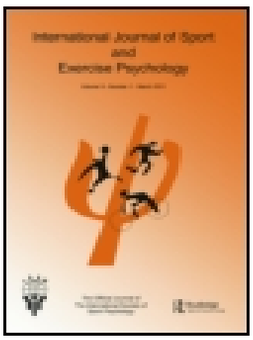

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The reliability and validity of the sport engagement instrument in the Finnish dual career context

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ABSTRACT

Although engagement is key to predicting burnout and dropout, few existing instruments measure this phenomenon in the sports context. As part of a larger three-year Lower Secondary Sports Schools Pilot Project (LSSSPP) in Finland, we conducted two studies as part of the present research with the major aims of (a) constructing the Sport Engagement Instrument (SpEI) and (b) validating the new instrument in the Finnish dual career context. In the preparatory study, an expert panel constructed the SpEI, a questionnaire comprising 37 items intended to measure cognitive and affective sports engagement. The main study utilised questionnaire data collected from two independent samples (n_1 = 992 and n_2 = 465) of lower secondary school student athletes aged 13 and 14 years to validate the SpEI. Six competing factorial structures with differing numbers and subsets of the 37 items were analysed using a series of confirmatory factor analyses. The results indicate that 18 items dispersed along with four affective engagement factors and either two first-order or one second-order cognitive engagement factor described the sports engagement phenomenon most accurately in both samples. Higher levels of sport burnout correlated negatively and behavioural engagement positively with affective and cognitive dimensions of engagement, which supported the instrument's validity. Although further validation is needed, the SpEI, in combination with coach and parental observations of changes in behavioural signs, might be useful in identifying athletes with low sports engagement and developing subsequent interventions accordingly.

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Affective engagement; cognitive engagement; behavioural engagement; burnout; questionnaire

The development stage (ages 13–19 years), characterised by an intensified level of training and competitions, has been recognised as a crucial part of an athlete's career (Wylleman et al., 2013). To extend the national network of specifically developed upper secondary sports schools (ages 16–19 years; see Nikander et al., 2021, for a review), the Finnish Olympic Committee initiated a 3-year Lower Secondary Sports Schools Pilot Project (LSSSPP) between the academic years 2017 and 2020. Altogether, 25 public mainstream

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lower secondary schools enrolling 400–900 students (ages 13–15 years) were certified for the project. Each school primarily provided teaching to regular students in accordance with the national core curriculum, but also offered targeted sports programmes with a more flexible curriculum to one classroom of about 25 talented athletes in Grades 7–9. The national project aimed to find solutions that allowed up to 10 hours a week during school days for physical education and sports, and to teach life skills needed for combining sports with education during later stages of the athletés career (Finnish Olympic Committee, 2017).

These schools with specific sports programmes provide important opportunities for adolescent athletes in the development stage to accumulate at least 20 hours a week of sports training, which is considered a necessity for reaching the mastery stage in sports (Aquilina, 2013). However, gradually increasing demands in sports and school have been shown to expose young athletes enrolled in sports programmes to sport and school burnout (Sorkkila et al., 2018, 2020), which might eventually lead them to drop out of sports (Sorkkila et al., 2019). Although the concept of engagement is considered key in predicting these severe outcomes (Isoard-Gautheur et al., 2016; Schmidt & Stein, 1991; Wang & Fredricks, 2014), there are few existing instruments to measure this phenomenon in the sports context (see Guillén & Martínez-Alvarado, 2014; Lonsdale et al., 2007).

Recognising the importance of sports engagement, in the present research, we included two studies jointly aimed at introducing the Sport Engagement Instrument (SpEI), a new instrument for measuring affective and cognitive sport engagement. These two studies are part of a larger Finnish research project (Authors, submitted) conducted in conjunction with the Lower Secondary Sports Schools Pilot Project (LSSSPP), which focuses on providing practitioners in schools with the knowledge to optimise the support they provide for adolescent athletes. Consequently, the SpEI might be a particularly valuable tool for identifying athletes with low affective and cognitive engagement, especially at the beginning of the development stage, before their risk for sport dropout peaks at the age of 15 years (Kokko et al., 2019).

Sport engagement

Drawing from work engagement (Schaufeli et al., 2002), sport engagement has been defined as positive feelings and cognitions toward sports that result in an enduring and stable sports experience. The Athlete Engagement Questionnaire (AEQ) is composed of 16 items. They are scattered along four dimensions: confidence, vigour, dedication, and enthusiasm. The AEQ is one of the few tools aimed at measuring elite athletes' sport engagement (Lonsdale et al., 2007; Lonsdale et al., 2007b). Confidence denotes one's ability to attain a high level of performance needed to achieve desired goals. Dedication, in turn, is defined as a desire to invest effort and time toward achieving important goals. Vigour characterises a sense of positive physical, mental, and emotional experiences, and enthusiasm feelings of excitement and high levels of enjoyment (Lonsdale et al., 2007b).

The Sport Engagement Scale (SES) presents another viable option for measuring sport engagement along three dimensions: absorption, dedication, and vigour (Guillén & Martínez-Alvarado, 2014; Stolarski et al., 2020). The SES originates from the Utrecht Work Engagement Scale (Schaufeli et al., 2002). This particular conceptualisation involving absorption, dedication, and vigour is one of the two dominant multidimensional approaches to engagement that have largely informed research and instrument

development in the work (Bakker, 2011; Bakker & Demerouti, 2008) and school contexts (Salmela-Aro & Read, 2017; Salmela-Aro & Upadaya, 2012, 2014). Although engagement is defined along four dimensions in the AEQ, these dimensions quite closely resemble the three dimensions in the SES. Both instruments measure engagement essentially as a personal resource of the individual, as basic psychological needs (autonomy, competence, relatedness) have been shown to represent motivational precursors for sport engagement (Hodge et al., 2009). Moreover, there is evidence that motivation mediates the association between psychological needs and engagement (Podlog et al., 2015). Thus, although both instruments have shown good psychometric properties in different sociocultural contexts and across competitive levels (De Francisco et al., 2018; Guillén & Martínez-Alvarado, 2014; Martins et al., 2014; Stolarski et al., 2020), they fail to account for significant interpersonal relationships as a part of the engagement construct (Lawson & Lawson, 2013).

The student engagement instrument

In addition to defining engagement as a construct consisting of absorption, dedication, and vigour (Schaufeli et al., 2002), the second common multidimensional approach to engagement depicts it as a malleable construct comprising three dimensions: behavioural (e.g., involvement in academic and extracurricular activities), affective (e.g., sense of belongingness to school, being accepted, and social support from teachers, peers, and parents), and cognitive (e.g., willingness and ability to plan, monitor, and regulate learning; Fredricks et al., 2004). Appleton et al. (2006) utilised this conceptualisation when developing the SEI, which is an instrument that measures students' affective and cognitive engagement toward school. The instrument has been validated in several countries, including Finland (Authors, 2016), the United States (Betts et al., 2010), and Portugal (Moreira et al., 2009), as well as in different student groups (Appleton et al., 2006; Betts et al., 2010; Moreira & Dias, 2019; Pinzone et al., 2019).

