sport; Profile 4 = Stable sport motivation; Profile 5 = Low sport motivation.

Note 2. Subscripts: Probabilities with the same subscript do not differ statistically significantly ($p > .01$) from each other.

Next, a similar kind of a latent transition analysis was carried out to indicate the transition probabilities from sport-related motivational profiles to school-related motivational profiles. The transition probabilities and statistically significant differences in paired comparisons between different profiles from sport to school are shown in Table 6. The paired comparisons showed that, in general, student-athletes representing a certain kind of sport-related profile were statistically significantly ($p < .01$) more likely to show a similar kind of school-related profile. For example, student-athletes representing the High sport motivation profile were statistically significantly more likely ($p < .001$) to show the High school motivation (28%) and the Moderate school motivation (29%) profiles than the Maladaptive strategies for school (2%) or the Low school motivation (1%) profiles. Moreover, in contrast with the transition probabilities from school to sport, student-athletes representing the Low sport motivation profile were also statistically significantly ($p < .003$) more likely to show the Low school motivation (36%) profile than the High school motivation (0%) profile.

Table 6. Transition Probabilities when Predicting School-Related Motivational Profiles with Sport-Related Motivational Profiles (Latent Transition Analysis).

	<i>School-related profiles</i>				
	Profile 1	Profile 2	Profile 3	Profile 4	Profile 5
<i>Sport-related profiles</i>					
High sport motivation	0.043 ^a	0.019 ^b	0.366 ^a	0.282 ^a	0.289 ^b
Moderate sport motivation	0.103 ^a	0.374 ^{bc}	0.192 ^{ab}	0.037 ^d	0.293 ^c
Low sport motivation	0.359 ^{abc}	0.251 ^{abc}	0.332 ^{abc}	0.000 ^b	0.058 ^c
Stable motivation for sport	0.195 ^{ab}	0.194 ^b	0.425 ^{ab}	0.000 ^a	0.187 ^b
Low value for sport	0.131 ^{ab}	0.201 ^b	0.307 ^b	0.032 ^a	0.329 ^{ab}

Note 1. Profile 1 = Low value for school; Profile 2 = Maladaptive strategies for school; Profile 3 = Moderate school motivation; Profile 4 = High school motivation; Profile 5 = Low school motivation.

Note 2. Subscripts: Probabilities with the same subscript do not differ statistically significantly ($p > .01$) from each other.

DISCUSSION

The purpose of this study was to investigate what kind of motivational profiles can be found among dual career athletes during high school in both school and sport. The student-athletes' motivation was examined longitudinally from the beginning until the end of high school through two different motivational structures, that is, task values and achievement strategies (success expectations and task avoidance). Combining these two perspectives on motivation provided the opportunity to explore the mutual relations of the motivational constructions, and the suggested (Covington, 1992; Lee et al., 2014; Wigfield & Cambria, 2010) role of success expectations as a common factor between task values and achievement strategies. The aim was also to examine the association of school-related motivational profiles with sport-related motivational profiles. This provided the opportunity to examine the extent to which the student-athletes show similar kind of motivation in two different environments and whether the motivational factors are, therefore, context-related (i.e., different depending on the context), or rather individual trait-like tendencies (i.e., similar across different contexts).

In the present study, five distinct motivational profiles were identified among the student-athletes in both school and sport contexts. There were highly motivated and less motivated student-athletes in both school and sport contexts. Overall, the student-athletes showed to be more motivated in sport than in school, which was illustrated in higher task values and lower task avoidance in sport. In addition, the number of student-athletes showing a profile with high motivation was greater in sport than in school. The changes in motivation over time were only minor and occurred mainly in task values and task avoidance, while success expectations were relatively stable. The changes reflected a domain-independent decrease in motivation as values decreased and avoidance increased in both school and sport domains. Finally, student-athletes appeared to be highly motivated for sport regardless of their level of motivation for school, while student-athletes representing a certain kind of motivational profile in school were likely to show a similar kind of profile in sport. Considering these findings, the present study suggests that task values and task avoidance may be rather context-related, whereas success expectations are more related to individual trait-like tendencies.

