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## DOES COMPETITIVE ANXIETY MEDIATE THE RELATIONSHIP BETWEEN MOTOR ABILITIES AND ENTRANCE EXAM PERFORMANCE?

## ALI TEKMOVALNA TESNOBA VPLIVA NA ODNOS MED GIBALNIMI SPOSOBNOSTMI IN USPEŠNOSTJO NA SPREJEMNEM IZPITU?

### ABSTRACT

Achieving competitive success in sports often requires navigating high-stress, anxiety-inducing situations. While motor abilities are fundamental for athletic performance, psychological factors such as anxiety also significantly impact competitive outcomes. This study explores the mediating role of competitive state anxiety components (cognitive and somatic) in the relationship between motor abilities and success on the entrance exam for the Faculty of Sport and Physical Education, a high-stakes, anxiety-provoking event. We hypothesized that motor abilities would be positively correlated with performance, with cognitive and somatic anxiety mediating this relationship. The sample consisted of 100 candidates (59 males) who underwent a five-week preparation program and completed a range of motor ability tests, as well as the Competitive State Anxiety Inventory-2. Results revealed a moderate negative correlation between competitive anxiety and performance, with cognitive anxiety partially mediating the relationship between motor abilities and success, while somatic anxiety showed no significant mediating effect. These findings contribute to a deeper understanding of the psychological mechanisms linking motor skills and performance in competitive environments. We suggest that psychological interventions focusing on reducing cognitive anxiety may improve performance in high-pressure situations, emphasizing the importance of mental preparation in sports. Further research is necessary to explore these effects in real-world competitive contexts and investigate additional factors, such as athletes' perception of anxiety as facilitative or debilitating.

*Keywords:* Psychological preparation, Performance, Mediation, Cognitive, Selection

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### IZVLEČEK

Doseganje tekmovalnih uspehov v športu pogosto zahteva spopadanje z visoko stopnjo stresa in tesnobe. Čeprav so gibalne sposobnosti temeljne za športno uspešnost, psihološki dejavniki, kot je tesnoba, prav tako pomembno vplivajo na tekmovalne rezultate. Ta študija preučuje posredniško vlogo komponent tekmovalne tesnobe (kognitivne in somatske) v odnosu med gibalnimi sposobnostmi in uspešnostjo na sprejemnem izpitu na Fakulteti za šport in športno vzgojo, ki predstavlja dogodek z visokimi vložki in velikim izzivom za tesnobo. Hipoteza je bila, da so gibalne sposobnosti pozitivno povezane z uspešnostjo, pri čemer kognitivna in somatska tesnoba vplivata na ta odnos. Vzorec je zajemal 100 kandidatov (59 moških), ki so opravili pettedenski pripravljalni program ter vrsto testov gibalnih sposobnosti in izpolnili vprašalnik Competitive State Anxiety Inventory-2. Rezultati so pokazali zmerno negativno korelacijo med tekmovalno tesnobo in uspešnostjo, pri čemer je kognitivna tesnoba delno vplivala na odnos med gibalnimi sposobnostmi in uspehom, medtem ko somatska tesnoba ni imela pomembnega posredniškega učinka. Ti izsledki prispevajo k boljšemu razumevanju psiholoških mehanizmov, ki povezujejo gibalne spretnosti in uspešnost v tekmovalnih okoljih. Predlagamo, da bi psihološke intervencije, osredotočene na zmanjševanje kognitivne tesnobe, lahko izboljšale uspešnost v situacijah z visokim pritiskom, kar poudarja pomen psihološke priprave v športu. Za nadaljnje razumevanje teh učinkov v resničnih tekmovalnih okoliščinah in raziskovanje dodatnih dejavnikov, kot je dožemanje tesnobe kot spodbudne ali zaviralne, pa je potrebnih več raziskav.

*Ključne besede:* Psihološka priprava, nastop, meditacija, kognitivno, selekcija

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<https://doi.org/10.52165/kinsi.31.2.5-20>

## INTRODUCTION

Achieving competitive results, as the ultimate goal of sports activity, occurs in situations that are filled with stressors and accompanied by intense emotions. Competitive performance is primarily determined by motor abilities and sports skills, but it is also influenced by various psychological characteristics such as anxiety. Psychological factors become especially significant in sports situations that are perceived as important and uncertain (Weinberg & Gould, 2007).

