

Personality resources as a mediator of the relationship between antecedents of stress and pre-competitive anxiety

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Published online: December 31, 2018

(Accepted for publication November 17, 2018)

DOI:10.7752/jpes.2018.04335

Abstract:

Purpose: The main purpose of this paper was to study the mediator effect of personal resources in synergies between the antecedents of stress (the perceived readiness for the competition and the perceived complexity of the goal) and pre-competition anxiety in swimmers. **Methods:** We conducted a confirmatory and mediator analysis in the context of structural equation modeling to study the data of a cross-sectional survey of male swimmers ($n = 98$; $M = 18.28$ years; $SD = 1.33$). **Results:** Testing of the model of personality resources showed that the four indicators – self-efficacy, self-control, optimism and grit – constitute a single factor. As a result of the mediatory analysis, the partial indirect effect of personality resources on the state of pre-competition anxiety of swimmers was obtained. **Conclusions:** It is established, that personality resources (self-efficacy, self-control, optimism and grit) have a systemic organization and form an integral factor at the level of empirical indicators. They partially mediate the influence of competitive stress factors on the level of situational anxiety, contributing thereby to its reduction in athletes.

Key words: stress, pre-competitive anxiety, personality resources.

Introduction

The problem of anxiety, especially pre-competition anxiety, is one of the most relevant in sports psychology (Jones, 2000; Nahum, 2017; Martens et al., 1990). The state of anxiety is caused by various stressors as its antecedents (Hanton et al., 2008). There are cognitive and somatic components usually distinguished in an anxiety state. The cognitive aspect of anxiety is characterized by negative expectations for success or self-esteem, concern over performance, pictures of failures, inability to concentrate and redirect attention. Somatic anxiety is caused by vegetative excitation of the body and manifested in such negative symptoms as muscle tension, rapid heart rate, high blood pressure, moist palms, etc. As the studies show, both cognitive and somatic anxiety may have a differentiated effect on athletic performance (Parnabas et al., 2015; Woodman & Hardy, 2003).

The most common theory in stress studies in the physiology of sport is Lazarus and Folkman transactional model of stress appraisal and coping (Lazarus & Folkman, 1984). According to this model, the cognitive assessment of the situation as a threat is the key factor in the development of psychological stress. However, despite the fact that the main focus of transactional theory is on the appraisal, the degree to which individuals assess the situation as threatening and the coping they choose to respond to it is largely determined by personality and social resources. Despite the widespread popularity, the transactional theory still does not answer the question: why do individuals perceive the situation as threatening?

The conservation resource (COR) theory by S. Hobfoll (Hobfoll, 1989) tries to give the answer to this question. According to COR, the cause of stress is the loss of resources or a threat of their loss. The RCT defines resources as «... those entities that are either centrally valued in their own right or act as a means to obtain centrally valued ends» (Hobfoll, 2002, p. 307). Hobfoll distinguishes four types of resources: 1) objective; 2) social; 3) energy; and 4) personality. The latter are decisive; they play a paramount role in the context of overcoming stress, providing the individual with the ability to adapt. Personality resources are aspects of Self, which are related to resistance to stress and to the sense of people in their ability to successfully control and influence the environment (Hobfoll et al., 2003).

According to Hobfoll, one of the key resources is a generalized sense of self-efficacy (Schwarzer & Jerusalem, 1995). Self-efficacy is defined as a belief in own ability to effectively influence own «environment» and achieve own goals. As Bandura showed, individuals with high self-efficacy are more stable in stressful situations (Bandura, 1997). The athletes' belief in self-efficacy has positive and moderate correlations with sport performance (Feltz, 2008).

The second key resource is dispositive optimism, which is understood as a positive attitude to the future (Carver & Scheier, 2002). It was found that this personality trait is one of the most important predictors of stress

coping. A research analysis indicates that there is a correlation between optimism and sport performance (Chiesi et al., 2013).

Another important resource is self-control, as a conscious aspect of self-regulation, aimed at controlling own behavior relatively autonomously from external pressure, from innate or acquired automatisms and physiological impulses (Baumeister & Tierney, 2011). A number of studies have shown that the resource of self-control is an important psychological mediator of the stress in sport (Englert & Bertrams, 2012; Furley et al., 2013). Another key resource is the ability to perseverance (grit). The «grit» concept is defined as the persistency in efforts and consistency of interests in achieving long-term goals, disregarding failures and obstacles, and an important factor of success in a variety of activities (Duckworth et al., 2007). Despite the fact that the «grit» construct is a relatively new subject of study in sports psychology, it has been established that athletes who stubbornly pursue their goals are more successful in sporting activities (Elumaro, 2016; Larkin et al., 2016).

