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# RELATIONSHIP BETWEEN THE ATHLETE'S ENVIRONMENT AND SPORTS PERFORMANCE WITH REGARD TO PSYCHOLOGICAL FACTORS

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## ABSTRACT

Sports performance is influenced by several factors. Psychological factors are a main contributor to sports performance, but are themselves influenced by the athlete's environment, e.g., social environment, financial situation, and so on. It is therefore necessary to assess the influence of environmental factors on competitive performance, which is likely to occur through psychological mechanisms. To this purpose, 592 athletes between 13 and 65 years of age ( $28.04 \pm 9.15$ , 357 female, 204 male, 2 of unspecified gender) at various performance levels were surveyed using a set of questionnaires (MIPS, CSAI, GSE, TDEQ5 and additional questions) regarding their psychological and competitive performance as well as their perceptions of their social situation and social environment. Differences in environmental and psychological factors were found between different athlete groups, e.g. according to gender (e. g. self-efficacy being higher in male participants,  $p \leq .010$ ,  $\eta = .114$ ), handedness (e. g. left-handers perceiving their social surroundings as more perfectionistic), and sport involved (e. g. higher values for CSAI worry in team sports,  $p \leq .038$ ,  $\eta = .009$ ). Connections between performance and several environmental factors (e.g., highest competitive level and family,  $p \leq .017$ ,  $r = -.102$ ) and intercorrelations among psychological scales, such as MIPS and CSAI, were also found. Self-efficacy correlated with highest competitive level in the current main sport ( $p \leq .006$ ,  $r = -.120$ ) as well as CSAI worry ( $p \leq .002$ ,  $r = -.138$ ), thus showing a probable effect of expected self-efficacy and CSAI worry on sports performance, while self-efficacy itself correlated with and was therefore most probably influenced by several environmental factors, for instance social environment ( $p \leq .001$ ,  $r = -.170$ ), finances ( $p \leq .001$ ,  $r = -.206$ ) and sleep quality ( $p \leq .001$ ,  $r = -.252$ ), amongst others, and CSAI worry was influenced by perfectionism of the environment (e. g. MIPS coach,  $p \leq .001$ ,  $r = -.3420$ ). Therefore, it can be said that sports performance is most likely influenced by a set of environmental factors (e.g., family, social surroundings, perfectionism of family, coach, and team) via psychological factors such as self-efficacy and CSAI. Psychological performance itself is a factor that influences sports performance, but it is most likely also the link through which environmental factors influence sports performance.

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## INTRODUCTION

Sports performance is limited by constitution, coordination, training condition, technique, tactical skill, psychological performance, and social factors (Weineck, 2010). Psychological factors include, e.g., motivation, volition, mental toughness, perfectionism, emotional control, anxiety, perception of self-efficacy, ability to cope with

injuries, as well as the affinity to doping (Adams, Brassington, Steiner & Matheson, 2004; Johnson, 2007; Barkoukis, Lazuras, Tsorbatzoudis & Rodafino, 2008; Crombie, Lombard & Noakes, 2009; Gonçalves, Rama & Figueiredo, 2012; Moesch, Hauge, Wikman & Elbe, 2013; Baron-Thiene & Alfermann, 2015). Performance-limiting factors vary across different types of sports. How-

ever, psychological factors have been shown to be relevant in team sports (Grobbelaar & Eloff, 2011, amongst others) as well as in individual sports (D'Arripe-Longueville, Hars, Debois & Calmels, 2009). There are differences regarding gender (Christoforidis, Kallivas, Matsouka, Bebetos & Kambas, 2010; Marczinka, 2011; Taylor et al., 2020) and probably other athlete-specific factors, like, e.g., playing position or handedness (Weber, 2014; Weber & Wegner, 2016; Weber & van Maanen-Coppens, 2018; Weber & Wegner, 2018a). Furthermore, it is likely that psychological factors such as motivation, volition, and action disposition are related to characteristics such as handedness and performance (Weber, 2014; Weber, 2021b; Weber, 2022a). Also, it has to be kept in mind that some factors, which are per se intrinsic to the athlete, might become social factors depending on how the athlete is perceived from the outside, e.g., age, gender, or handedness. For instance, young handball players or left-handed players might be placed in a position that is open on a team, regardless of whether they are suited to that particular playing position (Weber & Chittibabu, 2017). Handedness may also be important in individual sports. When competing in the spiral discipline of wheel-gymnastics, the turning direction that is best for the gymnast might not be the one preferred by the coach, and the preferred turning direction might also be influenced by handedness (Weber, 2021a). It seems that psychological performance is much more multifaceted than previously thought, and that, e.g., team roles and individual coaching play a crucial role regarding team performance (Beckmann & Elbe, 2008). Psychological performance demands on handball goalkeepers have been found to be largely psychological (Weber et al., 2018). Also, psychological traits and abilities do relate to mental toughness, handedness, and

other factors. It is therefore necessary to put sports psychology and (psychological) sports performance into a much broader context, as has been done in previous literature, and to add the social and environmental elements. The focus on sports performance needs to be enhanced in this respect to further support athletes' well-being and performance. Similar models have already been implemented in vocational contexts (Brown, 2002).

Psychological performance does influence competitive results in sports, whether it is the athletes' performance or that of judges, coaches, or other participants in a sports event. Individuals at the training or competition site can be favourable or detrimental to athletes' performance, for instance, when judges, coaches, or managers are biased. The judges' psychological performance on the other hand can, as an external factor, influence that of athletes, coaches and teams, e.g. in wheel-gymnastics (Weber, 2021 a), as can the behaviour of other participants in training or competition such as volunteers, fans (own or opposite), spectators and so on (Beckmann & Elbe, 2008; Karl, 2024 a & b; Braga & Guillén, 2012; Engler, Pelzer, Kaczmarek & Schaefer, 2023). Volunteers might provide false directions on the track, and fans might create pressure during competition (Braga & Guillén, 2012). In Biathlon, Harb-Wu and Krumer (2019) found different audience effects for high-level and less experienced athletes. Regarding the coach, the coach's psychological ability can influence not only the coach himself, but also the athlete (Shapcott & Carr, 2020) or team, and, also quite importantly, the judges.

At the same time, the athlete's psychological and physical performance is or might be influenced by their (social) environment and framework, such as family, team members, coaches, religion, partner, workplace, or

even political events (Washif, Farooq, Krug, Pyne, Verhagen, Taylor et al., 2021; Romdhani, Ammar, Trabelsi, Chtourou, Vitale, Masmoudi et al., 2022; Vollmann, Ehnold & Schlesinger, 2023). For example, coaches at different license and competitive levels displayed different personality traits (Wunder, Priem, Wagner, Stoll, 2024). Psychological performance in sports can also be influenced by sleeping habits, sleep quality, and other sleep-related parameters. In contrast, sleep itself is altered by various circumstances surrounding the athlete (Romdhani, Fullagar, Vitale, Nédélec, Rae, Ammar et al., 2022), for example, global or political events, which can also have an effect on training and competition and thus the athletes' psychological and/ or physical state (Washif et al., 2021). As psychological performance is directly related to sports performance (as outlined above), it is necessary to assess possible connections between psychological performance and the athlete's (social) environment. Regarding religion, fasting practices such as Ramadan or the closing of training facilities around Christmas can disrupt normal training, as can demands regarding sports clothing, which might be considered inappropriate in certain religions and cultures. On the other hand, religion can enhance sports performance (Srem-Sai et al., 2021; Romdhani et al., 2022).

Although it has been shown that social factors trigger neurological pathways that enhance sports performance (Davis, Hettiniga & Beedie, 2020), a literature review using Google Scholar did not identify a tested concept of how social factors, in combination with psychological factors, contribute to or limit sports performance. Potential social and/or environmental factors contributing to optimum performance in sports might be religion, social environment such as peers, coaches, partner, workplace and financial security,

gender, therapy settings, family or even political events and catastrophes like e.g. the Covid-pandemic, amongst others (Dyer, 1976; Adams et al., 2004; Satow, 2008; Madigan et al., 2019; Truong, Mosewich, Holt, Le, Miciak & Whittaker, 2020; Srem-Sai, Frimpong, Abieraba, Sorkpor, Hagan Jr et al., 2021; Taylor, Fujak, Hannon & O'Connor, 2022). Borggreffe and Cachay (2014) even view dual careers in higher education and competitive sports as a problem similar to inclusion. Hickman & Metz (2015), for example, found that professional golfers underperform under monetary pressure. If the financial situation does not allow the athlete to focus solely on training, factors such as workplace, superiors, and travel to training and competition in an unfavourable financial situation might create difficulties for the athlete (Mumcu, 2019). Most research in this direction is conducted at sports schools (Beckmann & Elbe, 2008; Madigan, Curran, Stoeber, Hill, Smith et al., 2019) or for younger athletes (Zibung & Conzelmann, 2015), but less frequently at higher performance levels. The sports performance of children between seven and nine is influenced by their parents' age, income, and education, as well as sports activities and competitions of the mother, older siblings, or other relatives, physical activity, living situation, playgrounds in the vicinity, and unqualified input from parents regarding sports technique (Krause, 2015).