Motor abilities, including agility, speed, and cardiovascular endurance, significantly impacts athletic performance. These components vary among athletes in different sports, suggesting the need for sport-specific fitness training to enhance performance (Reza et al., 2024). Motor abilities such as explosive strength, repetitive strength, speed, and flexibility have a statistically significant effect on performance in athletic disciplines like running, long jump, and shot put (Pavlovic, 2017). The study by de Quel et al. (2020) found that agility, upper- and lower-body muscle power, and general fitness significantly differentiated elite from sub-elite female junior karate athletes. Binary logistic-regression models demonstrated that assessing these fitness attributes in junior categories has predictive value for future competitive success, highlighting the importance of muscle power and agility as key indicators for coaches. However, some other studies on team sports showed no or a selective association between physical fitness and sport performance. For example, a study by Ibáñez et al. (2023) on a sample of women basketball players found a relationship between physical fitness and technical-tactical contributions, which varied across different times of the season. Physical fitness predicted competition performance only for centers and forwards at specific stages, and distinct physical-physiological profiles were identified, linking playing positions, performance ratings, and physical attributes.

In addition to motor abilities, various psychological factors can also influence athletes' performance in competitive situations. One of the most significant is the state anxiety provoked by competitive stressors and influenced by factors such as the importance of the competition and the uncertainty of the outcome (Weinberg & Gould, 2007). Classical theories (Martens, Vealey, & Burton, 1990) of competitive anxiety emphasize its multidimensional nature, distinguishing between two components: cognitive (e.g. negative expectations about one's performance, concerns about potential failure, anticipation of negative feedback and somatic (e.g. increased heart rate, rapid breathing, sweaty palms, muscle tension) anxiety).

A large body of research focused on the relationship between competitive anxiety and sports performance. A meta-analytical study encompassing 48 investigations examined the relationship between athletes' cognitive anxiety and their sports performance (Woodman & Hardy, 2003). Significant but small effects of both concepts on sports performance (cognitive anxiety:  $r = -0.10$ ) were obtained. A similar pattern of results was observed in another meta-analytical study, which explored the influence of somatic anxiety and cognitive anxiety (measured using the Competitive State Anxiety Inventory – CSAI 2) on sports performance (Craft, et al., 2003), where anxiety had a small but significant impact on sports performance (somatic anxiety:  $r = -0.09$ , cognitive anxiety:  $r = -0.13$ ). On the other hand, a meta-analytic study by Kleine (1990) found somewhat stronger effects of these anxiety components, measured using the CSAI-2 questionnaire, on sports performance (somatic anxiety:  $r = -0.30$ , cognitive anxiety:  $r = -0.16$ ).

This study examines if competitive state anxiety components mediate the relationship between motor abilities and success in the entrance exam at the Faculty of Sport and Physical Education. The entrance exam at the Faculty of Sport and Physical Education is based on demonstrating a wide range of motor abilities and skills and includes candidates who have been involved in sports for many years. Considering that admission to the faculty depends on the achieved result in comparison to other candidates, the entrance exam takes on the characteristics of a sports competition, which is highly important and uncertain for candidates and has the potential to provoke anxiety. Supporting this, research findings have shown that taking an entrance exam for different faculties represents a highly motivating and highly stressful situation for candidates (Arce-Medina & Flores-Allier, 2012).

Numerous studies have examined the effects of motor abilities and competitive anxiety on sports performance separately, but little attention has been given to their combined effects. This study aims to explore the mediating role of competitive anxiety components in the relationship between motor abilities and success on entrance exam for the Faculty of Sport and Physical Education. We hypothesize that higher motor ability scores will be associated with higher entrance exam performance, with this effect being partially mediated by competitive anxiety components. The findings will contribute to a better understanding of the psychological mechanisms that link motor abilities and success in anxiety provoking sport situations.

## **METHODS**

### **Participants**

The sample included 100 participants, candidates for admission to the Faculty of Sport and Physical Education (59 males), with an average age of 19.01 years ( $SD = 0.41$ ) and an average sports experience of 9.28 years ( $SD = 3.54$ ). All participants underwent a five-week preparation program for the entrance exam, which included 15 sessions aimed at increasing aerobic endurance and 15 sessions for each of the obstacle courses that are an integral part of the entrance exam. The study was conducted in accordance with the Declaration of Helsinki and all participants signed informed consent approved by the Institutional Review Board (Approval No. 02 25/24-02).

### **Instruments and measures**

#### *Motor test battery*

The motor test battery assessed speed, explosive power, agility, maximal power, flexibility, and aerobic endurance. Prior to testing, all participants underwent a standardized warm-up, which included light jogging, dynamic stretching, and flexibility exercises. The warm-up consisted of 5 minutes of moderate-intensity running followed by upper-body dynamic stretches. Specific warm-up exercises targeted the upper body, shoulder girdle, trunk, back, and legs to prepare for the motor tests. After the dynamic warm-up, participants performed static stretching for all major muscle groups, guided by a qualified instructor, lasting up to 10 minutes.

