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**SELF-REGULATION AND PERSONALITY TRAITS IN
OVERCOMING ACUTE AND CHRONIC STRESS**

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Abstract

In this paper we examine the role of conscious self-regulation and Eysenck personality traits in overcoming acute and chronic stress. The research sample includes 274 participants (153 male, 121 female) aged 20 to 61. The participants completed Morosanova's Self-Regulation Profile Questionnaire - SRPQM; Russian version of the Eysenck Personality Profile - Short (EEP-S), and two scales of Managerial Stress Survey (MSS, Leonova, 2001): Chronic stress manifestation and Acute stress manifestation. To examine the connections between the self-regulation, personality traits and stressful states (of acute and chronic character) the structural equation modeling was used. The study results demonstrated that self-regulation and personality traits are associated with acute and chronic stress in different ways. Personal dispositions (high neuroticism and introversion) significantly dictate the severity of chronic stress and to a lesser extent - acute stress. Self-regulation contributes to overcoming acute stress due to high scores of its reliability and by means of highly developed processes of programming actions, modeling significant conditions, and evaluating the results. The study also revealed the mediator role of self-regulation in the personal dispositions' influence on acute stress..

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1. Introduction

The problem of stress traditionally captures attention of researchers in various fields of psychology and related disciplines. To date, a number of personality traits have been identified as affecting development of stressful states: anxiety (Spielberger, 2006), locus of control (Rotter, 1990; Karaman & Watson, 2017), dispositional optimism (Scheier & Carver, 1985; Nes, 2016); self-esteem (Nima et al., 2013; Pruessner, Hellhammer, & Kirschbaum, 1999) self-efficacy (Bandura, 1997, Shwarzer & Hallum, 2008), etc. The issues of relationship between stress and basic personal measurements were elaborated in detail. Studies have shown that people with high neuroticism are more susceptible to stressful situations (McCrae, 1990) and are less skillful in coping with stress (McCrae & Costa, 1991; Gunthert, Cohen, & Armeli, 1999) and regulate negative emotional states (Watson & Clark, 1984). Neuroticism is also serves as an important moderator of physiological stress response (Bibbey et al., 2013; Evans et al., 2016). In general, in search of risk factors for stress related diseases there is a growing interest to the direct role of neuroticism (Hettema, Prescott, & Kendler, 2004; Uliaszek et al., 2010; Zinbarg et al., 2016). It is also shown that extraversion is negatively correlated with stress at the workplace (Grant & Langan-Fox, 2007) and positively - with subjective well-being (Goodwin & Engstrom, 2002).

Recently, to solve a variety of problems related to stress and coping issues, researchers addressed to the problem of self-regulation (SR), which in this regard is of significant importance as highlighted by Carver and Scheier (1999). At present, in the context of stress and coping issues, the growing interest is paid to the SR mediator role. A number of studies investigated the mediator role of self-regulation in the interrelation of personality, coping and professional demands (Gottschiling et al., 2016), between personal dispositions and actions reliability in psychologically stressful situations (Morosanova et al., 2017), between the negative career feedback and career outcomes (Hu, Hood, & Creed, 2018). In the study of self-regulation as a limited resource, it is shown that overcoming stress, regulating its negative influence reduces the self-regulation ability and leads to the so-called regulatory depletion (Muraven & Baumeister, 2000). In the study of self-regulation (regulation of actions) in sportsmen-shooters under psychologically difficult conditions of competitive struggle it is proved that development of stress among athletes can be compensated by their self-regulation (Morosanova, 2013).

Previously, in our studies oriented to solutions for overcoming stressful conditions and the problem of human actions reliability we investigated the relationship between the conscious self-regulation and the stress-type functional states. The study revealed that high development of conscious self-regulation enhances the psychic reliability of professionals, compensating for the adverse impact of stressful events on their activities success, and prevents fixation of negative «stress-type» functional states in the form of stable behavioural and personal deformations (Morosanova et al., 2009). In our investigation of the regulatory and intrapersonal prerequisites for the human actions reliability under psychologically stressful conditions, we proved that development of conscious self-regulation is a significant resource of the reliability of human actions (Kondratyuk & Morosanova, 2010) as well as the mediator between personal dispositions and indicators of the actions reliability (Morosanova et al., 2017).

