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Self-regulation skills and stress management during early sportschool-career

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Abstract

Introduction

A career at an elite sports school brings significant changes to the athletes' everyday lives, making self-competence a key factor in successfully adapting to this new environment. The development of new strategies for stress management could be a key factor in achieving success.

Purpose

The aim of this study is to examine the development of self-regulation skills in the first years from talent identification and initial commitment to elite sports schools to the second year of the sports school career. The purpose of this examination is to derive possible consequences that positively influence the career path.

Materials and methods

A total of 130 pupils aged between 10 and 13 years old (mean age = 11.67 years, SD = 1.44 years) were surveyed about their self-competence using the SSI-K3 (Kuhl & Fuhrmann, 2004)

at three different time points in order to link changes in skills to different phases of their school career.

Results

Correlation analysis demonstrated a negative relationship between high levels of perceived negative stress and volition ($r = -0.372$, $p < 0.001$) and self-access ($r = -0.669$, $p < 0.001$). The findings indicate a negative correlation between the two stress subcategories (stress load and threat) and volitional initiation ($r = -0.305$ and $r = -0.381$, $p < 0.001$) and self-access ($r = -0.658$ and $r = -0.581$, $p < 0.001$). Longitudinal analysis demonstrated that stress-related items increased at t1 and then decreased significantly at t2 ($p = .022$).

Conclusion:

The results demonstrate that changes to the conditions of a sports school career have a significant impact on self-competencies. These can be adapted to suit individual athletes, thereby reducing stress and increasing self-efficacy by giving them more influence over their own careers.

Keywords: Self-regulation skills, stress management, sportschool, career

Aim of the work

Dealing with stress is a challenging aspect of achieving peak performance in competitive sports (Nuetzel, 2023; Doron & Martinet, 2021). Compared to talented and well-supported athletes who are less successful, comparable athletes who are highly successful demonstrate better stress management skills. Successful athletes appear to view stressful situations as more challenging yet less stressful (cf. Schröder, 2026). This results in greater potential, which can be demonstrated at the competitive level by greater success. Therefore, the question arises as to how negatively perceived stress can be reduced while simultaneously strengthening self-regulation components so that athletes can continue to act and make decisions (i.e. decision-making and volitional control) despite the high level of stress.

In the context of sports school careers, it is important to note that career paths can fluctuate significantly. Not only are they subject to periodic fluctuations characterised by different priorities throughout the year, but athletes also develop and change their expectations of optimal support within the framework of their dual careers. This study therefore attempts to identify correlations between self-regulation skills and perceived stress levels, using the category of volitional control as a measure of decisiveness. As expected, decisiveness depends on the extent of certain self-competencies and stress perception. The results will be used to optimise support systems at elite sports schools and better assess needs.

Dual career, competitive sports and school

Combining a school career with an elite sports career inevitably leads to major challenges in terms of time management, stress and overcoming system-specific peculiarities (Stambulova & Wylleman, 2019; Henriksen et al., 2020; Kiens & Larsen, 2021.). Sports psychology support programmes can help students to develop strategies for overcoming these challenges, thus positively influencing their careers (Pummel & Lavallee, 2019; Schröder, 2026). Borggrefe and Cachay (2012) refer to various dimensions that address the different stress factors experienced by students at an elite sports school. The authors discuss social dimensions that take human resources into account, providing support in areas such as organisation, learning and psychological issues. The temporal dimension is intended to allow for increased flexibility, particularly in the organisation of school and lessons.

A factual dimension is divided into two areas. One aims to reduce the amount of material taught and the number of exams, while the other aims to integrate competitive sports expertise into everyday school life. For instance, training content could be incorporated into physical education classes.

