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DEVELOPMENTAL PSYCHOLOGY | NEW PERSPECTIVE

A new perspective on adolescent athletes' transition into upper secondary school: A longitudinal mixed methods study protocol

Tatiana V. Ryba^{1,2*}, Kaisa Aunola¹, Sami Kalaja², Harri Selänne³, Noora J. Ronkainen⁴ and Jari-Erik Nurmi¹

Abstract: The challenge of combining elite sport and education into a dual career pathway remains to be a source of concern for many high-performance athletes. Previous research findings suggest that committed participation in both domains is highly demanding and success in one pursuit often comes at the expense of the other. There are emergent studies, however, that argue for the beneficial and complementary nature of dual career pathways. Consequently, we emphasize the importance of understanding the processes underlying differences in the development of athletes' life trajectories. This article presents a study protocol to explore new methodological and analytical approaches that may extend current understandings of the ways psychological and sociocultural processes are interconnected in the construction of adolescent athletes' identities, motivation, well-being, and career aspirations in the transitory social world.

Subjects: Developmental Psychology; Research Design; Research Methods; Sport Psychology

Keywords: dual career; student athletes; mixed methods; career construction; transition; identity; motivation; burnout; psychological well-being

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PUBLIC INTEREST STATEMENT

The concept of dual careers for athletes refers to the challenge of combining an athletic career with education or employment. Our four-year project focuses on talented adolescent athletes, who often prioritize their athletic career as they struggle to reconcile the training and competition demands of high achievement sport with the academic requirements in upper secondary school. Understanding the developmental path as a process of transformation through participation in cultural practices, this research will add important insights into the ways in which adolescent athletes actively construct and negotiate their life trajectories in the context of youth sport culture. Our aim was to provide empirical evidence to national stakeholders for a contextually appropriate dual career strategy for young athletes in Finland.

1. Introduction

The challenge of combining elite sport and education to create a dual career pathway has recently been acknowledged by the European Commission in an effort to promote sport development in a socially responsible manner (*EU Guidelines*, 2012). In economically developed countries, there is an increasing expectation that youth athletes should combine their athletic and academic pursuits to avoid restricting their future study opportunities and life options. Despite this expectation, committed participation in both domains is highly demanding. International research findings are consistent, suggesting that talented and elite athletes who continue into upper secondary and higher education find it challenging to reach their potential simultaneously in two areas of achievement (Christensen & Sorensen, 2009; Lally & Kerr, 2005; O'Neill, Allen, & Calder, 2013; Stambulova, Engström, Franck, Linnér, & Lindahl, 2015). In Finland, where the present study is being conducted, almost 50% of children and adolescents are members of sport clubs (SLU, 2010). Furthermore, in the study conducted by Yrjölä (2011), 40% of Finnish student athletes reported that they would have stopped going to school had they failed their exams due to athletic pursuits.

Elite careers in sport are relatively short (i.e. elite and professional athletes often retire by age 30–35) and require an intensive investment of time and energy in developing sport-specific skills. Whilst most student athletes consider education important, they nevertheless tend to prioritize their athletic career as they struggle to reconcile the training and competition demands of elite sport with the requirements and restrictions in educational systems (Aquilina & Henry, 2010; Brandão & Vieira, 2013; Cosh & Tully, 2014). As a consequence, when participation in sports is threatened (due to injuries or de-selection, for example), the athletes' sense of self may be endangered, causing psychological difficulties in adaptation to life outside of sport (Allen Collinson & Hockey, 2007; Cević Erpič, Wylleman, & Zupančič, 2004; Park, Lavallee, & Tod, 2013). Likewise, the increased pressure associated with combining an academic and sporting career successfully may render adolescent athletes vulnerable to anxiety, stress overload, overtraining, and burnout, as well as various transition difficulties across development (Baron-Thiene & Alfermann, 2015; Christensen & Sorensen, 2009; O'Neill et al., 2013). Consequently, there is a definitive need to better understand the risk and resilience factors related to the construction of a dual career pathway during the critical transitions of adolescent athletes to upper secondary school, which often coincide with the transition to high-performance sport.

The present study design was informed by a developmental and holistic approach to athletic career. Wylleman and Lavallee's (2004) developmental perspective on transitions faced by athletes has recently been used to conceptualize a Holistic Athletic Career model (Wylleman, Reints, & De Knop, 2013), which we have modified further to incorporate the specificities of the Finnish context (see Figure 1). The culturally adapted, Finnish version of the Holistic Athletic Career model serves for better illustration of the present study's rationale.