#### *Speed (10-meter Flying Start Sprint Test)*

Speed was assessed using the 10-meter flying start sprint test. Participants started sprinting at the signal from the test operator and sprinted between two lines positioned 10 meters apart. Timing was recorded using the Microgate system (Microgate, Bolzano, Italy), with photoelectric sensors marking the start and finish lines. Each participant performed the test twice with a 5-minute rest between trials, and the best result was used for analysis. Time was recorded with a precision of 0.4ms.

#### *Explosive Power (10-meter Sprint Test)*

Explosive power was evaluated using the 10-meter sprint test from a stationary start behind the starting line. Participants started from a static position and sprinted between two lines separated by 10 meters, equipped with photoelectric sensors (Microgate, Bolzano, Italy). Each participant

performed the test twice with a 5-minute rest between trials. The best result was used for statistical analysis, recorded with a precision of 0.1 seconds.

#### *Agility (T-Test)*

Agility was assessed using the T-Test, where participants ran between four cones (A, B, C, D) arranged in a T-shaped configuration. The total running distance was 40 meters, starting and ending at cone A. Timing was recorded using the Microgate photoelectric cells system (Microgate, Bolzano, Italy). Participants started from cone A, ran forward 10 meters to cone B, sidestepped 5 meters to cone C, sidestepped 10 meters to cone D, returned 5 meters to cone B, and ran backward 10 meters to cone A. Each participant performed one practice trial followed by two timed trials, with the best result used for analysis. The researchers started the stopwatch at the command "go" and stopped it as the participant crossed the plane of the finish line. The time taken to complete each trial was recorded in seconds. Participants were disqualified if they failed to follow the course instructions, did not reach the finish line or complete the course, displaced any cones, failed to keep their trunk and feet facing forward throughout the test, or crossed their legs more than once during sidestepping. Unsuccessful trials were assigned a score of 0.

#### *Maximal Power (Countermovement Jump Test)*

Maximal power was measured using the countermovement jump (CMJ) test. Participants performed a vertical jump starting from an upright position between two sensors using the Optojump photoelectric cells system (Microgate, Bolzano, Italy). On the command "go", participants performed a rapid downward squat followed by an explosive vertical jump, utilizing arm swings. During the jump, participants maximally extended all joints and landed as close as possible to the take-off point. Two trials were performed with a 10-second rest between attempts, and the highest jump height, recorded in centimeters (cm), was used for analysis. In the "Maximal Power (Countermovement Jump Test)" section, instead of "upon the test operator's signal," it would be more precise to use "on the command 'go'."

#### *Flexibility (Sit-and-Reach Test)*

Flexibility was assessed using the sit-and-reach test. The equipment included a wooden sit-and-reach box measuring 45 cm in length, 35 cm in width, and 32 cm in height. The top surface of the box extended 15 cm beyond the footrest and featured a scale ranging from 0 to 50 cm with a sliding ruler. Participants sat with their feet flat against the footrest, legs extended, and knees

stabilized by the researcher to prevent bending. They reached forward, pushing the sliding ruler as far as possible. The farthest distance achieved was recorded in centimeters (cm).

#### *Aerobic Endurance (Cooper's 2400-meter Test)*

Aerobic endurance was evaluated using Cooper's 2400-meter test on a 1200-meter outdoor track with clearly marked distances every 100 meters. Participants completed two laps (2400 meters) in the shortest time possible. Testing was conducted in groups of 10 following a 30-minute warm-up that included jogging, dynamic and static stretching. Performance times were measured using a stopwatch.

#### *Anxiety*

The Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) was used to assess anxiety level immediately before the entrance exam. The inventory consists of 27 items, divided into three subscales: Cognitive Anxiety, Somatic Anxiety and Self-confidence (9 items each). For the purposes of this study, scales measuring cognitive and somatic anxiety were used. Cognitive Anxiety refers to the mental aspect of anxiety, such as worry or negative thoughts about performance. Somatic Anxiety refers to the physical symptoms of anxiety, such as increased heart rate, sweating, or muscle tension. Participants rate each item on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much so). The score is calculated as the average of the responses to the items belonging to the corresponding subscale, and a higher score indicates a greater expression of a certain subdimension.

#### *Entrance exam*

The entrance exam consists of three obstacle courses that assess the candidates' skills and abilities.

