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Received: 17.11.2020.

Correction received:

04.03.2021.

Accepted: 17.03.2021.

**RETHINKING THE ROLE OF ANXIETY AND SELF-EFFICACY IN COLLECTIVE SPORTS ACHIEVEMENTS**

The influence of an athlete's anxiety and self-efficacy on sports achievement has been the subject of numerous research, but their relationship is not fully understood. In our research, we try to explore the influence of competitive anxiety and General Self-Efficacy on sports achievement. To explore that relationship, we examined 76 active athletes in collective sports. The following instruments were applied: Competitive State Anxiety Inventory, General Self-Efficacy Scale, and Questionnaire of Sports Achievement (ad hoc made instrument). The results show that Cognitive anxiety (a dimension of the Competitive anxiety) negatively correlates with sports achievement ( $r = -.38$ ,  $p < .01$ ) contrary to another dimension - Somatic anxiety that does not show a significant association with achievement. However, the highest relationship is a positive correlation between General Self-Efficacy and sports achievement ( $r = .51$ ,  $p < .01$ ). In Regression analysis, significant predictors of sports achievement are General Self-Efficacy ( $\beta = .39$ ;  $p < .01$ ) and Cognitive anxiety ( $\beta = -.24$ ;  $p < .05$ ). Additional Bootstrapping analyses were conducted to examine the potential mediating effect of General Self-Efficacy in the relationship between Cognitive anxiety and sports achievement. We found a significant indirect effect of Cognitive anxiety on achievement only through General Self-Efficacy ( $b = -.30$ , CI  $[-.73, -.07]$ ), while the direct effect is not significant once the mediator is introduced. In the reversed analyses, with Cognitive anxiety as a mediator, the mediation was not significant, which means that high anxiety reduces sports achievement only through undermining self-efficacy and not directly. The obtained result suggests that self-efficacy has the primary role in sports achievement. Consequently, we suggest that for improving sports achievement, psychological intervention should primarily focus on increasing self-efficacy.

**Keywords:** self-efficacy, cognitive anxiety, competitive anxiety, collective sports, sports achievement

## Introduction

To what extent and in what ways athlete's concerns about success and self-confidence impact their sports achievement? This question has long been the target topic of numerous studies in sports psychology, as well as meta-analytical studies (e.g., Klein, 1990; Levy et al., 2011; Moritz et al., 2000; Woodman & Hardy, 2003). In the relevant literature, this question mainly revolves around the term performance anxiety. Performance anxiety has been considered as a specific form of social anxiety which, as a rule, does not occur in other areas of life, and hence, it can be viewed as a state, rather than a trait. If a stressful situation/event is to be defined as one that represents a certain kind of challenge or threat to a person (Deckers, 2018), sports competitions can be considered as stressful, as they challenge the athlete by default and are the requirement for a particular achievement.

With the construction of the Competitive State Anxiety Inventory-2 (CSAI-2) Martens et al. (1990) introduced the concept of multidimensional anxiety state (cognitive anxiety, somatic anxiety and self-confidence) into the field of sport psychology. The authors define cognitive anxiety as negative expectations and concerns about one's ability to perform and the possible consequences of failure, while somatic anxiety is being described as a personal perception of physiological effects of the anxiety experience such as palpitations, tense muscles, shortness of breath and other signs of autonomic arousal. Following this concept of multidimensional anxiety, Martens et al. (1990) suggest the combination of the somatic and cognitive component of anxiety, together with self-confidence, to be the tipping point of sports performance anxiety. Self-confidence represents athlete's belief "in meeting the challenge of the task to be performed" (Woodman & Hardy, 2003). These three components of competitive anxiety are different, but significantly related and expressed in various stages of sports achievements.

The somatic component of anxiety refers to its physiological and emotional aspects, while in its essence they are a direct consequence of the physiological activation. As a consequence of this activity, an athlete experiences a series of physical symptoms (i.e., arousal), and these symptoms are being recognized as nervousness and tension (Dosil, 2004). It is of great importance to note that somatic anxiety can affect sports efficiency depending on how the athlete perceives and interprets (e.g., horrifying, catastrophic or benign) these physical sensations often manifested through muscle tension or accelerated heart rhythm (Gould et al., 2002). Cognitive anxiety (trepidation or worry), as a mental component, occurs as a result of negative expectations regarding the outcome of the competition, mistrust in oneself, or doubts about one's abilities (Martens et al., 1990; Williams, 2010). The presence of cognitive anxiety is reflected in athletes' negative self-evaluation, which leads to excessive worrying, reducing one's ability to accomplish sports tasks effectively. Third component in the multidimensional theory of competitive anxiety, according to Martens et

al. (1990), is self-confidence. In sport, the term self-confidence refers to the belief of one's abilities and skills required for achieving success in certain sport situations (Vealey & Chase, 2008). Self-confidence is widely considered as a cornerstone of success and affirmation in sport. Although it is referred to as the manifestation of anxiety, confidence is not based on the clear-cut measure, but it is often assessed as to its absence. In light of that, cognitive anxiety is usually found in negative correlation with self-confidence (Besharat & Pourbohloul, 2011; Craft et al., 2003).