Each of four positive constructs is conceptually independent and has empirically substantiated discriminatory validity. In previous studies, these key personality resources were considered as separate predictors of anxiety, or sports performance. Their effects are moderate. It can be assumed that the combination of these four constructs will have a higher predictive ability than any of them separately. Understanding stress as a process allows logically binding together three types of variables in anxiety studies: antecedents (stress factors), intermediate (personality resources), and consequent (stress reactions). Thus, the present study postulates the following hypotheses.

Hypothesis 1: The four personality characteristics described above are interrelated by the general factor of higher order – personality resource index.

Hypothesis 2: Personality resources mediate the influence of competitive stress factors on the consciousness and activity of athletes and make them more resistant to stress, able to control the level of pre-competition anxiety.

The purpose of this paper was to study the mediator effect of personality resources in synergies between the antecedents of stress (the perceived readiness for the competition and the perceived complexity of the goal) and pre-competition anxiety in swimmers.

Material & methods

Participants and Procedure

The study involved 98 male swimmers aged 17 to 20 years ($M = 18.28$ years, $SD = 1.33$). They were moderately experienced and moderately successful. All participants gave their consent before they received the questionnaire. Participants were provided with general information about the study and assured of the confidentiality and complete anonymity of the answers. Filling in the questionnaires, which measured the anxiety antecedents and anxiety states, took place 1 hour before the start.

Measure

Antecedents of anxiety were measured using a modified Pre-Race questionnaire (Arapoglou et al., 2013). The analysis took into account two scales: perceived readiness and perceived complexity of the competition goal. The check of reliability and consistency of empirical data showed an acceptable internal consistency of scales (Cronbach's α .71 and .68, respectively).

Personality resources were measured:

Overall self-efficacy scale (Schwarzer & Jerusalem, 1995). The reliability coefficient for the measure stands at $\alpha = .80$ in the present study.

Self-control scale (Tangney, Baumeister, Boone, 2004). The internal consistency of the scale (Cronbach's α) in this study was .75.

Dispositional optimism test (LOT-R; Scheier et al., 1994). In the present study, the reliability coefficient for the measure stands at $\alpha = .78$.

Short grit scale (GRIT-S; Duckworth & Quinn, 2009). GRIT-S had an acceptable internal consistency of .77.

Spielberger short state anxiety self-assessment scale (Spielberger, 1985). The internal consistency of the scale was .87.

Statistical analysis

To test our hypotheses, we conducted a structural equation modeling that involved the confirmatory factor analysis and mediator analysis using AMOS 21 for Windows. The maximum likelihood method was used to evaluate the model parameters.

The correspondence of the model under study to the empirical data was estimated using the statistics of the chi-squared test (χ^2) and the root mean square error of approximation (RMSEA). The insignificant values of χ^2 indicate that the hypothetical model corresponds to the data, and the RMSEA values up to .08 indicate the acceptable relevance of data. In addition, we used a relative indicator of model matching quality: comparative fitness index (CFI). For this indicator, the value of .90 or higher is acceptable.

Results

Table 1 shows the means, standard deviations, correlations, and the internal consistencies (Cronbach's alpha) of the variables included in the analyses. As can be seen from this table, all scales show satisfactory Cronbach's alpha.

Table 1. Means, Standard Deviations, Internal Consistencies (Cronbach's α on the Diagonal), and Correlations Among the Variables ($N = 98$)

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Readiness	6.58	1.57	.71						
2. Difficulty of purpose	5.68	1.56	.50** *	.68					
3. Self-efficacy	29.97	5.20	.27**	.20*	.80				
4. Self-control	40.13	6.88	.25*	.30**	.57** *	.75			
5. Optimism	17.68	3.20	.32**	.33** *	.40** *	.48***	.78		
6. Grit	29.32	4.14	.31**	.41** *	.37** *	.65***	.38***	.77	
7. Anxiety state	10.74	3.33	.32**	.24*	-.23*	-.33***	-.34***	-.28**	.87

Note: * – $p < 0.05$; ** – $p < 0.01$; *** – $p < 0.001$.

To test the hypothesis 1, that 4 indicators of personality resources form a second-order factor, the model was tested (see Figure 1), which demonstrated good agreement with the data: $\chi^2 = 2.439$ (2); $p = .295$; RMSEA = .045; CFI = .996. To calculate the total indicator of personality resources (IPR), we used the sum of z-scores on 4 scales that are part of the factor.

