

This is a self-archived version of an original article. This version may differ from the original in pagination and typographic details.

Author(s): Nikander, Jaakko A.O.; Aunola, Kaisa; Tolvanen, Asko; Ryba, Tatiana V.

Title: Associations Between Student-Athletes' Self-Esteem and Career Adaptability Across the High School Years

Year: 2022

Version: Accepted version (Final draft)

Copyright: © 2021 Wiley

Rights: In Copyright

Rights url: <http://rightsstatements.org/page/InC/1.0/?language=en>

Please cite the original version:

Nikander, J. A., Aunola, K., Tolvanen, A., & Ryba, T. V. (2022). Associations Between Student-Athletes' Self-Esteem and Career Adaptability Across the High School Years. *Scandinavian Journal of Medicine and Science in Sports*, 32(4), 789-797. <https://doi.org/10.1111/sms.14114>

Corresponding author mail id:- aku.j.o.nikander@jyu.fi

Running Head: SELF-ESTEEM AND CAREER ADAPTABILITY

Associations Between Student-Athletes' Self-Esteem and Career Adaptability Across the High School Years

Jaakko A.O. Nikander, Kaisa Aunola, Asko Tolvanen, Tatiana V. Ryba.
Department of Psychology, University of Jyväskylä, Jyväskylä, Finland

Acknowledgements

This research was supported by the Finnish Ministry of Education and Culture (grant number OKM/39/626/2017). The data that support the findings of this study are available from the corresponding author upon reasonable request.

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/SMS.14114](https://doi.org/10.1111/SMS.14114)

This article is protected by copyright. All rights reserved

Abstract

The key challenges in sustainable elite sports concern young athletes' holistic development. Consequently, preparation for dual careers has been recommended to enhance athletes' well-being and equip them for life after sports. The aim of this study was to examine the developmental associations between self-esteem and career adaptability among adolescent athletes across the high school years and investigate the role of gender in these developmental trajectories. A total of 391 student-athletes were followed up four times from the beginning of high school (T1) to its end (T4) using the Dual Career Form of the Career Adapt-Abilities Scale and the Self-Esteem Questionnaire. The results indicated that individual differences in student-athletes' self-esteem and career adaptability were relatively stable across the high school years and were thus modeled via the between-persons factors capturing differences between individuals across time. The results further showed that the overall levels of self-esteem and career adaptability were positively associated. Males showed higher overall levels of career adaptability and self-esteem than females. This study suggests that it is important to facilitate youth athletes' self-regulation resources by involving them in vocational developmental tasks. Further, gender differences should be considered when supporting student-athletes' development.

Keywords: *dual career, career adaptability, gender, self-esteem, well-being, adolescence*

1 1 INTRODUCTION

2 The demands of different life domains (school, sporting, and private life) may lead to
3 increased pressure on student-athletes and pose potential threats to their psychosocial development
4 and well-being. According to the European Commission,¹ the main challenge related to elite sports
5 is how to safeguard and guide young athletes' talent development simultaneously in their
6 educational, athletic, and private lives. Special arrangements in the form of dual careers (DC)—a
7 combination of sports and education or work—have been recommended to enhance young athletes'
8 well-being and prepare them for life after sports.^{1,2} Although student-athletes report less stress and
9 fewer symptoms of depression and anxiety than non-athletes,³ they still face a unique range of
10 stressors that include, for example, role strain and transitions (e.g., starting sports high school or
11 university).² Sorkkila and Ryba and colleagues^{4,5} emphasized that research is needed to understand,
12 not only the risks, but also the protective factors affecting student-athletes' well-being (e.g., self-
13 esteem) in their DC pathways. For adolescent student-athletes to manage transitions, achieve
14 vocational goals, and solve a range of challenges in the course of their life trajectories, support
15 provided for them should target a broad range of skills, including career adaptability.^{6,7} The
16 present study examined the developmental associations between career adaptability and self-
17 esteem among student-athletes, and the role of gender in the development of both.

18 1.1 Career Adaptability

19 Career adaptability refers to an individual's readiness to and resources for achieving
20 vocational development and overcoming the complex challenges that arise during occupational
21 transitions.⁸ It is conceptualized as psychological resources that enable adolescents to regulate
22 their strategies along the four dimensions:⁸ *career concern* (i.e., the extent to which the individual
23 is conscious of and prepares for vocational development tasks and transitions in the near and
24 distant future), *career control* (i.e., the extent to which a person takes responsibility for
25 constructing their own career and choosing their approach to vocational development tasks),
26 *career curiosity* (i.e., information-seeking behaviors, openness to new experiences, exploration,
27 and reflection on the match between the individual's abilities and the demands of a particular
28 career), and *career confidence* (i.e., self-efficacy in pursuing a self-determined occupation and
29 successfully coping with career stressors).

30 Career adaptability and thoughts concerning adaptability become evident early in
31 secondary education.⁹ As an individual considers future transitions and developmental tasks, the

32 pressure to deal with goals relevant to those transitions increases.¹⁰ Career adaptability contributes
33 to positive transitions and personal functioning in adolescents,¹¹ predicting an increased sense of
34 control and life satisfaction.¹¹ However, individuals differ in their competencies (adaptability) and
35 career-related behaviors.¹² Rudolph and colleagues¹² found that personality traits contribute to the
36 prediction of career adaptability, suggesting that personality-related factors play a role in
37 adaptability. Further, Hirschi¹³ found that boys demonstrated higher career adaptability than girls.
38 Gender did not, however, affect the development of career adaptability among young students.¹³
39 Investigating adolescent athletes' career adaptability and the factors that promote it is important
40 because student-athletes tend to have difficulty envisioning their lives after sports and engaging in
41 self-exploration during their sporting careers.¹⁴ Park and colleagues¹⁵ found that athletes who had
42 not planned their post-sporting lives had an elevated risk of experiencing psychological distress,
43 especially following involuntary athletic career termination.