Measures of individual experiences (i.e., cognitive engagement) in concert with important reciprocal interpersonal relationships (DeFreese & Smith, 2013; Laird et al., 2016; Sheridan et al., 2014) with coaches, parents, and teammates (i.e., affective engagement) provide a means for understanding engagement from a holistic perspective (Hastie et al., 2020; Wylleman et al., 2004). Although the third component of engagement (i.e., behavioural engagement) can be measured through an individual's self-reported perception of involvement and effort (Hastie et al., 2020), it essentially relates to observable indicators of behaviour (Fredricks et al., 2004). Therefore, in the sports context, behavioural engagement is most accurately assessed by external observers using an observation tool that enables accounting for time spent on and off task, as well as the intensity and extent of observably engaged effort (Hastie et al., 2020). Practitioners and academic researchers could benefit from an instrument with potential to assess affective and cognitive engagement, defined as individuals' attitudes, perceptions, and beliefs toward themselves, teachers, parents, and peers (Voelkl, 2012).

Predictors of sport engagement

As engagement is a complex phenomenon that reflects various patterns of motivation, cognition, and behaviour (Alrashidi et al., 2016), the behavioural, cognitive, and

affective subtypes of engagement are typically recognised as conceptually distinct but positively correlated constructs (Fredricks et al., 2004; Hastie et al., 2020; Li et al., 2010). A myriad of research conducted in the school context shows that social support from significant others (affective engagement) and cognitive engagement facilitate student learning through increased behavioural engagement (Nguyen et al., 2018; Voelkl, 2012). However, research that assesses the specific associations between behavioural, affective, and cognitive subtypes of engagement is sparse in the sports context (Hastie et al., 2020). Among adolescent female gymnasts, higher levels of prior cognitive engagement have been shown to positively predict subsequent behavioural engagement (Weiss & Weiss, 2006). In turn, social support from significant others (e.g., affective engagement) has shown inconsistent associations (Scanlan et al., 2016; Weiss et al., 2010) with a range of positive (motivation, elite sports participation) behavioural outcomes (Mendonça et al., 2014; Sheridan et al., 2014). Previous studies suggest that social support from various sources should be investigated independently because the pivotal roles of coaches (Sheridan et al., 2014), peers (Beets et al., 2006), and parents (Laird et al., 2016) as prevalent providers of support affect youths' willingness to engage in sports.

Based on research stemming from the work context (Schaufeli et al., 2002), burnout is commonly framed as the conceptual opposite of engagement in the sports context (Guillén & Martínez-Alvarado, 2014; Lonsdale et al., 2007). Athlete burnout is defined as a multidimensional psychological syndrome that includes three dimensions, namely exhaustion, cynicism, and inadequacy (Sorkkila et al., 2017; Sorkkila et al., 2017). Generally, global burnout and its three dimensions are negatively related to motivation and engagement (Gustafsson et al., 2018). Research in the school context shows that students might simultaneously display high engagement and burnout (Salmela-Aro & Read, 2017). Among athletes in school-supported sports programmes, school- and sport-related burnout have been shown to represent two separate symptoms (Sorkkila et al., 2018). Consequently, adolescent athletes might develop symptoms of either school or sport burnout if demands are not balanced by sufficient social support (Sorkkila et al., 2020). Social support from significant others shields against sport burnout in general (Knight et al., 2018), but there is limited understanding of how specific sources of support relate to athlete burnout. The role of teammate (DeFreese & Smith, 2013), coach, and parental (Sheridan et al., 2014) support in reducing burnout has been underlined. Furthermore, previous research suggests differentiating between the two sources of parental support, as maternal support might be more influential in reducing sport-related burnout compared with paternal support (Sorkkila et al., 2017).

The present research

We conducted two studies in the present research with the major aims of (a) constructing the Sport Engagement Instrument (SpEI) and (b) validating this new instrument in the Finnish dual career context. The specific aim of the first, preparatory study was to describe the construction process of the SpEI. This involved describing the work of an expert panel in constructing the engagement factors and items based on the Finnish version of the 33-item SEI (Authors, 2016) and completing the phases of factor and item refinement after subjecting the initial scale to an external review.

The specific aim of the second, main study was to validate the SpEI using two independent samples of Finnish adolescent athletes participating in the LSSSPP. The validation

process included three objectives and related hypotheses based on the literature review. The first objective was to assess the construct validity of the SpEI by contrasting six competing factorial structures with distinct numbers and subsets of items that have all shown appropriate validity properties in the school context (Moreira & Dias, 2019). We expected that models comprising less items loading on each factor would provide a better fit to the data than models with a higher number of items on each factor (Hypothesis 1; Authors, 2018). The second objective was to assess the item and scale reliability of the factorial structure that showed the best validity properties. We expected that some of the items would present compatibility issues, given that a number of different versions with varying numbers and item subsets have displayed the best validity and reliability properties in the school context (Hypothesis 2; Moreira et al., 2009; Pinzone et al., 2019). The third objective was to examine the convergent and discriminant validity of the SpEI by estimating paths from sport burnout and behavioural engagement, competitive level, type of sport, gender, and time spent on sports to the affective and cognitive engagement subscales. We expected that behavioural engagement would be positively and burnout negatively related to cognitive and affective engagement (Hypothesis 3; Scanlan et al., 2016; Sorkkila et al., 2020; Weiss & Weiss, 2006). Furthermore, higher competitive level (Weiss & Aloe, 2019), individual sports (Chen et al., 2010), males (Gayles & Hu, 2009; Sturm et al., 2011), and more time spent on sports (Lupo et al., 2017) were expected to show a positive association with affective and cognitive sport engagement factors (Hypothesis 3). We used both independent samples to pursue the first two objectives, and we used the first sample to pursue the third objective.

The preparatory study

Instrument construction

A panel of six researchers and practitioners from Finland with a broad range of knowledge and experience in engagement research was assembled to generate the SpEI. A review of extant school engagement literature and existing scales revealed that the SEI (Appleton et al., 2006) would provide a valuable starting point for the preparatory study. The decision was reinforced by the fact that the original English version of the SEI (Appleton et al., 2006) had been translated into Finnish and proven to have adequate validity and reliability properties in two samples of Finnish students (Authors, 2016). Specifically, panel members discussed and adjusted items that stemmed from the Finnish version of the 33-item SEI (Authors, 2016) to construct a preliminary scale that captured the cognitive and affective dimensions of sport engagement. This process resulted in an item pool of 33 items that were scattered along three interrelated affective engagement subscales encompassing family support for sport (four items), coach–athlete relationships (nine items), peer support for sport (six items) and two cognitive engagement subscales including control and relevance of sports (nine items) and future goals and aspirations (five items).