Lau & Walter (2018) claim that every athlete has an individual set of positively influencing factors and mention a supportive network focused on long-term development, a motivating peer group, communication with the trainer, challenging surroundings, acknowledgment of the athlete's individuality, and a holistic approach as contributing factors. Self-efficacy could be a measurable expression of psychological performance in

this context, as it is linked to sports performance (Bandura, 1977) and to environmental factors such as social and financial support (Cunningham, Bruening, Sartore, Sagas & Fink, 2005). At the same time, self-efficacy is influenced by positive learning experiences (Bandura, 1977), which are, in turn, connected to the social environment (House, 1987; Lent, Brown & Hackett, 2000). Also, competitive anxiety can give insights regarding an athlete's ability to perform. In this study, psychological performance will therefore be measured using psychological questionnaires (GSE, CSAI).

This work aims to research the influence of environmental factors on psychological performance and on sports performance, as well as the influence of environmental factors (see Figure 1) and thus the athlete's overall performance, and answer the following questions:

*Do environmental factors influence sports performance?*

*Do environmental factors influence psychological performance?*

*Does psychological performance influence sports performance?*

*Are there differences in environmental factors across competitive levels?*

These questions will be concretized (e.g., regarding subgroups and interdependencies) in more detail in the methods section.

It will be discussed how environmental factors influence psychological performance, which is most probably best measured via per-

formance-limiting psychological factors and must be seen in the mentioned social and environmental context, and competitive success in sports. Differences between individual and team sports will be highlighted, along with special circumstances and requirements for different groups of athletes, e.g., semi-professionals, athletes of different genders, athletes participating in different sports, or athletes of different handedness.

An attempt will be made to verify the influence of a set of social and psychological factors on each other and the competitive level of the athlete, using the German version of the General Self-efficacy Scale (GSE, Schwarzer & Jerusalem, 1995; Hinz, Schumacher, Albani, Schmid & Brähler, 2006), the Multidimensional Instrumentary of Perfectionism in Sports (MIPS, Stöber, Otto, Pescheck & Stoll, 2004; Madigan, 2006), the Competitive State Anxiety Inventory (CSAI, Martens, Vealey & Burton, 1990; Stöber & Pescheck, 2004) and the Talent-Development-Environmental Questionnaire (TDEQ5, Alfermann, Lobinger, Nesges, Martindale & Andronikos, 2023). Selected instruments include performance-related factors and psychosocial aspects. The aim is to determine which aspects the athletes deem to be most crucial for their competitive performance, for example, parents, peers, teammates, coaches, or spouses/partners, and test for possible effects of certain factors on each other and on sports performance, which will be measured via competitive level.

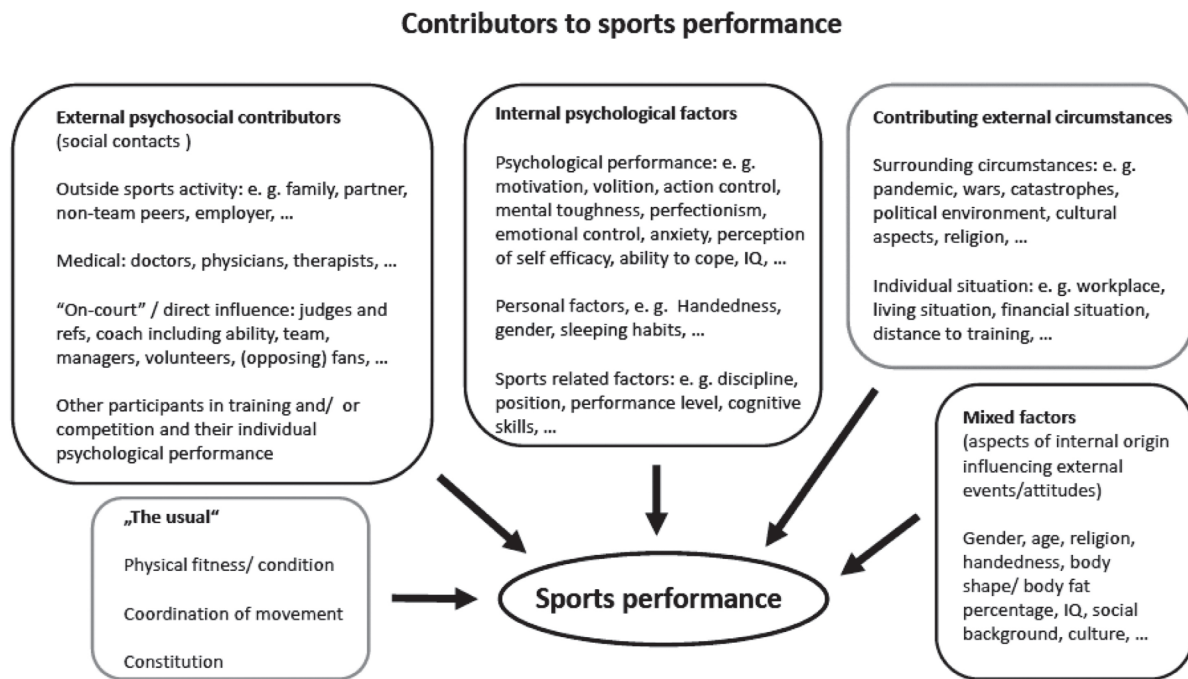


Figure 1. Possible contributors to sports performance.

**METHODOLOGY**

The questionnaire was online from October 1st, 2023, until February 29th, 2024. A total of 592 athletes provided informed consent and filled in the questionnaire, but only 563 participants (357 female, 204 male, 2 participants did not provide information regarding their gender)

could be included due to missing or implausible answers. The age of participants ranged from 13 to 65 ( $28.04 \pm 9.15$ ), with a median of 25 and a mode of 23. Since the age distribution is skewed towards younger ages, the results might be more applicable to athletes aged 13-38 (see Figure 2).

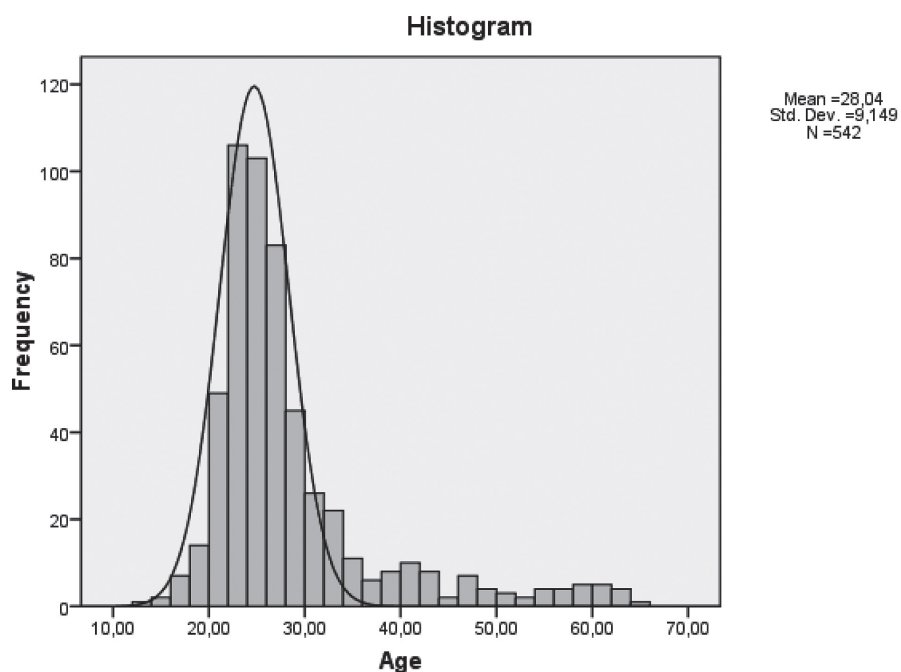


Figure 2. Age distribution

The sample included various types of sports: American Football (3), Archery (4), Athletics (14), Badminton (11), Basketball (11), Bodybuilding (38), Bowling (2), Cheerleading (3), Chess (1), Climbing (15), Combat (21), Cricket (2), Crossfit (2), Cycling (22), Dancing (31), E-sports (2), Equestrian (8), Field Hockey (5), Fitness (56), Floorball (1), Football (66), Footy AUS Football (1), Golf (4), Gymnastics (9), Handball (15), Hiking (5), Icehockey (1), Juggling (1), Kayaking (3), Motor sports (1), Netball (1), Pilates (8), Poledance (4), Rowing (4), Rugby (2), Running (52), Scuba diving (1), Skiing (3), Snooker (1), Softball (1), Squash (2), Swimming (40), Table tennis (5), Tennis (12), Triathlon (3), Volleyball (21), Wheel-gymnastics (13), Yoga (20), and Unspecified (12).