#### *Swimming obstacle course*

The swimming obstacle course used in the entrance exam for the Faculty of Sport and Physical Education, assessed candidates' aquatic motor skills, breath control, and swimming proficiency in a 50-meter pool with a depth of 2 meters. The course was divided into three sections, requiring candidates to complete five sequential tasks. They began with a water entry from a starting block or pool edge, followed by underwater swimming for 10 meters (females) or 12 meters (males). In the second section, they swam 38 meters (females) or 36 meters (males) on the surface using any stroke, then performed a deep dive to the pool bottom. In the final section,

candidates retrieved a object weighing up to 4 kg from a depth of 2 meters and placed it on the finish line to complete the course.

#### *Ball-handling obstacle course*

The ball-handling obstacle course assessed candidates' coordination, dexterity, and motor control with various types of balls, including handballs, basketballs, volleyballs, and footballs. The course consisted of multiple tasks, whose exact sequence was unknown to candidates in advance, requiring them to execute ball bouncing, passing, catching, dribbling, throwing, shooting, rolling, and maneuvering. Tasks included wall rebounding with controlled receptions, dribbling through obstacles, performing rotational and acrobatic movements while handling the ball, passing against a wall with directional changes, goal shooting, and precise ball control using hands and feet. Candidates had to complete the tasks efficiently within a time limit, demonstrating speed, precision, and adaptability in handling different balls under dynamic conditions.

#### *General motor skills obstacle course*

The general motor skills obstacle course assessed candidates' strength, agility, coordination, balance, and flexibility through a variety of gymnastic and athletic tasks. The course included balancing on beams, vaulting over apparatuses (horse, box), climbing ropes and bars, crawling through obstacles, performing rolls and somersaults, jumping over hurdles, maneuvering through agility drills, and handling small equipment such as hoops, sticks, and balls. Tasks required running, jumping, vaulting, rolling, crawling, climbing, and coordination-based exercises that tested body control, spatial awareness, and adaptability. Candidates had to complete the course efficiently within a time limit, demonstrating precision, speed, and fluidity of movement across different apparatuses and movement challenges.

The results of all obstacle courses were measured in time units (seconds), where lower values indicate better performance. To compute the overall score for the entrance exam, Z-scores were calculated for each obstacle course, and the average performance score on the entrance exam was subsequently derived from these values.

### **Procedure**

Motor ability testing was conducted five days before the entrance exam, with each candidate undergoing a 20-minute assessment. Before testing, all participants completed a mandatory warm-up consisting of 5 minutes of light-intensity running, 5 minutes of mobility exercises,

and 5 minutes of full-body stretching. Each candidate then performed each test twice, with the better result used for analysis. The state anxiety test was administered individually, 5 minutes before the obstacle course assessment, and took approximately 5 minutes to complete.

### Statistical analysis

First, descriptive statistics, including mean, standard deviation, skewness, and kurtosis were calculated for all variables in the study. To examine the underlying factor structure of the six motor ability variables, a Principal Component Analysis (PCA) with direct oblimin rotation was conducted. Next, Pearson's correlation analysis was performed to select variables for mediation analyses. Mediation analysis was conducted following Baron and Kenny's (1986) four-step regression approach. To statistically confirm mediation, the Sobel test was performed. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, Version 25; IBM Corp., Armonk, NY, USA).

## RESULTS

Descriptive statistics for variables related to competitive anxiety and motor skills are presented in Table 1. The results indicate that respondents exhibit a moderate level of competitive anxiety, as well as self-confidence. Additionally, the skewness and kurtosis values suggest that the data meet the assumptions required for parametric statistical analyses (Byrne, 2010; Hair et al., 2010).

Table 1. Descriptive statistics for the competitive anxiety variables and motor abilities variables.

	<i>Min</i>	<i>Max</i>	<i>M</i>	<i>SD</i>	<i>Skew (SE)</i>	<i>Kurt (SE)</i>
Cognitive anxiety	1.00	4.00	2.02	0.65	0.41 (0.24)	-0.03 (0.48)
Somatic anxiety	1.11	3.89	2.05	0.58	0.83 (0.24)	0.50 (0.48)
Speed (s)	1.13	2.05	1.40	0.13	1.16 (0.24)	4.55 (0.48)
Explosive power (s)	1.66	2.40	1.89	0.14	0.63 (0.24)	0.68 (0.48)
Agility (s)	9.65	14.40	11.53	1.00	0.59 (0.24)	0.18 (0.48)
Maximal power (cm)	22.4	64.6	39.16	7.21	0.31 (0.24)	0.65 (0.48)
Flexibility (cm)	5.0	45.0	27.91	8.27	-0.61 (0.24)	0.09 (0.48)
Aerobic endurance (s)	503	980	660.66	85.47	0.58 (0.24)	1.39 (0.48)

Notes. Min – minimum, Max – maximum, M – mean, Sd – standard deviation, Skew – skewness, Kurt – kurtosis, SE – standard error

## Factor analysis

A Principal Component Analysis (PCA) with direct oblimin rotation was conducted on six motor abilities variables to explore the underlying factor structure. The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis, with a value of 0.81, indicating that the data was suitable for factor analysis. Additionally, Bartlett's Test of Sphericity was significant ( $\chi^2(12) = 217.71, p < 0.001$ ), supporting the factorability of the correlation matrix.