Factor and item refinement

In spring 2019, a paper-and-pencil version of the initial scale consisting of 33 items was administered to 25 seventh-grade adolescent athletes from a school participating in

the LSSSPP. The participants, who functioned as external reviewers representing the intended target group, completed the 33-item scale under the supervision of two researchers from the research panel in a classroom in their school. Participants provided the two researchers with written and oral feedback on the clarity, relevance, and comprehensibility of the items. Based on the summarised participant feedback, the research panel made semantic changes, including grammatical changes and other minor language revisions on the item level. The feedback also indicated that the four items in the family support for sport subscale did not adequately capture the essence of family support in sports. Moreover, participants suggested that support provided by mothers and fathers should be measured via two distinct dimensions. Thus, the research panel continued to monitor the literature to find suitable items to replace these four items included in the preliminary scale for measuring family support. As a result of the inquiry, four items that specifically measure family support for sports were extracted from the Exercise Behaviour of Children and Adolescents in Finland Study Protocol (Kokko et al., 2019). This scale was then split into two subcomponents, which measured paternal and maternal support for sports with four parallel-worded items separately. As a result of the preparatory study, the panel produced 37 items, with 29 derived from the 33-item SEI (Authors, 2016) and eight items from the Exercise Behaviour of Children and Adolescents in Finland Study Protocol (Kokko et al., 2019). The full set of 37 SpEI items appears in Appendix A. We used these items to validate the instrument in the main study.

The main study

Procedure

The main study drew on data collected as part of a larger Finnish research project focused on investigating adolescent athletes' well-being in a Finnish dual career context (Authors, submitted). The research project comprises different types of data collected from three cohorts at four time points (T1–T4) in conjunction with the 3-year LSSSPP during the academic years 2017–2020. In the main study, we utilised parts of two cross-sectional datasets collected at T3 and T4, which have not been used in any previous study. The first data collection was conducted between January and March 2019 (T3), with participants from Cohort 2 from 24 of the 25 LSSSPP schools (Sample 2). The second data collection was carried out between January and March 2020 (T4), with participants from Cohorts 2 and 3 from 19 of the same 24 LSSSPP schools involved in the first data collection (Sample 1). Having two samples enabled us to fully test the reliability of the scale (i.e., dimensionality) by determining whether the measurements of items, their factors, and functions were the same across two independent samples (Boateng et al., 2018).

The ethics committee of (Blinded) University approved the research design before we recruited the study participants in 2017. After being accepted and prior to being granted a position in the schools' sports programmes, the participants and their parents signed a written consent form with the sports schools on which the mutual responsibilities were listed. An important part of the LSSSPP was to collect useful information for developing school-level practices; therefore, the consent form also included an invitation letter explaining the purpose of the research and an inquiry about adolescent athletes'

willingness to participate. As a result of the inquiry, written informed consent was obtained from roughly 500 out of 600 eligible athletes in Cohort 2, and from 610 of about 700 available athletes in Cohort 3. The LSSSPP schools sent this information to the research group, which stored the personal data in compliance with current security standards. Participation in the study was voluntary, and participants had the right to withdraw at any time and without giving a reason. Students responded anonymously to identical electronic questionnaires including the 37 items of the full version of the SpEI, as well as other items relevant for the research project, during school hours under teachers' supervision at T3 and T4. Teachers instructed participants to answer the questions calmly, honestly, and in numerical order and to move on to the next question if they did not understand the current one. The participants took 20–30 minutes to answer the questionnaires. The completed surveys were stored on a secure server without any personal data. The language of the survey was Finnish. School principals summoned all eligible participants from independent Cohorts 2 and 3 to participate in the data collection at T3 and T4.

Participants

Sample 1

The first sample comprised 992 student athletes (51.2% boys), of whom 57.2% were seventh graders (Cohort 3) and 42.8% were eighth graders (Cohort 2) at the time of data collection. The participants' response rate was 89.3%, and their mean age was 13.5 ± 0 years.

The athletes practiced ice hockey (15.5%), football (30.0%), other team sports (20.7%), and individual sports (33.8%, e.g., swimming, track and field, etc.). Of the athletes, 7.1% practiced sports or engaged in physical activity during their spare time less than 10 hours per week, 38.6% between 10 and 20 hours per week, and 54.3% more than 20 hours per week. Athletes competed at various levels (i.e., local, regional, national) and on average had been enrolled in sports clubs for 8.5 ± 1.5 years. The percentage of missing values on the SpEI variables varied between 0.3% and 5.6% ($M = 3.3\%$, $SD = 1.2\%$). Little's (1988) test showed that the missing values were not completely random: $\chi^2 = 3741.36$ (3384), $p \leq .001$.

Sample 2

The second sample comprised 465 student athletes (56.8% boys) from Cohort 2 who were in seventh grade at the time of data collection. The participants' response rate was 93%, and their mean age was 13 ± 0 years. The athletes practiced ice hockey (20.2%), soccer (27.3%), other team sports (19.2%), and individual sports (33.3%, e.g., swimming, track and field, etc.). Of the athletes, 12.2% practiced sports or engaged in physical activity during their spare time less than 10 hours per week, 48.7% between 10 and 20 hours per week, and 39.1% more than 20 hours per week. Athletes competed at various levels (i.e., local, regional, national) and on average had been enrolled in sports clubs for 8 ± 2.5 years. The percentage of missing values on the SpEI variables varied between 6.3% and 8.0% ($M = 7.0\%$, $SD = 0.7\%$). Little's (1988) test showed that the missing values were not completely random: $\chi^2 = 3101.49$ (2602), $p \leq .001$.

Measurements

Sport engagement

Sport engagement was measured with the SpEI, which consists of 37 items measuring two dimensions of sport engagement: affective engagement (four subscales: maternal support for sport, paternal support for sport, coach–athlete relationships, and peer support for sport); and cognitive engagement (two subscales: control and relevance of sports, and future goals and aspirations). All items were rated on a 5-point Likert scale (1 = *strongly agree*; 5 = *strongly disagree*) and reverse-coded so that higher scores represent a higher level of engagement.