Compatible with international findings (e.g. Côté, 1999; Wylleman & Reints, 2010), youth athletes in Finland start competing when they are approximately 7–8 years of age and 10 years of experience is typically required to achieve elite status (Blomqvist, Mononen, Konttinen, Koski, & Kokko, 2015). As the top level in Figure 1 indicates, the development of an elite athletic career includes: (1) *the initiation stage* during which the young athlete is introduced into organized competitive sports (from about 6 to 7 years of age); (2) *the specialisation stage* during which the athlete is often identified as talented, and training and competition intensify (from about 12 to 13 years of age); (3) *the mastery stage* in which the athlete participates at the highest competitive level (from about 18 to 19 years of age) and, depending on a sport, may acquire a (semi-)professional status; and (4) *the elite discontinuation stage* which describes the athlete's transition out of professional and elite competitive sports (from about 30 years of age). While the transitions between the athletic stages are normative for top-level athletes, the specific ages at which they occur may vary depending upon the type of sport. For example, in early maturation sports such as figure skating and gymnastics, early specialization and deliberate practice seem to be essential (Côté, Baker, & Abernethy, 2007), although in

Figure 1. Modified Finnish version of the holistic athletic career model.

	Age	6	7	10	15	18	20	25	30
Athletic career	Initiation		Specialisation			Mastery (professionalisation)			Elite discontinuation
Psychological development	Childhood			Adolescence			(Young) Adulthood		
Social relations	Parents Siblings Teachers Peers/Friends			Peers/Friends Coach Parents Teachers			Coach Partner Friends/Peers		Family Friends/Peers Colleagues (Coach)
Academic /vocational development	Pre-primary education (1 year)	Primary education (6 years)			Lower secondary education (3 years)	Upper secondary school	Higher education (university or polytechnic)		Working life
		Comprehensive school (9 years)				Vocational education and training	Working life		
Financial resources	Family			Sport clubs Sport federations Sport academies			Olympic committee Sponsors		Employer Scholarships

team and endurance sports, athletes tend to spend a longer time sampling sporting experiences in a variety of sports (Baker, Côté, & Abernethy, 2003; Wylleman & Reints, 2010).

The layer of athletes' psychological development includes childhood, adolescence, and (young) adulthood. Adolescent years are the most critical for the formation of identity, development of cognitive motivational strategies, and the social, learning, and organizational skills that may have long-term consequences for young people's educational choices, career aspirations, as well as lifespan sport participation and overall progress (Nurmi, 2004). Changes in athletes' social relations and the individuals who are perceived by athletes as being the most significant during that particular transition or stage are represented in the third layer of the model (for a review of social motivational influences across the athletic career span, see Keegan, Spray, Harwood, & Lavallee, 2014).

The fourth level depicts the athlete's development in the academic/vocational domain. This layer includes the educational transitions to comprehensive school, to upper secondary school (academic or vocational track), and to higher education (polytechnic or university). In Finland, it is typical to start working life right after graduation from secondary school (vocational track) or after completing higher education (academic track). Due to a prevalence of semi-professionalism in Finnish sport, there are varied trajectories of how to combine elite sport and academic/vocational development in young adulthood. Finally, the fifth layer of the model describes the stages of financial development in correspondence with the sources of material and logistic support that athletes receive along their career span.

The holistic lifespan perspective on elite athlete career development highlights that the successful integration of sport and education is likely to become a major source of concern during the adolescent years due to a major overlap between sport and school at the critical stage when athletic training and competition intensify. In most sports, athletes begin their critical junior-to-senior transition at ages 16–18. On average, only 10–30% of elite junior athletes will successfully complete the transition (Bussmann & Alfermann, 1994; Stambulova, Alfermann, Statler, & Côté, 2009; Vanden Auweele et al., 2004). The process of transitioning into elite level sport has been reported to be highly stressful for athletes as they adjust not only to the increased athletic demands required for higher training and performance outcomes, but also the new psychological and psychosocial challenges

encountered. Likewise, the educational transition into upper secondary school is critical, wherein approximately 10% of adolescents in Finland have been shown to experience a severe school burn-out (Salmela-Aro & Näätänen, 2005).

