

Mental regulation of psychological states in ordinary and stressful conditions

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Abstract. The problem of self-regulation is one of the central ones in the study of human behavior. To maintain sustainable behavior, it is necessary to manage oneself. The mental component of regulation is the least developed in the theoretical constructions of self-regulation of states. In this work, we set a goal – to identify the specifics of the relationships between the components of mental regulation and the characteristics of psychological states in situations with different level of stress. The study sample consisted of 92 people (41 men and 51 women, average age 23.7 years). During the study, standardized methods for diagnosing mental structures (reflexive, semantic self-system), psychological states, as well as ways of self-regulation were used. Based on the results of the study, we found that in everyday situations, the factor of mental state activity has the greatest weight, i.e. when performing routine tasks, the current state ensures efficiency and adequacy of behavior due to its regulatory function. In a tense situation, the factor of semantic regulation, which includes indicators of life-meaning orientation, comes to the fore. The contribution of mental structures involved in the regulation of the state depends on the characteristics of the situation. Thus, the importance of the components of consciousness in the regulation of mental states is shown. The results of the study can be used in the work of psychologists when planning and conducting activities aimed at increasing the regulatory capabilities of clients, taking into account the degree of tension in the life situation.

1 Introduction

The regulatory function of the psyche is a central topic in world psychology. A variety of theoretical approaches, concepts and models of self-regulation represent achievements in this area [1].

Meanwhile the area of self-regulation of mental states remains the least studied. This especially concerns the role of the components of consciousness in the regulatory process, as well as the integration of the obtained data into existing concepts of self-regulation. In this regard, the problem of this research is related to the situational aspect of the regulation of states, the study of the interrelation between mental states, methods of regulation and indicators of mental regulation in the range of “everyday - stressful” situations.

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The practical significance of the research is very high: self-regulation technologies are in demand in professional activities, training, overcoming stressful conditions, in elite sports, personal self-development, in maintaining health, correcting destructive forms of behavior associated with aggression, as well as in connection with the use of various types of psychoactive substances [2].

2 Purpose and objectives of the study

The purpose of the study is to identify the features of the relationship between the characteristics of mental regulation, methods of self-regulation and the intensity of mental states in situations of varying intensity.

The research hypothesis is as follows: in situations with different levels of stress there will be differences in the organization of relationships between the characteristics of mental regulation, methods of self-regulation and the intensity of states.

3 Literature review

Today, the subject of the psychology of self-regulation is quite well developed both theoretically and appliedly [3]. Experimental studies of regulatory processes are carried out not only “within” psychology itself, but also in related sciences [4]. New theoretical constructs related to self-regulation are emerging. Thus, on the pages of scientific publications devoted to various aspects of self-regulation one can find such terms as “self-organization”, “self-change”, “self-development”, “self-determination”, “self-monitoring”, etc., as well as applications of these constructs in various fields of psychology [5]. In our opinion, the generic concept for all of the above terms is the concept of “self-regulation”. All the other constructs are its various forms.

During human ontogenesis forms of self-regulation are becoming more complex in the following sequence: “self-control”, “self-discipline”, “self-government”, “self-determination”, “self-organization” [6]. The latter is the highest form of self-regulation; these are qualitative changes in the system of self-regulation as a whole leading to an increase in the level of its complexity and organization.

Along with the increasing flow of research, it should be noted that there is a significant fragmentation of regulatory concepts. Within the framework of theoretical psychology there is a need to integrate existing approaches, to understand self-regulation as a multi-level process of organizing behavior, activity and mental states.

Modern research increasingly shows a tendency towards the creation of integrative models of self-regulation. The latest such developments include the “integrated model of self-regulation” [1]. The authors have analyzed the most authoritative concepts of self-regulation in social psychology, personality psychology and cognitive neuroscience. Attempts at theoretical synthesis have shown that direct integration of these concepts into a single comprehensive model of self-regulation is impossible due to their significant heterogeneity. They showed that integration of this kind is possible only through identifying “points of convergence.” These key elements included “level of analysis,” “conflict,” “emotions,” and “cognitive functioning.” According to the researchers, the novelty of this approach lies in the need to explore the “vertical” of the regulatory process, to go beyond the immediate conflict, as well as to integrate the intellectual and emotional processes that underlie self-regulation.

Integrative models of this kind are being developed in relation to the theoretical constructs of self-control [7], metacognitive regulation [8], the development of self-regulation in ontogenesis [4], and self-regulation of emotions [9].