Sport burnout

Sport burnout was measured using the SpBI–DC (Sorkkila et al., 2017). The scale consists of 10 items measuring sports-related exhaustion (four items, e.g., "I feel overwhelmed by my sport"), cynicism (three items, e.g., "Sport doesn't interest me anymore"), and inadequacy (three items, e.g., "I often have feelings that I'm not doing well in my sport"). The items were rated on a 5-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*). A sum score was calculated from all 10 items to assess the level of student athletes' overall sport burnout. The Cronbach's *α* for the scale was .89. The results of the validation study by Sorkkila et al. (2017) show that sport burnout can be modelled either as a three first-order factor structure or a second-order factor structure consisting of three first-order factors. Furthermore, the approach to modelling burnout also depends on whether burnout is the primary or secondary interest of the study (Salmela-Aro & Upadyaya, 2014). Given that the present study focused on the two dimensions of sport engagement, and burnout was used to test the convergent and discriminant validity of these dimensions, burnout was measured as a global construct.

Behavioural engagement

The middle-school student version of the Research Assessment Package for Schools (Wellborn & Connell, 1987) was modified to the sports context to evaluate athletes' level of behavioural engagement (five items; three positively worded [e.g., "I work very hard in sport"] and two negatively worded [e.g., "I don't try very hard in sport"]). The items were rated on a 4-point Likert-scale (1 = *strongly disagree*; 4 = *strongly agree*), and the two negatively worded items were reverse-coded so that higher scores indicated a higher level of engagement. A sum score of all five items was used in the analyses. The Cronbach's α for the scale was .74.

Personal characteristics

Gender (1 = girl, 2 = boy) and type of sport (1 = team sport, 2 = individual sport) were entered as a dummy-coded variables, and competitive level (1 = local level, 2 = regional level, 3 = national level) and time spent on sports (1 = 0–10 hours, 2 = 11–20 hours, 3 = more than 20 hours) as ordinal variables.

Data analyses

The analyses were performed with the Mplus statistical package (8th edition; Muthén & Muthén, 2017). We used the full information maximum likelihood estimation (FIML), in

which all available data were utilised without imputing data. The analyses were conducted in two phases. In the first phase, the factorial structure of the SpEI construct was tested with Sample 1 using confirmatory factory analysis (CFA). Because several plausible sets of items and factor structures have been shown to adequately describe the SEI (Moreira & Dias, 2019; Pinzone et al., 2019), we tested six competing models with subsets of 37, 35, 31, 29, and 18 items to find the best fitting version for the SpEI. The six untested theory-based models were estimated independently, and the models' fits were compared using the Akaike information criterion (AIC) and the Bayesian information criterion (BIC).

Model 1 had a 37-item, six-factor structure with four affective engagement factors and two cognitive engagement factors (Authors, 2016; Betts et al., 2010). Model 2 had a 35-item (items CS9 and CR9 omitted), six-factor structure with four first-order factors representing the affective dimension of engagement. Cognitive engagement was measured by future aspirations and goals specified as a first-order factor and relevance of sports participation specified as a second-order factor comprising three first-order factors (control of sports participation, relevance of sports participation, and validity of athlete assessment; Authors, 2016). Model 3 had a 31-item (items CS9, FG4, FG5, CR1, CR3, and CR9 omitted), six-factor structure with four factors pertaining to affective engagement and two connected with cognitive engagement (Moreira et al., 2009). Model 4 had a 31-item, six-factor structure with four factors linked to affective engagement and two to cognitive engagement, created by removing six items with correlated residuals (items CR1, CR2, CR5, FG2, CS3, and PS5 omitted; Pinzone et al., 2019). In Model 5, 18 items pertained to six first-order factors, with three items loading on each factor (Brief-SEI; Authors, 2018). Model 6 comprised 18 items scattered along a second-order factor (i.e., control and relevance of sports, and future aspirations and goals) that measured overall cognitive engagement, and affective engagement was described by four first-order factors.

In models M1–M6, the residuals of the parallel-worded item pairs (MS1 and FS1, MS2 and FS2, MS3 and FS3, and MS4 and FS4) measuring paternal and maternal support for sports were allowed to correlate. For models M5 and M6, we selected three items to represent paternal and maternal support based on factor loadings on the latent factors. Moreover, avoiding item pairs with high residual covariance functioned as a second selection criterion (Hayduk & Littvay, 2012). Consequently, items FS4 and MS4 were omitted from models M5 and M6 due to nonsignificant inter-item correlations and cross loadings on more than one factor. Lastly, the models displaying the best fit to the data were cross-validated with an independent sample of student athletes (Sample 2). To control for the hierarchical nature of the data due to how participants are nested within classrooms in schools, we calculated design effects for the six latent variables representing the cognitive and affective dimensions of engagement in the SpEI. Design effects greater than 2.0 indicate a need for multilevel modelling (Muthén & Satorra, 1995). The results suggested no need for multilevel modelling, because the design effects varied between 1.07 and 1.47 for Dataset 1, between 1.30 and 1.98 for Dataset 2, and between 1.03 and 1.96 when Datasets 1 and 2 were combined.

In the second phase, we computed the reliability and validity of the items that constituted the final SpEI. Item reliability was measured by examining squared correlations between the item and the factor. The items' structural validity was assessed by estimating standardised factor loadings (Bollen, 1989). The internal consistency was investigated by calculating McDonald's ω reliabilities for the SpEI's subscales due to items having correlated

residuals (Dunn et al., 2014). Lastly, we explored the convergent and discriminant validity of the SpEI by estimating paths from behavioural engagement, sport burnout, gender, type of sport, level of competition, and weekly amount of physical activity to the latent factors in the final model. The goodness of fit was evaluated by the following indices: chi-squared test (χ^2), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis Index (TLI). The cutoff values for well-fitting models were $\chi^2 = (p > .05)$, CFI > .95, TLI > .95, and RMSEA < .05 (Hu & Bentler, 1999).

Results

Descriptive statistics

Table 1 provides the descriptive statistics of the 37 items included in the full SpEI. The item means varied between 2.69 and 4.70 and variances between 0.70 and 1.10. Some of the items were non-normally distributed, with skewness and kurtosis values outside the range of ±2. This was accounted for by using the maximum-likelihood robust estimation method in the subsequent statistical analyses (Muthén & Muthén, 1998-2017).

Confirmatory factor analysis

The main study was initiated by estimating M1, which included all 37 items measuring four dimensions of affective engagement –MS (4 items), FS (4 items), CS (9 items), PS (6 items) – and two dimensions of cognitive engagement: CR (9 items) and FG (5 items). Next, M2–M6, encompassing 35, 31, and 18 items capturing the affective and cognitive subtypes of engagement, were estimated separately. Fit indices for the estimated models are displayed in Table 2. Results showed that M1–M3 adequately fit the data, whereas M4 did not fit the data. M5, comprising 18 items loading on six first-order factors, and M6, consisting of the same 18 items distributed along four first-order factors of affective engagement and a second-order factor of cognitive engagement, described the data well (note that M5 and M6 are data-equivalent).