44 **1.2 Self-esteem**

45 Self-esteem—one's overall attitude towards oneself, which involves self-evaluation of
46 one's own worth and value¹⁶—plays a role in developing career adaptability.^{16,17} Self-esteem has
47 been shown to be positively associated with perceived competence in sports,¹⁸ enhanced
48 initiative¹⁹, career adaptability,^{7,20} and career success;²¹ for example, Erol and Orth²² showed that
49 increased self-esteem is related to a sense of career control, which is likely to translate into better
50 career opportunities. Moreover, Choi and colleagues²³ demonstrated that self-esteem is among the
51 strongest predictors of career decision efficacy. Although self-esteem appears to be rather stable
52 throughout adolescence,^{24,25} it can be influenced by life events, individual experiences, and
53 environmental factors.²⁴ A crucial question is, therefore, to what extent is self-esteem development
54 associated with the development of career adaptability during the critical adolescent years? Gender
55 may also play a role. In a previous study, Baldwin and Hoffman²⁶ showed that boys have higher
56 levels of self-esteem than girls, and girls exhibited a greater mean-level fluctuation in self-esteem,
57 suggesting gender differences in the development of self-esteem during early adolescence.
58 However, Birkeland et al.²⁴ did not find gender differences in self-esteem development. Overall,
59 the previous results suggest that boys, on average, may have higher levels of self-esteem than
60 girls.²⁶ However, owing to inconsistent findings concerning the development of self-esteem,^{24, 26}
61 future studies on this topic are needed before conclusions can be made concerning gender
62 differences in the development of self-esteem across the high school years.

63 1.3 The Present Study

64 To support student-athletes in integrating combined sport and education into their lives, it
65 is necessary to gain an understanding of the individual factors that affect their life paths. Therefore,
66 in the present study, we investigated the developmental associations between the relatively new
67 concept of career adaptability and self-esteem among student-athletes in the crucial phase of their
68 development. More specifically, this study aimed to investigate the following research questions:

69 (1) To what extent do individual differences in a) career adaptability (both in terms of the
70 five dimensions and regarding the overall common level of career adaptability) and b) self-esteem
71 remain stable across the high school years, and to what extent there is rather time specific
72 fluctuation in these at different phases of high school? It was expected that student-athletes would
73 differ from each other in terms of the level of career adaptability. That is, some individuals would
74 demonstrate higher adaptabilities than others, and these individual differences in the level of
75 career adaptability would remain stable across high school¹² (Hypothesis 1). In line with the
76 previous research,^{7,20} we hypothesized that self-esteem would show stability across high school^{7,20}
77 (Hypothesis 2).

78 (2) To what extent are career adaptability and self-esteem associated across high school
79 years? It was hypothesized that self-esteem is positively associated with career adaptability across
80 high school^{5,7,12,20} (Hypothesis 3) and that self-esteem would positively predict subsequent career
81 adaptabilities^{8,12} (Hypothesis 4).

82 (3) What is the role of gender in the development of career adaptability and self-esteem?
83 Based on previous research, we expected to find that gender does not affect the development of
84 career adaptability¹³ (Hypothesis 5), but we predicted that males would show higher levels of self-
85 esteem than females²⁶ (Hypothesis 6).

86 2 METHODS

87 2.1 Participants and Procedures

88 The present study contributed to the Finnish Longitudinal Dual Career Study,⁵ which
89 followed student-athletes across their high school years. The sample consisted of 391 athletes
90 (51 % female; $M_{\text{age}} = 16$, $SD = 0.17$ at the beginning of the study) from six sports high schools. In
91 Finland, sports high schools are one of the identified DC pathways²⁷ that provide structural
92 support for talented athletes to combine upper secondary education with sports.

93 The study was approved by the ethics board of the University of Jyväskylä before data
94 collection commenced. The participants signed an informed consent form before participating in
95 the study. The data were collected using an online questionnaire or via completion of an identical
96 paper questionnaire. The data applied in the current study were collected at the baseline, that is, at
97 the beginning of the first grade (T1; September), and after that, once at the end of each grade
98 (March), that is, at the end of the first grade (T2), at the end of the second grade (T3), and at the
99 end of the third grade (T4). Career adaptability and self-esteem were assessed using self-rated
100 scales at each measurement point (T1–T4).

101 2.2 Measurements

102 **2.2.1 Dual career adaptability.** Career adaptability was measured at time points T1–T4
103 using the Career Adapt-Abilities Scale–Dual Career Form (CAAS-DC).⁷ The Dual Career Form
104 was developed by adding a subscale (Dual Career Concern) to the original CAAS.⁸ The CAAS-DC
105 contains a total of 27 items that measure five dimensions of career adaptability: concern (four
106 items; e.g., *thinking about what my future will be like*), control (six items; e.g., *making decisions*
107 *by myself*), curiosity (six items; e.g., *observing different ways of doing things*), confidence (six
108 items; e.g., *learning new skills*), and dual career concern (five items; e.g., *concerned about my*
109 *athletic career*). All items were rated on a 5-point Likert scale (1 = *not my strongest ability* to 5 =
110 *one of my strongest abilities*). For each subscale, a mean score was obtained, indicating
111 competence in that domain. The CAAS-DC score was shown to demonstrate factorial and
112 concurrent validity in a Finnish high school sample.⁷ Cronbach's alpha values were used in the
113 present study for the scores of different subscales and time points (T1, T2, T3, and T4); values
114 varied between 0.82 and 0.91.