Athletes completed an online questionnaire that included the standardized inventories described above (GSE, CSAI, MIPS, and TDEQ5), along with additional items assessing demographic characteristics, sport-related information, environmental factors, and psychological variables.

#### *Demographic and sport-related variables*

Participants reported their age and gender, as well as their handedness (right-handed, left-handed, or ambidextrous). They also provided information on their sport affiliation (e.g., student, semi-professional, professional), their main and secondary sport(s), the competitive level of their main sport, the highest competitive level achieved across all sports they had engaged in, and their type of sport organization (club, school, university, none, or other).

#### *Environmental factors*

Several variables assessed athletes' perceived environment using single-item ratings from 1 (*detrimental*) to 10 (*optimal*). These included perceived support from the general social environment, family, partner, and edu-

cation/work context, as well as sleep quality, the ability to find time to sleep when needed, distance to the training location, financial situation, and the extent to which religious demands facilitated or hindered athletic participation.

#### *Psychological variables*

Perceived perfectionism from coach, team, and parents was assessed using the MIPS (1 = *never* to 6 = *always*). Self-efficacy was measured using the General Self-Efficacy Scale (1 = *not at all true* to 4 = *exactly true*). Competitive anxiety and self-confidence were measured using the CSAI subscales for cognitive anxiety, somatic anxiety, and self-confidence (1 = *not at all* to 4 = *very much so*). The talent development environment was assessed using the TDEQ5 dimensions: long-term development, alignment of expectations, communication, holistic quality of preparation, and social network (1 = *strongly agree* to 6 = *strongly disagree*).

Self-efficacy was used as a measure for psychological performance. Also, CSAI was used to determine psychological ability to perform under pressure.

The study addressed four main research questions:

- (1) whether athletes at different competitive levels differ in psychological performance and/or environmental factors, and whether these differences vary across subgroups (e.g., gender, handedness, or type of sport);
- (2) whether environmental factors are associated with psychological performance (GSE, CSAI), and whether these associations differ between athlete subgroups (e. g. gender, handedness, type of sport, affiliation);
- (3) whether environmental factors are linked to sport performance, and whether these connections vary between subgroups; and
- (4) whether psychological performance predicts sport performance, and whether this relationship varies across subgroups.

Group differences in psychological performance and environmental factors between athletes of different competitive levels were examined using univariate ANOVAs with Scheffé post hoc tests. Correlations among all variables within athlete groups were calculated using Pearson's correlation coefficient. Because the highest competitive level was coded with the lowest numerical value (1), correlations involving this variable were interpreted with this vector effect in mind. Statistical significance was set to  $p \leq .05$  and trends were considered at  $p \leq .10$ . Correlation coefficients were interpreted as low ( $\geq .10$ ), medium ( $\geq .30$ ), or high ( $\geq .50$ ), and effect sizes as small ( $\geq .10$ ), medium ( $\geq .24$ ), or large ( $\geq .37$ ). All analyses were performed using SPSS 29.

## RESULTS

Results will be presented for all four research questions in consecutive order. Differences with regard to the first research question were found for athletes of different genders or handedness and at different performance levels, and these differences vary between athlete subgroups. Values for male and female athletes differed regarding TDEQ social network, perceived situation regarding studies and job, and perceived self-efficacy (see Table 1). Moreover, athletes of different handedness differed in their perceptions of perfectionism from the coach, team, parents, and the TDEQ social network. Furthermore, athletes in team and individual sports showed differences in social environment, CSAI worry, and CSAI confidence (see Table 1).

**Table 1.** Group Differences Across Sex, Handedness, and Sport Type.

Comparison	Variable	N (groups)	Mean $\pm$ SD	p	$\eta^2$
<b>Men vs. Women</b>	TDEQ Social Network	179 vs. 303	3.65 $\pm$ 1.24 vs. 3.90 $\pm$ 1.26	.036	.095
	Studies/Job Interference	199 vs. 356	6.50 $\pm$ 2.25 vs. 5.89 $\pm$ 2.15	.002	.134
	GSE	190 vs. 335	30.37 $\pm$ 4.78 vs. 29.21 $\pm$ 5.04	.010	.114
<b>Handedness</b> (Right vs. Left vs. Ambidextrous)	MIPS Coach	432 / 42 / 18	2.34 $\pm$ 1.16 / 2.85 $\pm$ 1.31 / 2.06 $\pm$ 1.14	.014	.130
	MIPS Team	421 / 42 / 18	2.08 $\pm$ 1.08 / 2.51 $\pm$ 1.24 / 1.91 $\pm$ 1.12	.041	.114
	MIPS Parents	446 / 42 / 17	1.83 $\pm$ 1.08 / 2.42 $\pm$ 1.47 / 1.77 $\pm$ 0.87	.004	.148
	TDEQ Social Network	419 / 42 / 17	3.82 $\pm$ 1.24 / 3.48 $\pm$ 1.23 / 4.28 $\pm$ 1.50	.073	.105
<b>Team vs. Individual Sports</b>	MIPS Coach	122 vs. 366	2.86 $\pm$ 1.18 vs. 2.20 $\pm$ 1.14	.001	.060
	MIPS Team	123 vs. 354	2.62 $\pm$ 1.06 vs. 1.92 $\pm$ 1.05	.001	.079
	MIPS Parents	118 vs. 380	2.01 $\pm$ 1.18 vs. 1.81 $\pm$ 1.08	.087	.006
	CSAI Worry	117 vs. 366	2.51 $\pm$ 0.72 vs. 2.35 $\pm$ 0.75	.038	.009
	CSAI Confidence	116 vs. 369	2.52 $\pm$ 0.67 vs. 2.37 $\pm$ 0.74	.061	.007

Note. \* Scheffé: right vs. left  $p \leq .027$ ; left vs. ambidextrous  $p \leq .058$ ; \*\* right vs. left  $p \leq .055$ ; \*\*\* right vs. left  $p \leq .004$ ; \*\*\*\* left vs. ambidextrous  $p \leq .087$

Regarding research question one, there were also differences among athletes at different performance levels across several factors (see Table 2). The differences for some values

did not occur between the highest and lowest, but between the lowest and intermediate levels (see values below Table 2).

**Table 2.** Differences in Psychological Measures Between Competitive Levels.

Measure	Total Sample (N)	Total (M±SD)	Highest Level (n; M±SD)	Lowest Level (n; M±SD)	p	η <sup>2</sup>
Social Environment	548	7.24 ± 1.89	19; 8.42 ± 1.64	323; 7.21 ± 1.90	.042	.155
Family	550	7.38 ± 1.95	19; 8.42 ± 1.98	323; 7.25 ± 1.99	.064	.148
MIPS Coach	490	2.38 ± 1.18	17; 2.33 ± 0.85	283; 2.09 ± 1.08	< .001	.326
MIPS Team	479	2.13 ± 1.10	17; 1.92 ± 0.95	274; 1.92 ± 1.08	< .001	.251
MIPS Parents	501	1.88 ± 1.12	18; 2.08 ± 1.17	294; 1.75 ± 1.07	.059	.155
CSAI Worry	486	2.39 ± 0.74	18; 2.34 ± 0.76	278; 2.26 ± 0.74	.001	.219
CSAI Confidence	488	2.42 ± 0.72	18; 2.46 ± 0.80	282; 2.37 ± 0.74	.012	.182
TDEQ Aligns	418	3.41 ± 1.19	13; 3.03 ± 1.00	237; 3.50 ± 1.29	.061	.170
Exp. TDEQ Communication	434	3.52 ± 1.40	15; 3.33 ± 0.86	245; 3.67 ± 1.46	.040	.173

Note. M = Mean; SD = Standard deviation; η<sup>2</sup> = Partial eta squared (presumed). Sample sizes (n) for Highest and Lowest levels differ due to missing data.

Although further exploration of distinct subgroups regarding gender for every type of sport would expand the paper in an unjustified manner, it is notable that when considering football players in general, differences between performance levels occurred for a distinct set of factors; when solely considering female football players, these factors differed from those for football players of both genders.

Correlations regarding the second, third, and fourth research questions (connections between psychological factors, environmental factors, and performance) were found: between performance level and perceived self-efficacy; between the different questionnaires; and between environmental factors and performance level and self-efficacy. Different connections were found within right- and left-handers, as well as within male and female athletes; also, correlations differed between non-professionals, all semi-professionals, and male/female semi-professionals, when viewed separately, as well as

between different sports (see Tables 3 - 6).

When considering all tested athletes, the highest level ever competed in all sports correlated with the current level of competition in the main sport, self-efficacy, and support from family, as well as results from the MIPS questionnaire and CSAI worry. Current level in main sports showed correlations with the highest level, MIPS, CSAI worry, TDEQ communication, and TDEQ social network. Support from the partner correlated with TDEQ's social network, and TDEQ's holistic quality of preparation correlated with sleep quality and the compatibility of sports and religion. The financial situation was negatively correlated with CSAI somatic but positively correlated with CSAI confidence. It has to be noted that self-efficacy correlated positively with all surrounding social factors except family, but did not intercorrelate with other psychological factors. MIPS, CSAI, and TDEQ were partially intercorrelated (see Table 3).