Developmental trajectories for school motivation

The first aim of the study was to find out what kind of school-related motivational profiles there are among dual career athletes, and how typical these profiles are. Five distinct motivational profiles were found: (a) Low value for school; (b) Maladaptive strategies for school; (c) Moderate school motivation; (d) High school motivation; and (e) Low school motivation. The most common profiles were Low value for school and Moderate school motivation, whereas the least common profiles were High school motivation and Low school motivation. In general, the student-athletes seemed to be relatively motivated in school, which is presumed, as engagement in secondary education is often viewed as an expected part of youth (Pless, 2014). Moreover, student-athletes are expected to succeed in both school and sport (Ryba et al., 2016). Securing the employment of the student-athletes after retiring from elite sports is also an interest of the structural support system of the dual career athletes in Finland, which is part of a wider European initiative (EU Guidelines, 2012; Ryba, Stambulova, Selänne, Aunola, & Nurmi, 2017). However, it has been found that sport is often prioritized among dual career athletes (Aunola et al., 2018; Cosh & Tully, 2014; Simons et al., 1999). It could be that as engaging in education is motivated by societal expectations as an external factor, there is less internal motivation in school than in sport. Nevertheless, combining education with competitive sports is highly demanding (for a review, see Stambulova & Wylleman, 2015), which may force athletes to prioritize one domain over the other due to limited personal resources.

In this study, school-related task values remained stable among the majority (61%) of the participants, while with others decreased. The stability of task values (stability referring here to the stability of the mean level rather than the stability of individual differences) has also been found in another study under the same research project by Aunola and colleagues (2018), as they found that task values (interest, attainment and utility) showed stability during the first two years of high school. However, the stability of the task values is in contrast with some other findings, since it has been found that there is a general decline in the valuing of mathematics, language skills and physical education from grade one to twelfth (Jacobs et al., 2002; Wigfield & Eccles, 2000). The contrast may be explained by the difference in the examined samples as the present study focused on student-athletes in particular. Nevertheless, although there was variation in the stability of the level of task values in the sample across time, during the third year of high school task values remained stable in all profiles. It is possible that the stability of task values at the end of high school may reflect individual future plans becoming more relevant as graduation approaches. Moreover, an individual's identity may become more developed over the high school years. The identity clarification could be

reflected in the task values' stabilization, as the attainment value is directly related to the identity, and the utility value, in turn, is related to the usefulness of the task for the future (Eccles, 2005).

Among the school-related achievement strategies, success expectations remained stable among all student-athletes except for those who showed High school motivation profile. For these student-athletes, success expectations increased between the beginning and end of high school. The level of school-related task avoidance remained same over school years for student-athletes typified by the High school motivation and Low school motivation profiles, whereas it increased among others until the spring of the second grade. Thus, task avoidance in school increased among the majority of the sample. Moreover, task avoidance was generally higher in school than in sport. This pattern of results may be interpreted in the context of the Expectancy-value Model (Eccles, 2005). According to the model, cost is associated with maladaptive achievement behaviors and choices, such as avoidance behavior, whereas interest, attainment, and utility aspects of the task values promote approach-behavior (Jiang et al., 2018). Furthermore, cost has been estimated to be a demotivating factor in taking part in achievement-related activities (Viljaranta et al., 2015). Considering the dual career, the role of cost may be reflected in investing less effort in school, which is visible through higher, and even increasing, task avoidance in the school context. Nonetheless, another explanation can be found from Covington's (1992) theory of self-worth, according to which especially school challenges individual's self-worth through high demands, competitions, and assessments. Thus, the individual resorts to the use of maladaptive strategies to protect the sense of self-worth.