Conclusively, all the goodness-of-fit indices indicated that M5 and M6 provided sound fit to the data, except for the χ^2 test, which is sensitive to sample size. In addition, M1–M3 showed acceptable fit. Furthermore, we used penalised-likelihood criteria (exp [$AIC_{min} - AIC_i$]/2) to compare M1–M3 with M5 and M6. M5 and M6 displayed the lowest AIC and BIC indices, indicating that these models are the most parsimonious for the observed data. Comparing M5 and M6 ΔAIC ($p = .18$) yielded an insignificant value. This suggests that M5, with six first-order factors related to affective engagement and cognitive engagement, or M6, with affective engagement specified as four first-order factors and cognitive engagement as a second-order factor, describe well the phenomenon of sport engagement. Lastly, M5 and M6 were cross-validated with Sample 2. Both M5 and M6 fit well with the Sample 2 data (see Table 2). M5 and M6 with the best fit are presented in Figure 1.

Reliability and validity

Based on the CFA findings, we further explored item reliabilities and factor loadings of the SpEI for M5 and M6, both containing 18 items. The reliability and validity values are

Table 1. Descriptive statistics of the items included in the full scale of the SpEi for sample 1 (n = *992*).

Item	*M*	SD	Skewness	Kurtosis
MS1 My mother encourages me to be physically active or play sports	4.39	0.82	−1.11	1.29
MS2 My mother is physical active or play sports with me	3.08	1.07	0.26	−0.12
MS3 My mother attends to my practice, games or competitions	3.92	1.12	−0.62	−0.36
MS4 My mother and I discuss my participation in physical activity or sports	4.06	0.98	−0.65	−0.13
FS1 My father encourages me to be physically active or play sports	4.39	0.91	−1.63	1.89
FS2 My father is physical active or play sports with me	2.69	0.91	0.39	0.19
FS3 My father attends to my practice, games or competitions	3.62	1.06	−0.43	−0.48
FS4 My father and I discuss my participation in physical activity or sports	3.85	0.97	−0.50	−0.43
CS1 My coaches support me when needed	4.18	0.94	−1.24	1.39
CS2 Adults in my sports club listen to the athletes	4.05	0.93	−0.97	0.75
CS3 The sports club rules are evenhanded	4.38	0.83	−1.53	2.61
CS4 Most coaches in my sports club are interested in me as a person, not just as an athlete	3.50	1.10	−0.49	−0.36
CS5 Overall, my coaches are open and honest with me	4.11	1.00	−1.29	1.38
CS6 Overall, adults in my sports club treat athletes fairly	3.98	1.03	−0.97	0.43
CS7 I enjoy talking to the coaches	4.27	0.92	−1.47	1.97
CS8 Coaches in my sports club care about athletes	4.47	0.82	−1.75	2.92
CS9 I feel safe in my sports club	4.32	0.83	−1.44	2.30
PS1 My teammates like me the way I am	4.28	0.82	−1.13	1.24
PS2 My teammates care about me	4.27	0.85	−1.29	1.77
PS3 My teammates are there for me when I need them	4.14	0.81	−0.94	1.09
PS4 My teammates respect what my viewpoint	4.51	0.77	−1.90	2.65
PS5 I enjoy talking to my teammates	4.72	0.70	−1.96	3.46
PS6 I have some friends in my sports club	4.56	0.89	−1.34	1.76
CR1 After finishing my practice, I reflect how I did	3.91	1.00	−0.78	0.10
CR2 Most of what is important to know you learn in sports	3.26	1.03	−0.14	−0.38
CR3 When practicing sports, I occasionally check to see whether I know what Ím doing	3.58	1.02	−0.40	−0.37
CR4 The reason I do well in sports, is because I work hard	4.27	0.87	−1.20	1.12
CR5 My performance in competitions is a good barometer of what Ím able to do	4.14	0.95	−1.20	1.39
CR6 Training is fun because I improve	4.27	0.90	−1.39	1.98
CR7 What I learn in sports practice is important for my future	4.18	0.95	−1.16	1.09
CR8 Success in sport competition is a good measure of what Ím capable of	4.00	0.96	−0.92	0.68
CR9 I feel like I have input about what happens to me at sport	4.12	0.95	−1.00	0.60
FG1 Continuing to practice sports in the future is important	4.70	0.70	−2.83	3.40
FG2 I plan to continue my sport participation after compulsory education	4.56	0.84	−2.21	3.01
FG3 Sports training is important for achieving my future goals	4.49	0.85	−1.89	2.78
FG4 I am hopeful about my future	4.21	0.96	−1.21	1.09
FG5 Participating in sports will create many future opportunities for me	4.08	1.05	−1.10	0.67

Notes: MS, maternal support for sport; FS, paternal support for sport; CS, coach-athlete relationships; PS, peer support at sport; CR, control and relevance of sport; FG, future aspirations and goals.

Table 2. Fit indices for the estimated models.

Model/author	N	No. of factors	No. of items	$\chi 2$	*Df*	*p*	RMSEA	CFI/TLI	AIC/BIC
M1: Six-factor model (Betts et al., 2010)	992	6	37	610	1786.26	<.001	.04	93/.92	77877.81/78515.34
M2: Six-factor model, (Authors, 2016)	992	6 + 3	35	539	1382.17	<.001	.04	.94/.94	74093.74/74712.37
M3: Six-factor model (Moreira et al., 2009)	992	6	31	415	1156.59	<.001	.04	.94/.93	65037.59/65587.48
M4: Six-factor model (Pinzone et al., 2019)	992	6	31	415	2040.05	<.001	.06	.86/.84	68846.26/69396.15
M5: Six-factor model (Authors, 2018)	992	6	18	117	224.41	<.001	.03	.98/.98	39313.34/39666.84
M6: Six-factor model (Authors, 2018)	992	6 + 2	18	120	226.38	<.001	.03	.98/.98	39309.93/39648.70
Cross-validation of the M5 model with sample 2	465	6	18	117	213.56	<.001	.04	.97/.96	18388.63/18458.35
Cross-validation of the M6 model with sample 2	465	6 + 2	18	120	217.64	<.001	.04	.97/.96	18386.79/18672.59

presented in Table 3. The factor loadings were good for all 18 items in both samples. Most items had standardised factor loadings greater than .70. The majority of the item reliabilities exceeded the level of .50, except for items MS2, MS5, FS2, FS5, and CR8. We