Considering the relationship between anxiety and successful sports performance, there is a straightforward negative link between these two. In a competitive situation, successful sports performance relies on mild somatic anxiety (arousal) and low cognitive anxiety (Woodman & Hardy 2003). Mild somatic anxiety helps the athlete to achieve and maintain the optimal level of activation, required for the (successful) performance of a particular physical activity. Each athlete may have a certain level of anxiety before or during competitions. While some athletes experience non-disturbing, lower intensity arousal (that is "positive jitters"), others experience intense and, hence, disturbing or blocking levels of trepidation. If high anxiety persists across different sport competitions, it directly affects the athlete's achievement, most likely decreasing it. It further resonates as additional negative information for the athlete that s/he is not good enough, that s/he cannot achieve the desired results, affecting their self-confidence, and, consequently, entering into a series of unsuccessful moves, bad decisions, and lost matches. In other words, the self-fulfilling prophecy.

Hardy (1999) makes a distinction between cognitive and somatic anxiety in terms of focus – hence, cognitive anxiety refers to the athlete's concern about the success of his sporting performance, but also the concern about the possible consequences of failure; and somatic anxiety relates to the perception of current physiological response on psychological stress. This definition of somatic anxiety reflects an athlete's interpretation of vegetative arousal. Therefore, the essential difference between cognitive and somatic anxiety, in the context of multidimensional measures, is the content of the assessment - perceived cognition or perceived somatization.

Levels of cognitive and somatic anxiety rise as the competition approaches and reach its peak right before the beginning of the competition. When the match starts, somatic anxiety is radically decreasing, and the course of the game dictates the variation in cognitive anxiety. The mistakes that athletes make in the competition are, as a rule, the effects of cognitive, rather than somatic anxiety, and therefore, cognitive anxiety is inversely proportional to achievement. More specifically, the increase in cognitive anxiety leads to a decline in sporting achievement (Cox, 2002). Most research aimed at examining sports anxiety shows that a critical construct that needs to be explored is cognitive anxiety (Bridges & Knight, 2005; Dunn & Dunn, 2001). This term refers to the kind of anxiety that is oriented to the future and occurs in situations

where an athlete's attention is focused on the expected obstacles, or when potential failure is foreseen (Bridges & Knight, 2005; Dunn & Dunn, 2001). The general assumption is that only the presence of cognitive anxiety can diminish the athlete's performance, because a particular way of thinking generates it, i.e. focusing on potential hazards and obstacles and, as such, it can cause not only the anticipation of failure but the failure itself.

In addition to anxiety, the experience of general self-efficacy (a particular aspect of self-confidence in a specific activity) is an essential psychological construct regarding the success and achievements of athletes. Bandura's (Bandura & Walters, 1977) theory of self-efficacy is one of the most widely used approaches in assessing the relationship of self-confidence in sport and motor skills (Heazlewood & Burke, 2011). Bandura defines self-efficacy as an individual's belief in their competence and success on a specific task or group of functions, and suggest that self-efficacy is a crucial part of the achievement. The higher the self-efficacy, the higher the performances and the lower emotional excitement is. Perceived success increases expectations of future successes, while failure reduces it. In the context of Bandura theory, self-efficacy is a common cognitive mechanism mediating human motivation and behaviour. Our evaluation of our own ability to act at a certain level influences our practice, our cognitive schemes and our emotional responses in demanding and challenging situations. In the context of a sporting event, the assessment of self-efficacy is the primary determinant of the athlete's behaviour, because the competition itself contains specific incentives and requires the engagement of certain skills and techniques. Also, Bandura in his theory states that these estimates are the results of a complex process of self-assessment and self-assertion of individuals based on different information on efficiency (previous success, self-talk, as well as individual physiological states). Maddux (1995) added two more categories significant for this process - emotional states and imaginary experiences. Previous achievements are considered to be the most important source of information about efficiency. If an individual perceives their experience as successes, the beliefs of self-efficacy will increase, and if he sees them as failures, the experience of self-efficacy will decline. Relaxation after easy success and reinforcement after failure is the usual sequence of competitive "sinusoids" (Bandura & Walters, 1997). Information on efficiency in sports can be acquired through comparison of an individual's progress and comparison with others. This implies observing the performance of other athletes and the use of this information in the process of an athlete's performance (Maddux, 1995). Such information is easily accessible in collective sport, so players often use them to develop and improve their self-efficacy. During training or match, each player has the opportunity to assess their performance and compare it to other members' performance. Research done on athlete shows a positive correlation between perceived self-efficacy and performance in many sports (through invested effort and perseverance in sports activities). A proper assessment of its efficiency helps athletes and reduces the fear of injury to