Considering the relationship between task values and achievement strategies, the results in the school domain provided mixed findings. Changes across school years in either task values or achievement strategies (success expectations and task avoidance) was not necessarily accompanied by changes in the other, although among student-athletes typified by the Low value for school profile, task values decreased and task avoidance increased simultaneously. In general, the more student-athletes valued school, the more adaptive their achievement strategies were. Nevertheless, even though task values were lower among student-athletes typified by the Low value for school profile than among those typified by the Maladaptive strategies for school profile, success expectations were higher in the former, while they both showed moderately high task avoidance. Lee and colleagues' (2014) findings may provide an explanation in the case of the Maladaptive strategies for school profile, as they found that high values accompanied by low expectations were associated with engagement in maladaptive strategies among Korean eleventh grade students. Another possible explanation could be that engaging in education is more motivated by external factors, as discussed above, which could be why there is avoidance behavior in school although the perceived value of

school is seen as high. In the case of student-athletes characterized by the Low value for school profile, it may be that although these student-athletes do believe in their success in the school context, they place more value in sports. Therefore, more effort is directed to sports, as the value attached to the task determines whether there is actual task engagement regardless of the level of success expectations (Eccles, 2005). This issue is addressed further after the discussion of the motivational profiles in the sport context below.

Developmental trajectories for sport motivation

The second aim of this study was to investigate what kind of sport-related motivational profiles there are among dual career athletes and how typical these profiles are. As well as in school, five distinct motivational profiles were found in the sport context: (a) High sport motivation; (b) Moderate sport motivation; (c) Low value for sport; (d) Stable sport motivation, and (e) Low sport motivation. The results showed that the majority (74%) of the student-athletes showed either the High sport motivation or the Moderate sport motivation profiles. Student-athletes who showed these two profiles were characterized by higher motivation, which was particularly evident in high task values and low task avoidance. Only 4% of the student-athletes represented the Low sport motivation profile, which differed from student-athletes typified by other profiles, with relatively low sport-related task values and more maladaptive achievement strategies (low success expectations and high task avoidance). The results showed that student-athletes' motivation in sports was relatively high and generally higher than in school. As discussed above regarding the motivational profiles in school, this result can also be explained by previous results related to the prioritization of sports over school (Aunola et al., 2018; Cosh & Tully, 2014; Simons et al., 1999), as well as the influence of possible external factors in school-related motivation. Likewise, this result is not surprising when considering that the data were collected from sport high school students. Presumptively, adolescents who choose a sport high school instead of a regular high school are likely to be highly motivated in sports.

The present study found that sport-related task values were relatively high throughout high school, which was also expected. A possible explanation for students-athletes' high value for sport could be related to identity. As discussed above, task values are strongly tied to an individual's identity through attainment and utility values (Eccles, 2005; Simons et al., 2004). Furthermore, dual career athletes have been shown to have a stronger athletic identity than student identity (e.g., Stambulova,

Engström, Franck, Linner, & Lindahl, 2015) and for that reason, it may be that student-athletes' task values reflect sport more than school. Although student-athletes seem to have high values for sport, among most of them (91%) task values decreased during high school. This result supports previous findings by Aunola and colleagues' (2018) study in which the number of student-athletes representing the Relatively low sport motivated profile increased from 13% to 23% during the first two years of high school. As Aunola and colleagues (2018) suggested, it may be possible that the transition to upper secondary education makes it challenging to combine sport and school as demands increase in many areas of life, which could explain the decrease in task values. Another explanation could be that the student-athletes may have a stronger athletic identity at the beginning of high school, but become more realistic with their athletic future as high school years go by.

The difference between athletes who represented the two extreme profiles, High sport motivation and Low sport motivation, was clearly manifested in sport-related achievement strategies. It was visible in that the student-athletes with high sport motivation showed the highest success expectations and low task avoidance, whereas student-athletes with low sport motivation showed the lowest success expectations and the highest task avoidance. In the case of student-athletes typified by other profiles, defining their achievement strategies as purely adaptive or maladaptive proved to be difficult as their achievement strategies seemed to be in-between the dichotomy. This was supported by the result according to which the student-athletes who represented Moderate sport motivation and the High sport motivation profiles did not differ in task avoidance, but student-athletes with high sport motivation demonstrated significantly higher success expectations than student-athletes with moderate sport motivation. This finding is also in line with the suggestion that achievement strategies emphasize the underlying psychological processes differently rather than being a single specific type of strategy (Nurmi et al., 1995).