115 **2.2.2 Self-esteem.** Self-esteem was measured at time points T1–T4 using five items (e.g., *I*
116 *feel like a person who has a number of good qualities*) taken from the Rosenberg Self-Esteem
117 Scale (RSES).¹⁶ All items were rated on a 5-point Likert scale (1 = *strongly disagree* to 5 =
118 *strongly agree*). The measure has been used in previous studies involving adolescents in Finland,
119 and the test scores have demonstrated good validity.⁷ Cronbach's alphas in the current sample at
120 different time points ranged between 0.77 and 0.82.

121 2.3 Analysis Strategy

122 To investigate the developmental stability and within-person fluctuation of career
123 adaptability and self-esteem during the high school years, as well as these constructs'

124 developmental associations, we employed random intercept cross-lagged path analysis²⁸ in the
125 structural equation modeling framework. The selected strategy was found to be the most
126 appropriate strategy to test the stated hypotheses because it considered both the between- (i.e.,
127 individual variation in the overall levels of the studied constructs across time) and within-person
128 (i.e., time-specific variation in the studied constructs) effects and thus produces more valid
129 (unbiased) results reflecting the developmental phenomena than autoregressive cross-lagged panel
130 models.²⁸

131 First, to explore between individual variation in the overall levels of the five career
132 adaptability dimensions and self-esteem across four measurement points, six first-order factors
133 describing these overall levels were specified. Additionally, a second-order factor for the five first-
134 order level factors of career adaptability was specified to model the overall level of career
135 adaptability across time. Correlation between the overall levels of career adaptability across time
136 and overall level of self-esteem across time was allowed. Second, time-specific factors capturing
137 common variation between career adaptability dimensions at a particular time point were specified
138 separately for each time point T1–T4. Similarly, time-specific factors were estimated for self-
139 esteem at each time point T1–T4. These specific factors were not allowed to correlate with the
140 first-order factors of career adaptability and self-esteem or the second-order factor of career
141 adaptability. Third, regression paths between time-specific factors capturing the lagged effects of
142 career adaptability and self-esteem were allowed for successive measurement points. These
143 regression coefficients captured the cross-lagged effects between adaptability and self-esteem after
144 controlling for the possible stability of each construct. In addition to the regression coefficients,
145 the residual correlations between the time-specific factors of adaptability and self-esteem at each
146 measurement point were allowed. Finally, a gender variable was added to the model to predict the
147 overall levels of career adaptability and self-esteem across time, and the mean differences between
148 genders in other specified factors were examined and estimated with the help of modification
149 indices (i.e., the associations between gender and the first-order factors in the model were fixed to
150 zero; therefore, poor model fit and the model modification indices indicated whether any of these
151 associations needed to be estimated). The Mplus syntax for the constructed model is provided in
152 Supplemental Material S1.

153 The model was estimated using the Mplus statistical program (version 7.3.; Muthén &
154 Muthén, 1998–2019). Initial analyses revealed the invariance of the study constructs across time

155 and gender groups.¹ The results of the invariance tests are given in Supplemental Material S2. The
156 covariance coverage of the data varied from 0.69 to 1.00. The missing values were supposed to be
157 missing at random (MAR), and estimation was performed using the full information maximum
158 likelihood estimator (MLR), which produces robust standard error and scale corrected chi-square
159 test values. In addition to the chi-square test, the model fit was evaluated using the comparative fit
160 index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation
161 (RMSEA), and the standardized root mean square error (SRMR). Good model fit was indicated if
162 the chi-square test result was non-significant, CFI and TLI were at least .95, RMSEA was lower
163 than .06, and SRMR was lower than .08.

164 **3 RESULTS**

165 The descriptive statistics (Table 1) demonstrated that participants showed relatively high
166 self-esteem and career adaptabilities across high school. Among the five dimensions of
167 adaptability, confidence, control, and DC concern had the highest mean scores across high school,
168 while concern and curiosity had the lowest. Based on the correlations, self-esteem and the career
169 adaptability dimensions were positively correlated at each measurement point. The correlations
170 were particularly strong in the case of the control adaptability dimension.

171 **3.1 Development of Career Adaptability**

172 The results of the tested model are shown in Figure 1 (only statistically significant paths
173 are shown). The final model (model modifications are presented in detail in S1) demonstrated a
174 good fit to the data: $\chi^2(240) = 331.014, p < .05$, RMSEA = 0.031, SRMR = 0.037, CFI = 0.983,
175 TLI = 0.978. The results showed that adaptability was relatively stable across high school and that
176 most of the variation in the adaptability dimensions was caused by the individual differences in the
177 overall level of career adaptability ($R^2_{concern} = .65, p < .001$; $R^2_{DCconcern} = .85, p < .001$; $R^2_{control}$
178 $= .67, p < .001$; $R^2_{curiosity} = .77, p < .001$; $R^2_{confidence} = .86, p < .001$). In addition, the levels of the
179 different adaptability dimensions were relatively stable across high school; approximately half of

¹ When testing invariance, we applied change in RMSEA (as RMSEA is a generally stricter indicator of invariance than CFI and is suitable in the case of large sample sizes and complex models; see, Chen, 2007).²⁹ The results of these analyses showed that in the cases of all constructs, factor loadings, intercepts, and residual variances of the observed variables were invariant across time and gender groups (as indicated by a change of RMSEA lower than .015; change of RMSEA values varied between -.007 and .011 depending on the construct and the model) between the tested nested models.