However, the objective of this initiative is twofold: firstly, to promote athletic careers, and secondly, to link social interest in elite sports with the ethical challenges this presents to the education system. In this context, Karhus (2019) notes that the development of elite sports in Norway is characterised by significant interest in competitive sports, and that athletes must be prepared for the demands of competitive sports, as well as the social requirements of behaviour and lifestyle for competitive athletes, within the framework of school education (Norwegian Directorate of Education and Training, 2013, p. 15; Karhus, 2019). Berlin's elite sports schools must also meet this demand, emphasising the importance of promoting elite sports in a social

context. In Berlin, this is primarily achieved through the respective school websites, which emphasise fair play and educate students to become responsible members of the society.

Self-regulation

Despite the considerable demands of pursuing a dual career, many athletes achieve above-average academic performance (Brettschneider, 1999; Durand-Bush & Salmela, 2002). Experts demonstrate a particularly high level of self-regulatory skills in sporting and academic contexts alike (Cleary & Zimmerman, 2001; Kitsantas & Zimmerman, 2002). Furthermore, it has been empirically confirmed on several occasions that self-regulation is a significant predictor of academic and sporting excellence (Nota, Soresi & Zimmerman, 2004; Schröder, 2026). In this context, it is pertinent to consider the potential role of self-regulatory skills in connecting athletic excellence and academic success, and whether elite youth athletes are able to effectively apply the strategies they acquire in sport to academia. In their study, Jonker, Elferink-Gemser and Visscher (2011) analysed differences in six dimensions of self-regulatory skills among elite youth athletes and their non-athletic peers, as well as between two educational systems. Within the pre-university system, elite athletes scored significantly higher than non-athletes, particularly in the areas of planning, reflection, and effort. The effect sizes ranged from small to medium. In addition, comparisons within the athlete group revealed that elite athletes in the pre-university system obtained higher scores in planning ($F = 8.994$, $p = .003$) and self-efficacy ($F = 5.392$, $p = .021$) than their counterparts in the pre-vocational system. There were no systematic differences for the other self-regulation dimensions. The results suggest that elite youth athletes exhibit a more pronounced profile of self-regulatory skills, particularly with regard to reflection and motivation. These characteristics are considered to be central to self-regulated learning in both performance and academic contexts (Cleary & Zimmerman, 2001; Zimmerman, 2006). Furthermore, it appears that athletic excellence can compensate for differences in academic performance to some extent: as soon as young people start participating in competitive sports, the differences between academic education systems become significantly smaller. The disproportionate presence of elite athletes in the pre-university education system (78.8% compared to 44% of the general population; CBS, 2008) and their lower rate of repetition (11.2% versus 23.8%) support this interpretation.

In another study by Jonker (2011), the extent to which elite youth soccer players have more pronounced self-regulatory skills than non-athletic control subjects were examined, as well as whether these skills contribute to explaining their academic performance. In this study, elite

youth players in the pre-vocational system demonstrated higher effort scores compared to control students in the pre-university system. Additionally, a similar, albeit non-significant, advantage was observed in reflection. Once again, the results demonstrate that elite youth football players achieve higher academic success and display greater proficiency in self-regulation across a range of domains when compared to their non-athletic peers. The study demonstrates that self-regulatory skills are a key resource that enables young athletes to successfully cope with the dual demands of school and competitive sports (Toering et al., 2009).

Stress

As Nuetzel's (2025) systematic review indicates, the well-being and mental health of elite athletes is largely dependent on the balance between stressors and available resources. Emotional support, autonomy and adaptive coping strategies, such as distancing oneself from sports-related demands, have been identified as crucial protective factors in preventing burnout and maintaining long-term performance (Nuetzel, 2025). As Nuetzel (2025) emphasises, mental health is as important as physical health in ensuring basic functionality. This, in turn, enables individuals to cope with stress, perform meaningful tasks and participate in society.

Material and Methods

Study design and participants

A total of 130 students aged between 10 and 13 years old (mean age = 11.67 years, SD = 1.44) participated in a survey about their self-competence. The SSI-K3 (Kuhl & Fuhrmann, 2004) was used to assess this. The survey was conducted at three time points: before entering an elite sports school (t_0, N = 29); immediately afterwards (t_1, N = 43); and one year later (t_2, N = 58). This was undertaken to establish a correlation between changes in skills and the various phases of the school career. Due to the impracticality of conducting a survey of all students at all times, the calculations are based on group differences in independent groups. Participants who were present at all times were recorded in a longitudinal study separately.