Achievement strategies seem to be relatively stable in the sport context, as given the change throughout high school since success expectations decreased only for dual career athletes who showed Moderate sport motivation profile while task avoidance increased only for dual career athletes with low sport motivation. This result suggests that compared to school, sport-related achievement strategies are more stable since in the sport context task avoidance increased only among 4% of the participants, which is less than in the school context. There are no previous studies on the development of achievement strategies in sport, however, the findings of the present study suggest that avoidance behavior may be more related to the context rather than identity. Nevertheless, as discussed above, task avoidance in school may reflect the role of cost among dual career athletes, wherein school might be experienced as a cost of participating in sports.

According to the relationship between sport-related task values and achievement strategies, the results did not provide a consistent picture. Although most student-athletes showed a decrease in task values, the achievement strategies remained stable among the majority. This inconsistent relationship was also evident in the mean-level results of the task values and achievement strategies, which was supported by the result that although there was no difference in task values between athletes who demonstrated the Low value for sport and the Low sport motivation profiles, these athletes differed in their achievement strategies. To our knowledge, there are no previous studies considering the relationship between task values and achievement strategies in the sport context, and therefore, the findings of the present study are contrasted with previous findings concerning achievement goals. In this study, the results of the relationship between task values and achievement strategies in the sport context were in contrast with achievement goal literature, as achievement goals have been suggested to predict task values (Hulleman et al., 2008), but it has also been shown that task values predict achievement goals (Liem et al., 2008). Nevertheless, the inconsistency between the present and previous findings may be partly due to the differences in the used concepts and operationalization. However, Liem and colleagues (2008) found that self-efficacy predicted both mastery goals and performance-approach goals, and negatively performance-avoidance goals, which could provide an explanation for the present findings. It might be that the student-athletes' success expectations could reflect a more stable part of motivation while the stability and changes in task values and task avoidance are more context-related.

The association of school-related motivational profiles with sport-related motivational profiles

The third and final aim of the present study was to find out the associations between the motivational profiles in sport and school contexts. The findings displayed that regardless of the athletes' motivation in school, their sport motivation was relatively high. However, good motivation in sport did not guarantee good motivation in school. The student-athletes who were less motivated in school were still likely to show relatively good motivation in sport, which was illustrated by the finding that among all the five motivational profiles in school it was the most probable to show the Moderate sport motivation or the High sport motivation profiles, which were also the most common profiles in the sport context. In turn, the student-athletes with low motivation in sport were likely to have low motivation in the school context as well. This was supported by the result that student-athletes representing the Low sport motivation profile were likely to show the Low school motivation profile.

It seems rather probable that sport motivation is accompanied by lower motivation in the school context, as the results showed that sport motivation was high regardless of the level of school motivation. Constructing a dual career is often highly demanding (Aunola et al., 2018; Cosh & Tully, 2014; Simons et al., 1999), and may result in investing time in either school or sport. Furthermore, sport is often prioritized, as the athletes tend to identify themselves more as athletes than students (e.g., Stambulova et al., 2015). Applying in a sport high school may also be motivated by external factors, such as societal expectations (Pless, 2014; Ryba et al., 2016). Moreover, school motivation may be driven by an athlete's own interest in earning a stable living in the future, as in the sport context, some sports are more financially rewarded than others (Aunola et al., 2018). The idea of securing one's livelihood comes close to the idea of utility value, referring to the usefulness of the task in terms of the future (Eccles, 2005). The interpretation that school is relatively externally motivated may explain why there were lower task values in school than in sport in this study. Moreover, the value attached to the task determines whether there is actual task engagement, although one might believe in succeeding in a task (Eccles, 2005). Therefore, even if the athlete believes in success in both contexts, sport is ultimately put first, because sport has a higher value to the individual.