As stated earlier, the adolescent years are crucial for the exploration and construction of identity. In sport psychology literature, athletic identity has been defined as the degree to which an individual identifies with the athlete role (Brewer, Van Raalte, & Linder, 1993). A strong athletic identity has been related to higher commitment in training and focus on sport goals (Horton & Mack, 2000). However, the potential risk of the strong and exclusive athletic identity is that an athlete's self-worth and self-esteem become dependent on performance outcomes. Hence, when athletes underperform or get injured, their psychological well-being might be compromised. It has been suggested that athletes with a one-dimensional sporting identity may have higher expectations and greater pressure to succeed, which in turn may lead to higher levels of athlete burnout (Coakley, 1992; Gustafsson, Kentta, Hassmén, & Lundqvist, 2007; Lemyre, Hall, & Roberts, 2008).

Furthermore, identity and involvement in activities thought meaningful, especially during adolescence, are the main factors underpinning future occupational choices (Savickas, 2005; Savickas & Porfeli, 2011; Super, 1980). There also appears to be a connection between the assigned value to an activity and self-concept (Wigfield & Eccles, 2000). In other words, engagement in activities and certain everyday practices rendered to be meaningful in constituting one's identity will likely persist and influence the subsequent task choices to the extent that they reflect the view one has about one's present and future self (Eccles & Harold, 1991). In view of the research findings indicating that athletes tend to lack life experiences and role experimentation outside the sporting contexts, and that their social relationships are often enclosed within athletic events and people (Miller & Kerr, 2002; Petitpas, Van Raalte, & Brewer, 2013; Verkooijen, van Hove, & Dik, 2012; Vuolle, 1978), it is hardly surprising that athletes with higher athletic identity are more likely to choose a sport-related profession in the future (Cabrita, Rosado, Leite, Serpa, & Sousa, 2014). While the pursuit of a sport-related occupation certainly cannot be taken as a problem, some researchers have raised concerns about athletes' agency in making career choices (e.g. Cosh & Tully, 2014; Griffith & Johnson, 2002). Since the crucial developmental period for the exploration of self within the social dynamics of diverse cultural sites coincides with the period of intense commitment and engagement in elite sport disciplinary practices, it would seem necessary to understand the processes implicated in narrowing down the social field in which elite athletes design their future life trajectories. One of the ways to do so is to examine the value adolescent athletes attach to sport and academic competence, respectively, and the mediating role these beliefs and adolescent self-concepts play in achievement-related choices.

Research studies concerning elite sport's compatibility with education has yielded inconsistent results. One reason for contradictory findings is that the studies were conducted in different countries, which have different sport and educational systems. Another reason is that different measures were used for such constructs as academic achievement (e.g. graduation rate, grade point average, credits per semester). American-based research tends to support the negative association of sport and academics (e.g. Adler & Adler, 1985; Purdy, Eitzen, & Hufnagel, 1982; Rubin & Rosser, 2014). However, in a survey of 236 American student athletes at a Division I university (Gaston-Gayles, 2004), only academic motivation was found to be a significant predictor of academic achievement (measured by GPA). Two sport-related motivation variables—that is, student athletic motivation (a measure of the extent to which student athletes were motivated to excel in athletic-related tasks) and athletic career motivation (a measure of the extent to which student athletes were motivated toward a professional athletic career)—were found to be non-significant in explaining academic performance. American research has suggested that student athletes, especially black males in revenue sports, tend to have lower GPA and graduation rates than the general college student population because they often come to college less academically prepared than their peers (Gaston-Gayles, 2004; Gatmen, 2012; Purdy et al., 1982).

According to a recent Finnish study of university student athletes' academic progress (Airas, 2014), only 22.6% of athletes make the expected progress (estimated by required credits per year). Surprisingly, the athletic level does not seem to have a significant effect on the progress of studies. These findings echo previous national research that Finnish athletes often exhibit a strong athletic identity and prioritize their athletic development over educational pursuits (Gröhn & Riihivuori, 2008; Yrjölä, 2011). Yet the aforementioned findings also suggest that factors other than sport involvement and commitment may be important determinants of athletes' academic/professional development. In light of consistent research results indicating that female athletes outperform male counterparts in academic outcomes (e.g. Adler & Adler, 1985; Airas, 2014; Rubin & Rosser, 2014), it is likely that adolescent girls develop better learning skills in school and subsequently enter higher education with more academic competence than male athletes.