**Table 3. Correlations between social factors, psychological factors, and competitive level in the whole population.**

All athletes	Highest level											Social network		
	all sports	main sport	MIPS coach	MIPS team	MIPS parents	Self-efficacy	CSAI worry	CSAI somatic	CSAI dence	Long term development	Align expectations		Communication	Holistic quality
Highest level all sports	Pearson p N	.000* 553	-.209 490	-.122 479	-.130 501	-.120 520	-.138 486	-.044 477	-.050 488	.042 442	.017 418	.050 434	.045 425	.066 476
Current level main sport	Pearson p N	.595 .000*	-.334 .000*	-.125 .000*	-.125 .000*	-.059 .000*	-.072 .000*	-.072 .000*	-.083 .068	.099 .038	.394 .038	.137 .004*	.008 .865	.003* .425
Social environment	Pearson p N	.081 .060	-.061 .173	-.024 .494	-.024 .602	-.014 .760	.170 .000*	.008 .000*	.008 .863	.025 .598	.053 .281	.085 .076	.017 .732	.075 .101
Family	Pearson p N	.543 548	-.173 .494	.015 .609	.739 .127	.934 .060	.000* .000*	.000* .000*	.863 .440	.598 .444	.281 .042	.076 .019	.732 .004	.101 .068
Partner	Pearson p N	.550 .055	.549 .002	.495 .002	.484 .082	.506 .033	.484 .002*	.481 .001	.492 .038	.445 .074	.429 .089	.438 .097	.429 .048	.480 .103
Studies and job	Pearson p N	.218 .065	.897 .023	.967 .030	.083 .056	.474 .017	.002* .115	.985 .063	.424 .041	.135 .048	.078 .390	.051 .405	.340 .398	.030* .445
Sleep quality	Pearson p N	.552 738	.497 .041	.499 .488	.695 .345	.151 .000*	.000* .000*	.707 .483	.165 .004	.272 .447	.875 .424	.643 .440	.021* .431	.256 .482
Time for sleep	Pearson p N	.554 .068	.447 .017	.499 .071	.488 .014	.510 .019	.527 .114	.485 .036	.496 .063	.449 .040	.426 .058	.442 .065	.433 .032	.484 .032
Distance to training	Pearson p N	.552 .024	.687 .074	.497 .023	.486 .024	.508 .003	.526 .206	.435 .119	.162 .110	.162 .045	.403 .039	.174 .058	.757 .026	.485 .083
Finances	Pearson p N	.579 .050	.082 .550	.612 .495	.602 .484	.939 .506	.000* .000*	.009* .481	.014* .492	.343 .427	.427 .438	.224 .428	.589 .429	.068 .480
Religion	Pearson p N	-.036 .397	-.033 .438	-.009 .834	-.033 .474	-.020 .650	.141 .001*	-.066 .152	.000 .993	.025 .599	-.029 .551	-.001 .437	.125 .428	.060 .193
MIPS coach	Pearson p N	-.209 .000*	.334 .000*	1.000 .723	.723 1.000	.525 .000*	.011 .806	.225 .000*	1.42 .002*	-.057 .235	-.170 .000*	-.225 .000*	-.087 .073	-.175 .000*
MIPS team	Pearson p N	-.122 .007*	-.258 .000*	.723 .000*	.723 1.000	.504 .000*	-.011 .808	.269 .000*	1.81 .000*	.020 .675	-.081 .101	-.178 .000*	-.127 .009*	-.170 .000*
MIPS parents	Pearson p N	-.130 .004*	-.125 .000*	1.000 .000*	1.000 .000*	1.000 .000*	-.051 .263	.340 .000*	.020 .663	.066 .170	.413 .399	.426 .473	.419 .051	.451 .388
Self-efficacy	Pearson p N	.006* 520	-.059 .177	.806 .806	-.011 .808	-.051 .263	1.000 .000*	-.010 .837	.029 .537	.035 .931	-.041 .482	.015 .767	-.046 .352	.000 .994
CSAI worry	Pearson p N	.520 .002*	.519 .000*	.471 .000*	.458 .269	.481 .340	.527 .005	.454 .653	.464 .000*	.403 .822	.405 .788	.419 .623	.410 .262	.458 .081
CSAI somatic	Pearson p N	.486 .044	.485 .072	.467 .225	.457 .200	.472 .266	.464 .010	.474 .000*	.485 .000*	.438 .038	.418 .056	.431 .016	.425 .066	.462 .003
CSAI confidence	Pearson p N	-.044 .333	-.072 .115	.002* .000*	.266 .000*	.266 .000*	-.010 .837	.474 .000*	.485 .000*	-.038 .006	-.056 .009	.016 .404	-.066 .000*	-.003 .167

Note. Significant correlations\*; Tendency

When considering semi-professional athletes, semi-professionals of both genders together displayed a different set of correlating factors than male or female semi-professionals alone (see Table 4), and differed from non-professional athletes. Male athletes in particular showed several correlations or tendencies towards correlations which did not occur in female semi-professionals (self-efficacy and highest level of competition in all sports/ perceived support from social environment/ perceived support from partner/TDEQ holistic quality of preparation, TDEQ long-term development/MIPS coach/MIPS parents/TDEQ communication/TDEQ social network, and current level in main sport). Female semi-professionals displayed the fewest correlations of all groups shown in Table 4: the highest lev-

els of all competitive sports and sleep time/ sleep quality, compatibility with religion and self-efficacy, and a tendency for correlation between sleep quality and current level in the main sport. For nonprofessional athletes, the highest level correlated with perceived support from family, all MIPS factors, self-efficacy, and CSAI worry, while the current level correlated with perceived support from the social environment, MIPS, CSAI worry, and TDEQ communication. Self-efficacy, which itself correlated with the highest level in all sports, showed correlations with perceived support from partner, studies and job, sleep quality, time for sleep, distance to training, financial situation, and religion. Most of these correlations were not present in semi-professionals.

**Table 4. Correlations between social factors, psychological factors, and competitive level in semi-professionals and non-professionals.**

(Semi-) professionals	Pearson <i>p</i> <i>N</i>	Social environment	Family	Partner	Studies and job	Sleep and quality	Time for sleep	Distance to training	Finances	Religion	MIPS coach	MIPS team	MIPS participants	Self-efficacy	CSAI worry	Long term development	Communication	Holistic quality	Social network
Highest level all sports		-.066	-.117	-.020	-.094	-.309	-.307	-.005	-.050	-.130	.042	.141	-.023	-.164	1.00	-.062	.009	.198	.043
		.568	.308	.868	.418	.006*	.006*	.968	.662	.264	.729	.247	.849	.169	.409	.621	.941	.122	.730
		78	78	71	77	77	78	78	78	76	76	71	69	70	70	66	64	64	62
Current level main sport		.081	.028	-.075	.001	-.126	-.196	-.148	-.055	-.016	-.295	-.275	.073	-.027	-.034	.156	.148	-.088	.227
		.485	.810	.540	.994	.280	.089	.201	.634	.895	.014*	.024*	.554	.825	.781	.219	.250	.502	.069
		76	76	69	75	75	76	76	76	74	69	67	68	69	68	64	62	61	65
Self-efficacy		.328	.137	.187	.108	.165	.175	.087	.066	.393	.091	.114	-.038	.002	-.037	-.066	-.066	-.228	-.135
		.005*	.252	.136	.369	.166	.141	.467	.583	.001*	.469	.370	.768	.988	.777	.619	.619	.088	.294
		72	72	65	71	72	72	72	72	72	66	64	64	72	64	61	59	57	62
Non-professionals																			
		.000	-.108	-.092	-.073	-.006	.039	.063	.024	-.051	-.295	-.202	-.159	-.100	-.235	.045	.046	.027	.049
		1.000	.019*	.055	.111	.895	.395	.171	.602	.265	.000*	.000*	.001*	.033*	.000*	.381	.376	.609	.318
Highest level all sports		.470	.472	.436	.471	.475	.476	.474	.472	.471	.419	.410	.431	.448	.416	.376	.370	.363	.409
		.104	-.040	-.002	-.031	.066	.076	.031	.099	-.071	-.360	-.263	-.172	-.050	-.248	.068	.126	.041	.096
		.023*	.390	.965	.496	.150	.097	.502	.031	.124	.000*	.000*	.000*	.291	.000*	.188	.015*	.437	.052
Current level main sport		.471	.473	.438	.472	.476	.477	.474	.474	.472	.421	.412	.432	.450	.417	.377	.371	.364	.410
		.145	.073	.138	.119	.272	.200	.122	.232	.103	-.004	-.034	-.057	.003	.014	.031	.031	-.028	.026
		.002*	.121	.005*	.011*	.000*	.009*	.009*	.000*	.028*	.940	.506	.247	.946	.788	.564	.564	.603	.610
Self-efficacy		.450	.452	.418	.451	.455	.455	.454	.452	.452	.405	.394	.417	.455	.400	.362	.360	.353	.396
(Semi-) professionals m																			
		-.010	-.088	.254	.002	-.311	-.264	-.035	-.093	-.338	.220	.263	-.085	-.327	.125	.192	.147	.139	.246
		.954	.604	.135	.993	.065	.114	.845	.584	.044*	.220	.153	.643	.063	.488	.310	.446	.480	.182
Highest level all sports		.37	.37	.36	.36	.36	.37	.37	.37	.36	.33	.31	.32	.33	.30	.30	.29	.28	.31
		-.062	-.032	-.163	.094	.070	-.148	-.095	-.043	-.308	-.423	-.478	-.033	-.080	.026	.363	.391	-.284	.385
		.720	.852	.348	.592	.690	.389	.581	.802	.072	.016*	.008*	.861	.669	.889	.053	.040*	.143	.036*
Current level main sport		.36	.36	.35	.35	.35	.36	.36	.36	.35	.32	.30	.31	.31	.29	.28	.28	.28	.30
		.469	.142	.305	.015	.209	.327	.051	.118	.375	.062	.123	.075	-.153	.060	-.004	-.004	-.364	-.233
		.006*	.432	.089	.937	.244	.063	.779	.512	.035*	.750	.540	.704	.429	.770	.986	.986	.081	.241
Self-efficacy		.33	.33	.32	.32	.33	.33	.33	.33	.32	.29	.27	.28	.33	.29	.26	.25	.24	.27
(Semi-) professionals f																			
		-.106	-.139	-.220	-.174	-.312	-.348	.021	-.025	.030	-.081	.054	.023	-.025	.080	-.221	-.086	-.235	-.110
		.509	.385	.204	.276	.047*	.026*	.897	.879	.852	.631	.747	.893	.878	.639	.196	.624	.181	.523
Highest level all sports		.41	.41	.35	.41	.41	.41	.41	.41	.40	.38	.38	.38	.39	.36	.36	.35	.34	.36
		.178	.072	-.013	-.050	-.275	-.231	-.194	-.060	.210	-.210	-.139	.155	.032	-.078	.044	-.025	.053	.108
		.273	.660	.944	.758	.085	.152	.230	.712	.199	.213	.414	.360	.848	.650	.800	.889	.768	.536
Current level main sport		.40	.40	.34	.40	.40	.40	.40	.40	.39	.37	.37	.37	.38	.36	.35	.34	.33	.35
		.213	.139	.078	.149	.115	.013	.127	-.007	.424	.103	.104	-.158	.162	-.048	-.048	-.138	-.118	-.019
		.192	.397	.666	.365	.486	.939	.440	.965	.008*	.542	.540	.358	.351	.785	.436	.436	.515	.915
Self-efficacy		.39	.39	.33	.39	.39	.39	.39	.39	.38	.37	.37	.36	.39	.35	.35	.34	.33	.35

