

Research Article

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Mental Regulation of Psychological States in the Weekly Cycle of Production Workers: A Dynamic Aspect

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Abstract

Introduction. Work performance of production workers is associated with self-regulation of psychological states. This study explores the dynamics of functional structures of mental regulation of psychological states of production workers during the work week and examines the relationships between psychological states and mental structures, as well as self-regulatory measures. **Methods.** The study sample comprised 62 production workers (17 males and 45 females, $M = 34$, $\sigma = 6.7$). At the beginning of the study, the characteristics of respondents' mental structures (self-attitude, meaningfulness in life, and reflection) were identified. Afterwards, during the week, their psychological states and self-regulatory measures were assessed. **Results.** Production workers most often experience states of optimal mental performance at the beginning (74%) and end of the work week (71%). The incidence of high-intensity negative psychological states (tension, anxiety) increases from Monday to Thursday and then decreases. The highest incidence of low-intensity negative states (fatigue, drowsiness) occurs on Monday (23%) and Friday (16%). The maximum number of self-regulatory measures is observed in the middle of the work week. Specific patterns of the involvement of mental regulation indicators and regulatory measures in changes in psychological states during the weekly cycle were identified. **Discussion.** The study found that the increase in high- and low-intensity unbalanced states that reduce work productivity in the middle and end of the work week is compensated by increased regulatory activity among employees. The greatest involvement

of indicators of mental structure and regulatory measures in self-regulation of psychological states is characteristic of the beginning and end of the work week. The main indicators of mental regulation of states during the work week are indicators of meaningfulness of life (life purpose and outcome), self-attitude (self-management) and employee overall reflection.

Keywords

psychological state, mental regulation, dynamics, reflection, self-regulation, professional activities

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Introduction

According to the structural-functional model of mental regulation of a subject's psychological states that we develop (Prokhorov, 2020), the mental mechanisms and structures of consciousness, which are integral parts of a person's mental (subjective) experience, are the leading factors in the "conscious" regulatory process. The structure of mental experience integrates the components of consciousness (meaning-related and reflective structures, experiences, mental representations, the self-system) and their interaction aimed at achieving the goal of regulating the subject's psychological state.

The important role of consciousness components and their interactions in the regulation of psychological states has been pointed out in several studies. Thus, M. I. Kartasheva (2022) demonstrated the structure of relationships between the characteristics of consciousness during the regulation of psychological states, where indicators of the ego system play a central role. In turn, G. Yu. Martyanova (2015) notes that the subjective image of states performs a regulatory function during adaptation to difficult life situations, differentially influencing the subject's regulatory activity. In addition, the degree and direction of the influence of students' basic meaning-related attitudes on the regulatory processes of the conscious regulatory system of educational activities has been established (Galuzo, 2016), and the role of various meaning-related constructs in the self-regulation of psychological states in the educational activities of students has been identified (Mukhrygina, 2008).

It is also worth mentioning the research of A. V. Karpov (2012), conducted within the framework of a meta-systemic approach that shows that reflection is a fundamental procedural tool of consciousness. M. A. Kholodnaya (2022) emphasizes that a high level of self-reflection can be associated with both productive forms of self-regulation, manifested in increased performance, and maladaptive forms, accompanied by a decrease in performance. The author also found similar patterns at low reflection levels. The author identifies the individual's metacognitive abilities as the key mechanism responsible for the splitting effect of reflection indicators.

Research devoted to the study of performance and the effectiveness of self-regulation of an individual's states plays an important role in psychological literature. For example, within the structural-integrative approach, A. S. Kuznetsova, M. A. Titova, and T. A. Zlokazova (2019) obtained results demonstrating the great importance of self-regulation of functional state for specialists in different professions, especially in the case of increased working stress. Research conducted within the integrative approach by V. M. Byzova, A. E. Lovyagina, and E. I. Perikova (2019) demonstrated that the effectiveness of self-regulation of learning activities is largely determined by the components of students' reflection and metacognitive processes.