the lowest level and thus increases the success in acquiring new motor skills (Perkos et al., 2002). A meta-analysis of the work carried out by Moritz et al. (2000) shows that there is a positive and significant connection between self-efficacy and sporting achievement (the average correlation in the analysed works is moderate and is .38).

The aim of this study is to examine the relationship between competitive anxiety, self-efficacy and sport achievement. Previous literature review reveals an unresolved relationship between anxiety and self-efficacy - is low general self-efficacy a basis for the development of anxiety in general, and therefore, competing anxiety, or does anxiety produce low general self-efficacy and thus a lack of competitive self-confidence? We tried to answer this question in the present study.

## Method

### Participants

The present study included a convenient sample of 76 active athletes (70% male, age:  $M = 18.38$ ;  $SD = 3.94$ ) engaged in team sports (handball 71%, football 18%, water polo 11%). The research was conducted in sports clubs in Serbia. Questionnaires were administered individually and anonymously, and participants were informed about the purpose and investigative nature of the study. Before questionnaire administration, all participants signed the Informed Consent.

### Instruments

#### ***The Revised Competitive State Anxiety Inventory-2 (CSAI-2R)***

To assess competitive anxiety, we used *The Revised Competitive State Anxiety Inventory-2* (CSAI-2R; Cox, Martens, & Russell, 2003), which consists of three subscales Somatic anxiety, Cognitive anxiety and Self-confidence. In this paper, we used subscales, which refers to Somatic and Cognitive anxiety. Somatic anxiety subscale (7 items) registers the intensity of tension in the body and abdomen, agitation, heart palpitation, hand sweating, dry throat, wet and cold hands, etc. (item example: "My body feels tense"). Cognitive anxiety subscale (5 items) assesses athlete's concern about the quality of his or her sports performance, doubts about themselves and their abilities, fear of failure, and anxiety over a possible disappointment of a significant person (item example: "I am concerned about losing"). Each item is set to a four-point Likert scale. Higher scores indicate higher performance anxiety.

## General Self-Efficacy Scale (GSE)

Self-efficacy was assessed using the *General Self-Efficacy Scale* (GSE; Schwarzer & Jerusalem, 1995). The scale is designed following Bandura's theory and consists of several examples of everyday problems and how one deals with them. The questionnaire consists of 10 items, which are answered on a 4-point Likert type scale (item example: "I can solve most problems if I invest the necessary effort"). The higher score points to a higher perceived self-efficacy.

## Sports Achievement

Sports achievement was assessed with the questionnaire designed for this study, in which participants gave self-assessment of their sports performance on an annual basis. Instrument consists of 6 items with the 7-point Likert scale (item example: "I get great results").

## Results

Table 1 shows descriptive characteristics of variables in the study. All variables show satisfactory reliability, and values of skewness and kurtosis suggested that the deviation of data from normality was not severe (Tabachnick & Fidell, 2013) and fulfill the basic conditions for the implementation of the further data analyzes.

Table 1  
*Descriptive statistics for variables in the study*

Scale	Theoretical range	Achieved range	<i>M</i>	<i>SD</i>	$\alpha$	<i>Sk</i>	<i>Ku</i>
General Self-Efficacy	10-40	16-40	33.45	5.24	.89	-0.95	1.28
Cognitive anxiety	4-20	4-20	8.72	4.04	.82	0.74	-1.15
Somatic anxiety	8-40	8-40	21.48	9.32	.92	0.35	-1.18
Sport achievement	6-42	20-42	35.23	5.60	.83	-1.06	0.77

Note. *M* – mean; *SD* – standard deviation;  $\alpha$  - alpha reliability; *Sk* – skewness; *Ku* – kurtosis.

In the analysis of the results we paid attention to only two dimensions from the CSAI questionnaire: Cognitive and Somatic anxiety, while the third dimension – Self-confidence was not analyzed, considering it as a redundant,

or a particular situation of self-efficacy (in sports), which was why it was expected that this factor highly correlate with General Self-Efficacy.