Note. Significant correlations\*; Tendency

Football players of both genders showed significant connections between the highest level of competition and self-efficacy, as well as between the level of competition in the main type of sport and the available time for sleep, with, by tendency, available time for sleep. Also, self-efficacy correlated with perceived support from the social environment, perceived support from the partner, sleep quality, and a favourable financial situation, and, to a lesser extent, with support from the family.

When considering only female football players, the highest level of competition correlated with self-efficacy even more strongly and, by tendency, also with perceived support from the partner. The level of competition in the focus sport showed a tendency to correlate

with sleep time and self-efficacy. Self-efficacy correlated with fewer factors than when male players were included (only sleep quality and financial situation).

The correlations for female swimmers differed from those of football players. Studies and jobs, as well as parents' perfectionism, showed a tendency for correlation with the highest level of competition. Also, the highest level of competition was highly correlated with the coach's and team's MIPS perfectionism and moderately correlated with CSAI worry. The level of competition in the main type of sport correlated highly with MIPS team perfectionism, which, in turn, tended to correlate with self-efficacy (see Table 5).

**Table 5.** Different connections among competition level, psychological performance, and social environment across distinct athlete groups.

Football players		Social environment	Family	Partner	Studies and job	Sleep quality	Time for sleep	Finances	MIPS coach	MIPS team	MIPS parents	Self-efficacy	CSAI worry
Highest level ever competed (All sports)	<i>p</i>	-.023	-.034	-.057	-.038	.000	.081	-.020	-.206	-.124	-.131	-.298	.002
	Pearson-coefficient	.856	.784	.656	.761	1	.516	.876	.108	.331	.309	.018*	.990
	<i>N</i>	64	66	63	65	65	66	65	62	64	62	62	60
Current level of competition (Main sport)	<i>p</i>	.140	.113	.018	.109	.143	.212	.139	-.181	-.184	-.080	-.197	.141
	Pearson-coefficient	.270	.368	.891	.389	.256	.088	.268	.160	.145	.538	.126	.282
	<i>N</i>	64	66	63	65	65	66	65	62	64	62	62	60
Self-efficacy	<i>p</i>	.277	.239	.265	.211	.264	.088	.332	-.147	-.154	-.165	1	.155
	Pearson-coefficient	.032*	.062	.042*	.102	.038*	.496	.009*	.266	.239	.211		.253
	<i>N</i>	60	62	59	61	62	62	61	59	60	59	62	56
Female football players		Social environment	Family	Partner	Studies and job	Sleep quality	Time for sleep	Finances	MIPS coach	MIPS team	MIPS parents	Self-efficacy	CSAI worry
Highest level ever competed (All sports)	<i>p</i>	-.079	-.087	-.301	-.022	.037	.113	-.056	-.130	-.149	-.086	-.427	.132
	Pearson-coefficient	.634	.600	.075	.892	.824	.493	.736	.448	.379	.624	.008*	.457
	<i>N</i>	39	39	36	39	39	39	39	36	37	35	37	34
Current level of competition (Main sport)	<i>p</i>	.097	.120	-.217	.093	.188	.307	.097	-.075	-.149	-.104	-.294	.095
	Pearson-coefficient	.557	.467	.203	.574	.252	.057	.556	.665	.379	.552	.078	.594
	<i>N</i>	39	39	36	39	39	39	39	36	37	35	37	34
Self-efficacy	<i>p</i>	.242	.084	.208	.161	.372	.154	.464	-.101	-.069	-.247	1	-.118
	Pearson-coefficient	.149	.621	.237	.342	.023*	.363	.004*	.564	.693	.159		.521
	<i>N</i>	37	37	34	37	37	37	37	35	35	34	37	32
Female swimmers		Social environment	Family	Partner	Studies and job	Sleep quality	Time for sleep	Finances	MIPS coach	MIPS team	MIPS parents	Self-efficacy	CSAI worry
Highest level ever competed (All sports)	<i>p</i>	-.031	.033	-.205	-.349	.170	.138	.035	-.554	-.518	-.344	-.153	-.462
	Pearson-coefficient	.867	.859	.276	.054	.360	.460	.852	.005*	.010*	.092	.437	.026*
	<i>N</i>	31	31	30	31	31	31	31	24	24	25	28	23
Current level of competition (Main sport)	<i>p</i>	-.060	.092	-.198	-.211	.239	.230	.157	-.332	-.533	-.314	-.117	-.194
	Pearson-coefficient	.754	.628	.302	.263	.203	.221	.407	.122	.009*	.135	.562	.388
	<i>N</i>	30	30	29	30	30	30	30	23	23	24	27	22
Self-efficacy	<i>p</i>	-.153	-.252	.021	.099	.051	.210	.141	.076	.369	-.159	1	-.048
	Pearson-coefficient	.438	.196	.916	.617	.797	.283	.473	.736	.091	.468		.835
	<i>N</i>	28	28	27	28	28	28	28	22	22	23	28	21

Note. Significant correlations\*; Tendency

When considering right- and left-handed athletes, self-efficacy showed more correlations with social factors in the right than in the left-handed. The highest level correlated with MIPS, self-efficacy, and CSAI worry in right-handers and only with MIPS parents in left-handers. Current level correlated with MIPS, CSAI worry, TDEQ long-term development, TDEQ communication, and TDEQ social network in right-handers, but only with

MIPS coach and TDEQ social network in left-handers. Right- and left-handed athletes displayed different sets of intercorrelations between questionnaires: CSAI confidence intercorrelated with almost all factors of the TDEQ in left-handers, but only with holistic quality of preparation in right-handers, while MIPS coach and MIPS team correlated with CSAI confidence in right-, but not in left-handers (see Table 6).