E. A. Sergienko (2018), exploring the psychological level of behavioral regulation, points out that the regulatory function in relation to a subject's psychological states and activities belongs to behavioral control, which enables a person to realize his/her individual resources in accordance with his/her goals and objectives. In turn, N. V. Grishina (2023), in describing the determination of human behavior, along with the influences of their past experience and current situation, emphasizes constructs of the future, among which a person's goals and life plans play an important role. V. I. Morosanova (2021) emphasizes that the development of conscious self-regulatory resources promotes successful learning, serves as the basis for adaptation and the formation of a new self-organization of life, and also prevents the development of acute stress reactions and negative emotional states in a person.

Among mental structures, reflection and its role in regulating states and emotions have a special place in global research. They distinguish between reflection, which is aimed at regulating a person's states and emotions, and rumination, which manifests itself in self-reflection and has a pronounced negative impact on a person's experiences (Lyke, 2009). Thus, N. A. Dunn & A. F. Luchner (2022) note that, unlike rumination, reflection has a positive effect on the states of individuals with high levels of self-criticism. A paper by K. J. Bucknell, M. Kangas & M. F. Crane (2022) convincingly demonstrates that the level of rumination negatively impacts subjective well-being, while adaptive reflection and resilience, conversely, are crucial factors in personal well-being. Another study (Jones, Papadakis, Hogan & Strauman, 2009) noted that moderate and high levels of rumination are associated with depressive symptoms and goal-achievement failure, in contrast to the regulatory form of reflection. The latter is often considered a crucial condition for subjective well-being (Wang & Jun, 2025) and a significant factor in the regulation of emotional states (Orvell et al., 2020).

The role of self-esteem in regulating psychological states is often examined in terms of its influence on a subject's mood. It has been shown (Gütges et al., 2025) that instability in

self-perception influences frequent mood swings in respondents, while reflected self-esteem, being a more stable structure, leads to stabilization of states in a person's daily life. Another study (Brown & Mankowski, 1993) found that people with low self-esteem tend to further underestimate their own qualities when they are in a negative mood, while this does not occur when they are in a positive mood. Collins & Winer (2023) also highlight that when assessing themselves in a state of depression, individuals are less likely to choose positive words and more likely to turn to negative comparisons, unlike non-depressed states, where positive words and comparisons prevail.

Global research has also paid attention to the importance of meaning-related structures in the regulation of psychological states. For example, He et al. (2023) showed that low levels of meaningfulness in life are directly related to levels of psychological stress, reflecting its increased levels among respondents. Another study (Akdağ, Ünsal & Gürbüz, 2024) found that reduced psychological stress in adolescents is associated with both meaningfulness in life and their level of psychological resilience.

Our previous studies demonstrated that the effectiveness of students' mental regulation of their psychological states is determined by the intensity of the learning situation (Prokhorov, Chernov, 2023). Meanwhile, another study (Prokhorov et al., 2023) found that by the final stage of their studies, students develop a stable system of mental regulation of their psychological states, and the number of mental self-regulatory techniques they employ increases. Similar results were obtained in studies by D.N. Grinenko and I.S. Morozova (2017), which demonstrated the influence of a complex of cognitive-stylistic factors on the development of personal self-regulation in educational activities.

This study **aims** to identify the specific characteristics of mental self-regulation of psychological states of production workers during the work week.

Methods

The participants in the study were production workers (plastic pipe production and clothing production), N = 62; 17 males and 45 females; M = 34 years.

The empirical study was carried out in several stages. In *the first stage*, the characteristics of mental structures and regulatory measures were measured. The subjects were asked to complete the following assessment tools:

1. Assessment of Reflective Processes: Recognition, Awareness, and Identification by A.O. Prokhorov and A.V. Chernov (Prokhorov, Chernov, 2019).
2. Purpose-in-Life Test (PIL) modified by D.A. Leontiev (Noëtic Orientations Test, NOT) (Leontiev, 2000).
3. Self-Attitude Questionnaire (SAQ) by S.R. Pantileev (Pantileev, 1993).
4. Typology of Self-Regulatory Measures for Psychological states (Prokhorov, Nazarov, 2019).
5. Mental Structures (Prokhorov et al., 2025).