180 the variation in different dimensions at different measurement points (T1–T4) was caused by the
181 overall individual level of particular adaptability dimensions ($R^2_{concern} = .45-.47, p < .001$;
182 $R^2_{Deconcern} = .35-.47, p < .001$; $R^2_{control} = .48-.56, p < .001$; $R^2_{curiosity} = .36-.38, p < .001$; $R^2_{confidence}$
183 $= .43-.51, p < .001$).

184 In addition to the overall level of adaptability, time-specific variation was found. The time-
185 specific variation of career adaptability at T3 predicted subsequent career adaptability at T4 (R^2
186 $= .17$): The higher the adaptability at the end of the second grade, the higher the adaptability at the
187 end of high school.

188 3.2. Development of Self-Esteem

189 Similar results were found for self-esteem, which was relatively stable across the high
190 school years. Most of the variation in self-esteem at different measurement points was caused by
191 the individual differences in the overall level of self-esteem across time ($R^2_{T1} = .61, p < .001$;
192 $R^2_{T2} = .59, p < .001$; $R^2_{T3} = .53, p < .001$; $R^2_{T4} = .41, p < .001$). However, this effect decreased
193 at the end of the high school, and measurement point-related variation increased ($R^2_{T4} = .59, p$
194 $< .001$). The time-specific variation of self-esteem at the T3 predicted subsequent self-esteem at
195 the T4 ($R^2 = .15, p < .01$): The higher the self-esteem at the end of the second grade, the higher
196 subsequent self-esteem at the end of high school.

197 3.3 Developmental Association Between Career Adaptability and Self-esteem

198 The model revealed that the individual differences in the overall level of career adaptability across
199 the high school years were positively and statistically significantly associated with individual
200 differences in the overall level of self-esteem ($r = .50, p < .001$). Further, one specific association
201 was found indicating that the individual overall level of control was positively associated with the
202 individual overall level of self-esteem ($r = .47, p < .001$). In addition to these associations between
203 the overall levels of adaptability and self-esteem, time-specific positive associations between the
204 constructs were found at each measurement point, and the correlations became stronger towards
205 the end of the high school ($r^{T1} = .29, p < .01$; $r^{T2} = .29, p < .001$; $r^{T3} = .56, p < .001$; $r^{T4} = .46, p <$
206 $.001$). The cross-lagged associations between career adaptability and self-esteem were not
207 significant. Finally, the results concerning the role of gender showed that gender predicted
208 individual levels of career adaptability ($R^2 = .03$) and self-esteem ($R^2 = .07$), with females
209 demonstrating lower levels of both compared to males.

210 4 DISCUSSION

211 This study aimed to add to our understanding of the development of and developmental
212 associations between self-esteem and career adaptability among adolescent student-athletes across
213 high school, as well as the role gender plays in student-athletes' career adaptability and self-
214 esteem. First, the results showed that career adaptability and self-esteem were relatively stable
215 across individual differences in high schoolers' overall levels of each construct over time, which
216 explained most of the variation. Second, during the high school years, career adaptability and self-
217 esteem were positively associated with each other, showing mutual variation. Third, gender was
218 associated with the overall levels of career adaptability and self-esteem, with males showing
219 higher levels of both compared to females.

220 The present study's first objective was to examine the extent to which individual
221 differences in career adaptability and self-esteem are stable across the high school years and to
222 what extent time-specific fluctuation occurs at different phases of high school. In this study, career
223 adaptability was found to be relatively stable, with an individual-level explanation available for
224 over half of the variation across high school. It was expected (Hypothesis 1) that there would be
225 stable individual differences between student-athletes across high school.^{8,12} One explanation for
226 adaptability's high degree of stability could be, as previous studies¹⁴ have shown, that athletes tend
227 to postpone their career-related activities;¹⁴ consequently, stable personality-related factors¹² play a
228 larger role in their adaptability at this stage than more time-specific contextual and environmental
229 factors. Overall, it seems that individual involvement in vocational developmental tasks
230 determines the extent of student-athletes' career aspiration development. Similarly, as expected
231 (Hypothesis 2), self-esteem was found to be relatively stable across high school, with an
232 individual-level explanation available for around half of the variation. However, an interesting
233 finding was that individuality's influence decreased at the end of high school. This may indicate
234 that the life events concerning the upcoming transition can affect self-esteem at the individual
235 level.^{24,26}

236 In addition to overall high stable individual-level career adaptability and self-esteem, our
237 stability hypothesis was further supported by the findings concerning time-specific variation
238 predictions: Career adaptability in the middle of high school predicted career adaptability at the
239 end of high school. Timonen et al.⁹ suggested that starting high school and subsequent transitions
240 may trigger thoughts about adaptability. Those youths who self-assess as having the resources to
241 construct a career and being prepared for transitions will show high career adaptability later in life.