There is emergent empirical work, which offers supporting evidence to suggest that athletic and educational pursuits are not only compatible but also complementary (e.g. Aquilina, 2013; Jonker, Elferink-Gemser, & Visscher, 2009). In a recent study of European student athletes' motivation toward dual careers, Lupo and colleagues (2015) concluded that to develop a better understanding of the athletes' sport and academic motivation, the same construct has to be investigated in relation to different sport and educational systems in Europe. As previous research has also indicated that the development of personal competencies and skills with which to achieve excellence in both domains play an important role in athletes' ability to cope with career and life transitions (Baron-Thiene & Alfermann, 2015; Elbe & Beckmann, 2006; Stambulova et al., 2015), it is essential to examine the processes producing differences in adolescent integration of sporting and academic pursuits in specific social and cultural contexts.

In this article, we present a research protocol for the ongoing study of adolescent athletes' dual careers in Finland. First, we suggest novel approaches to examining developmental trajectories of student athletes, which account for inter-individual differences in these trajectories and related risk and resilience factors embedded within the multiple layers of the presented Finnish version of the Holistic Athletic Career model. Second, methodology and methods of the study are outlined. Finally, we discuss the challenges and benefits of the longitudinal mixed methods design in the study of dual career pathways.

2. What is novel in the present study protocol?

Although athlete career transitions literature has grown exponentially in sport psychology, with the holistic lifespan perspective being used as a foundational framework in dual career studies (Stambulova & Wylleman, 2015), there is limited research that explores the intercontextual dynamics between school and sport that underpin the construction of differences in developmental trajectories of student athletes. Despite the acknowledgment that dual career transitions occur *simultaneously* and are linked to other domains of athletes' development, the transactional processes involved and transmitted in-between school and sport have seldom been explicated (as an exception, see Stambulova et al., 2015). For example, researchers in educational and sport psychology have studied school burnout (e.g. Aypay, 2011; Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009) and sport burnout (e.g. Gustafsson et al., 2007; Raedeke & Smith, 2004) separately in different studies. Yet, the risk of burnout can be assumed to increase when the academic and athletic demands are simultaneously intensified. An important question then becomes to what extent one type of burnout will transfer to another context over time and whether the prevalence of, for example, school burnout will increase the risk of sport burnout and vice versa. Another question is to what extent motivation for dual careers (sport and academic) can be sustained across gendered cultural contexts in sport and school. Moreover, what are the key daily discourses and practices implicated in the transactional exchange between individual athletes and their school and sport social environments that generate mutual accommodation, adaptation, and negotiation to produce new psychological states and trajectories of development (Heft, 2013; Sameroff, 2009; Valsiner, 2000)?

Because the development of different outcome variables (e.g. motivation, well-being, identity) are typically assessed within rather than across different domains (that is, within either sport or academic domains rather than across both), and they are assessed without differentiating individual and domain-related variation in the study variables, contextual variation of motivation, self-concept and well-being of the athletes is poorly understood. Similarly, little is known about how the personal and the social processes are interconnected and transformed *through time* in the construction of the dual career pathways.

To address the identified limitations in this area, the present study employs a longitudinal mixed methods design (Plano Clark et al., 2014) with the overarching objective to examine qualitative changes in the psychosocial processes underpinning dual career behaviors of talented adolescent athletes during their transition to upper secondary school. According to Johnson, Onwuegbuzie, and Turner (2007), mixed methods can address complex issues by the degree of mixing quantitative and qualitative approaches based on the research questions. The design of the present study comprises a fully longitudinal mixed methods study (Van Ness, Fried, & Gill, 2011) of adolescent athletes and an interview study from the life story approach (Atkinson, 1998) of coaches. The longitudinal study includes a repeated quantitative and qualitative data selection at multiple time points (for details, see Section 3.2), beginning at the start of 2015/2016 academic year, to grasp the dynamic interplay between personal and social factors in the production of developmental trajectories. Life story interviewing allows adolescent athletes to discuss their sport and school experiences in ways that they choose to share, reflecting on their lives from the present perspective and also probing into possibilities to anticipate change and future choices. Coaches are interviewed once about their everyday practices with an objective to get a sense of how they develop their coaching philosophy and attitudes toward holistic development of athletes (e.g. dual career, lifelong sport participation) and how these inform their practice.