In *the second stage*, participants were asked to evaluate their current psychological state within five days using the Relief of Personal Psychological state assessment tool (Prokhorov, 1998). Additional questions were asked to indicate the self-regulatory measures that were used if the current state did not meet the requirements of the activity.

The analysis of the dynamics of psychological states in a weekly cycle was carried out based on the classification of psychological states by their level of mental activity: states of optimal mental activity (balanced), unbalanced states of increased or decreased intensity (Prokhorov, 1998). The group of optimal psychological states included *calm, joy, concentration, and interest*. The group of unbalanced states of high mental activity included *tension, anxiety, excitement, and thrill*. The group of unbalanced states of low mental activity included *fatigue, drowsiness, apathy, indifference, sadness, and sorrow*. From here on, when we refer to psychological states of different levels of mental activity, we refer specifically to these psychological states.

In this study, we focused on the following **objectives**: (a) identifying the influence of mental structures on the self-regulation of psychological states during the weekly working cycle and (b) establishing the dynamics of the application of various self-regulatory measures in their relationships with psychological states during work activity.

To analyze the dynamics of mental regulation of psychological states and the level of organization of respondents' mental structures, the *Index of Organization of Structures (IOS)* was calculated. For each component of the mental structure of self-regulation of states, relationships at a significance level of $p \leq 0.01$ were assigned 1 point, then the total score was calculated for each day of the week (Karpov, 2004).

Statistical processing of the obtained data was performed using frequency analysis and Spearman's correlation analysis. When analyzing the mental structures of self-regulation, *only highly significant correlations ($p \leq 0.01$) were considered*. These correlations are further denoted by "***". All calculations were performed using SPSS 23.0 software.

Results

A phenomenological analysis of the qualitative characteristics of psychological states revealed that, during the work week, production workers most frequently experience states of optimal mental activity (see Figure 1). The highest rates of optimal psychological states were observed on Monday, Tuesday, and Friday.

The incidence of experiencing unbalanced psychological states of high mental activity (tension, anxiety, excitement, etc.) is lowest on Monday, highest on Wednesday and Thursday, and the same on Friday as Tuesday. The percentage of unbalanced psychological states of low mental activity (fatigue, drowsiness, apathy, etc.) is highest on Monday, lowest on Wednesday, and gradually increases towards Friday.

Figure 1

Relative incidence of psychological states during the work week, %.

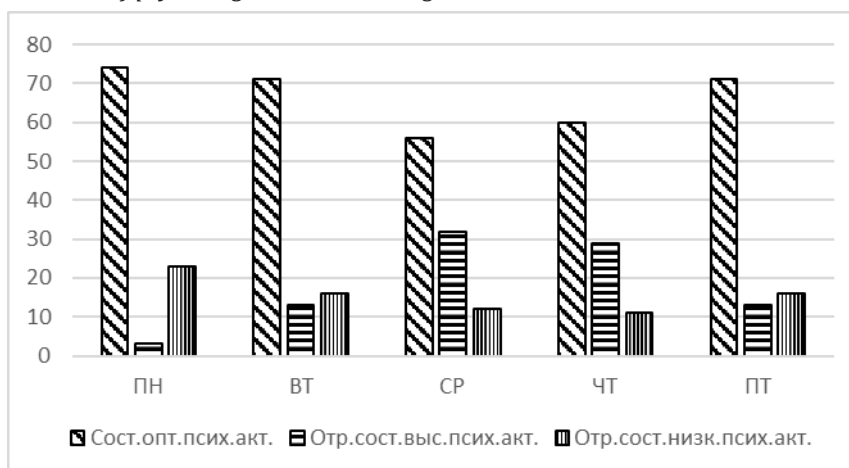


Table 1

Absolute incidence of self-regulatory measures in a five-day cycle

Self-regulatory measures	Mon	Tue	Wed	Thu	Fri
Passive rest	9	15	14	9	14
Activation of positive imagery	26	20	21	11	17
Self-suggestion	7	14	10	6	4
Active relaxation	5	9	5	7	8
Thinking	13	9	7	4	5
Shutdown / switching	15	28	30	18	15
Communication	12	11	9	9	8
Passive relaxation	0	1	8	0	1
Working out	27	15	23	13	14
Eating	3	19	13	12	6
Total	117	141	140	89	92