Measurement

The groups were surveyed using the SSI-K3 (Kuhl & Fuhrmann, 2004), which has been demonstrated to have good internal consistency (α = .73 – .90) as established by Kuhl and Fuhrmann (2004) and as confirmed in the present study. It was determined that categories with poor Cronbach's alpha values (<.70) would not be considered in the analysis.

Table 1. Mean values and standard deviations (SD) of the groups related to the main categories and the validity of the SSI-K3.

Kategorie	***N***	N_{Items}	***Mean***	***SD***	***Alpha***
Stress	*129*	*8*	*1.06*	*0.71*	*.892*
Self-access	*129*	*12*	*1.88*	*0.57*	*.869*
Willingness to perform	*129*	*12*	*1.65*	*0.51*	*.827*
Self-control	*128*	*8*	*1.51*	*0.56*	***.477****
Self-regulation	*129*	*8*	*1.68*	*0.53*	*.786*
Stress load	*130*	*4*	*0.96*	*0.76*	*.86*
Threat	*130*	*4*	*1.15*	*0.78*	*.82*
SSI-K3 total	*124*	*52*	-	-	*.795*

** The category 'self-control' is not used in the results analysis because it is not reliable.*

Results

Table 2. The mean value and standard deviation (SD) of the groups related to the main variables.

Kategorie	***Mean***			***SD***		
	T_0	*T_1*	*T_2*	*T_0*	*T_1*	*T_2*
Stress	*0.93*	*1.23*	*1.00*	*0.72*	*0.71*	*0.71*
Self-access	*2.03*	*1.80*	*1.87*	*0.58*	*0.54*	*0.58*
Willingness to perform	*1.77*	*1.61*	*1.62*	*0.58*	*0.45*	*0.51*
Self-control	*1.63*	*1.47*	*1.47*	*0.53*	*0.37*	*0.47*
Self-regulation	*1.75*	*1.67*	*1.64*	*0.47*	*0.52*	*0.57*
Stress load	*0.75*	*1.08*	*0.98*	*0.72*	*0.76*	*0.78*
Threat	*1.11*	*1.37*	*1.02*	*0.82*	*0.795*	*0.72*