Our key theoretical assumption is that psychological processes are enmeshed with sociocultural ontogenetic historicity (Bruner, 1990; Heft, 2013). Hence, individual subjectivity, learning, motivation, and well-being are mutually determined, and viewed as transactional processes as much as a product of interaction with socializing contexts (Hartup, 1989; Sameroff, 2009). Acknowledging epistemological tensions of combining quantitative and qualitative methods, which have been problematized in methodological debates in the realm of social sciences (Denzin, 2009; Sparkes & Smith, 2009), this research is positioned in a critical realism that assumes ontological realism and subjectivist epistemology. Ontological realism is deemed important to obtain objective measures of “fixed” reality at particular moments of time. Yet epistemological constructivism is appropriate for understanding subjective experience and also commensurable with a transactional developmental framework that views psychological experience as ongoing, inseparable from the sociocultural domain and arising out of a particular history. Hence our position is that longitudinal quantitative data will present coherent glimpses of psychological processes unfolding in a culturally meaningful way. Concurrent qualitative data will enhance our understanding of the ways in which Finnish adolescent athletes construct their psychological worlds and negotiate personal meanings in the narrative context of youth sport culture. Qualitative data gathered from coaches will add insights into sporting cultural narratives and career discourse practices that afford and constrain adolescent athletes’ agency. The study protocol was approved on 15 June 2015 by the Scientific Ethics Committee of the University of Jyväskylä, Finland.

3. Methodology and methods

3.1. Study participants

The adolescent participants are first year, both male and female, student athletes (aged 15–16) currently enrolled in six upper secondary sport schools (two each from the Northern, Central, and Southern part of Finland, respectively). At Time 1, the sample consisted of 391 adolescents (51% females) representing 50% individual sports and 50% team sports. Twenty percent of the athletes participated in Winter Olympic sports (e.g. alpine skiing, cross country skiing, ice hockey), 52% in

Summer Olympic sports (e.g. athletics, football, swimming), and 28% in non-Olympic sports (e.g. orienteering, floorball, Finnish baseball). Seventy-seven percent of the student athletes surveyed were aspiring to advance to the professional ranks. The participants' Grade Point Average (possible range from 4 to 10) was 8.85, ($SD = 0.62$; Range = 7.25–10.00) and 68% of the participants expected to obtain a university Master's degree in the future. Although all participants filled in a questionnaire, which also included an open-ended question about their future goals and life aspirations, life story interview data were gathered from a subset of 18 (10 female and 8 male) student athletes. The subsample of 18 participants was selected in cooperation with Sport Federations and Sport Academies to include international level adolescent athletes who have already started or soon are expected to start the transition into senior sport.

The coaching sample consists of ten ice hockey and ten athletics coaches from two sport clubs in Central Finland. The rationale for selecting these two sports was that (1) they are among the most popular sports in Finland, and (2) they are characterized by different sport professionalization processes. It is expected that each sample is homogeneous enough to identify common themes and patterns for a respective sport. A further comparative thematic analysis is intended to, presumably, generate additional insights into the gendered practices of a highly professionalized athletic environment of (male) ice hockey and a more diverse, yet still oriented toward an elite athletic career, environment of athletics.

3.2. Data gathering and measures

Qualitative data are gathered in low-structured interviews conducted from a life story approach (Atkinson, 1998, 2002). Consistent with this method, the interviewees are asked to tell their story of becoming an athlete or a coach, respectively. Such an open question prompts the construction of narratives without unnecessary interference from the researcher (Liversage, 2009). Although certain themes are of particular interest to the present study, for example the participants' attitudes toward dual careers, the specific questions that would probe into these themes are not structured in advance but derive from the content of the participant and the researcher's conversation.

Quantitative data are gathered via web-surveys supported by MrInterview software. Measurements take place at the baseline, that is, at the beginning of the first grade of upper secondary school (Time 1), and, after that, once at the end of each school year: spring of the first grade (Time 2), spring of the second grade (Time 3), and spring of the third grade (Time 4). Typically, adolescents in Finland have a three-year track in upper secondary school. However, there is also the option of choosing a three-and-a-half- or four-year track instead of the three-year track, which is often used by elite and aspiring athletes. For those on the extended academic track, there will be an extra measurement point in the autumn or spring of the fourth grade (Time 5). The interviews with coaches take place at Time 1.