It will be fair to note that in addressing the issues of resistance to the effects of stress etiology factors and overcoming stress, predictors related to different psychic levels of individuality are usually considered in isolation and independent of each other. Besides, there is not enough research integrating

different approaches. Therefore, in our opinion, particularly important in theoretical and practical sense is the issue of interrelations within the triad «self-regulation – personality - stressful states».

The structural interrelation of conscious self-regulation with extraversion and neuroticism (according to Eysenck) and stress manifestations was revealed for the first time on a special professional sample (Morosanova, 2012). In the empirical study presented in this article (in a larger and less specific sample), we had our task to verify and refine the previously obtained patterns and develop ideas about the mediator role of self-regulation between personal dispositions and stress manifestations.

In our studies we consider self-regulation based on the approach proposed in the works of V. Morosanova (Morosanova, 2013), who defines conscious self-regulation as the human ability to setting the goals and managing their achievement by means of the functional cognitive- regulatory processes (Goal planning, Modeling of significant conditions, Programming of actions, Results evaluation) and instrumental personal-regulatory features (Flexibility, Independence, Reliability). Through the agency of these cognitive-regulatory processes and personal-regulatory features, a person coordinates his psychological resources to advance and achieve the goals of activity (Morosanova, 2014). In our studies of the stress symptoms we rely on the structural-integrative approach which is characterized by understanding stress as a special class of a subject's states that result from the changes in the mechanisms of activity and behavior regulation under the influence of current and prolonged stress factors and various difficult situations (Leonova, 2004, 2007). This approach appears as more advantageous as it provides research with methods for diagnosing the symptoms of acute and chronic stress, which we used in our study (Leonova, 2001). Basic personality traits (extroversion and neuroticism) were examined and considered in accordance with H. Eysenck's dispositional theory of personality (Eysenck, 1981).

2. Problem Statement

On the one hand the self-regulation is a topical and essential part of the stress and coping modern research (Carver, Scheier, & Fulford, 2008). On the other hand, numerous studies explored the contribution of personality traits (extraversion and neuroticism) to the stress sensitivity (McCrae, 1990; Grant & Langan-Fox, 2007). This paper investigates the role of conscious self-regulation and Eysenck personality traits in overcoming acute and chronic stress.

3. Research Questions

In this article we are going to answer a number of essential questions.

First: what are the structure and the nature of the interrelationships of the conscious self-regulation and personality traits with stress manifestations?

Second: what is the specificity of the relationship between the conscious self-regulation, personality traits (by Eysenck) as predictors of stress and the severity of its acute and chronic symptoms?

And the last but not the least: is the conscious self-regulation mediating the influence of personality traits (in particular, neuroticism and introversion) on the development of stress?

4. Purpose of the Study

In this study we set a goal to understand the relationship between the conscious self-regulation, Eysenck personality traits and different forms of stressful states.

5. Research Methods

5.1. Participants

The study involved 274 people (153 men and 121 women) from different professional groups (teachers, rescuers, pilots) aged 20 to 61 ($M = 34.69$; $SD = 10.57$). All participants completed the tests in the same order and in the presence of the researcher. The average time to complete all the tests was 70 minutes. All the data obtained during the study were recorded and processed anonymously.

5.2. Measures

The diagnostic package included three methods for assessing personal, regulatory and stress variables.

- To scrutinize individual features of self-regulation, we used Morosanova's Self-Regulation Profile Questionnaire (SRPQM), modified release of 2011 (Morosanova & Kondratyuk, 2011). The 52-item questionnaire includes 8 scales assessing basic regulatory processes (goal planning, modeling of significant conditions, programming of actions, and results evaluation) and personal-regulatory features (flexibility, independence, and reliability of self-regulation). The questionnaire also includes the integrated indicator characterizing the overall development of the conscious self-regulation system. The general level of self-regulation is calculated as the total sum score. Participants responded on a 4-point scale ranging from «strongly agree» to «strongly disagree». This version of the questionnaire was validated by means of all the psychometric procedures and standardization based on the sample of 820 subjects aged 18 to 66 (Morosanova & Kondratyuk, 2011).
- Eysenck Personality Profile - Short (EPP-S) (Russian version adapted by «Kogito-centre», 1999) is a 200-item questionnaire including 3 basic bipolar scales to assess extraversion, neuroticism, and psychoticism. The Russian release went through all the procedures of psychometric validation.
- Two scales of Managerial Stress Survey (MSS): Chronic stress manifestation and Acute stress manifestation (Leonova, 2001). Each scale consists of 22-32 items. Items are rated on a 4-point scale ranging from «strongly agree» to «strongly disagree» to indicate the extent of compliance of each item to subjective experience. These scales describe the phenomenology of the most distinctive acute stress manifestations, such as physiological discomfort, cognitive tension, emotional strain, difficulties in communication, complications in acting, general well-being, as well as chronic stress manifestations, such as anxiety, aggression, depression, asthenization, psychosomatic reactions, and sleep disorders. The original version of MSS was developed and standardized in-parallel in Russian, English and German on the sample of over 2000 people.