An initial analysis revealed that two factors had eigenvalues greater than 1, explaining 68.41% of the total variance. Specifically, Factor 1 accounted for 51.44% and Factor 2 for 16.96% of the variance. The scree plot further confirmed the two-factor solution. The first factor included variables such as explosive strength, speed, maximal strength, aerobic endurance, and agility and was named the general motor factor, while the second factor included only flexibility (Table 2). The factor scores were saved as variables and used in further analyses.

Table 2. Pattern and structure matrix for motor abilities (principal components analysis with oblimin rotation).

	Pattern matrix		Structure matrix	
	1	2	1	2
Speed	0.856		0.860	
Explosive power	0.902		0.901	
Agility	0.563		0.570	
Maximal power	-0.795		-0.793	
Flexibility	0.983		0.983	
Aerobic endurance	0.769		0.759	

Correlations between state anxiety variables, general motor factor, flexibility and entrance exam score are given in Table 3. As expected, the highest positive correlation was obtained between the general motor factor and entrance exam score. Further, cognitive and somatic anxiety are in a negative relationship with entrance exam score (considering that a lower score on entrance exam indicates better achievement) and in positive relationship with self-confidence.

Table 3. Correlations between state anxiety variables, general motor factor, flexibility and entrance exam score (Pearson r).

	CA	SA	GMF	FL	EE
CA	1				
SA	.651**	1			
GMF	.371**	.363**	1		
FL	-0.148	-0.059	0.000	1	
EE	.446**	.350**	.700**	-0.092	1

Notes. CA – cognitive anxiety, SA – somatic anxiety, GMF – general motor factor, FL – flexibility, EE – entrance exam score

### Mediation

To determine mediating role of anxiety components in the relationship between general motor factor and entrance exam score mediation analysis was conducted, separately for cognitive anxiety and somatic anxiety.

*Cognitive anxiety.* In Step 1 of the mediation model, the regression of the General Motor Factor on Entrance Exam Score, ignoring the mediator, was significant ( $b = 0.50$ ,  $t = 9.69$ ,  $p < 0.01$ ). Step 2 indicated that the regression of the General Motor Factor on the mediator, Cognitive Anxiety, was also significant ( $b = 0.24$ ,  $t = 3.95$ ,  $p < 0.01$ ). In Step 3, the mediation analysis showed that the mediator (Cognitive Anxiety), when controlling for the General Motor Factor, was significant ( $b = 0.24$ ,  $t = 2.88$ ,  $p < 0.01$ ). Step 4 revealed that the General Motor Factor, when controlling for the mediator (Cognitive Anxiety), remained a significant predictor of Entrance Exam Score ( $b = 0.44$ ,  $t = 8.26$ ,  $p < 0.01$ ). The significance of the mediating effect (indirect effect) was confirmed using Sobel's Z test, with a significant result ( $z = 2.33$ ,  $p < 0.05$ ). The mediation analysis partitioned the total effect of the General Motor Factor on Entrance Exam Score ( $c = 0.495$ ) into a direct effect ( $c' = 0.439$ ) and a mediated effect ( $ab = 0.057$ ). Although the mediation through Cognitive Anxiety was statistically significant, it explained only a small proportion of the total effect of the General Motor Factor on Entrance Exam Score (Figure 1).