An interesting finding concerning the Low sport motivation profile was that student-athletes in this profile were also likely to show the Low school motivation profile and were, therefore, likely to have low motivation in both school and sport. This finding indicates that sport motivation plays a central role in not only school motivation, but also the overall motivation towards the dual career. Although the Low sport motivation profile was represented by only 20 participants, it raises concerns over the persistence of the student-athletes' motivation in the long term. As previous studies have shown, an individual's achievement strategies are formed early in childhood and they can form self-repeating cycles (Onatsu-Arvilommi & Nurmi, 2000; Aunola et al., 2006; Nurmi et al., 2003). Both the Low school motivation and the Low sport motivation profiles were characterized by maladaptive strategies. Indeed, it may be that students-athletes who do not believe in their own abilities will find themselves in a cumulative cycle where they continue avoiding tasks and miss out on having experiences of success. Because of this, it is important to track the athletes that have low sport motivation, because they might be in danger of dropping out of both sport and school, which would further undermine their adaption to the society after retiring from the athletic career (Ryba et al., 2017).

As it is important to support the least motivated student-athletes, it would be important to find ways to enhance school motivation among the dual career athletes since there seems to be more variation in school motivation than in sport motivation. As the dual career athletes tend to put more value in sports, the authority figures in the sport context, such as coaches, have a central role in

supporting the academic path of the student-athletes. It has been suggested that coaches who facilitate a caring athletic environment and who are invested in supporting the athlete's holistic development and preparation for the future, provide a basis for the athlete to construct future plans outside of sports (Poux & Fry, 2015). Similar findings exist among student-athletes, as it has been suggested that they might benefit from coaching that supports obtaining for success in both education and sport, whereas coaching that perceives education less important may jeopardize the student-athlete's motivation towards education (Saarinen, Ryba, Ronkainen, Rintala, & Aunola, 2020). Moreover, coaching that focuses merely on competitive performances may cause damage to an athlete's development outside of sports (Poux & Fry, 2015; Saarinen et al., 2020). Indeed, coaching that cares about an athlete's life outside of sports has been shown to be related to increased perceived competence, enjoyment, and commitment in the sport context (Stuntz, 2016). Thus, coaching that supports an athlete's development holistically beyond the sport context may enhance motivation in both school and sport contexts.

The findings of this study provided for a preliminary support for an assumption that success expectations are more related to an individual's personality, whereas task values and task avoidance are rather context-related. To argue this point, the probability of showing a certain level of success expectations in each profile was about the same in both school and sport contexts, which was especially visible in the transition probabilities from sport to school. Moreover, there was less consistency in task values and task avoidance in the transition probabilities. In general, the mean-level changes in the motivational variables also showed that success expectations remained relatively stable in both contexts, whereas more changes were found in task values and task avoidance. Indeed, in the Expectancy-value Model, success expectations are understood as the individual's broad ability beliefs about competence in a domain, which portrays a bigger picture than merely focusing on expectations towards a certain task (Eccles, 2005; Eccles & Wigfield, 2002). These beliefs are shaped by previous experiences of similar achievement situations and the interpretation of them, which are more broadly affected by a wider social-cultural context, including the socializer's behavior and beliefs. Therefore, success expectations begin to develop early in childhood, and they affect and guide both task values and task avoidance. This is also supported by previous research suggesting that success expectations are clearly related to an individual's sense of self-worth (Covington, 1992; Harter, 1998; Lee et al., 2014). However, it is assumed that task values affect task choice, and especially the role of cost is critical in the task choice (Eccles, 2005; Wigfield & Cambria, 2010; Wigfield & Eccles, 2000). Additionally, cost is assumed to be similar to task avoidance (Jiang et al., 2018). Therefore, these findings support the notion that both task values and task avoidance are to a large extent context-related.