6. Findings

To answer the first question - what is the structure and nature of the interconnections of conscious self-regulation and personality traits with manifestations of stress? - we used the structural modeling methods by means of comparing several alternative models. When constructing the models, the maximum likelihood method, implemented in the EQS 6.1 program, was used. Based on theoretical assumptions and research tasks, we compared the models with four latent factors: «Self-regulation», «Dispositions», «Acute stress» and «Chronic stress», differing by the presence of connections between the factors examined. Indicators obtained during the study were used as Indicator variables. We analyzed the models taking into account different options of the relationship between the four factors. The resulting structural model is shown in Figure 1.

The model admits the existence of a correlation between the factors «Self-regulation» and «Dispositions». The «Dispositions» factor contributes to the «Chronic Stress» factor and, to a lesser extent - to the «Acute stress» factor, and the «Self-regulation» factor determines the «Acute stress» factor. This model shows good agreement with empirical data: chi-square (df = 111) = 201.85; CFI= 0.96; SRMR = 0.04; RMSEA = 0.05 (90% range from 0.042 to 0.066). All factor loads, regression coefficients and correlations between the factors were significant, and their signs corresponded to our theoretical assumptions.

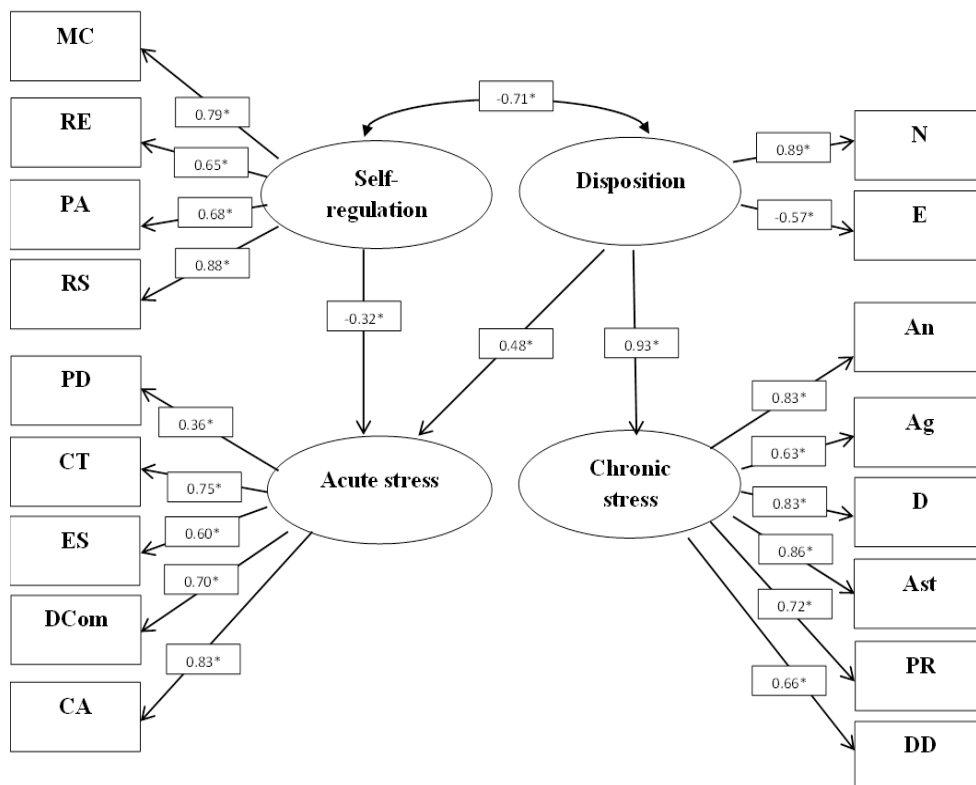


Figure 01. The structural model of personality traits, self-regulation and stress states

Notes. MC – Modeling of significant conditions, PA – Programming of actions, RE – Results evaluation, RS – Reliability of self-regulation, N – Neuroticism, E – Extraversion, PD – Physiological discomfort, CT – Cognitive tension, ES – Emotional strain, DCom – Difficulties in communication, CA – Complications in acting, An – Anxiety, Ag – Aggression, Dep – Depression, Ast – Asthenization, PR – Psychosomatic reactions, SD – Sleep Disorders; * – load is significant at $p < 0.05$.