The developmental trajectories of young athletes during upper secondary school are followed up according to various outcome measures including measures, for example, of well-being, motivation, identity development, and career construction. In addition to following up the developmental trajectories of athletes during the school years, the individual variation in these trajectories will be examined as a risk and resilience factor of possible dropout either from school or competitive sport across development. The used instruments and measurement points are presented in detail in Table 1.

3.3. Data analyses

3.3.1. Quantitative data

The quantitative data are analyzed through the use of statistical methods particularly suitable for analyzing developmental dynamics, such as structural equation modeling, growth curve and growth mixture analysis, and regression mixture models (Muthén, Khoo, Francis, & Boscardin, 2003). In particular, to investigate the heterogeneity in the developmental pathways, and in the risk and resilience factors of development, statistical tools that allow for the integration of variable-oriented and

Table 1. Instruments and assessment

Assessment/Instrument	Description	Time point of the study
Interview of the subsample of athletes (n = 18)	Low structured/ thematic and structural narrative analyses	T1-T4, T5
Interview of the subsample of coaches (n = 20)	Low structured / thematic and existential-narrative analyses	T1
Self-Report Questionnaires (n = 391)		
<i>Background information</i>		
Background questionnaire	e.g. year of birth, gender, mother language, etc	T1
Background questionnaire concerning sport	e.g. competitive level, time spent on sport, athletic expectations and goals	T1-T4, T5
Background questionnaire concerning education	e.g. time spent on studying, academic expectations and goals	T1-T4, T5
<i>Self-concept (modified from the scale by Wigfield et al., 1997)</i>		
Self-concept of Ability, Sport	3 items; 1 scale (self-concept of sportability)	T1-T4, T5
Self-concept of Ability, Academic	8 items; 3 scales (self-concept of ability in math, languages, and theoretical subjects)	T1-T4, T5
<i>Task-values (developed on the basis of Eccles et al., 1983 and Niemivirta, 2002)</i>		
Sport	13 items; 3 scales measuring interest, utility, and importance values in sport domain	T1-T4, T5
Academic	18 items; 3 scales measuring interest, utility, and importance values in 3 separate academic domains (math, languages, theoretical subjects)	T1-T4, T5
<i>Achievement Strategies</i>		
Sport (SAQ modified to sport context)	9 items; scales measuring (a) success expectations, (b) task-avoidant behaviors	T1, T2, T4/5
Academic (Strategy and Attribution questionnaire (SAQ); Nurmi, Salmela-Aro, and Haavisto (1995))	9 items; scales measuring (a) success expectations, (b) task-avoidant behaviors	T1, T2, T4/5
<i>Causal Attributions</i>		
Sport (Aunola, Ryba, & Selänne, 2015)	18 items; ability, effort, task and coach attributions for success and failure situations	T1, T2, T4/5
Academic (Aunola, Rytkönen, & Nurmi, 2007)	16 items; ability, effort, task and teacher attributions for success and failure situations	T1, T2, T4/5
<i>Burnout</i>		
Sport (SBI modified to sport context)	10 items; 3 subscales measuring (a) exhaustion, (b) cynicism, (c) sense of inadequacy at sport	T1-T4, T5
Academic School Burnout Inventory (SBI); Salmela-Aro and Näätänen (2005); see also Salmela-Aro et al. (2009)	10 items; 3 subscales measuring (a) exhaustion, (b) cynicism, (c) sense of inadequacy at school	T1-T4, T5
<i>Identity</i>		
Sport (Athletic Identity Measurement Scale (AIMS); Brewer et al. (1993))	10 items; 3 subscales measuring (a) social identity, (b) negative affectivity, (c) exclusivity	T1-T4, T5
Academic (AIMS modified to academic context)	10 items; 3 subscales measuring (a) social identity, (b) negative affectivity, (c) exclusivity	T1-T4, T5
<i>Achievement goals</i>		
Sport (Perception of Success Questionnaire (POSQ); Roberts, Treasure, & Balague, 1998)	10 items; scales measuring (a) performance goals, (b) mastery goals in sport	T1, T2, T4/5

(Continued)

Table 1. (Continued)