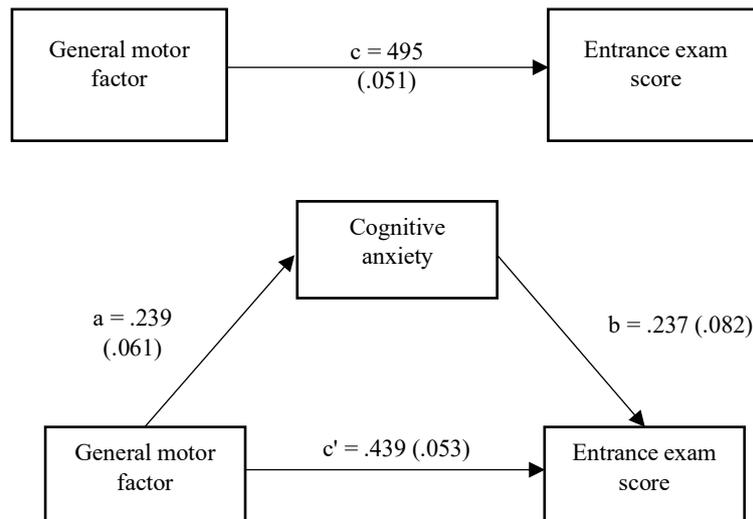


Figure 1. Mediation model for cognitive anxiety.

*Somatic anxiety.* In Step 1 of the mediation model, the regression of the General Motor Factor on Entrance Exam Score, without considering the mediator, was significant ( $b = 0.50$ ,  $t = 9.69$ ,  $p < 0.01$ ). Step 2 showed that the regression of the General Motor Factor on the mediator, somatic anxiety, was also significant ( $b = -0.22$ ,  $t = -3.88$ ,  $p < 0.01$ ). Step 3 showed that somatic anxiety remained significant when controlling for the General Motor Factor ( $b = -0.22$ ,  $t = -3.88$ ,  $p < 0.01$ ). In Step 4, the analysis revealed that the General Motor Factor, when controlling for the mediator (somatic anxiety), was still a significant predictor of Entrance Exam Score ( $b = 0.47$ ,  $t = 8.63$ ,  $p < 0.01$ ). However, the Sobel Z-test for the mediating effect ( $z = 1.09$ ,  $p > 0.05$ ) was not significant. This suggests that somatic anxiety does not significantly mediate the relationship between the General Motor Factor and Entrance Exam Score (Figure 2).

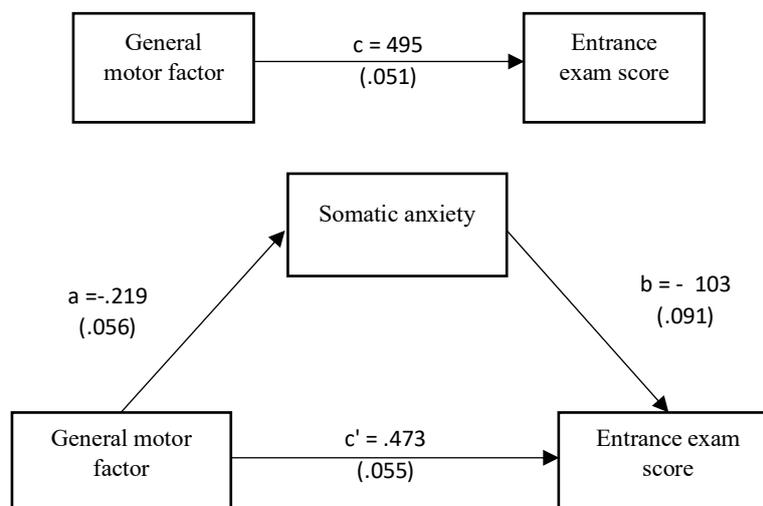


Figure 2. Mediation model for somatic anxiety.

## DISCUSSION

Understanding the determinants that influence performance in competitive situations, as well as their interrelationships, is of great theoretical and practical significance for both sports professionals and athletes. The aim of this study was to examine the mediating role of competitive state anxiety components in the relationship between motor abilities and success in a highly competitive and anxiety-inducing entrance exam for the Faculty of Sport and Physical Education.

Since the entrance exam assesses a broad spectrum of motor abilities and skills, participants were assessed on the following motor abilities: speed, explosive power, agility, maximal power, flexibility, and aerobic endurance. Principal Component Analysis revealed that flexibility emerged as a distinct factor, while the remaining motor abilities grouped into a general motor factor. As expected, correlation analysis showed a strong association between success on the entrance exam and the general motor factor, but no significant relationship with flexibility. Given these findings, only the general motor factor was included in the further analysis.

As expected, the results confirmed a negative correlation between candidates' performance on the entrance exam and competitive anxiety. Specifically, the correlation between performance and cognitive anxiety was  $-0.45$ , while the correlation between performance and somatic anxiety was  $-0.35$ , both of which, according to Cohen (2013), correspond to a moderate effect size. These findings align with previous research and meta-analytic evidence, which consistently report a low-to-moderate negative association between performance and competitive anxiety. Moreover, the evidence suggests that cognitive anxiety exhibits a stronger relationship with performance outcomes than somatic anxiety (Craft et al., 2003; Kleine, 1990; Woodman & Hardy, 2001).