«Extraversion» and «Neuroticism» serve as indicator variables for the «Dispositions» factor and bipolarity of these indicators allows to diagnose introversion and stability. Factor «Self-regulation» includes indicator variables «programming», «modeling», «results evaluation», «reliability of self-regulation». The «Acute stress» factor is represented by indicators «physiological discomfort», «cognitive tension», «emotional tension», «difficulties in communication», and «difficulties in behavior». This factor includes all the subscales that reflect the acute form of stress experience in the MSS technique, except the «General health» subscale which is a kind of quintessence of acute stress manifestations and is actually the factor of a higher order. For the «Chronic Stress» factor, the indicator variables are all the subscales included in the «Chronic Stress» scale of the MSS technique: «anxiety», «aggression», «depression», «asthenia», «psychosomatic reactions», and «sleep disorders».

Analysis of the structural model allows us to answer the second question - what is the specificity of conscious self-regulation and Eysenck personality traits as predictors of acute and chronic stress. The model shows that personal dispositions, primarily high neuroticism (maximal regression coefficients) and introversion determine the severity of chronic stress. Their influence on acute stress can be traced to a lesser degree. The highly developed conscious self-regulation and its reliability prevent manifestations of acute stress. This effect is achieved due to the high degree of self-regulation development and reliability of regulatory processes of programming actions, modeling significant conditions, evaluating the results under the stressful conditions.

It should be noted that structure of the constructed model basically corresponds to the one obtained previously in another sample (Morosanova, 2012), which indicates good reproducibility of the model. The patterns revealed in the model appear to be quite theoretically grounded. So, acute stress is caused by the impact of extreme short-term stressors and assumes, first of all, the rapid consumption of "superficial" human adaptive resources: emotions, defensive behavior, acquired skills, ability to overcome troubles and cope with burden. In this case conscious self-regulation can serve as a subjective resource of a person, ensuring overcoming mostly acute stress conditions. Note that «Self-regulation» factor does not include «planning» – the only one of the four regulatory processes («goal planning», «modeling of significant conditions», «actions programming», and «result evaluation»). When it was included as an indicator variable in the latent factor «Self-regulation», the model indicators deteriorated significantly. Explaining this result, one should take into account the peculiarities of stressful situations, often excluding the possibility of planning in general.

Among the regulatory-personal properties, the indicator «regulatory-personal reliability» is of the greatest interest in the context of overcoming acute stress states. Considering self-regulation reliability as the stability of mental activity self-regulation in psychologically difficult, stressful situations, the inclusion of this indicator in the «Self-regulation» factor seems quite natural and expected. Moreover, as it follows from the model, it is this variable that accounts for the maximum regression coefficient. Earlier in our studies we demonstrated the importance of this regulatory-personal characteristic for the reliability of actions under the psychologically stressful conditions of professional activity (Morosanova et al., 2017; Morosanova, 2012). The connection between conscious self-regulation and acute stress was confirmed in the previously mentioned research. New in this study is the revealed contribution of personal dispositions (primarily neuroticism) to the formation of acute stress which is supported by the model.

As for the determining connection of personal dispositions and chronic stress, the results of the study show that high neuroticism and high introversion aggravate the severity of chronic stress and its symptoms. The relationship between neuroticism and chronic stress has been confirmed in a number of studies (Brown & Rosellini, 2011; Gunthert et al., 1999). Chronic stress caused by the long-term stressors and involving adaptation to prolonged extreme factors, mobilization and consumption of human adaptive resources, may highlight and reveal personality features associated with the temperament and character of a person which in daily routine are expressed less clearly and can be compensated by self-regulation. The absence of a link between chronic stress and conscious self-regulation is consistent with an understanding of the resource basis of self-regulation and considering self-regulation as a limited resource (Baumeister & Alquist, 2009; Morosanova, 2014). Moreover, as Evans and Kim (2012) notes in his research, accumulating chronic stressors can destroy self-regulating processes that can cope with external difficulties.