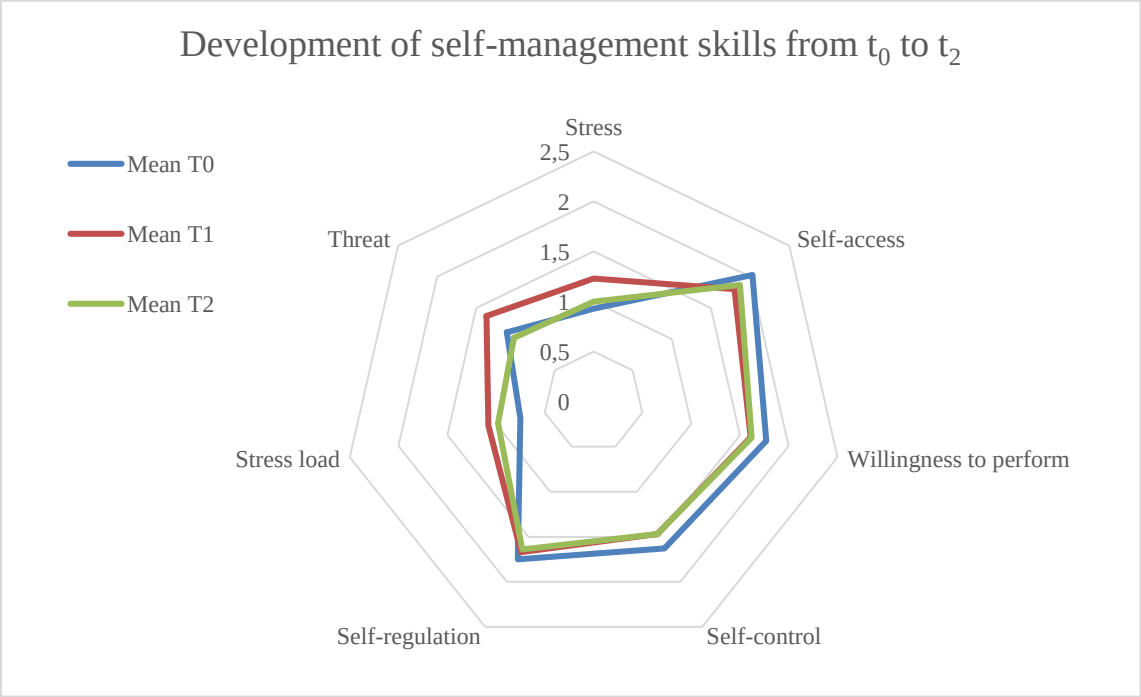

Figure 1. Development of self-management skills from the time of talent identification to 8th grade at elite sports school in Berlin.

Table 3. Correlations for the main variables in the study.

Scale		**N**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	Self-regulation	130	1						
2	Self-control	130	.146	1					
3	Willingness to perform	130	.304**	.325**	1				
4	Self-access	130	.248**	.211*	.513**	1			
5	Stress	130	-.084	-.217*	-.372**	-.669**	1		
6	Stress load	130	-.160	-.170	-.305**	-.658**	.924**	1	
7	Threat	130	-.001	-.231**	-.381**	-.581**	.928**	.715**	1

**. *The correlation is significant at the 0.01 level (two-tailed).*

*. *The correlation is significant at the 0.05 level (two-tailed).*

Table 4. ANOVA tests showing group differences.

categories	*Source*	*Sum of Squares*	*Df*	*Mean Square*	*F*	*Sig.*	η^2
Stress	*Within groups*	*64.07*	*127*	*.504*	*1.852*	*.161*	*.028*
	Between groups	*1.87*	*2*	*.934*			
Threat	*Within groups*	*74.97*	*127*	*.590*	*2.724*	*.069*	*.041*
	Between groups	*3.215*	*2*	*1.608*			
Stress load	*Within groups*	*73.19*	*127*	*.576*	*1.638*	*.198*	*.025*
	Between groups	*1.89*	*2*	*.944*			
Self-control	*Within groups*	*26.246*	*127*	*.207*	*1.252*	*.290*	*.019*
	Between groups	*.517*	*2*	*.259*			
Self-regulation	*Within groups*	*36.151*	*127*	*.285*	*.418*	*.660*	*.007*
	Between groups	*.238*	*2*	*.119*			

Self-Access	*Within groups*	*41.064*	*127*	*.323*	*1.52*	*.222*	*.023*
	Between groups	*.984*	*2*	*.492*	*1*		
Will to perform	*Within groups*	*32.649*	*127*	*.257*	*1.01*	*.367*	*.016*
	Between groups	*.520*	*2*	*.260*	*1*		

*Note. * p = < .05 two-tailed*

Tab. 5. Kruskal–Wallis test for non-normally distributed categories: stress, threat and negative stress load.

groups	df	Z	p	r	normality (Shapiro-Wilk)	p
stress						
t_1-t_3	86	-.458	.647	.049	>.001	
t_1-t_2	71	-1.856	.063	.169		
t_3-t_2	100	1.699	.089	.22		
negative stress						
t_1-t_3	86	-1.340	.180	.145	>.001	
t_1-t_2	71	-1.834	.067	.22		
t_3-t_2	100	.676	.499	.067		
threat						
t_1-t_3	86	.530	.596	.057	>.001	
t_1-t_2	71	2.285	.022	.17		
t_3-t_2	100	-1.412	.158	.23		

Discussion

The results suggest that effective stress management is crucial for providing optimal support to young sporting talents at elite sports schools. While few results are statistically significant, it is evident that the transition to an elite sports school, in particular, evokes concerns among students. This transition is perceived as threatening, which increases negative stress. The high negative correlations with self-regulation skills highlight the need for schools to provide structured support in this area. Measures to reduce stress and increase essential self-competence could contribute to better stress management and thus increased success.