**Table 6. Correlations between social environment, psychological factors, and competitive level in right- and left-handed athletes.**

Right hand	MPS coach	MPS team	MPS parents	Self-eff	CSAI worry	CSAI somatic	CSAI Long	term develop	Align	expectations	Commun	Holistic	Social	work
Pearson	-.250	-.148	-.131	-.100	-.115	-.031	-.095	0.60	0.60	0.60	0.60	0.60	0.60	0.60
P	.000*	.003*	.006*	.033*	.018*	.530	.050	.240	.240	.240	.240	.240	.240	.240
N	425	414	439	455	423	414	423	382	382	382	382	382	382	382
Pearson	-.377	-.272	-.134	-.051	-.211	-.096	-.065	0.103	0.103	0.103	0.103	0.103	0.103	0.103
P	.000*	.000*	.005*	.274	.000*	.051	.185	.044*	.288	.004*	.480	.017*	.467	.049*
N	425	414	438	455	422	413	422	381	381	381	381	381	381	381
Pearson	-.034	-.034	-.025	-.172	.075	-.013	.008	0.025	0.047	0.096	0.027	0.099	0.042	0.030
P	.488	.493	.607	.000*	.125	.795	.874	.627	.369	.062	.604	.045	.790	.849
N	428	416	441	456	425	416	425	383	383	383	383	383	383	383
Pearson	.049	.082	-.023	.072	.073	-.025	.030	0.025	0.022	0.111	0.111	0.082	0.058	0.098
P	.313	.096	.629	.122	.131	.607	.533	.619	.670	.836	.838	.094	.716	.539
N	429	418	443	458	426	417	426	384	384	384	384	384	384	384
Pearson	.048	.068	-.052	.156	.092	.003	-.037	0.076	0.052	0.084	0.073	0.106	0.204	0.053
P	.338	.183	.294	.001*	.068	.955	.459	.155	.092	.116	.176	.038*	.204	.053
N	394	385	407	422	393	383	393	354	337	351	344	385	206	.747
Pearson	-.010	-.061	-.010	.099	-.014	-.075	.026	0.023	-.029	0.018	0.014	-.029	0.043	0.047
P	.844	.215	.838	.034	.766	.417	.427	.658	.576	.729	.788	.551	.791	.771
N	429	419	443	458	426	417	426	385	366	381	372	416	400	400
Pearson	.007	-.033	-.065	.249	-.060	-.030	.061	0.037	-.033	.005	.129	.006	-.163	-.081
P	.887	.500	.169	.000*	.219	.547	.209	.467	.534	.928	.013*	.405	.302	.609
N	430	419	444	461	427	418	427	385	366	381	372	417	400	400
Pearson	-.049	-.066	-.031	.169	-.032	-.066	.006	0.018	-.023	-.006	.096	.006	-.489	-.262
P	.310	.179	.509	.000*	.512	.174	.907	.719	.655	.902	.065	.906	.063	.094
N	432	421	446	461	429	420	429	387	368	383	374	419	400	400
Pearson	-.075	-.011	-.021	.129	-.035	-.053	.052	0.038	-.045	.040	.038	.034	-.149	-.124
P	.121	.822	.654	.006*	.473	.276	.280	.462	.389	.430	.460	.485	.345	.436
N	431	420	445	460	428	419	428	386	367	382	373	418	400	400
Pearson	-.056	.002	-.046	.226	-.130	-.156	.098	0.081	-.055	.070	.035	.093	-.124	-.104
P	.249	.973	.332	.000*	.007*	.001*	.043	.383	.297	.170	.503	.057	.434	.122
N	430	419	444	459	427	418	427	385	366	381	372	417	400	400
Pearson	.002	-.047	-.007	.123	-.063	-.071	.015	0.009	-.038	-.003	.125	.077	-.166	-.104
P	.970	.340	.878	.008*	.193	.150	.758	.853	.474	.947	.016*	.119	.295	.609
N	428	417	442	457	426	415	424	383	364	379	370	415	400	400
Pearson	.727	.497	-.010	.327	.218	.130	-.074	-.074	-.175	-.245	-.093	-.168	.697	.742
P	.000*	.000*	.837	.000*	.000*	.009*	.009*	.151	.001*	.000*	.074	.001*	.000*	.000*
N	432	413	422	410	405	396	403	381	363	377	368	397	400	400
Pearson	.727	.497	-.010	.327	.218	.130	-.074	-.074	-.175	-.245	-.093	-.168	.697	.742
P	.000*	.000*	.837	.000*	.000*	.009*	.009*	.151	.001*	.000*	.074	.001*	.000*	.000*
N	432	413	422	410	405	396	403	381	363	377	368	397	400	400
Pearson	.497	.476	.411	-.068	.313	.241	.005	0.062	-.028	-.037	-.102	-.015	.742	.733
P	.000*	.000*	.000*	.165	.000*	.000*	.917	.228	.594	.470	.052	.762	.000*	.000*
N	422	411	446	422	413	404	413	376	359	374	364	403	.000*	.000*
Pearson	-.010	-.049	-.068	.117	-.027	-.012	.021	-.019	0.000	0.004	-.075	.015	.223	.360
P	.837	.326	.165	.587	.810	.679	.679	.716	.993	.945	.158	.798	.172	.025*
N	410	397	422	461	405	394	403	366	349	364	355	398	.39	.39
Pearson	.327	.242	.313	-.027	.1	.646	-.305	0.317	.999	.657	.432	.016*	.560	.572
P	.000*	.000*	.000*	.587	.000*	.000*	.000*	.746	.999	.657	.432	.016*	.000*	.000*
N	405	395	413	405	429	412	412	.036	.362	.375	.368	.400	.337	.381
Pearson	.218	.179	.241	-.012	.646	.1	-.315	-.036	-.061	.006	-.067	.005	.036*	.017*
P	.000*	.000*	.000*	.810	.000*	.420	.413	.496	.255	.912	.207	.927	.036*	.017*
N	396	388	404	394	412	420	413	.369	.353	.362	.358	.391	.39	.39
Pearson	.130	.178	.005	.021	-.305	-.315	.1	-.040	-.022	-.066	.167	-.097	.252	.161
P	.009*	.000*	.917	.679	.000*	.000*	.000*	.445	.676	.207	.001*	.054	.117	.322
N	403	393	413	403	421	413	429	.375	.359	.372	.363	.398	.40	.40

Note. Significant correlations\*; Tendency

In summary, results show that there are differences between athletes at different competitive levels in the surrounding and psychological factors of their environment, as expected according to the first research question. Differences vary within certain subgroups of athletes, e.g., athletes of different genders or handedness, or playing different sports (individual or team). As stated in the second, third, and fourth research questions, there are connections among social environment and psychological performance, social environment and competitive level/sports performance, and psychological performance and sports performance. These connections vary across groups of athletes, e.g., athletes from different sports, genders, or handedness. Environmental factors, therefore, influence psychological and sports performance.

## DISCUSSION

Limitations of the study include a small sample size, especially within subgroups such as sport type, competitive level, or handedness. In hindsight, it would have been necessary to ask for the country of origin and the specific religion to further evaluate the data. Results might be more applicable within the lower age range. Also, the skewness of the age distribution towards younger ages makes the results more applicable to athletes aged 13-38.

Different groups of athletes seem to have unique profiles of beneficial or detrimental environmental factors. These factors can influence sports performance directly or indirectly through their effects on psychological factors, such as self-efficacy and CSAI. For example, perfectionism can be favourable for sports performance, possibly via a connection to CSAI confidence. Financial problems can cause physical stress, but a good financial situation can also boost confidence and, therefore, performance. Communication by the coach and a

strong social network in sports can positively influence sports performance; e.g., coaches and parents who demand perfection correlate with high performance, and the coach's communication can increase confidence. However, these demands are also correlated with worrying and its somatic outcomes, while family support correlates with high performance levels, but not with self-efficacy (see Table 3). The lack of connection between self-efficacy and family support could probably be explained by cultural differences and, therefore, inhomogeneity regarding this factor within the sample (Kay & Spaaij, 2021; Shakib & Veliz, 2013), while female football players do show a tendency for correlation between family support and self-efficacy (Table 5). For semi-professional athletes, sleep quality, sleep time, and, for male athletes, perfectionism from the coach and team seem crucial, as do religion, self-efficacy, the coach's communication, and the social network in sports. Non-professionals also need self-efficacy and perfectionism in their surroundings and, as with semi-professional male athletes, good communication by the coach (see table 4). Across different sports, perfectionism and even worry seem to boost competitive performance in female swimmers, whereas for football players, social environment, sleep, and finances are the important factors (see Table 5). Right- and left-handers show that psychological factors correlate more strongly in left-handers and therefore seem to play a performance-limiting role for these athletes, especially perfectionism, as well as psychological factors tested in the CSAI and TDEQ, e.g., social network (see table 6). Among the performance-limiting factors, self-efficacy, perfectionism, worry, social network, and communication, as well as sleep, family, and religion, seem most important for sports performance. These factors were present in most athlete sub-groups.

Results are in part in accordance with previous research, for example, the impact of financial situation on CSAI results and self-efficacy. Vollmann et al. (2023) found that soldiers of the German Armed Forces were more likely to pursue a dual career in sports. Regarding financial factors, the current study aligns with the findings of Hickman & Metz (2015) and Mumcu (2019), which indicate that financial difficulty has been creating or is expected to create pressure on athletes. Self-efficacy, too, has been found to be linked to financial support and social factors in previous studies (Cunningham, 2005).