In the studies of domestic scientists, the term “mental self-regulation” is most often used. The latter is understood as expedient activity in organizing and managing behavior, activities, mental processes and human states [10]. Thus, the concept of “self-regulation” is broader in relation to other “self-processes” associated with changes introduced into mental processes and states by the subject himself.

The main task of the psychology of self-regulation is to study the role of mental processes as regulators that ensure a person’s sustainable focus on achieving his goals. The regulatory function of mental processes finds its expression in the structure of mental regulation of human activity. There are two approaches to describing the structure of mental self-regulation.

Within the first approach we can see creating of block-type structural and functional models. In these models the structure of mental self-regulation is revealed as a system of blocks that are necessary and sufficient for the sustainable achievement of specified results. The second approach is focused on studying the structure in terms of the levels and main components of self-regulation, their place and role in a single regulatory process. A special area of research is activities on self-regulation of mental states, aimed at achieving optimal interaction with oneself.

The experience of studying self-regulation of mental states is generalized and systematized in the concept of self-regulation by A. O. Prokhorov, which is the theoretical basis of our empirical research [11]. A holistic model of mental regulation of states is a structure of relationships between mental states, characteristics of consciousness: reflection, mental representations, experiences, semantic structures, mental (subjective) experience, target characteristics and external social factors, such as situations, cultural space, lifestyle, temporary factors coupled with regulatory actions and feedback. Self-regulation of mental states is carried out at three levels: the level of regulation of a single state (basic level), the level of functional complexes (formed in repeated situations of life) and at the general level (a holistic functional structure of regulation). At the basis of regulation are the mechanisms for changing a particular mental state. The transition from one state to another is carried out using various regulatory methods. The central integrating formation of self-regulation is the mental (subjective) experience of a person, in which the “I” system acts as the leading structure. This mental experience integrates the components of consciousness, which is aimed at achieving the goal - regulation of the mental state of the subject.

4 Methodology

The study of the specific influence of mental structures on the self-regulation of mental states was carried out on a mixed sample consisting of students, professional athletes and office workers. 92 people took part in the study, of which 41 men and 51 women, average age 23.7 years.

In the study we used standardized methods well known in Russian psychology. We measured indicators of mental states, self-attitude, reflection, means, effectiveness of self-regulation, self-control of emotions and behavior, ability to self-government, as well as ways of coping behavior.

We used the methods of mathematical statistics: factor analysis (principal component analysis, Varimax rotation) and Student’s t-test. Data processing was performed in the SPSS Statistics 23.0.

The study was carried out in stages. At the first stage, we measured the mental state and features of regulation in everyday situations. The nature of the everyday, routine situation for athletes is most consistent with the training process, for students - with a lecture session, for office workers – with the conditions of a normal working day. At the second stage, we took measurements of the mental state and characteristics of self-regulation of respondents

in a tense situation. For athletes it is the conditions of competition. For students it is a semester exam and for office workers it is the process of writing an annual report.

5 Results

Comparison of state characteristics according to Student's t-test under stressful and everyday situations showed differences both in average intensity ($p < 0.001$) and in individual subsystems of states: mental processes ($p < 0.025$), physiological reactions ($p < 0.029$), experience ($p < 0.005$), behavior ($p < 0.001$). Differences in indicators of behavior and experiences turned out to be the most notable.

In a tense situation behavior becomes less consistent ($p < 0.004$), thoughtful ($p < 0.010$), controlled ($p < 0.004$), adequate ($p < 0.003$), relaxed ($p < 0.002$), stable ($p < 0.000$), confident ($p < 0.000$) and open ($p < 0.002$). The intensity of the experiences of cheerfulness ($p < 0.006$), optimism ($p < 0.017$), liberation ($p < 0.001$), lightness ($p < 0.001$) and relaxedness ($p < 0.001$) decreases. In a tense situation muscle tension significantly increases ($p < 0.004$), discomfort from the gastrointestinal tract appears ($p < 0.001$), as well as dryness of the oral mucosa ($p < 0.039$).

The average rate of use of various self-regulation methods is also higher in everyday situations. Comparison of averages using Student's t-test revealed significant differences in methods such as passive rest ($p < 0.008$); active discharge ($p < 0.002$); rumination ($p < 0.003$); passive discharge ($p < 0.030$). It has been found that the intensity of using various methods varies slightly from situation to situation, at the same time respondents use active methods of self-regulation to a greater extent.

In order to explore the correlation of mental structures with mental states and the characteristics of its regulation in various situations we have carried out factor analysis. The initial set of variables included indicators of reflexivity, semantic characteristics, self-attitude, mental states, regulatory qualities and the effectiveness of self-regulation. The results of factor analysis for the everyday situation revealed 13 factors (61% of the variance); of which six factors explain 52% of the variance (Table 1).