In this context, Kiens and Larsen (2021) describe a sports psychology intervention that had a positive effect on the self-analysis and awareness skills of sports students. These effects were recorded qualitatively. The 16-session intervention began with a communication workshop and ended with goal setting. The sessions in between covered content on self-awareness, commitment skills, and coping skills. Overall, the participants (10th grade students at an elite school in Estonia) evaluated this intervention.

Storm and Eske (2022) investigated the influence of elite sports promotion on dual careers at Danish schools. They found that the grades of top athletes who did not attend an elite sports school generally fell below the general average, as well as below the average of athletes who had been promoted at an elite sports school as part of a dual career. The results suggest that students who participate in competitive sports achieve significantly better grades than comparable students who do not ($d = .026$; $p < .001$).

The authors took many independent variables into account, such as the parents' age, educational qualifications and family situation, among others. However, they also emphasise that the influencing factors are so complex that only cautious assumptions can be made. These findings are consistent with motivational psychology studies that have demonstrated a correlation between a high need for achievement-motive and athletic performance (Schröder & Knisel, 2024). It stands to reason that a strong need for achievement motive is not limited to competitive sports, but can also extend to academic contexts. The ability to regulate oneself in certain situations, especially those related to performance, is an important skill.

A systematic review by Nuetzel (2023) shows that elite athletes are exposed to a variety of athletic and non-athletic stressors throughout their careers. If these stressors are not adequately managed, they can significantly increase the risk of mental health impairments.

The review confirms that effective coping strategies, especially those based on high self-efficacy in coping, resilience, a sense of coherence and social support, moderate the negative effects of stress and promote growth processes rather than defensive reactions (Nuetzel, 2023). The findings demonstrate that psychological maturity, social support systems and sport-specific requirements have a significant influence on the types of coping strategies employed and their effectiveness. Transitional phases, such as the transition from junior to senior level, seem to be particularly associated with an increased risk of mental health problems (Nuetzel, 2023).

The study by Macquet and Skalej (2015) shows that time management in elite sports is characterized by highly structured and intensively used time organization. The training centers (SATC) and coaches fragmented the athletes' daily routines into tightly scheduled, linear time slots. This time structure functioned as both a framework for action and an object of active regulation, primarily employed to optimise athletic and academic performance. The analysis revealed that the participants primarily utilised their leisure time for recreational, performance-related, or learning-related activities. Conversely, activities not directly associated with performance were often suppressed. In the area of decision-making, the study confirms the relevance of experience-based processes. Athletes made time-related decisions based on their perception of the situation and recognition of typical patterns. In addition, they used anticipatory strategies more frequently, had a higher degree of time control, and showed closer relationships with their coaches, which facilitated strategic negotiations about time use (Macquet & Skalej, 2015). Novices, on the other hand, relied more heavily on emotion-focused and socially supported strategies and had greater difficulty adapting to rigid time management.

In practical terms, the findings imply the need to provide athletes with sufficient non-performance-related time slots to prevent fatigue, stress, and boredom and to promote psychosocial adjustment (Macquet & Skalej, 2015). In addition, the importance of stable social networks and coach-athlete relationships is emphasized.

The study by Doron and Martinent (2021) analysed the dynamic relationships between stress assessment, coping, emotion, and objective performance during real fencing competitions.

The results show that dealing with challenges in a positive way, problem-focused coping, and pleasant emotions are key to keeping up optimal performance, while threats, dysfunctional emotion-focused coping, and unpleasant emotions can hurt performance.

The evaluation of stress resistance training for elite athletes (SRT-EA) by Sallen, Hemming, and Richartz (2018) was conducted on four levels of impact and shows overall positive effects on the stress competence of young competitive athletes.