Limitations and future directions

The limitations of this study need to be considered when generalizing the results. First, the present study did not investigate the role of background variables on motivation. Previous studies have found that, for example, grade point average and gender have an impact on task values (Aunola et al., 2018; Viljaranta et al., 2009) and achievement strategies (Nurmi et al., 2009; Määttä, 2007). Thus, in the future, the development of motivation should be studied by controlling the possible background variables in order to better understand causal relations of task values and achievement strategies. Second, the Cronbach alpha reliabilities for sport-related achievement strategies were low. Moreover, task avoidance was measured only during the first two years of high school, and therefore, examining its development until the end of high school was not possible. It is possible that as graduating from high school approaches, student-athletes' future plans become more relevant, and this is reflected in task avoidance. Measuring task avoidance in the spring of the third grade would have been necessary in order to better understand the development of motivation and the mutual connections of the motivational variables.

Third, in this study, a mean score was formed from the task value components, which did not enable investigating the role of each task value component separately. From the task values, the cost component was also not measured. Cost has been shown to have a stronger impact on task choice than other task value components (Eccles, 2005; Jiang et al., 2018; Viljaranta, Lazarides, Aunola, Rääkkönen, & Nurmi, 2015), and, therefore, it would have been important to measure the role of cost. Especially among dual career athletes, one domain might be experienced as an expense of the other. In this study, the role of cost on motivation was examined indirectly through task avoidance. Consequently, there is an evident need to investigate the role of cost on motivation and its associations with other task values as well as task avoidance. Fourth, the solution of five profiles accomplished through the latent profile analysis in both school and sport is only one way to interpret the results. It should be noted that solutions of three, four or six profiles were also possible, and a different number of profiles could have given a different kind of interpretation of the results. In addition, taking into account the results of the five-profile solution, it should be noted that the sample sizes of some profiles were small. Due to small sample sizes, some statistically significant differences may have remained insignificant, for instance, the Stable sport motivation profile was represented by only 44 students-

athletes. Despite the finding that this profile showed a clear decrease in the mean level of task avoidance, the decrease was not statistically significant, which may result from the small sample size.

Finally, the data of this study consisted of Finnish dual career athletes who belong to a specific socio-cultural environment and educational system. Socio-cultural factors have been shown to have an impact on motivation (Eccles, 2005; Eccles & Wigfield, 2002; Wigfield & Cambria, 2010), particularly on individual expectations of success, which would necessitate the investigation of the motivational structures of the present study with dual career athletes from different countries and cultures to gain better reliability and generalizability of the development of motivation among dual career athletes.

Conclusion

The results of this study add to previous literature by providing for a better understanding of the development of dual career athletes' motivation during high school in both school and sport contexts. This study also broadens the perspective on motivation in general by examining both task values and achievement strategies in two separate domains, that is, school and sport. The findings showed that the student-athletes were generally more motivated in sport than in school. However, in both school and sport contexts, there were both highly motivated and less motivated student-athletes. In both contexts, there were only small developmental changes in motivation, which were reflected in a decrease in task values and an increase in task avoidance. However, success expectations were relatively stable and quite similar in both school and sport contexts. A significant finding was that student-athletes appeared to be highly motivated for sport despite the level of motivation for school, while students-athletes with less motivation in sport were also less motivated toward school. Considering the possible ways to support the dual career athletes' motivation in combining sports and education successfully, the findings of the present study suggest that the support should be focused on the school domain, and particularly on the student-athletes that are the least motivated in both domains, since they are in a risk of dropping out from both school and sports. In addition, the present study suggests that the students-athletes' success expectations and self-competence are more stable features and formed early in the development, whereas task choices that are affected by task values, and the degree of approach-avoidance behavior in achievement situations, are more context-related and guided by success expectations. In the future, it would be interesting to investigate the ways in

which the early formed competence beliefs could be shaped by the socio-cultural environment. This could further help in improving the interventions in supporting the dual career athletes to gain their full potential.

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