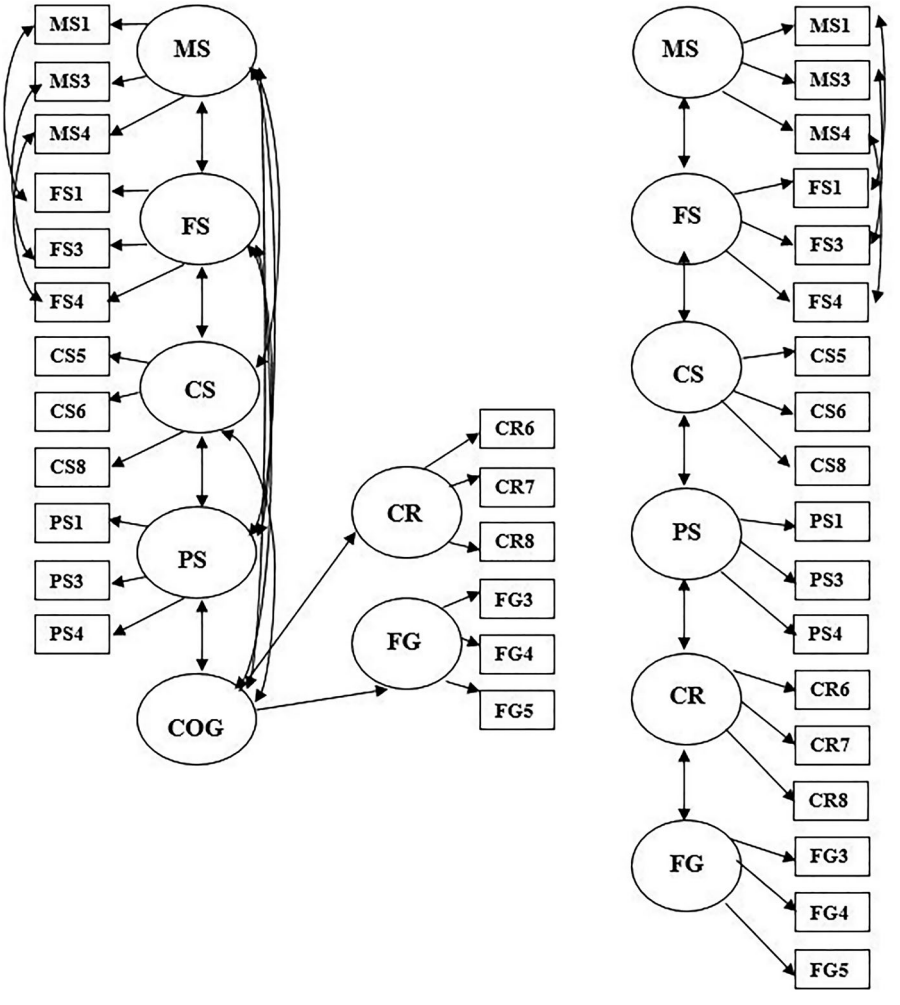

Figure 1 . Graphical presentation of models M5 and M6 of the sport engagement instrument. Note. All estimates are statistically significant at $p < .001$ (see Table 2 for estimates). MS, maternal support for sport; FS, paternal support for sport; CS, coach-athlete relationships; PS, peer support at sport; CR, Control and Relevance of sport; FG, Future Aspirations and Goals; COG, cognitive engagement.

examined the factors' internal consistency by calculating McDonald's ω across the two samples. McDonald's ω indicated acceptable to excellent internal consistency, with values ranging between .60 and .94, with maternal and paternal support factors showing the lowest ω values. In general, McDonald's ω coefficients were somewhat higher, and a bit more fluctuation was observed between factor loadings within factors than in the Brief-SEI validation study in the school context (Authors, 2018). Overall, the results indicate that M5 and M6 demonstrate good factorial validity.

Convergent and discriminant validity

Finally, we assessed convergent and discriminant validity by calculating regression coefficients from sport burnout, behavioural engagement, gender, type of sport, level of

Table 3. Estimated item reliability (R^2), standardised factor loading coefficients (λ), and McDonald's omega (ω) values for models M5 and M6 in sample 1(n = 992) and sample 2 (n = 465).

Model 5	Ω	R^2	λ
Maternal support for sport	.66/.72		
MS1		.30/.29	.55/.54
MS3		.35/.37	.59/.61
MS4		.56/.53	.74/.73
Paternal support for sport	.60/.75		
FS1		.48/.45	.69/.67
FS3		.35/.27	.59/.52
FS4		.71/.65	.84/.81
Coach-athlete relationships	.88/.90		
CS5		.69/.75	.83/.86
CS6		.69/.72	.83/.85
CS8		.73/.70	.85/.84
Peer support at sports	.89/.93		
PS1		.67/.65	.82/.81
PS3		.77/.65	.88/.80
PS4		.74/.72	.86/.85
Control and relevance of sports	.78/.73		
CR6		.62/.54	.79/.73
CR7		.62/.59	.78/.71
CR8		.39/.34	.63/.58
Future aspirations and goals	.86/.90		
FG3		.70/.66	.84/.81
FG4		.65/.70	.81/.84
FG5		.66/.68	.81/.83
Model 6	Ω	R^2	λ
Maternal support for sport	.66/.72		
MS1		.30/.29	.55/.55
MS3		.35/.38	.59/.60
MS4		.56/.53	.74/.73
Paternal support for sport	.60/.75		
FS1		.48/.45	.69/.67
FS3		.35/.29	.60/.52
FS4		.71/.66	.84/.81
Coach-athlete relationships	.88/.90		
CS5		.69/.76	.83/.86
CS6		.69/.74	.83/.85
CS8		.73/.71	.85/.85
Peer support at sports	. 89/.93		
PS1		.67/.66	.82/.80
PS3		.77/.65	.88/.81
PS4		.74/.71	.86/.85
Cognitive engagement	.89/.89		
Control and relevance of sports		.93/.99	.96/.99
Future aspirations and goals		.88/.80	.93/.89

Notes: The first figure represents the values of Sample 1, and the second, the values of sample 2. All standardised factor loadings are significant at $p < .001$.

competition, and weekly amount of physical activity to the six latent factors in the SpEI construct in Sample 1. Although M5 and M6 described the sport burnout phenomenon equally well, we chose M5 as the final model because of its theoretical diversity. The results are presented in Table 4.

As displayed in Table 4, adolescent athletes' sport burnout and behavioural engagement revealed the anticipated associations with affective and cognitive dimensions of engagement. The more burnout symptoms adolescents reported, the less support from mothers, peers, and coaches they reported. Moreover, higher levels of sport burnout correlated negatively with control and relevance of sports and future goals and aspirations. In

Table 4. Associations between the affective and cognitive engagement subtypes and the predictor variables in Sample 1 ($n = 992$).