Summary and Conclusions

This paper emphasizes the importance of timely support for young athletes as part of their development at an elite sports school in Berlin.

The key stages of talent identification and talent development must be adapted to individual needs, and existing systems must be reviewed in terms of their effectiveness. Since there are numerous factors that ultimately determine the extent to which support systems are perceived as helpful, there must also be established individual cooperation, which is naturally also communicated via the coaches (Borggrefe & Cachay, 2012; Stambulova & Wylleman, 2019; Henriksen et al., 2020; Kiens & Larsen, 2021; Schröder, 2026).

Regular goal-setting discussions at school and sports level prevent false expectations from arising, thereby reducing the risk of failing to achieve goals that are not realistic. The GROW model (Whitmore, 2010) is a simple sports psychology coaching method that can be used in short, regular exchanges with school and sports partners. Goals are regularly formulated and compared, making it possible to integrate them into an existing schedule and rule out possible overlaps. This comparison with reality — referring to specified exam times, qualification competitions and other tightly scheduled content — also helps students to manage their time. This transparent presentation of upcoming requirements enables various planning and implementation options. Goals are constantly reviewed for accuracy and adjusted if necessary to avoid excessive demands.

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The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

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References

Barnes, F. B., Fletcher, D., & Neely, K. C. (2021). Stress-Related growth in elite sport performers: Qualitative differentiators in psychosocial mechanisms. The Sport Psychologist, 35(4), 293-304. https://doi.org/10.1123/tsp.2020-0015

Borggrefe, C., & Cachay, K. (2012). "Dual careers": The structural coupling of elite sport and school exemplified by the German Verbundsysteme. European Journal for Sport and Society, 9(1-2), 57-80. https://doi.org/10.1080/16138171.2012.11687889

Brettschneider, W. D. (1999). Risks and opportunities: adolescents in top-level sport ñ growing up with the pressures of school and training. European physical education review, 5(2), 121-133. https://doi.org/10.1177/1356336X990052004

CBS [Central Bureau of Statistics]. (2008). Jaarboek onderwijs in cijfers 2008 [Statistical abstract of education 2008]. Voorburg/Heerlen: CBS.

Cleary, T. J., & Zimmerman, B. J. (2001). Self-regulation differences during athletic practice by experts, non-experts, and novices. Journal of applied sport psychology, 13(2), 185-206. https://doi.org/10.1080/104132001753149883

Doron, J., & Martinent, G. (2021). Dealing with elite sport competition demands: an exploration of the dynamic relationships between stress appraisal, coping, emotion, and performance during fencing matches. Cognition and Emotion, 35(7), 1365-1381. https://doi.org/10.1080/02699931.2021.1960800

Durand-Bush, N., & Salmela, J. H. (2002). The development and maintenance of expert athletic performance: Perceptions of world and Olympic champions. Journal of applied sport psychology, 14(3), 154-171. https://doi.org/10.1080/10413200290103473

Gerber, M. (2023). The challenge of developing school structures that facilitate education and elite sport: Implications for the prevention of stress and mental health issues. In The Importance of Recovery for Physical and Mental Health (pp. 223-241). Routledge.

Gerber, M., Holsboer-Trachsler, E., Pühse, U., & Brand, S. (2011). Elite sport is not an additional source of distress for adolescents with high stress levels. Perceptual and motor skills, 112(2), 581-599. https://doi.org/10.2466/02.05.10.PMS.112.2.581-599

Gerber, M., Kellmann, M., Brand, S., Gygax, B., Ludyga, S., Müller, C., ... & Gerber, M. (2022). Differences in mental health outcomes between adolescent elite athletes and peers not engaged in elite sport. Cur Issues Sport Sci, 7, 013.