Assessment/Instrument	Description	Time point of the study
Academic (POSQ modified to academic context)	10 items; scales measuring (a) performance goals, (b) mastery goals in education	T1, T2, T4/5
<i>Career Construction</i>		
Student Career Construction Inventory (shortened SCCI; Savickas and Porfeli (2011))	14 items; 3 subscales measuring (a) self-concept, (b) occupational exploration, (c) career decision-making	T1-T4, T5
Career Adapt-Abilities Scale (CAAS; Porfeli & Savickas, 2012)	24 items; 4 subscales (concern, control, curiosity, and confidence) + 3 items measuring constructing of dual career (Ryba & Aunola, 2015)	T1-T4, T5
<i>Self-esteem</i>		
Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965)	5 items; 1 scale measuring general self-esteem	T1-T4, T5
<i>Self-reported grades</i>		
	Grades of math, mother language, and foreign language, and GPA	T1-T4, T5
<i>Future goals</i>		
	Open question concerning future goals; content analysis	T1-T4, T5
Dropout	Questions concerning continuation vs. drop out from sport / school	T2-T4, T5
Registry information (n = 391)	Grades from the official registry	T1-T4, T5

Notes: T1 = Time 1 (Grade 1/autumn), T2 = Time 2 (Grade 1/spring), T3 = Time 3 (Grade 2/spring), T4 = Grade 3/spring), T5 = Time 5 (Grade 4/autumn or spring).

person-oriented methodologies (e.g. growth mixture modeling, regression mixture models; Muthén, 2001a, 2001b) will be used. Moreover, a multilevel modeling framework will be applied in two ways: (1) to take account of the fact that athletes are in many cases nested within school classes, and (2) to study both *between-* and *within-individual* processes, i.e. the processes typical for individual across sport and academic domains (between-level processes) and the processes typical for particular domain (sport or academic) within individual (within-level processes).

Multilevel modeling makes it possible to differentiate the variance in outcome measures due to individual differences from the variance that is due to domain-specific effects. Therefore, it will be possible to test the extent to which domain-specific factors, on the one hand, and individual factors (like gender, self-esteem, general level of well-being), on the other, account for the variation in athletes' development across upper secondary school and also to what extent individual vs. domain-related factors contribute to the risk of school or sport dropout.

Modeling longitudinal data in a multilevel context further present the possibility to test whether developmental problems in one domain will generalize across development into other domains as well. This makes it possible to test, for example, whether performance-orientation in the domain of sport will be generalized across development to concern the academic domain, or whether low well-being in the academic domain is transferred across development to sport. Testing cross-level interactions in this context will further give insights on the possible moderating and mediating mechanisms of development. Finally, the multilevel modeling also provides a tool with which to examine whether the factorial structures of the variables under interest are similar or different at different levels of data (see, e.g. Seiffge-Krenke, Aunola, & Nurmi, 2009). The present study tests whether the factorial structures of athletes' identity and the various aspects of motivation and burn-out differ at the level of individual and at the level of domain (sport vs. school). The major part of the analyses will be carried out using the Mplus statistical package (Muthén & Muthén, 1998-2015).

3.3.2. Qualitative data

The qualitative data are analyzed with a narrative interpretive framework (Riessman, 2008; Smith & Sparkes, 2009). Analyzing life stories can be “the most effective means for gaining an understanding of how the self evolves over time” (Atkinson, 2002, p. 128), and offers insight to the complex ways in which meanings are negotiated in the creation of a coherent life narrative. At the same time, life stories are generated in a social context and can be analyzed for shared narrative resources and cultural discourses that shape personal experience (Riessman, 2008). In our analytical work, we will give attention to both the content (i.e. what is said and what is left out) and the form of the story (i.e. how it is spoken, and what the common narrative forms and structures are in use), and seek to discern the ways in which *whats* (concrete actions) interact with *whys* (salient life themes) and *hows* (individual agency and adapt-abilities) (Del Corso & Rehfuß, 2011). The benefits of a narrative approach for understanding issues surrounding identity development, career decision-making, and how people negotiate life transitions have been widely acknowledged in psychological research (e.g. Bujold, 2004; McAdams, Josselson, & Lieblich, 2001; Savickas, 2005, 2012).