	Behavioural engagement	Sport burnout	Gender[1]	Type of sport[2]	Level of competition[3]	Weekly amount of PA[4]
Model 5						
MS	0.26**	−0.10**	−0.23**	−0.01	0.07	0.11**
FS	0.20**	−0.06	0.08	0.10**	0.06	0.14**
CS	0.38**	−0.26**	−0.06	−0.01	0.01	0.02
PS	0.29**	−0.29**	−0.15**	−0.04	0.03	0.03
CR	0.51**	−0.30**	0.09**	0.12**	0.04	0.04
FG	0.47**	−0.29**	0.04	0.08*	0.10**	0.04

Notes: Estimates are standardised path coefficients. MS, maternal support; FS, paternal support; CS, coach-athlete relationships; PS, peer support; CR, control and relevance of sports; FG, future goals and aspirations. [1]1 = girl, 2 = boy, [2]1 = team sports, 2 = individual sports, [3]1 = local level, 2 = regional level, 3 = national level, [4]1 = 0–10 h, 2 = 11–20 h, 3 = > 20 h. *p<.05, **p< .01.

addition, behavioural engagement correlated positively with the cognitive and affective types of engagement. Boys reported less maternal and peer support for sport but higher levels of control than girls did. Athletes in individual sports, competing at a higher level, and devoting more time to sports were more cognitively and affectively engaged in sports compared with athletes in team sports and competing at a lower level, as well as those who devoted less time to sports.

Discussion

The present research consisted of two studies with the major aims of (a) constructing the Sport Engagement Instrument (SpEI) and (b) validating the new instrument in the Finnish dual career context. The first, preparatory, study was aimed at constructing the SpEI, a self-assessment tool for measuring affective and cognitive sport engagement. A systematic review of sport and school engagement literature by an expert panel showed that previous sport engagement instruments (Lonsdale et al., 2007) have mainly been developed around the engagement dimensions of absorption, dedication, and vigour (Schaufeli et al., 2002). The second common conceptualisation, which includes affective, cognitive, and behavioural dimensions of engagement (Fredricks et al., 2004), has been used extensively for instrument development in the school context (Moreira & Dias, 2019). This conceptualisation has not been utilised in the sport context; therefore, the expert panel adjusted the Finnish version of the 33-item SEI that has shown good validity and reliability properties among Finnish students (Authors, 2016) to the sport context. The initial questionnaire, with 33 items scattered along three affective engagement and two cognitive engagement factors, provided a sound theoretical starting point for further development.

In the factor and item refinement process, the questionnaire was administered to 25 adolescent athletes to assess its practical usefulness. Based on the participant feedback, we made minor adjustments to some of the 15 items measuring coach-athlete relationships and peer support at sport and the 14 items measuring control and relevance of sport and future goals and aspirations. Furthermore, participants perceived that measuring parental support as a universal construct did not adequately differentiate the unique support provided by mothers and fathers. Thus, the parental support factor was replaced with two factors assessing paternal and maternal support for sports separately with four parallel-worded from the Exercise Behaviour of Children and Adolescents in Finland Study

Protocol (Kokko et al., 2019). Taken together, the systematic, theoretical and practical approaches applied in the preparatory study provided a necessary foundation for the main study by producing an initial set of 37 SpEI items.

The aim of the subsequent main study was to validate the SpEI using two independent samples of adolescent athletes participating in the LSSSPP. The first objective of the main study was to test the factor structure of the SpEI using confirmatory factor analysis. In accordance with our first hypothesis (Authors, 2018; Pinzone et al., 2019) and after testing six models with different numbers and subsets of items, two different models (M5 and M6) with 18 items each displayed the best psychometric properties. Models (M1-M4) with 37, 35, and 31 items fit the data adequately or poorly. The results of the CFA supported conceptualising sport engagement as a two-dimensional structure including an affective and cognitive dimension, with four factors assessing athletes' affective (i.e., maternal, paternal, coach, and peer social support) and two factors pertaining to cognitive (i.e., control and relevance of sports, and future aspirations and goals) engagement. Consistent with the brief version of the SEI in the school context (Authors, 2018; Moreira & Dias, 2019), the SpEI subscales pertaining to affective and cognitive subtypes of engagement were best described by three items each. A short scale with only the necessary items can be quickly completed by athletes and easily administered by practitioners and researchers. The second important result was that findings were consistent across two independent samples, confirming the importance of each of the six factors in understanding athletes' engagement process. Furthermore, demonstrating evidence of cross-validity across two samples has been recognised as a fundamental step when estimating psychometric properties of a measurement scale (Boateng et al., 2018), which has also been reported in other recent validation studies in the sports context (Martins et al., 2014).

The second objective of the main study was to assess the item and scale reliability of the factorial structure that showed the best validity properties. Confirming the second hypothesis (Moreira et al., 2009; Pinzone et al., 2019), the 18 items included in the final SpEI (M5 and M6) displayed varying item reliability and validity properties, as well as good internal consistency across the two samples in general. The six items pertaining to the cognitive dimension of engagement displayed excellent psychometric properties. Verifying the results of previous validation studies of the SEI in the school context (Authors, 2016, 2018), these six items can be modelled either along two intercorrelated first-order factors (e.g., control and relevance of sports, and future aspirations and goals; M5) or as indicators of a second-order factor (M6). Instead of three interrelated first-order factors of affective engagement typical for the SEI (Appleton et al., 2006; Betts et al., 2010), the affective dimension of the SpEI was shaped along four first-order factors. The six items relating to the subscales of coach and peer social support showed adequate validity and reliability properties. In turn, the six items intended to measure paternal and maternal support for sport showed lower reliability values, possibly stemming from the fact that these items were derived from another instrument (Kokko et al., 2019) and that they measure a combination of instrumental and emotional support. However, paternal and maternal support has been shown to contribute uniquely to adolescents' sports experience (Sorkkila et al., 2017); thus, the strength of this instrument is that it allows for assessing these two sources of support independently.

Although there is a consensus that engagement is a multidimensional construct that encompasses multiple components (Alrashidi et al., 2016; Fredricks et al., 2004), previous instruments measure sport engagement primarily as a psychological resource of the individual (De Francisco et al., 2018; Guillén & Martínez-Alvarado, 2014; Martins et al., 2014; Stolarski et al., 2020). The SpEI allows for studying engagement as a more tangible process including personal and interpersonal relationships, which assert their influence on negative and positive outcomes through underlying psychological processes (Podlog et al., 2015). Peers, coaches, or parents do not necessarily affect the engagement process directly (Beets et al., 2006; Laird et al., 2016; Sheridan et al., 2014); however, they indirectly expose the individual to a set of norms and values, which in turn encourage or discourage engagement in a specific behaviour (Li et al., 2010). Thus, our results advocate for conceptualising social support from coaches, parents, and peers as indicators of affective engagement, in a similar fashion to the SEI (Authors, 2016). From the researchers' point of view, the results of the current study may present an important springboard for further instrument development utilising a multidimensional framework including both affective and cognitive dimensions. This could allow for a deeper understanding and provide tools to assess the engagement process from a holistic perspective (Hastie et al., 2020; Wylleman et al., 2013).