Håkansson, A., Moesch, K., & Kenttä, G. (2022). COVID-19-related impact on mental health and career uncertainty in student-athletes—Data from a cohort of 7,025 athletes in an elite sport high school system in Sweden. Frontiers in Sports and Active Living, 4, 943402. https://doi.org/10.3389/fspor.2022.943402

Henriksen, K., Schinke, R., Moesch, K., McCann, S., Parham, W. D., Larsen, C. H., & Terry, P. (2020). Consensus statement on improving the mental health of high performance athletes. International journal of sport and exercise psychology, 18(5), 553-560. https://doi.org/10.1080/1612197X.2019.1570473

Hummel, A., & Brand, R. (2010). Eliteschulen des Sports (EdS) als Bildungsorganisationen in einer modernen, offenen Zivilgesellschaft.

Jonker, L. (2011). Self-regulation in sport and education: important for sport expertise and academic achievement for elite youth athletes.

Jonker, L., Elferink-Gemser, M. T., & Visscher, C. (2011). The role of self-regulatory skills in sport and academic performances of elite youth athletes. Talent Development & Excellence, 3(2), 263-275.

Jonker, L., Elferink-Gemser, M. T., Toering, T. T., Lyons, J., & Visscher, C. (2010). Academic performance and self-regulatory skills in elite youth soccer players. Journal of sports sciences, 28(14), 1605-1614.

Jordalen, G., Lemyre, P. N., & Durand-Bush, N. (2020). Interplay of motivation and self-regulation throughout the development of elite athletes. Qualitative Research in Sport, Exercise and Health, 12(3), 377-391. https://doi.org/10.1080/2159676X.2019.1585388

Kårhus, S. (2019). Pedagogization of elite sport in the school system: Vested interests and dominant discourses. Sport, education and society, 24(1), 13-24. https://doi.org/10.1080/13573322.2017.1292233

Kiens, K., & Larsen, C. H. (2021). Provision of a mental skills intervention program in an elite sport school for student-athletes. Journal of Sport Psychology in Action, 12(1), 11-25. https://doi.org/10.1080/21520704.2020.1765925

Kitsantas, A., & Zimmerman, B. J. (2002). Comparing self-regulatory processes among novice, non-expert, and expert volleyball players: A microanalytic study. Journal of applied sport psychology, 14(2), 91-105. https://doi.org/10.1080/10413200252907761

Krüger, H. H., Keßler, C., Otto, A., & Schippling, A. (2014). Elite und Exzellenz aus der Perspektive von Jugendlichen und ihren Peers an exklusiven Schulen. Zeitschrift für Erziehungswissenschaft, 17 (Suppl 3), 221-241. https://doi.org/10.1007/s11618-014-0530-5

Kuhl, J., & Fuhrmann, A. (2004). Selbststeuerungs-Inventar: SSI-K3 (Kurzversion). Universität Osnabrück: Unveröffentlichtes Manuskript.

Macquet, A. C., & Skalej, V. (2015). Time management in elite sports: How do elite athletes manage time under fatigue and stress conditions?. Journal of Occupational and Organizational Psychology, 88(2), 341-363. https://doi.org/10.1111/joop.12105

Nielsen, J. C., Skrubbeltrang, L. S., Olesen, J. S., & Karen, D. (2022). Cooperation between schools and elite sports. How are schools affected from engaging in athletic talent development? International Studies in Sociology of Education, 31(3), 325-346. https://doi.org/10.1080/09620214.2020.1847167

Nota, L., Soresi, S., & Zimmerman, B. J. (2004). Self-regulation and academic achievement and resilience: A longitudinal study. International journal of educational research, 41(3), 198-215. https://doi.org/10.1016/j.ijer.2005.07.001

Nuetzel, B. (2023). Coping strategies for handling stress and providing mental health in elite athletes: a systematic review. Frontiers in Sports and Active Living, 5, 1265783. https://doi.org/10.3389/fspor.2023.1265783

Nuetzel, B. (2025). Stress and its impact on elite athletes' wellbeing and mental health-a mini narrative review. Frontiers in Sports and Active Living, 7, 1630784. https://doi.org/10.3389/fspor.2025.1630784

Prohl, R., & Stiller, T. K. (2011). Leistungssport als Bildungsprozess-zu Funktion und Gestaltung der Eliteschulen des Sports. na.