Table 2

*Intercorrelations among variables*

Variable	1	2	3	4
1. General Self-Efficacy	-	-.50**	-.34*	.51**
2. Cognitive anxiety		-	.12	-.38**
3. Somatic anxiety			-	-.02
4. Sport achievement				-

Note. \* $p < .05$ ; \*\*  $p < .01$ .

In Table 2, we can see that Cognitive anxiety is significantly related to Sports achievement, in contrast to Somatic anxiety. Specifically, Cognitive anxiety is negatively correlated with Sport achievement ( $r = -.38, p < .01$ ). However, the highest correlation with Sports achievement shows General Self-Efficacy ( $r = .51, p < .01$ ).

Table 3

*Summary of Linear Regression Analysis*

	$R^2$	$F$	$SE$	$\beta$	$t$	$r$
General Self-Efficacy	.26	8.36	4.85	.38**	3.36	.45
Cognitive anxiety				-.24*	-2.14	-.37
Somatic anxiety				.07	0.76	-.02

Note. \* $p < .05$ ; \*\*  $p < .01$ .

In order to examine which of the factors most predicts Sports achievement, we conducted Regression Analysis. Predictors consisted of General Self-Efficacy, Cognitive anxiety, and Somatic anxiety. The results are shown in Table 3. We see that the regression model is significant ( $R^2 = .26; p < .01$ ) and that the predictors contribute 26% to the explanation of the variance of sports achievement as a criterion variable. The most significant individual predictor is General Self-Efficacy ( $\beta = .38, p < .01$ ), while Cognitive anxiety predicts Sports achievement in a negative direction ( $\beta = -.24, p < .05$ ). According to post hoc power analysis (Faul et al., 2007), which is conducted to estimate achieved statistical power of given  $\alpha$ , sample size, and effect size, we obtained critical  $F = 2.73$ , for  $\alpha$  error probability 0.05,  $ES(f^2) = 0.15$ , and actual power = .80.

In order to examine the relationships between the variables in more detail, we analyzed their possible mediating effect. We checked the mediator's influence of General inefficiency in relation to two types of competitive anxiety

(Cognitive and Somatic) and Sports achievement (Figure 1). Two “Bootstrapping” analyzes were carried out using the Hayes PROCESS macro.

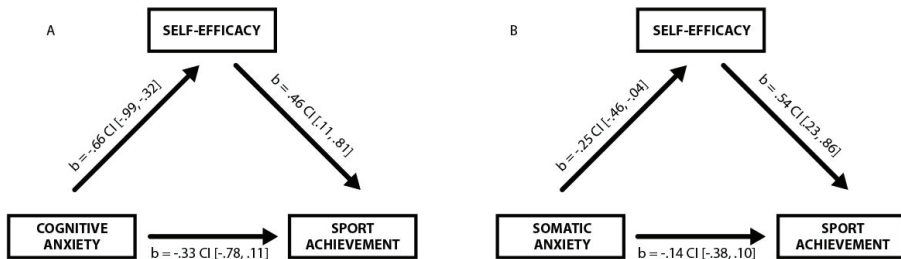


Figure 1. Analysis of mediating effects.

The results revealed that only the indirect effect of Cognitive anxiety on the Sports achievement through General Self-Efficacy is significant ( $b = -.30$ . CI [-.73. -.07]), while direct effect, remains insignificant (Figure 1a). This result suggests the total mediation of General Self-Efficacy on the relationship between Cognitive anxiety and Sport achievement. Similar results (Figure 1b) are obtained for Somatic anxiety ( $b = -.13$  CI [-.40. -.004]). These results indicate that high levels of anxiety reduce sport achievement solely by reducing the self-efficacy experience, and not directly. It is important to note that in the inverse analysis, that is, when the anxiety variables were set up as mediators, mediation was not significant.

## Discussion

The purpose of this study was to explore the influence of somatic and cognitive anxiety, as well as of general self-efficacy on sport achievement. The research question was whether low general self-efficacy is the basis for the development of competitive anxiety or anxiety produces a low general self-efficacy of the athlete? Clarifying this relationship is essential for designing effective psychological treatments within sports psychology that can positively influence the improvement of both individual and collective sports achievements.

To answer research question we firstly conducted regression analysis in which the predictor variables were somatic and cognitive anxiety, as well as general self-efficacy, and the criterion variable was a self-assessment of the sports achievement at an annual level by the competitors in collective sports. In regression analysis, General Self-Efficacy (in positive direction) and Cognitive anxiety (in negative direction) are significant predictors of Sports achievement. However, subsequent “Bootstrapping” analyses with Hays’s PROCESS



macro, showed that General Self-Efficacy represents the mediator variable between Cognitive anxiety and Sports achievement. This result means that Cognitive anxiety influences sports achievement only through the level of General Self-Efficacy. A lower level of General Self-Efficacy leads to lower Sports achievement.