242 Individuals who focus on goals related to career transitions and developmental tasks may also
243 reflect more on their future endeavours.¹⁰

244 The present study's second aim was to examine the developmental association between
245 self-esteem and career adaptability across time among student-athletes. As we expected
246 (Hypothesis 3), and in line with previous research,^{5,7,12,20} career adaptability was positively
247 associated with self-esteem at each measurement point and at the individual level across high
248 school. However, self-esteem at the previous time point did not predict subsequent career
249 adaptabilities at the following time point, as expected (Hypothesis 4). This may be because both
250 career adaptabilities and self-esteem showed high stability. It may also be related to trait-like
251 factors.¹² No change was observed. The findings further suggested that towards the end of high
252 school, mutual variation between adaptability and self-esteem increases, which may indicate that
253 there are some common factors behind these constructs that explain the association. Regarding the
254 adaptability dimensions, a positive association was found between level of control and self-esteem.
255 Erol and Orth²² suggested that increased self-esteem is related to a sense of control and better
256 career opportunities. Additionally, in line with Rudolph and colleagues'¹² finding that a proactive
257 personality predicts career adaptability, student-athletes who self-assess as having a plan, assume
258 an active role in their career development, and feel that they are in control of their future may
259 develop not only career adaptability, but also high self-esteem.

260 The present study's third objective was to examine the role of gender in the development
261 of career adaptability and self-esteem. The results showed that gender was positively associated
262 with both the student-athletes' overall level of career adaptability (contradictory to Hypothesis 5)
263 as well as with their overall level of self-esteem (Hypothesis 6), with males reporting higher
264 overall career adaptability and self-esteem levels than females. Concerning self-esteem, our
265 findings are in line with previous studies.^{24, 26} It can be speculated that as males have been shown
266 to perceive their self-esteem more positively than females during adolescence²⁶ and as career
267 adaptability is related to trait-like optimism,¹² male student-athletes may, at least in part, derive
268 their higher perception of adaptability from their optimism about the future.^{14,30} Overall, our
269 findings highlight that gender differences in career adaptability and self-esteem levels should be
270 considered when providing support for youth athletes.

271 To conclude, given that the individual-level explained most of the variation in career
272 adaptability, it is important to recognize individuals with low levels of career adaptability (and
273 identify the reasons for that) and support the development of adaptabilities starting at the

274 beginning of high school (or even earlier). Such interventions can be achieved by facilitating
275 individual planning and the exploration of possible future paths, engaging in meaningful
276 conversations, and increasing these individuals' sense of control. The association between career
277 adaptability and self-esteem across high school suggests that both are complementary resources
278 for positive development. Student-athletes with high self-esteem and career adaptability might
279 have more resources to explore other plans and pursue endeavours outside of sports in the future.

280 The present study has some limitations that should be considered before generalizing the
281 results. First, the sample comprised high school students; the results might be different for
282 vocational school students. Second, the present study examined the effect of gender on career
283 adaptability and self-esteem. However, other factors may play a role in the development of the
284 studied constructs. In further studies, the role of different individual, school- and sport-related
285 factors as well as sources of social support or pressure, such as coaches and teachers, in student-
286 athletes' career adaptability and self-esteem development should be investigated alongside the
287 associations between these factors to gain a deeper understanding of the possible confounding
288 affecting the phenomena.

289 **5 PERSPECTIVES**

290 The present study contributes to the existing literature in three ways. First, we showed that
291 self-esteem and career adaptability are relatively stable across high school among student-athletes,
292 indicating that support for career-related activities should be individually targeted early on during
293 a dual career. Second, as the individual overall level of control was positively associated with the
294 individual overall level of self-esteem, student-athletes who feel that they are in control of their
295 future may develop not only career adaptability, but also high self-esteem. Third, gender
296 differences should be considered when providing support for student-athletes' dual career
297 construction development and well-being.

298 **Declaration of Conflicts of Interest**

299 The author(s) declare no potential conflicts of interest with respect to the research, authorship
300 and/or publication of this article.

301

302 **References**

- 303 1. EU Guidelines on Dual Careers of Athletes. *Recommended policy actions in support of dual*
304 *careers in high-performance sport*. Brussels: Sport Unit of the Directorate-General for
305 Education and Culture of the European Commission; 2012.
- 306 2. Stambulova NB, Wylleman P. Psychology of athletes' dual careers: A state-of-the-art
307 critical review of the European discourse. *Psychology of Sport & Exercise*. 2019;42:74–88.
- 308 3. Gerber M, Holsboer-Trachsler E, Puhse U, Brand S. Elite sport is not an additional source
309 of distress for adolescents with high stress levels. *Perceptual and Motor Skills*.
310 2011;112(2):581–599.
- 311 4. Sorkkila M, Ryba TV, Selänne H, Aunola K. Development of school and sport burnout in
312 adolescent student-athletes: A longitudinal mixed-methods study. *Journal of Research on*
313 *Adolescence*. 2020;30(S1):115–133.
- 314 5. Ryba TV, Aunola K, Kalaja S, Selänne H, Ronkainen NJ, Nurmi J-E. A New perspective
315 on adolescent athletes' transition into upper secondary school: A longitudinal mixed
316 method study protocol. *Cogent Psychology*. 2016;3(1):1142412–15.
- 317 6. Henriksen K, Storm LK, Stambulova N, Pyrdol N, Larsen CH. Successful and less
318 successful interventions with youth and senior athletes: Insights from expert sport
319 psychology practitioners. *Journal of Clinical Sport Psychology*, 2019;13(1):72–94.
- 320 7. Ryba TV, Zhang C-Q, Huang Z, Aunola K. Career adapt-abilities scale–Dual career form
321 (CAAS-DC): Psychometric properties and initial validation in high-school student-athletes.
322 *Health Psychology and Behavioral Medicine*. 2017;5(1):85–100.
- 323 8. Savickas, ML. The theory and practice of career construction. In S. D. Brown & R. W. Lent
324 (Eds.), *Career development and counselling: Putting theory and research to work*.
325 Hoboken, NJ: John Wiley & Sons. 2013; (pp. 42–70)
- 326 9. Timonen E, Silvonen J, Vanhalakka-Ruoho M. Nuorten uramuuntuvuus toisen asteen
327 opintojen alussa. *Psykologia*. 2016;51(3):191–208.
- 328 10. Salmela-Aro K, Aunola K., Nurmi J-E. Personal goals during emerging adulthood. A 10-
329 year follow up. *Journal of Adolescent Research*. 2007;22(6):690–715.
- 330 11. Johnston CS. A systematic review of the career adaptability literature and future outlook.
331 *Journal of Career Assessment*. 2018;26(1):3–30.
- 332 12. Rudolph CW, Lavigne KN, Katz IM, Zacher H. Linking dimensions of career adaptability
333 to adaptation results: A meta-analysis. *Journal of Vocational Behavior*. 2017;102:151–173.