The structure of the first factor (24.6% of the variance) consisted of 12 variables. The core of the structure is the components of mental states, followed by indicators of self-regulation and regulatory properties. Therefore, this factor can be interpreted as "state activity".

Table 1. Factor analysis of indicators of mental states regulation in everyday situations

Factor 1 State activity (24.6%)	Factor loadings
State intensity	0.86
Activity of experience	0.83
Activity behavior	0.78
Activity of mental processes	0.76
Activity of physiological reactions	0.71
Regulation of mental processes	0.68
Regulation of behavior	0.61
Regulation of experience	0.65
Passive discharge	-0.53
Modeling	0.44
Factor 2 Semantic regulation (7.2%)	
Meaningful of life	0.85
Result of life	0.72

Locus of control – Self	0.71
The purpose of life	0.72
Self-attitude	0.52
Planning	0.55
Perseverance	0.40
Self-acceptance	0.42
Factor 3 Positive self-esteem (6%)	
Self-accusation	-0.79
Internal conflict	-0.72
Self-confidence	0.65
Self-worth	0.56
Self-leadership	0.55
Self-attachment	0.55
Reflected self-attitude	0.59
Openness	0.44
Factor 4 Awareness (5.5%)	
Recognizing your condition	0.79
Recognizing the state of others	0.77
Awareness of your condition	0.57
Awareness of the condition of others	0.77
Identifying your condition	0.74
Identifying the state of others	0.77
Factor 5 Reflexive regulation (4.7%)	
Reflexivity	0.94
Reflection on the future	0.75
Reflection of the present	0.70
Retrospective reflection	0.71
Reflection of communication	0.46
Factor 6 Active regulation (4%)	
Autosuggestion	0.76
Switching attention	0.75
Active discharge	0.73
Thinking	0.71
Updating positive images	0.69
Communication	0.64

The second factor (7.2% of the variance) is based on life meaning orientations, which indicates the priority of meaning orientation. The presence in the factor of such self-attitude scales as “self-acceptance” and “reflected self-attitude” demonstrates the importance of self-approval of one’s actions and confidence in their approval by others.

The indicator of a positive “self-attitude towards the Self” points at self-orientation in behavior, and indicators of regulatory properties (planning, persistence) point at conscious regulation. This factor represents “semantic regulation”.

The third factor (6% of variance) includes seven self-attitude variables where negative self-attitude indicators have a negative factor loading. The factor is called “positive self-esteem”.

The structure of the fourth factor (5.5% of the variance) consists of eight variables that relate to indicators of reflexive processes and regulatory properties. We called this factor “awareness”.

The fifth factor (4.7% of the variance) includes the variables of reflection and cognitive meanings, which allows us to call it the “reflexive regulation” factor.

The sixth factor (4% of variance) contains 6 variables. It can be interpreted as “active regulation” since it includes active methods of self-regulation.

The identified factors, according to their semantic content, can be combined into the following groups: characteristics of the state and its regulation (informativeness 28.6%), reflexivity (10.2%), life meanings (informativeness 7.2%), self-attitude (informativeness 6%). An everyday situation is characterized by variability (diversity) of states in all its components (mental processes, physiological reactions, experiences, behavior) realized due to the high efficiency of self-regulation using a variety of methods of active regulation (self-hypnosis, communication, reflection, creating positive images, switching off/switching, active discharge).

The analysis of the factor structure of mental regulation in everyday situations showed a significant contribution of the structures of consciousness, to the interaction with mental states and characteristics of self-regulation. The significant role of mental structures is indicated by the relative autonomy of the variables of self-attitude, reflection and life meanings.

Table 2. Factor analysis of indicators of mental states regulation in a stressful situation

Factor 1 Semantic regulation (21.7%)	Factor loadings
Meaningful of life	0.81
Locus of control – Self	0.74
Result of life	0.64
The purpose of life	0.68
Self-acceptance	0.45
Programming	0.44
Perseverance	0.38
Factor 2 Positive self-esteem (8.4%)	
Self-accusation	-0.70
Internal conflict	-0.70
Self-confidence	0.66
Reflected self-attitude	0.66
Self-worth	0.62
Self-leadership	0.56
Self-attachment	0.64
Openness	0.42
Factor 3 Self-regulation of the state (7.2%)	
Regulation of mental processes	0.87
Regulation of physiological reactions	0.87
Regulation of behavior	0.50
Regulation of experience	0.83
Planning	0.49
Evaluation of results	0.40
Factor 4 State optimization (5.2%)	
State intensity	0.89
Activity of physiological reactions	0.72