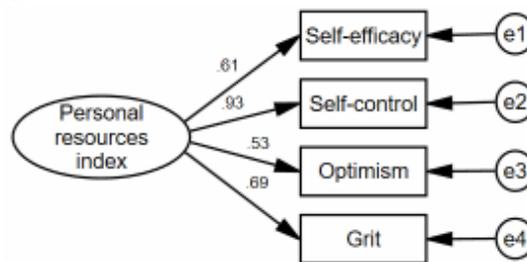
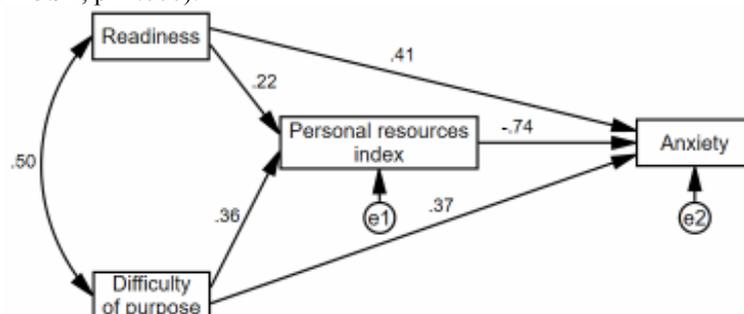
**Figure 1.** One factor CFI model personal resources index

Figure 2 shows the results of path analysis. As can be seen, the direct effect of perceived readiness of athletes to compete on pre-competition anxiety is positive and statistically significant ($\beta = .41$; $z = 4.82$; $p = .000$). The direct effect of the stressor, i.e. complexity of the competition goal on the state of anxiety is also statistically significant ($\beta = .37$; $z = 3.94$; $p = .000$).

**Figure 2.** Mediator model of determination pre-competitive anxiety

The most important information in the mediatory analysis is the indirect effect of stress factors on situational anxiety that is mediated by personality resources. It gives an opportunity to explain the nature and mechanism of communication, as well as answers to the question «how» and «why» personality resources influence the state of competition anxiety in swimmers.

Thus, the standardized indirect effect of perceived readiness on pre-competition anxiety through personality resources is estimated as $-.16$ ($z = -1.86$; $p = .06$). That is, two athletes who differ in one standard unit, according to the evaluated perceived readiness, differ by $-.16$ units by the level of competition anxiety in the mediation of personality resources. The bootstrap confidence interval (from $-.27$ to $-.05$) for this indirect effect is confirmed by the following statement with 95% confidence.

The indirect effect of the perceived complexity of the goal on the state of competition anxiety, mediated by a personality resource, is estimated to be $-.27$ ($z = -2.93$; $p = .003$). The bootstrap confidence interval is in the range from $-.34$ to $-.06$. Since the direct effects of perceived readiness and goal complexity on competition anxiety are significant, the result is partial mediator effects.

Discussion

This study deals with the associations between the antecedents of stress (perceived readiness and complexity of the competition goal) and the state of pre-competition anxiety in athletes, mediated by positive personality traits (personality resource: self-efficacy, self-control, optimism and grit).

The obtained data confirm the first hypothesis concerning the integral factor of personality resources, which determines the interrelation of the studied positive personality traits. Since the personality resources considered in our study are flexible personality traits and have a lifelong genesis, their correlation can be determined by the synergistic effect during the complication of athletes' activity and gain in experience.

A content analysis of the impacts of personality resource indicators on the latent factor obtained in the confirmatory model indicates that the most significant personality resources are self-control and perseverance. Athletes with a high level of self-control can better control their thoughts, regulate their emotions and slow down their impulses compared to those who have low self-control. A high level of perseverance contributes to the ability of athletes to focus on long-term goals and to withstand situational temptations and short-term achievements. These results are consistent with the numerous available data on the importance of self-control and perseverance as factors in resisting stress, self-control of the state of anxiety and competitive performance of athletes (Englert & Bertrams, 2012; Furley et al., 2013; Elumaro, 2016).

The innovative contribution of this study to literature is that four key personality resources have not previously been studied as part of a holistic model of both predictors and mediators of pre-competition anxiety in sports. The study revealed a partial mediator effect of personality resources. Thus, the second hypothesis received partial confirmation. In a situation of sports competitions, personality resources perform a filtering function, mediating the influence of the competition situation on the consciousness and activity of athletes, participating in the assessment of the degree of influence of stress factors, by giving personality meaning to the situation. They alone do not carry an assessment, but their severity transforms the very subjective scale that underlies subjective assessments, contributing to the assessment of the situation. Personality resources help perceive the requirements of competitions as a challenge and regard them as a complex task, rather than a threat to the psychological well-being of athletes.

The results demonstrate the instrumental role of personality resources: they are engaged where the situation requires and contribute to the achievement of the goals. Personality resources considered in the study have a lifelong genesis and are correctable and evolvable that can be used in the psychological training of athletes.

Conclusions

A negative emotional state associated with a feeling of nervousness, worry, anxiety and excitement of an organism that athletes experience during competitions is defined as situational anxiety. Cognitive and somatic components of anxiety differentially influence the sport performance.

The results of the study showed that the perceived readiness and complexity of the competition goal, which were considered as antecedents of anxiety, are positively and statistically significantly related to pre-competition anxiety in swimmers.

Personality resources have a systemic organization and form an integral factor of personality resources at the level of empirical indicators.

The second-order factor of personality resources partially mediates the influence of competitive stress factors on the level of situational anxiety, contributing thereby to its reduction.

Conflict of interest: Authors state no conflict of interest.

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