- 334 13. Hirschi A. Career adaptability development in adolescence: Multiple predictors and effect
335 on sense of power and life satisfaction. [Online magazine]. *Journal of Vocational Behavior*.
336 2009;74(2):145–155.
- 337 14. Ryba TV, Ronkainen N, Douglas K, Aunola K. Implications of the identity position for
338 dual career construction: Gendering the pathways to (dis)continuation. *Psychology of Sport*
339 *and Exercise*. 2021;53.
- 340 15. Park S, Lavalley D, Tod D. Athletes' career transition out of sport: A systematic review.
341 *International Review of Sport and Exercise Psychology*. 2013;6(1):22–53.
- 342 16. Rosenberg M. *Society and the adolescent self-image*. Revised edition. Middletown, CT:
343 Wesleyan University Press; 1989.
- 344 17. Hewitt JP. The social construction of self-esteem. In Snyder CR, Lopez SJ (Eds.),
345 *Handbook of Positive Psychology*. New York: Oxford University Press. 2002; pp.135–148.
- 346 18. Amorose AJ, Anderson-Butcher D, Cooper J. Predicting changes in athletes' well-being
347 from changes in need satisfaction over the course of a competitive season. *Research*
348 *Quarterly for Exercise and Sport*. 2009;80(2):386–392.
- 349 19. Orth U, Robins RW, Widaman KF. Life-span development of self-esteem and its effects on
350 important life outcomes. *Journal of Personality and Social Psychology*. 2012;102(6):1271–
351 1288.
- 352 20. Rusu A, Mairean C, Hojbota A-M, Gherasim LR, Gavrioaiel SI. Relationships of career
353 adaptabilities with explicit and implicit self-concepts. *Journal of Vocational Behaviour*.
354 2015;89:92–101.
- 355 21. Kuster F, Orth U, Meier LL. High self-esteem prospectively predicts better work conditions
356 and outcomes. *Social Psychological and Personality Science*. 2013;4(6):668–675.
- 357 22. Erol RY, Orth U. Self-esteem development from age 14 to 30 years: A longitudinal study.
358 *Journal of Personality and Social Psychology*. 2011;101(3):607–619.
- 359 23. Choi BY, Park H, Yang E, Lee Y, Lee SM. Understanding career decision self-efficacy: A
360 meta-analytic approach. *Journal of Career Development*. 2012;39(5):443–460.
- 361 24. Birkeland MS, Melkevik O, Holsen I, Wold B. Trajectories of self-esteem during
362 adolescence. *Journal of Adolescence*. 2011;35(1):43–54.
- 363 25. Trezniewski KH, Donnellan MB, Robins RW. Stability of self-esteem across the life span.
364 *Journal of Personality and Social Psychology*. 2003;84(1):205–220.

- 365 26. Baldwin S, Hoffman J. The dynamics of self-esteem: a growth-curve analysis. *Journal of*
366 *Youth and Adolescence*. 2002;31(2):101–113.
- 367 27. Morris R, Cartigny E, Ryba TV, Wylleman P, Henriksen K, Ramis Y, Lindhal K, Cecić
368 Erpič S. A taxonomy of dual career development environments in European countries.
369 *European Sport Management Quarterly*. 2020;21(1):134–151.
- 370 28. Berry D, Willoughby, M.T. On the practical rethinking of cross-lagged panel models:
371 Rethinking a developmental workhorse. *Child Development*. 2017; 88(4):1186–1206.
- 372 29. Chen, F.F. Sensitivity of goodness of fit indexes to lack of measurement invariance,
373 structural equation modelling: *A Multidisciplinary Journal*. 2007;14(3):464–504.
- 374 30. Henriksen K, Mortensen J. Reality and dreams. A comparison of elite athletes' lived career
375 paths with young talented athletes' imagined career paths. *Scandinavian Sport Studies*
376 *Forum*. 2014;5:69–91.