Activity of experience	0.79
Activity behavior	0.72
Flexibility	0.40
Factor 5 Awareness (4.8%)	
Recognizing your condition	0.79
Recognizing the state of others	0.73
Identifying your condition	0.72
Identifying the state of others	0.67
Awareness of your condition	0.61
Awareness of the condition of others	0.70
Modeling	0.41
Factor 6 Self-actualization (4.3%)	
Integral component of attitude towards the world	0.82
Affective component of attitude towards the world	0.64
Cognitive component of attitude towards the world	0.75
Integral component of self-attitude	0.75
The affective component of self-attitude	0.69
Cognitive component of self-attitude	0.66

In a tense situation, according to the results of factor analysis, we identified 10 factors (64.7% of the variance) of which six factors explain 51.6% of the variation in the original variables (Table 2).

The first factor (21.7% of the variance) is designated as “semantic regulation”. This factor included indicators of life-meaning orientations, “self-acceptance,” as well as regulatory properties “programming” and “persistence” (9 variables in total).

The second most important factor (8.4% of the variance) was made up of self-attitude indicators, of which “self-attachment”, “self-worth”, “self-confidence”, “openness”, “self-leadership”, “reflected self-attitude” have positive factor loadings, and “self-blame” and “internal conflict” are negative. This factor is called “positive self-esteem”.

The third factor “state self-regulation” (7.2% of the variance) consists of indicators of the effectiveness of self-regulation of state substructures (mental processes, physiological reactions, experiences, behavior) and such regulatory properties as “result assessment” and “planning”.

The key components of the fourth factor (5.2% of the variance) are indicators of the intensity of the state and its substructures (mental processes, physiological reactions, experiences, behavior). It also includes the regulatory property “flexibility” and communicative meanings. This factor is related to the process of “state optimization”.

The fifth factor (4.8% of the variance) includes indicators of reflection and regulatory properties “modeling”, “recognizing” and “identifying”. The factor is called “awareness”.

Indicators of global self-attitude and attitude towards the world represent the sixth factor “self-actualization” (4.3% of the variance). It demonstrates the presence of a strong “I”, meaningful acceptance of life and confident positioning of oneself in the world around us.

According to their semantic content, the identified factors can be combined into the following groups: semantic structures (informativeness 21.7%), the “I” system (informativeness 12.7%), characteristics of the state and its regulation (informativeness 12.4%), reflexivity (informativeness 4.8%).

The results of the study clearly demonstrate that mental structures are actively involved in the regulation of mental state. At the same time, the mental correlates of the regulatory process are situationally determined, which is reflected in the organization of indicators of factor structures.

6 Discussions

The conducted research is theoretically justified, based on the model of mental regulation of mental states and takes into account various factors of successful regulation (features of the situation, characteristics of the semantic sphere, reflection, self-attitude, methods of regulation).

Such studies in psychology are carried out quite rarely. In particular, the bulk of research relates to the field of self-regulation of emotions. Works devoted to the self-regulation of psychological states from the perspective of the mental organization are clearly not enough. In classical psychology, predominantly structural-functional models of regulation were developed, revealing the most general structure (components, levels) and functions of the system of mental regulation of behavior [5]. In addition, in modern concepts of self-regulation the main "support" is the psychological qualities of the individual, and the vector of the regulation process is behavior. At the same time, the least developed in these concepts is the mental component of the regulatory process. The relationship between the regulatory process and the structures of consciousness has not been studied sufficiently. In the approach we propose, the main attention is paid to the mental regulation of psychological states.

7 Conclusion

The study of the contribution of mental structures to the self-regulation of mental states taking into account the characteristics of the situation revealed the following patterns.

As the stress level of the situation increases the substructures of experiences and behavior are subject to the greatest changes. Indicators of tension and pessimism dominate, and behavior becomes less controllable.

The contribution of mental structures to the regulation of the state is determined by the characteristics of the current situation. In everyday (routine) situations, the characteristics of the state itself, the coordinated activity of all its subsystems come to the fore. Thanks to this, the resulting conditions contribute to the person's adequate involvement in solving current problems and maintaining efficiency during periods of basic activity. In a tense situation, semantic characteristics (general meaningfulness of life, presence of a goal, internal locus of control) receive the greatest "weight" in the mechanisms of mental regulation. Along with them, the components of the "I" system (self-relationship) are included in the regulatory process.

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