Pummell, E. K., & Lavallee, D. (2019). Preparing UK tennis academy players for the junior-to-senior transition: Development, implementation, and evaluation of an interventionprogram. Psychology of Sport and Exercise, 40, 156–164. doi: 10.1016/j.psychsport.2018.07.007

Sallen, J., Borchert, T., & Gerlach, E. (2018). Die Schulzeitstreckung in der gymnasialen Oberstufe: Ein Wundermittel zur Entlastung von Schülerathlet/innen an Eliteschulen des Sports. Sportwissenschaft in pädagogischem Interesse, 30, 178-180.

Sallen, J., Hemming, K., & Richartz, A. (2018). Facilitating dual careers by improving resistance to chronic stress: effects of an intervention programme for elite student athletes. European journal of sport science, 18(1), 112-122. https://doi.org/10.1080/17461391.2017.1407363

Schröder, S. (2025). DUAL2E - a concept for promoting elite sports careers at elite sports schools. It is based on research in implicit sports motives and explicit self-competences. In ICERI 2025 Proceedings (pp. 6488-6488). IATED. https://doi.org/10.21125/iceri.2025.1789

Schröder, S. (2026). What distinguishes the successful athletes from elite athletes in terms of their self-competencies? Both groups are similar supported by the elite sports school system,

but different in their performance level. Sustainability and Sports Science Journal, 4(1), 1-13. https://doi.org/10.55860/XXZS2262

Seidelmeier, I. (2005). Einführung eines Qualitätsmanagementsystems an einer Eliteschule des Sports (Doctoral dissertation, München, Univ. der Bundeswehr, Diss., 2006).

Stambulova, N. B., & Wylleman, P. (2019). Psychology of athletes' dual careers: A state-of-the-art critical review of the European discourse. Psychology of Sport and Exercise, 42, 74-88. https://doi.org/10.1016/j.psychsport.2018.11.013

Storm, R. K., & Eske, M. (2022). Dual careers and academic achievements: does elite sport make a difference?. Sport, Education and Society, 27(6), 747-760. https://doi.org/10.1080/13573322.2021.1919070

Szymanski, B., Beckmann, J., Elbe, A. M., & Müller, D. (2004). Wie entwickelt sich die Volition bei Talenten einer Eliteschule des Sports? Zeitschrift für Sportpsychologie, 11(3), 103-111. https://doi.org/10.1026/1612-5010.11.3.103

Toering, T. T., Elferink-Gemser, M. T., Jordet, G., & Visscher, C. (2009). Self-regulation and performance level of elite and non-elite youth soccer players. Journal of sports sciences, 27(14), 1509-1517. https://doi.org/10.1080/02640410903369919

Toering, T., Jordet, G., & Ripegutu, A. (2013). Effective learning among elite football players: The development of a football-specific self-regulated learning questionnaire. Journal of sports sciences, 31(13), 1412-1420. https://doi.org/10.1080/02640414.2013.792949

Tranæus, U., Ivarsson, A., & Johnson, U. (2017). Stress and injuries in elite sport. In Handbuch Stressregulation und Sport (pp. 451-466). Berlin, Heidelberg: Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-662-49322-9_22

Whitmore, J. (2010). Coaching for Performance: The Principles and Practice of Coaching and Leadership: Fully Revised 25th Anniversary Edition. Hachette UK.

Zschätzsch, D. (2014). Duale Unterstützungsleistungen an den Berliner Eliteschulen des Sports: Eine athletenorientierte Evaluation (Doctoral dissertation, Dissertation, Leipzig, Universität Leipzig, 2014). Barnes, F. B., Fletcher, D., & Neely, K. C. (2021). Stress-Related growth in elite sport performers: Qualitative differentiators in psychosocial mechanisms. The Sport Psychologist, 35(4), 293-304. https://doi.org/10.1123/tsp.2020-0015