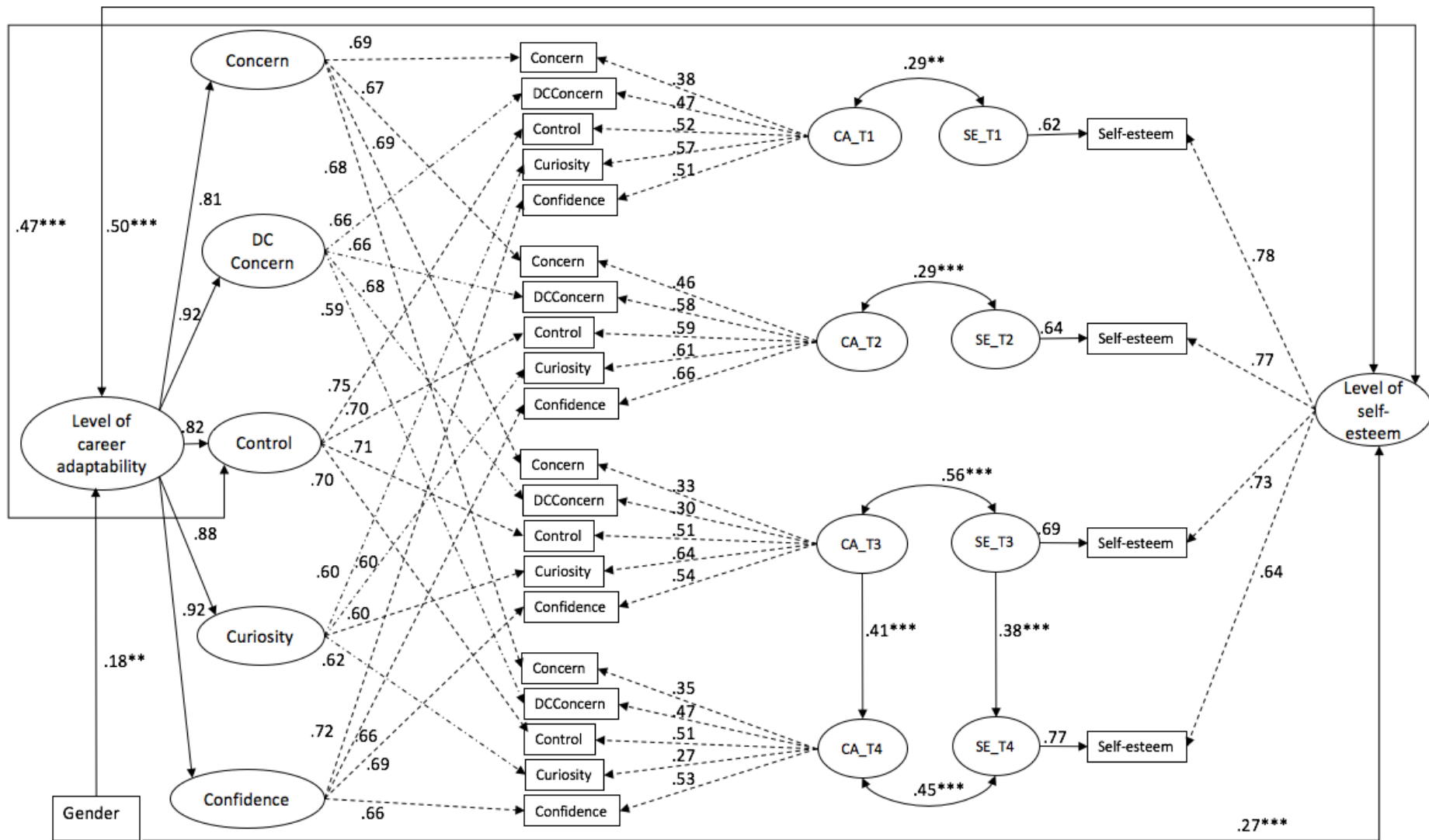
Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1 SelfesT1	.77	.65 ^c	.55 ^c	.48 ^c	.27 ^c	.21 ^c	.16 ^b	.24 ^c	.34 ^c	.23 ^c	.22 ^c	.24 ^c	.32 ^c	.24 ^c	.12 ^b	.20 ^b	.50 ^c	.39 ^c	.35 ^c	.34 ^c	.31 ^c	.28 ^c	.23 ^c	.23 ^c
2 SelfesT2		.77	.59 ^c	.59 ^c	.18 ^b	.26 ^c	.18 ^b	.24 ^c	.23 ^c	.36 ^c	.31 ^c	.28 ^c	.18 ^c	.25 ^c	.17 ^b	.24 ^b	.35 ^c	.48 ^c	.42 ^c	.38 ^c	.22 ^c	.38 ^c	.29 ^c	.28 ^c
3 SelfesT3			.77	.68 ^c	.17 ^b	.23 ^c	.28 ^c	.27 ^c	.24 ^c	.27 ^c	.45 ^c	.35 ^c	.22 ^c	.23 ^c	.33 ^c	.32 ^c	.39 ^c	.38 ^c	.57 ^c	.43	.24 ^c	.31 ^c	.34 ^c	.29 ^c
4 SelfesT4				.82	.13 ^a	.22 ^c	.20 ^b	.31 ^c	.18 ^c	.26 ^c	.35 ^c	.39 ^c	.14 ^b	.18 ^b	.24 ^c	.32 ^c	.31 ^c	.28 ^c	.40 ^c	.51 ^c	.20 ^c	.28 ^c	.23 ^c	.34 ^c
5 ConcT1					.85	.55 ^c	.45 ^c	.39 ^c	.54 ^c	.38 ^c	.24 ^c	.29 ^c	.60 ^c	.39 ^c	.25 ^c	.29 ^c	.53 ^c	.34 ^c	.30 ^c	.31 ^c	.65 ^c	.43 ^c	.33 ^c	.26 ^c
6 ConcT2						.86	.52 ^c	.39 ^c	.36 ^c	.62 ^c	.36 ^c	.36 ^c	.37 ^c	.59 ^c	.34 ^c	.36 ^c	.33 ^c	.53 ^c	.32 ^c	.28 ^c	.43 ^c	.72 ^c	.36 ^c	.29 ^c
7 ConcT3							.84	.59 ^c	.36 ^c	.33 ^c	.50 ^c	.39 ^c	.34 ^c	.32 ^c	.52 ^c	.42 ^c	.36 ^c	.28 ^c	.47 ^c	.32 ^c	.37 ^c	.36 ^c	.54 ^c	.39 ^c
8 ConcT4								.84	.38 ^c	.33 ^c	.44 ^c	.58 ^c	.24 ^c	.28 ^c	.35 ^c	.32 ^c	.33 ^c	.28 ^c	.38 ^c	.44 ^c	.35 ^c	.31 ^c	.45 ^c	.61 ^c
9 ConfiT1									.89	.52 ^c	.45 ^c	.36 ^c	.62 ^c	.40 ^c	.33 ^c	.39 ^c	.67 ^c	.44 ^c	.40 ^c	.37 ^c	.64 ^c	.44 ^c	.46 ^c	.31 ^c
10 ConfiT2										.91	.49 ^c	.44 ^c	.38 ^c	.71 ^c	.39 ^c	.42 ^c	.41 ^c	.75 ^c	.44 ^c	.40 ^c	.44 ^c	.76 ^c	.45 ^c	.29 ^c
11 ConfiT3											.85	.60 ^c	.25 ^c	.34 ^c	.68 ^c	.45 ^c	.37 ^c	.39 ^c	.64 ^c	.46 ^c	.64 ^c	.41 ^c	.58 ^c	.40 ^c
12 ConfiT4												.87	.31 ^c	.31 ^c	.45 ^c	.47 ^c	.38 ^c	.36 ^c	.46 ^c	.61 ^c	.36 ^c	.38 ^c	.47 ^c	.60 ^c
13 CurioT1													.90	.48 ^c	.33 ^c	.35 ^c	.64 ^c	.39 ^c	.34 ^c	.31 ^c	.57 ^c	.40 ^c	.32 ^c	.29 ^c
14 CurioT2														.87	.39 ^c	.37 ^c	.40 ^c	.70 ^c	.40 ^c	.39 ^c	.39 ^c	.67 ^c	.33 ^c	.25 ^c
15 CurioT3															.85	.54 ^c	.33 ^c	.35 ^c	.63 ^c	.42 ^c	.27 ^c	.33 ^c	.50 ^c	.34 ^c
16 CurioT4																.85	.33 ^c	.34 ^c	.41 ^c	.45 ^c	.35 ^c	.33 ^c	.41 ^c	.38 ^c
17 ContT1																	.85	.56 ^c	.54 ^c	.53 ^c	.61 ^c	.39 ^c	.37 ^c	.31 ^c
18 ContT2																		.88	.58 ^c	.48 ^c	.43 ^c	.68 ^c	.39 ^c	.26 ^c
19 ContT3																			.85	.63 ^c	.30 ^c	.38 ^c	.50 ^c	.34 ^c
20 ContT4																				.83	.35 ^c	.34 ^c	.40 ^c	.53 ^c
21 DCT1																					.85	.52 ^c	.47 ^c	.38 ^c
22 DCT2																						.84	.45 ^c	.35 ^c
23 DCT3																							.82	.56 ^c
24 DCT4																								.84
<i>M</i>	3.76	3.72	3.72	3.61	2.86	2.98	2.87	2.98	3.44	3.47	3.36	3.29	3.05	3.17	3.14	2.99	3.45	3.47	3.36	3.29	3.37	3.33	3.15	3.10
<i>Males</i>	3.91	3.85	3.88	3.77	2.99	3.09	2.92	3.10	3.43	3.52	3.42	3.46	3.10	3.28	3.18	3.09	3.52	3.53	3.48	3.44	3.46	3.41	3.26	3.21