Since motor abilities are a strong predictor of performance in competitive settings, a key objective of this study was to examine whether this influence is direct or mediated by competitive anxiety. Mediation analysis revealed that cognitive anxiety partially mediated the relationship between motor abilities and performance, whereas no significant mediating effect was found for somatic anxiety. These findings suggest that while motor abilities primarily exert a direct effect on candidates' performance on the entrance exam, they also contribute indirectly through their impact on cognitive anxiety.

Numerous studies and theoretical models suggest that cognitive and somatic anxiety influence sports performance through distinct mechanisms. Regarding cognitive anxiety, researchers

propose a negative linear relationship, indicating that higher levels of cognitive anxiety are associated with poorer performance in competitive situations (Martens et al., 1990), which has been confirmed by various studies (Filaire et al., 2009; Terry et al., 1996). This effect is primarily explained by reduced cognitive capacity, including impaired attention and working memory, which limits the processing of relevant information. This occurs due to an excessive preoccupation with self-evaluation and concerns about performance outcomes (Wilson, Vine, & Wood, 2009; Weinberg & Gould, 2023). Beyond these established mechanisms, our findings suggest that an individual's perception of their motor abilities may heighten cognitive anxiety, thereby contributing to poorer performance.

According to dominant theoretical models, the relationship between somatic anxiety and sports performance follows an inverted U-shaped pattern. This means that an optimal level of somatic anxiety is necessary for peak performance, while both excessively low and excessively high levels can negatively impact results (Martens et al., 1990). Theoretical assumptions indicate that somatic anxiety, through the activation of physiological arousal (i.e., the sympathetic nervous system), can directly impair fundamental motor abilities, primarily movement coordination (Weinberg & Gould, 2023). However, our study did not provide evidence that somatic anxiety serves as a mediator in the relationship between motor abilities and success on the entrance exam for the Faculty of Sport and Physical Education. A possible explanation for these findings can be found in the temporal dynamics of cognitive and somatic anxiety during sports competitions (Martens et al., 1990). Specifically, while somatic anxiety tends to decrease rapidly from the beginning to the end of a competition, cognitive anxiety exhibits a more variable trajectory and has the potential to persist throughout the performance. In other words, even if candidates experience high levels of somatic anxiety at the start, it tends to decline over the course of the competition, reducing its capacity to mediate the relationship between motor abilities and performance outcomes. Moreover, considering that candidates complete multiple performance tasks (polygons) within the same day, they develop a certain level of habituation to the triggers of somatic anxiety, further diminishing its mediating role in this relationship.

### **Study limitations and future research**

The present study examined candidates undergoing the entrance exam for the Faculty of Sport and Physical Education, an assessment designed to evaluate extensive prior sports experience and a high level of motor proficiency. While the selection process closely mirrors competitive performance demands, a critical question remains regarding the generalizability of these

findings to real-world competitive sports contexts. These results offer valuable insights into the mechanisms through which anxiety states influence performance in high-stakes, uncertain competitive situations. However, for a more comprehensive validation, future research should examine these effects in athlete populations engaged in actual competitive environments. Moreover, meta-analytic evidence suggests that the anxiety-performance relationship is influenced by multiple factors, such as gender, competition level, and sport type. Consequently, the moderating effects observed in this study should be further tested while accounting for these contextual variables. Furthermore, research has shown that the impact of competitive anxiety varies depending on whether athletes perceive it as facilitative or debilitating (e.g., Butt, Weinberg, & Horn, 2003; Jones & Swain, 1992). This distinction represents another crucial factor that should be incorporated into future studies to refine the understanding of anxiety's role in sports performance.

## CONCLUSION

This study demonstrated that, beyond their direct impact, motor abilities also partially contribute to the development of the cognitive component of competitive anxiety, which in turn affects performance. However, somatic anxiety did not show a similar mediating effect. One possible explanation is that the perceived level of one's motor abilities influences self-doubt regarding one's competence to successfully perform in a critical and uncertain competitive setting, (such as completing the entrance exam obstacle course), which ultimately impairs performance. Although the mediating effect of cognitive anxiety is not large, it may be crucial in high-stakes sports competitions where many athletes possess similar levels of motor abilities, making psychological factors a key determinant of success.

Based on these findings, psychological preparation for high-stakes competitions should include reframing techniques designed to achieve two key objectives. First, they should help athletes detach from self-evaluations of their motor abilities at a given moment and instead focus on achieving their optimal performance. Second, they should encourage a performance-oriented mindset rather than an outcome-driven one, thereby reducing the pressure associated with an absolute need to win.