Previous literature has stated that sports performance is influenced by psychological factors (Weineck, 2010). This is also true of the athletes in this study, since several psychological factors correlated with competitive level. Gender-related differences described by Christoforidis et al. (2010), Marczinka (2011), Taylor et al. (2020), and Weber (2022b) have also been found in this study. Handedness also led to differences in psychological factors, as previously described by Weber et al. (2018a and 2022a). Differences in coaches' communication across performance levels (Wunder et al., 2024) align with this study's findings, in which coach communication correlated with competitive level. Results might be helpful for individual athlete coaching and future coaching strategies, as previously suggested in the literature (Beckmann & Elbe, 2008).

In the light of the current findings, it is very likely that psychological and therefore sports performance might be influenced by the athlete's (social) environment and framework such as family, team members, coaches, religion, partner, workplace, or even political events, as previous literature suggests (Bandura, 1977; House, 1987; Lent, Brown & Hackett, 2000; Washif et al., 2021; Romdhani et al., 2022; Vollmann et al., 2023; Wunder et

al., 2024). In this study, psychological performance in sports and sports performance were associated with sleep quality and sleep duration, consistent with the findings of Romdhani et al. (2022). A connection between sports performance and religion was found, as previously suggested by Srem-Sai et al. (2021) and Romdhani et al. (2022). A connection between social factors and neurological pathways that enhance sports performance (Davis et al., 2020) is likely, given the current findings on left-handers, and should be further evaluated.

## CONCLUSIONS

Athletes can be influenced by, or inhibited by, their environmental and social factors, either directly or through the influence of social factors on their psychological performance. This has to be considered when training athletes, especially in inhomogeneous groups. Surrounding factors have to be taken into account, and training may need to be tailored to them, e.g., sleep quality and financial security in female football players. When analysing competitive outcomes, these factors also need to be evaluated, and measures may need to be taken based on the athlete's needs, which may vary across different kinds of athletes, e.g., males/females, athletes of different handedness, or athletes with different occupations.

In summary, there is likely an individual set of influencing factors, as Lau & Walter (2018) already claimed regarding the TDEQ. It is necessary to research further the most influential factors within individual subgroups, e.g., female athletes or athletes across different sports, to understand the implications for training and coaching better.

## REFERENCES

Adams, M. U., Brassington, G. S., Steiner, H., & Matheson, G. O. (2004). Psychological factors associated with performance-limiting

- injuries in professional ballet dancers. *Journal of Dance Medicine & Science*, 8(2), 43–46.  
<https://doi.org/10.1177/1089313X0400800202>
- Alfermann, D., Lobinger, B. H., Nesges, O., Martindale, R. J., & Andronikos, G. (2023). German version of the Talent Development Environment Questionnaire (TDEQ-5). *German Journal of Exercise and Sport Research*, 53(1), 59–69.  
<https://doi.org/10.1007/s12662-022-00850-x>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84(2), 191–215.  
<https://doi.org/10.1037/0033-295X.84.2.191>
- Barkoukis, V., Lazuras, L., Tsorbatzoudis, H., & Rodafinos, A. (2013). Motivational and social cognitive predictors of doping intentions in elite sports: An integrated approach. *Scandinavian journal of medicine & science in sports*, 23(5), e330-e340.  
<https://doi.org/10.1111/sms.12068>
- Baron-Thiene, A. & Alfermann, D. (2015). Personal characteristics as predictors for dual career dropout versus continuation – A prospective study of adolescent athletes from German elite sport schools. *Psychology of Sport and Exercise* 21 (2015), 42 – 49.  
<https://doi.org/10.1016/j.psychsport.2015.04.006>
- Beckmann, J. & Elbe, A.-M. (2008). *Praxis der Sportpsychologie im Wettkampf- und Leistungssport* (2. Auflage). Balingen: Spitta.
- Borggrefe, C., & Cachay, K. (2014). Duale Karrieren–Möglichkeiten und Grenzen der Vereinbarkeit von Spitzensport und Schule, Studium, Beruf. *Kinder-und Jugendsport: Herausforderungen im Spannungsfeld zwischen Allgemein-und Spezialbildung*, 195.
- Braga, B., & Guillén, D. (2012). Working under pressure: Evidence from the impacts of soccer fans on players' performance. *Economics Letters*, 114(2), 212–215.  
<https://doi.org/10.1016/j.econlet.2011.10.017>
- Brown, D. (Ed.). (2002). *Career choice and development*. Hoboken: John Wiley & Sons.
- Calmels, C., d'Arripe-Longueville, F., Hars, M., & Debois, N. (2009). Perceived development of psychological characteristics in male and female elite gymnasts. *International Journal of Sport Psychology*, 40(3), 424-455.
- Christoforidis C, Kalivas V, Matsouka O, Bebetos E, & Kambas A. (2011). Does Gender Affect Anger and Aggression in Handball Players? *The Cyprus Journal of Sciences*. 2010 (8), 3–11.
- Crombie, D., Lombard, C., & Noakes, T. (2009). Emotional intelligence scores predict team sports performance in a national cricket competition. *International Journal of Sports Science & Coaching*, 4(2), 209–224.  
<https://doi.org/10.1260/174795409788549544>
- Cunningham, G. B., Bruening, J., Sartore, M. L., Sagas, M., & Fink, J. S. (2005). The application of social cognitive career theory to sport and leisure career choices. *Journal of Career Development*, 32(2), 122–138.  
<https://doi.org/10.1177/0894845305279164>
- Davis, A. J., Hettinga, F., & Beedie, C. (2020). You don't need to administer a placebo to elicit a placebo effect: Social factors trigger neurobiological pathways to enhance sports performance. *European Journal of Sport Science*, 20(3), 302–312.  
<https://doi.org/10.1080/17461391.2019.1635212>
- Dyer, K. F. (1976). Social influences on female athletic performance. *Journal of Biosocial Science*, 8 (2), 123 – 129.  
<https://doi.org/10.1017/S0021932000010555>
- Engler, C., Pelzer, F., Kaczmarek, C., & Schaefer, S. (2023). Effects of spectators on the performance of a dance routine. *German Journal of Exercise and Sport Research*, 1–6.  
<https://doi.org/10.1007/s12662-023-00929-z>
- Gonçalves, C. E. B., Rama, L. M. L. & Figueiredo, A. B. (2012). Talent Identification in Sport: an Overview of Some Unanswered Questions. *International Journal of Sports*

- Physiology and Performance*, 2012 (7), 390 - 393. <https://doi.org/10.1123/ijsp.7.4.390>
- Grobelaar, H. W. & Eloff, Maryke (2011). Psychological Skills of Provincial Netball Players in Different Playing Positions. *South African Journal for Research in Sport, Physical Education and Recreation*, 33(2), 45-58. <https://doi.org/10.4314/sajrs.v33i2.69689>
- Hickman, D. C., & Metz, N. E. (2015). The impact of pressure on performance: Evidence from the PGA TOUR. *Journal of Economic Behavior & Organization*, 116, 319–330. <https://doi.org/10.1016/j.jebo.2015.04.007>
- Harb-Wu, K., & Krumer, A. (2019). Choking under pressure in front of a supportive audience: evidence from professional biathlon. *J. Econ. Behav. Organ.* 166, 246–262. <https://doi.org/10.1016/j.jebo.2019.09.001>
- Hinz, A., Schumacher, J., Albani, C., Schmid, G., & Brähler, E. (2006). Bevölkerungsrepräsentative normierung der skala zur allgemeinen selbstwirksamkeitserwartung. *Diagnostica*, 52(1), 26–32. <https://doi.org/10.1026/0012-1924.52.1.26>
- House, J. S. (1987). Social support and social structure. In *Sociological Forum*, 2(1), pp. 135–146). Dordrecht: Kluwer Academic Publishers.
- Johnson, U. (1997). Coping strategies among long-term injured competitive athletes. A study of 81 men and women in team and individual sports. *Scandinavian Journal of Medicine & Science in Sports*, 7(6), 367–372. <https://doi.org/10.1111/j.1600-0838.1997.tb00169.x>
- Karl, L. (2024). *Böller-Schüsse am Ösi-Hotel in Leipzig* [Pyrotechnics at the Austrian's Hotel in Leipzig], in: Bild online, 7th of July, 2024 at <https://www.bild.de/regional/leipzig/fussball-em-in-leipzig-aufweck-attacke-boellerschuesse-am-hotel-der-oesis-6683d42eefae-c85f78bb60ff>
- Kay, T., & Spaaij, R. (2012). The mediating effects of family on sport in international development contexts. *International review for the sociology of sport*, 47(1), 77-94. <https://doi.org/10.1177/1012690210389250>
- Krause, M. (2015). Der Einfluss von Umfeldfaktoren auf die sportliche Leistungsfähigkeit bei 7- bis 9-jährigen Kindern. [Influence of surrounding factors on sportific performance in 7 to 9 year old children] Master's thesis, University of Graz.
- Lau, A. & Walter, N. (2018). Einschätzung von psychischen Faktoren im Boxen und Umfeld-faktoren in der Leichtathletik. [Assessment of psychological factors in boxing and surrounding factors in track and field] In *Die Spitze im Blick: Tagungsband zum gleichnamigen Nachwuchsleistungssport-Symposium vom 8.-10. Mai 2017 in Leipzig* (Vol. 10, p. 70). Meyer & Meyer. <https://doi.org/10.5771/9783840312496>
- Lent, R. W., Brown, S. D., & Hackett, G. (2000). Contextual supports and barriers to career choice: A social cognitive analysis. *Journal of Counseling Psychology*, 47(1), 36. <https://doi.org/10.1037/0022-0167.47.1.36>
- Madigan, D. J. (2016). Confirmatory factor analysis of the Multidimensional Inventory of Perfectionism in Sport. *Psychology of Sport and Exercise*, 26, 48-51. <https://doi.org/10.1016/j.psychsport.2016.06.003>
- Madigan, D. J., Curran, T., Stoeber, J., Hill, A. P., Smith, M. M., & Passfield, L. (2019). Development of perfectionism in junior athletes: A three-sample study of coach and parental pressure. *Journal of Sport and Exercise Psychology*, 41(3), 167–175. <https://doi.org/10.1123/jsep.2018-0287>
- Marczinka, Z. (2011). What's the Difference? – Coaching Female and Male Handball Players. In: EHF (Ed.) *EHF Scientific Conference 2011*. Haugsdorf: Hofer (pp. 89 – 93).
- Martens, R., Vealey, R. S., & Burton, D. (1990). *Competitive anxiety in sport*. Cham-