Analyses of the adolescent athletes’ interviews will focus on critical moments (Thomson et al., 2002), which prompt shifts in psychological functioning (e.g. identity formation, motivation, and well-being), transforming individual subjectivity, and positionality in social relations and networks. As advocated by qualitative researchers engaged in longitudinal studies, it is a subjective sense of time within the cultural dimensions of social life that can provide insights into the processes through which agentic individuals animate their life trajectories, marked by concrete events, relationships, and transitions (McLeod & Thomson, 2009; Neale & Flowerdew, 2003; Saldana, 2003, 2013). Of particular interest to our analysis is to understand the ways in which cultural patterns of gender intersect with sport discourses and practices in the construction of subjective meanings and motives that direct action.

The coaching data will be analyzed with an integrated existential-narrative framework as outlined by Richert (2010). With these interviews, our focus is on understanding how coaches develop their personal coaching philosophy and how their beliefs and values guide their coaching practices. In this part of the work, we are interested in discerning whether it is an authentic value for coaches to support athletes’ dual careers, or if their philosophies are framed around performance discourses of elite sport. We will also identify espoused and implicit values (Schein, 1990) in the studied sport clubs, and seek to understand how coaches negotiate the possible discrepancies between the two. Coaches’ narratives are moreover analyzed for shared cultural narratives used for developing and justifying certain approaches and views on the coaching practice and athlete development.

4. Challenges of longitudinal mixed methods

To date, longitudinal research in psychology has been dominated by quantitative research designs. Longitudinal qualitative and longitudinal mixed methods research is scarce, although there is a growing interest in methodological pluralism in the field. Our choice of the longitudinal mixed methods design stems from the overarching objective to understand the ways in which developmental trajectories (of the psychological processes related to dual career) are culturally constituted and constructed over time within the dynamics of social interactions across contexts. As pointed out by Plano Clark et al. (2014), this research design is costly, time consuming, and requires meticulous planning and execution. Here, we share three encountered and anticipated challenges pertinent to logistics and methodological aspects of the present study.

First, obtaining quality data and retention of participants is a key challenge in any longitudinal research. Gaining entry into the national Sports Academies’ network, as well as establishing good relations with sport schools, were crucial for the successful gathering of interview and questionnaire data at Time 1. The project progress is contingent on maintaining the established cooperation as well as facilitation of adolescent athletes’ further participation. The strategies to support retention include: presenting the research to the coordinators of Sport Academies followed by personal communication with key persons in sport schools; conducting an information session for parents by

members of the research team and/or school collaborators; discussing the issue of dual careers with the adolescent athletes prior to explaining the study objectives and requesting their informed consent; collecting data during a school day; conducting and administering face-to-face interviews and questionnaires by members of the research team; offering small rewards to the adolescent participants, such as a movie ticket at Time 2 and a sport-related gift (approximate cost of 10 euro) at the completion of research.

Second, the present study's focus on the dual career trajectories of adolescent athletes and the use of mixed methods requires a range of expertise that cuts across disciplinary boundaries. Therefore, it might be challenging for mixed methods research teams to develop common ground due to the conceptual and methodological understandings rooted in disciplinary traditions. The strength of an interdisciplinary research team lies in its ability to openly negotiate differences in the creative effort in order to generate novel approaches toward theoretical and methodological problems.

Third, longitudinal mixed methods studies are still rare and present numerous epistemological and methodological challenges concerning the integration of quantitative and qualitative data. While the issue of mixing paradigmatic assumptions has been debated for over two decades in the social sciences, the longitudinal design presents an additional challenge of preserving temporality in data analyses and interpretations. Since it is not enough to analyze the sets of data within each method and then attempt to combine the two when reporting the results, our provisional solution is that data will be continuously analyzed in stages and then compared in order to: (1) contextually enhance the interpretation of quantitative findings; (2) possibly reveal probing questions for subsequent interview sessions through statistical analyses, and (3) outline emergent trajectories by means of an integrated analytical approach.

Despite the discussed challenges that can potentially constrain the production of knowledge, extending our current understandings of the ways in which psychological and sociocultural processes are dynamically interconnected in the construction of adolescent athletes' identities, motivation, well-being, and career aspirations can be seen as a worthwhile endeavor. We expect that the mixed methods design adopted in the study will yield novel insights into the transactional processes and intercontextual dynamics underpinning the construction of dual career developmental pathways, which in turn can enable the implementation of effective interventions and support programs for student athletes to facilitate their transitions in both sporting and academic environments.

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Competing interests

The authors declare no competing interest.

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