The third and final objective was to determine the SpEI's convergent and discriminant validity by estimating paths from the predictor variables to affective and cognitive engagement. In line with Hypothesis 3, behavioural engagement showed medium to large positive correlations with all six affective and cognitive engagement scales. Sport burnout, on the other hand, displayed medium-sized negative associations with all affective engagement and cognitive engagement subscales, except for paternal and maternal support for sports. These findings have theoretical and practical implications. Theoretically, the link between the three dimensions of engagement provide preliminary evidence of conceptualising sport engagement as a tripartite construct in a similar manner to the school context (Fredricks et al., 2004). From a practical point of view, the SpEI has potential to dissect the influence of personal and interpersonal assets to predict behavioural and developmental outcomes. Furthermore, the SpEI factors showed associations with personal characteristics that were small in magnitude (Chen et al., 2010; Lupo et al., 2017; Sturm et al., 2011; Weiss & Aloe, 2019). Girls reported more maternal and peer support, and boys higher levels of control and relevance of sports. In addition, individual sports, higher competitive level, and more time spent on sports all related positively with the affective and cognitive factors of the SpEI.

Limitations and future directions

The limitations and future directions of the present study are discussed in relation to relevant aspects to consider when developing and validating new scales (Boateng et al., 2018). First, established research provides a solid conceptual framework, in which engagement is depicted along three dimensions (i.e., affective, behavioural, and cognitive). The SpEI assesses the affective and cognitive dimensions of engagement, and the behavioural dimension of sport engagement can be captured by means of external observation. However, future validation studies of the scale could benefit from adding items that examine involvement and effort in sports. Second, we primarily used deductive

methods, including summoning an expert panel and pretesting the questions with a target population, to generate the items and ensure content validity. However, the content of the items could have been developed further by mixing deductive methods with inductive techniques such as sufficient rounds of cognitive interviews and focus group discussions until saturation was reached (Boateng et al., 2018). There is particular need to test and adjust the item contents or increase the number of items representing the paternal and maternal subscales. Future researchers could add suitable items that measure different types of support separately, such as emotional (e.g., empathy, caring, and encouragement), informational (e.g., problem assistance through advice and suggestions), and instrumental (e.g., help in the form of money, transportation, resources, and assistance; Mendonça et al., 2014), to solve the problem. Third, the 18 items comprising the final version of the SpEI were selected based on previous validation work conducted in the school context. However, the classical test theory or item response theory could have presented viable options to reduce the number of items to identify the most parsimonious, functional, and internally consistent items within the item pool (Boateng et al., 2018). Fourth, we used a global construct of sport burnout to assess the convergent and discriminant validity of the scale, which has occasionally been criticised in the literature (Lundkvist et al., 2018). Thus, separating between and regressing the three subscales of burnout (i.e., exhaustion, cynicism, and inadequacy) on the latent engagement constructs would provide a fruitful approach fur future studies. This was the first study to assess the properties of the SpEI scale, and therefore future studies should continue the validation work in other contexts and among adolescent athletes of different ages to generalise the results.

Conclusion and practical implications

The present study supports the utilisation of the SpEI as a tool for screening affective and cognitive sport engagement among Finnish adolescent athletes enrolled in a dual career context. Due to constantly growing demands in school and sports, these athletes are prone to burnout and dropout, particularly in late adolescence, around age 16–19 (Sorkkila et al., 2018, 2019). Given that the instrument was originally developed to measure engagement in the school context (Appleton et al., 2006), combined systematic monitoring of school and sport engagement using parallel measures contributes to identifying individuals with low engagement and intervening at an early stage before the risk of burnout and dropout is pronounced. The risk for sport dropout peaks at the age of 15 years (Kokko et al., 2019); thus, the instrument might be particularly beneficial for screening athletes at the ages of 12 or 13 years for changes in affective and cognitive engagement that typically precede behavioural decisions (Wang & Fredricks, 2014). The two factors that measure cognitive engagement could help to identify athletes with low future goals and who attribute low control and relevance to sports. The subscales measuring paternal, maternal, coach, and peer support for sports in the SpEI allow for assessing the specific influence of each individual source. If the athlete perceives that support derived from a specific source is insufficient, the results could inform discussions on how to improve interactions between the athlete and the source of support. Taken together, using the instrument annually to assess adolescent athletes' engagement in sports could provide a basis for individual discussions and opportunities to design and

implement effective, nuanced, and individualised interventions to promote sport engagement on the group level.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Ethics statement

This study was carried out in accordance with the recommendations of Finnish Advisory Board on Research Integrity guidelines, The Board for Research Ethics at Åbo Akademi University.

Data availability statement

The data that support the findings of this study are available from the corresponding author, JK, upon reasonable request.

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Appendix A

Items in the full version of the SpEI.

MS1	My mother encourages me to be physically active or play sports.
MS2	My mother is physical active or play sports with me.
MS3	My mother attends to my practice, games or competitions.
MS4	My mother and I discuss my participation in physical activity or sports.
FS1	My father encourages me to be physically active or play sports.
FS2	My father is physical active or play sports with me.
FS3	My father attends to my practice, games or competitions.
FS4	My father and I discuss my participation in physical activity or sports.
CS1	My coaches support me when needed.
CS2	Adults in my sports club listen to the athletes.
CS3	The sports club rules are evenhanded.
CS4	Most coaches in my sports club are interested in me as a person, not just as an athlete.
CS5	Overall, my coaches are open and honest with me.
CS6	Overall, adults in my sports club treat athletes fairly.
CS7	I enjoy talking to the coaches.
CS8	Coaches in my sports club care about athletes.
CS9	I feel safe in my sports club.
PS1	My teammates like me the way I am.
PS2	My teammates care about me.
PS3	My teammates are there for me when I need them.
PS4	My teammates respect what my viewpoint.
PS5	I enjoy talking to my teammates.
PS6	I have some friends in my sports club.
CR1	After finishing my practice, I reflect how I did.
CR2	Most of what is important to know you learn in sports.
CR3	When practicing sports, I occasionally check to see whether I know what Ím doing.
CR4	The reason I do well in sports, is because I work hard.
CR5	My performance in competitions is a good barometer of what Ím able to do.
CR6	Training is fun because I improve.
CR7	What I learn in sports practice is important for my future.
CR8	Success in sport competition is a good measure of what Ím capable of.
CR9	I feel like I have input about what happens to me at sport.
FG1	Continuing to practice sports in the future is important.
FG2	I plan to continue my sport participation after compulsory education.
FG3	Sports training is important for achieving my future goals.
FG4	I am hopeful about my future.
FG5	Participating in sports will create many future opportunities for me.

Notes: MS, maternal support for sport; FS, paternal support for sport; CS, coach-athlete relationships; PS, peer support at sport; CR, control and relevance of sports; FG, future aspirations and goals.