paign, IL: Human Kinetics Books.

Moesch, K., Hauge, M.-L. T., Wikman, J. M., Elbe, A.-M. (2013). Making it to the top in team sports: start later, intensify, and be determined. *Talent Development and Excellence*, 5(2), 85 – 100.

Mumcu, C. (2019). Business analytics in women's professional sports. In *Routledge Handbook of the Business of Women's Sport* (pp. 239-251). Routledge.

Romdhani, M., Ammar, A., Trabelsi, K., Chtourou, H., Vitale, J., Masmoudi, L., ... & Chamari, K. (2022). Ramadan Observance Exacerbated the Negative Effects of COVID-19 Lockdown on Sleep and Training Behaviors: A International Survey on 1,681 Muslim Athletes. *Frontiers in nutrition*, 9. <https://doi.org/10.3389/fnut.2022.925092>

Romdhani, M., Fullagar, H. H., Vitale, J. A., Nédélec, M., Rae, D. E., Ammar, A., ... & Chamari, K. (2022). Lockdown Duration and Training Intensity Affect Sleep Behavior in an International Sample of 1,454 Elite Athletes. *Frontiers in physiology*, 953. <https://doi.org/10.3389/fphys.2022.904778>

Satow, L. F. (2008). Mentale Stärke / Mental Toughness Test - Sport (MTT-S). <https://www.psychomeda.de/online-tests/mentale-staerke-test-im-sport.html>, retrieved 26th of September, 2022.

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35–37). Windsor, UK: NFER-NELSON.

Shakib, S., & Veliz, P. (2013). Race, sport, and social support: A comparison between African American and White youths' perceptions of social support for sport participation. *International Review for the Sociology of Sport*, 48(3), 295-317. <https://doi.org/10.1177/1012690212439172>

Shapcott, S., & Carr, S. (2020). Golf coaches' mindsets about recreational golfers: Gendered golf experiences start on the practice tee. *Motivation Science*, 6(3), 275.

Srem-Sai, M., Frimpong, J. B., Abieraba, R. S. K., Sorkpor, R. S., Hagan Jr, J. E., & Schack, T. (2021). Religion as a Function of Self-reported Discrete Emotions Among Elite Student-Athletes Before Competition. *Int. J. Psychol. Brain Sci*, 6, 58-65. <https://doi.org/10.11648/j.ijpbs.20210604.12>

Stöber, J. & Pescheck, E. (2004). Skala „Wettkampfstärke im Sport“. In J. Stöber, K. Otto, E. Pescheck & O. Stoll *Skalendokumentation „Perfektionismus im Sport“* (Hallesche Berichte zur Pädagogischen Psychologie Nr. 7, S. 16-18). Halle (Saale): Martin-Luther-Universität.

Stöber, J., Otto, K., Pescheck, E., & Stoll, O. (2004). Skalendokumentation“ Perfektionismus im Sport“. (Hallesche Berichte zur Pädagogischen Psychologie Nr. 7). Halle (Saale): Martin-Luther-Universität.

Taylor, T., Fujak, H., Hanlon, C., & O'Connor, D. (2022). A balancing act: women players in a new semi-Professional team sport league. *European Sport Management Quarterly*, 22(4), 527-547. <https://doi.org/10.1080/16184742.2020.1815821>

Truong, L. K., Mosewich, A. D., Holt, C. J., Le, C. Y., Miciak, M., & Whittaker, J. L. (2020). Psychological, social and contextual factors across recovery stages following a sport-related knee injury: a scoping review. *British Journal of Sports Medicine*, 54(19), 1149-1156. <https://doi.org/10.1136/bjsports-2019-101206>

Vollmann, F., Ehnold, P., & Schlesinger, T. (2023). Analyse der Bildungsentscheidungen von (ehemaligen) Sportler\* innen der Sportfördergruppen der Bundeswehr. *German Journal of Exercise and Sport Research*, 1-13. [Analysis of the educational decisions of (former)

athletes of the Armed Forces (Bundeswehr) sports promotion groups].

<https://doi.org/10.1007/s12662-023-00895-6>

Washif, J. A., Farooq, A., Krug, I., Pyne, D. B., Verhagen, E., Taylor, L., ... & Chamari, K. (2021). Training during the COVID-19 lockdown: Knowledge, beliefs, and practices of 12,526 athletes from 142 countries and six continents. *Sports Medicine*, 1 - 16.

<https://doi.org/10.1007/s40279-021-01573-z>

Weber, J. (2014). *Untersuchung des Zusammenhanges zwischen Positionsspezialisierung und Leistung im Handballsport*. [Assessment of the connection between position-specialization and performance in team handball] Doctoral dissertation, Christian-Albrechts University of Kiel; 2014.

Weber, J. (2021 a). The Relationship Between the Percentage of Body Fat and Judging in German Wheel Gymnastics. *Science of Gymnastics Journal*, 13(3), 425 - 444.

<https://doi.org/10.52165/sgj.13.3.425-437>

Weber, J. (2021b). Are there connections between the body fat percentage, competitive results and motivation in wheel gymnasts?. *Science of Gymnastics Journal*, 13(3), 323 - 441.

<https://doi.org/10.52165/sgj.13.3.323-336>

Weber, J. (2022a). Are there connections between handedness, competitive results and motivation in wheel gymnasts?. *Science of Gymnastics Journal*, 14(1), 107-138.

<https://doi.org/10.52165/sgj.14.1.107-117>

Weber, J. (2022b). Demands profile in wheel gymnastics: differences between athletes at different performance levels, between genders and in different disciplines. *Science of Gymnastics Journal*, 14(1), 119-138.

<https://doi.org/10.52165/sgj.14.1.119-130>

Weber, J., & Chittibabu, B. (2017). Tactical demands and development of tactical skill in female team handball. *Kinesiologia Slovenica*, 23(2), 44-54.

Weber, J., van Maanen-Coppens, L., & Wegner, M. (2018). Performance demands on female team handball goalkeepers. *Kinesiologia Slovenica*, 24(1), 43 - 57.

Weber, J., Wegner, M. (2016). Are there different psychological profiles per playing position in female team handball? *Talent Development & Excellence*, 8(2), 52 – 63.

Weber, J., Wegner, M. (2018 a). Handedness in female team handball. *Talent Development & Excellence*, 10 (1), 31 - 45.

Weber, J., Wegner, M. (2018). Psychological aspects in Handball Injuries. In: Laver, L., Landreau, P., Seil, R., Popovic, N. (eds) *Handball Sports Medicine*. Springer, Berlin, Heidelberg.

[https://doi.org/10.1007/978-3-662-55892-8\\_45](https://doi.org/10.1007/978-3-662-55892-8_45)

Weineck, J. (2010). *Optimales Training* (16th, corrected edition). Balingen: Spitta.

Wunder, J., Priem, M., Wagner, G. G., & Stoll, O. (2024). Does the German sports system recruit coaches with a functional personality?—Attempting an answer by comparing German basketball coaches with teachers and managers. *German Journal of Exercise and Sport Research*, 1-12.

<https://doi.org/10.1007/s12662-024-00963-5>

Zibung, M., & Conzelmann, A. (2015). Der Einfluss familialer Merkmale auf den Entwicklungsprozess vom Fussballtalent zum Spitzenspieler. *Schweizerische Zeitschrift für Sportmedizin und Sporttraumatologie*, 63(1), 46-51.

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