In other words, although it is known that anxiety harms sporting performance, our results imply that this relationship is not direct. In this case, anxiety influences self-efficacy and lower self-efficacy negatively affects sports achievement. This result further implies that the target of psychological interventions should primarily be the self-efficacy of the athlete.

Cognitive Behavioral Therapy (CBT) interventions such as imagery, goal-setting, thought management and self-talk, physical relaxation and arousal regulation proved to be effective both in improving self-efficacy and reducing anxiety (Vealey & Forlenza, 2013; Van Raalte et al., 2016; Zakrajsek & Blanton, 2017). CBT is also considered as a treatment of choice for the management of sport-related anxiety (Martnes et al., 1990; Smoll & Smith, 1996). In general, the individuals or groups work with the psychologist or therapist to address the negative thoughts and behaviors that underlie the anxiety symptoms.

The recommendation for the practice, but also for the future research, is the design and empirical testing of a specific CBT program aimed to improve the self-efficacy of athletes in collective sports, given that they have been dealt with in this research.

### Conflict of interest

We have no conflicts of interest to disclose.

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## Appendix

### Appendix A: Questionnaire of Sports Achievement

Assess the extent to which each of these statements is true for you in the last year. The numbers have the following meaning: 1 - *strongly disagree* ... 4 - *neutral* ... 7 - *strongly agree*

1	I achieve great results.	1	2	3	4	5	6	7
2	I often experience success.	1	2	3	4	5	6	7
3	I train regularly.	1	2	3	4	5	6	7
4	I work hard on the training.	1	2	3	4	5	6	7
5	I reach my maximum performance on the field.	1	2	3	4	5	6	7
6	The coach is pleased with my performance on the field.	1	2	3	4	5	6	7
7	I am a real team player, and I stand for the team and cooperate.	1	2	3	4	5	6	7
8	The coach is pleased with my contribution to the team.	1	2	3	4	5	6	7
9	I am motivated by the competitive spirit.	1	2	3	4	5	6	7
10	Victory motivates me. I am motivated by victory.	1	2	3	4	5	6	7

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# PREISPITIVANJE ULOGE ANKSIOZNOSTI I SELF-EFIKASNOSTI U POSTIGNUĆU U KOLEKTIVNIM SPORTOVIMA

Uticaj anksioznosti i self-efikasnosti na postizanje sportskog uspeha predmet je brojnih istraživanja u sportu, ali njihov odnos nije u potpunosti razjašnjen. U našem istraživanju pokušavamo da objasnimo da takmičarska anksioznost utiče na sportska dostignuća samo kroz nivo izraženosti generalne self-efikasnosti. Niži nivo generalne self-efikasnosti dovodi do nižih sportskih dostignuća. Da bismo istražili odnos između generalne self-efikasnosti i anksioznosti u vezi sa sportskim postignućima, ispitali smo 76 aktivnih sportista u ekipnim sportovima, kao i njihove trenere. Primenjeni su sledeći instrumenti: Upitnik stanja takmičarske anksioznosti, Skala generalne self-efikasnosti i Upitnik sportskih postignuća. Rezultati pokazuju da kognitivna anksioznost negativno korelira sa sportskim postignućim ( $r = -.38, p \leq .01$ ), za razliku od somatske anksioznosti koja ne pokazuje značajnu povezanost sa postignućima. Ipak, najviša veza je pozitivna korelacija između self-efikasnosti i sportskog postignuća ( $r = .51, p \leq .01$ ). U regresionoj analizi značajni prediktori sportskog postignuća su self-efikasnost ( $\beta = .39; p \leq .01$ ) i kognitivna anksioznost ( $\beta = -.24; p \leq .05$ ). Urađena je analiza medijacije kako bi se ispitao potencijalni prediktorski uticaj generalne self-efikasnosti na takmičarsku anksioznost i sportsko postignuće. Dobijeni rezultati pokazuju da kognitivna anksioznost utiče na sportsko postignuće samo kroz nivo opšte self-efikasnosti ( $b = -.30, CI [-.73, -.07]$ ). Niži nivo opšte self-efikasnosti dovodi do nižih sportskih postignuća. Shodno tome, možemo zaključiti da za poboljšanje sportskih postignuća psihološka intervencija treba da bude prvenstveno usmerena na unapređenje self-efikasnosti sportiste.

**Ključne reči:** self-efikasnost, kognitivna anksioznost, takmičarska anksioznost, kolektivni sportovi, sportsko postignuće