Attention should be paid to the high correlation between the «Self-regulation» factor and the «Dispositions» factor, which is consistent with numerous data on the existence of a regulatory basis of the personal dispositions (Morosanova 2003, 2012, 2013; McCrae & Lockenhoff, 2010; Rothbart, Ellis, & Posner, 2004). As noted by R. Hoyle, "the characteristic means by which people self-regulate and the routine success or failure they experience are reflected in personality traits. Many of these traits are rooted in temperament..." (Hoyle, 2010, p. 2). Morosanova (2003, 2013) also emphasizes that individual profiles of self-regulation, manifested both in the development of a person's overall level of self-regulation and in the individual manner of setting and achieving the goals, are largely determined by the properties of temperament and character, in particular extraversion and neuroticism. At the same time, a high level of conscious self-regulation development makes possible to reduce the negative impact of neuroticism on human behavior. The data proving that influence of certain personality traits on behavior can be weakened (reduced) with sufficient development of the self-regulation capacity are given in a number of studies (Hoyle, 2006; DeWall et al., 2010).

To address the third question of the article - whether the conscious self-regulation is mediating the influence of personal characteristics (in particular, neuroticism and introversion) on the development of stress, Sobel's test was conducted that allowed to construct and analyze two models describing the options for mediating acute and chronic stress. The mediator effect was tested for the general level of self-regulation (SR) as an integrative indicator of the development of regulatory-cognitive processes and regulatory-personal properties. The mediator effect of the self-regulation was tested in the analysis of neuroticism and extraversion as independent variables. Integral indicators of acute stress and chronic stress were used as dependent variables.

The Sobel test confirmed the mediator effect of the indicator of General self-regulation level (SR) in the influence of neuroticism and introversion on the severity of acute stress as a dependent variable (see Table 1). Thus, the conscious self-regulation is actually mediating the negative impact of neuroticism and introversion on the severity of acute stress manifestations.

Table 01. The statistical parameters of Sobel test result

Predictor	Mediator	Dependent variable	Sobel test	
Neuroticism	SR	Acute stress	4.684	0.000
Extraversion	SR	Acute stress	-4.474	0.000

For the dependent variable «chronic stress», the mediator effect of the general SR level was not confirmed, although it could be assumed on the basis of a correlation analysis that revealed statistically significant links between general SR level and neuroticism ($r = -0.45$; $p = 0.01$), general SR level and extraversion ($r = 0.41$; $p = 0.01$) as well as between general SR level and chronic stress ($r = -0.48$; $p = 0.01$). These results are consistent with the understanding of self-regulation as an exhaustible resource. So, in case this resource is sufficient - the influence of certain personality traits on behavior can be reduced being mediated by self-regulation, yet with the depletion of regulatory resources the influence of personality traits on behavior can be strengthened (Baumeister & Alquist, 2009; DeWall et al., 2010). Obviously, the impact of prolonged stressors will contribute to the emergence of the so-called self-regulatory exhaustion, thus contributing to the development of chronic stress under the influence of neuroticism.

In the future research it seems promising to investigate the phenomenon of duality in the nature of self-regulation, which follows from the data obtained. On the one hand, there is a so-called innate, natural ability for self-regulation rooted in the temperament of a person. On the other hand, - the conscious self-regulation developing in human experience under the influence of external social conditions, acquired in the course of professional activity and the formation of skills and, to some extent, responsible for the possibility to compensate initially given, natural self-regulation. In case of chronic stress, prolonged in time the acquired self-regulation becomes the most vulnerable, whereas the innate, natural self-regulation comes to the fore, and such temperamental properties of the person as extraversion and neuroticism begin to play a special role. In case of acute stress, stability of regulatory mechanisms allows to reduce the influence of personality traits aggravating susceptibility to stress factors.

7. Conclusion

New data have been obtained on the structure and specifics of the interrelationships between conscious self-regulation, personal dispositions (extraversion and neuroticism according to Eysenck) and manifestations of acute and chronic stress.

We have confirmed the earlier obtained data supporting our assumption that development of conscious self-regulation is a resource that helps to overcome acute stress symptoms, while overcoming the impact of long-term stress factors is more determined by severity of personal dispositions.

For the first time it is shown that development of a general level of conscious self-regulation prevents the emergence of acute stress, either directly or through means of mediating the influence of personal dispositions contributing to the development of acute stress.

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