Females	3.62	3.60	3.57	3.45	2.73	2.87	2.82	2.87	3.45	3.42	3.30	3.12	2.99	3.06	3.09	2.93	3.31	3.37	3.24	3.14	3.28	3.26	3.05	3.00
SD	.62	.65	.68	.76	.80	.83	.81	.84	.69	.75	.71	.77	.73	.72	.72	.70	.73	.78	.79	.80	.76	.73	.75	.84
Males	.57	.63	.63	.73	.81	.84	.84	.81	.67	.77	.72	.73	.74	.75	.75	.75	.71	.77	.80	.79	.72	.74	.70	.77
Females	.63	.65	.68	.78	.78	.83	.84	.85	.70	.73	.70	.78	.72	.70	.68	.67	.74	.80	.76	.74	.78	.74	.77	.87

377 **Table 1.** Means (*M*), Standard Deviations (*SD*), and Bivariate Correlations between the Study Variables. Cronbach's alphas are presented in the
378 diagonal.

379 Note 1. $c = p < .001$, $b = p < .01$, $a = p < .05$ Selfes = Self-esteem, Conc = Concern, Confi = Confidence, Curio = Curiosity, Cont= Control, DC = Dual
380 career concern, , T1 = measurement point 1, T2 = measurement point 2, T3 = measurement point 3, T4 = measurement point 4.

381



383 *Figure 1.* Factor model of career adaptability, self-esteem, and gender (Standardized coefficients; Only statistically significant paths reported). SE_T1
384 = specific factor of self-esteem at time point 1, SE_T2 = specific factor of self-esteem at time point 2, SE_T3 = specific factor at time point 3, SE_T4
385 = specific factor of self-esteem at time point 4, CA_T1 = specific factor for adaptability at time point 1, CA_T2 = specific factor for adaptability at
386 time point 2, CA_T3 = specific factor for adaptability at time point 3, CA_T4 = specific factor for adaptability at time point 4.