## Acknowledgments

The authors would like to thank all participants for taking part in the study.

## Declaration of Conflicting Interests

The authors have no conflicts of interest to declare.

## REFERENCES

- Arce-Medina, E., & Flores-Allier, I. P. (2012). Stress impact on applicants trying to gain entrance to public universities. *Procedia-Social and Behavioral Sciences*, 69, 1938-1944. <https://doi.org/10.1016/j.sbspro.2012.12.148>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, 51(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Butt, J., Weinberg, R., & Horn, T. (2003). The intensity and directional interpretation of anxiety: Fluctuations throughout competition and relationship to performance. *The Sport Psychologist*, 17(1), 35-54. <https://doi.org/10.1123/tsp.17.1.35>
- Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming*. New York: Routledge.
- Cohen, J. (2013). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York: Routledge.
- Craft, L. L., Magyar, T. M., Becker, B. J., & Feltz, D. L. (2003). The relationship between the Competitive State Anxiety Inventory-2 and sport performance: A meta-analysis. *Journal of Sport and Exercise Psychology*, 25(1), 44-65. <https://doi.org/10.1123/jsep.25.1.44>
- de Quel, Ó. M., Ara, I., Izquierdo, M., & Ayán, C. (2020). Does physical fitness predict future karate success? A study in young female karatekas. *International journal of sports physiology and performance*, 15(6), 868-873. <https://doi.org/10.1123/ijsp.2019-0435>
- Filaire, E., Alix, D., Ferrand, C., & Verger, M. (2009). Psychophysiological stress in tennis players during the first single match of a tournament. *Psychoneuroendocrinology*, 34(1), 150-157. <https://doi.org/10.1016/j.psyneuen.2008.08.022>
- Hair, J., Black, W. C., Babin, B. J. & Anderson, R. E. (2010) *Multivariate data analysis* (7th ed.). Upper Saddle River, New Jersey: Pearson Educational International.
- Ibáñez, S. J., Piñar, M. I., García, D., & Mancha-Triguero, D. (2023). Physical fitness as a predictor of performance during competition in professional women's basketball players. *International journal of environmental research and public Health*, 20(2), 988. <https://doi.org/10.3390/ijerph20020988>
- Jones, G., & Swain, A. (1992). Intensity and direction as dimensions of competitive state anxiety and relationships with competitiveness. *Perceptual and motor skills*, 74(2), 467-472. <https://doi.org/10.2466/pms.1992.74.2.467>
- Kleine, D. (1990). Anxiety and sport performance: A meta-analysis. *Anxiety research*, 2(2), 113-131. <https://doi.org/10.1080/08917779008249330>
- Martens, R., Burton, D., Vealey, R., Bump, L., & Smith, D. (1990). The development of the Competitive State Anxiety Inventory-2 (CSAI-2). In R. Martens, R.S., Vealey, & Burton (Ed.), *Competitive anxiety in sport* (pp. 117-190). Champaign, IL: Human Kinetics.
- Martens, R., Vealey, R. S., & Burton, D. (1990). *Competitive anxiety in sport*. Champaign, IL: Human Kinetics
- Pavlović, R. (2017). Motor abilities of students as predictors of result performance in athletic disciplines. *Sport Science*, 10(1): 42-49.

Reza, M. N., Rahman, M. H., Islam, M. S., Mola, D. W., & Andrabi, S. M. H. (2024). Assessment of Motor Fitness Metrics among Athletes in Different Sports: An Original Research. *Physical Education Theory and Methodology*, 24(1), 47-55. <https://doi.org/10.17309/tmfv.2024.1.06>

Terry, P. C., Cox, J. A., Lane, A. M., & Karageorghis, C. I. (1996). Measures of anxiety among tennis players in singles and doubles matches. *Perceptual and motor skills*, 83(2), 595-603. <https://doi.org/10.2466/pms.1996.83.2.595>

Weinberg, R. S., & Gould, D. (2023). *Foundations of sport and exercise psychology*. Human Kinetics.

Wilson, M. R., Vine, S. J., & Wood, G. (2009). The influence of anxiety on visual attentional control in basketball free throw shooting. *Journal of Sport and Exercise Psychology*, 31(2), 152-168. <https://doi.org/10.1123/jsep.31.2.152>

Woodman, T. I. M., & Hardy, L. E. W. (2003). The relative impact of cognitive anxiety and self-confidence upon sport performance: A meta-analysis. *Journal of Sports Sciences*, 21(6), 443-457. <https://doi.org/10.1080/0264041031000101809>