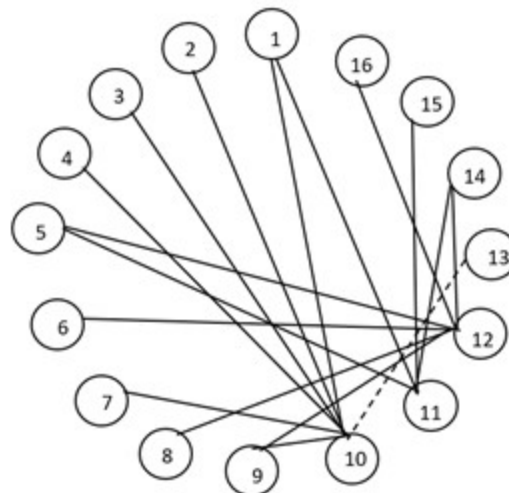
A frequency analysis of employees' self-regulatory measures (see Table 1) shows that the most common measures for Monday are *working out* and *activation of positive imagery*; for Tuesday, Wednesday, and Thursday – *shutdown / switching attention*; and for Friday – *activation of positive imagery*. The lowest rates throughout the week, with the exception of Wednesday, are characteristic of *passive relaxation*, while on Wednesday, it's *active relaxation*. This distribution of self-regulatory measures may be due to the limited ability to regulate states

during the workday. In most cases, employees are confined to their workstations and only have short breaks. Therefore, self-regulatory measures that don't require special equipment or locations (sports equipment and/or special rooms for active relaxation, nap couches, etc.) are used. Respondents tend to use accessible, simple, and reliable measures for self-regulation.

Next, we consider the dynamics of relationships between psychological states and mental indicators of self-regulation by working week days (correlations were considered at a statistical significance level of $p \leq 0.01$).

Figure 2

Functional structure of self-regulation of psychological states on the first day of the week (Monday)



Note: Legend: 1 – life purpose, 2 – life outcome, 3 – self-confidence, 4 – self-management, 5 – self-acceptance, 6 – closeness, 7 – identification process (reflection), 8 – overall level of reflection, 9 – overall indicator of the involvement of mental structures in self-regulation, 10 – states of optimal mental activity, 11 – unbalanced states of low mental activity, 12 – unbalanced states of high mental activity. Self-regulatory measures: 13 – passive relaxation, 14 – passive rest, 15 – thinking, 16 – activation of positive imagery

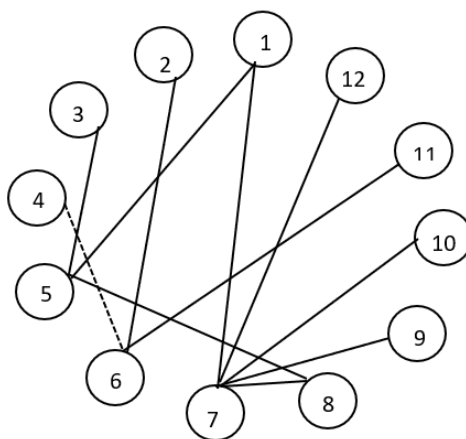
Figure 2 shows the functional structure of self-regulation of psychological states characteristic of Monday. On Monday, the greatest number of respondents (74%) experience psychological states of optimal mental activity. This group of states is characterized by relationships with the *life purpose* (0.423**), *life outcome* (0.385**) and *self-attitude* indicators (“*self-confidence*” (0.442**) and “*self-management*” (0.451**). From the perspective of reflection, relationships with the *identification scale* (0.404**) and the *overall reflection level* (0.418**) were established. There is also a positive correlation with the indicator of the Mental Structures diagnostic instrument (0.479**). In addition, there is a negative correlation with

the *passive relaxation* self-regulatory measure (-0.434**). For unbalanced states of low mental activity there were correlations with the *life purpose* (0.648**), *self-acceptance* (0.797**) and self-regulatory measures: *passive rest* (0.608**), *thinking* (0.691**). For unbalanced states of high mental activity, relationships were established with the *overall reflection level* (0.422**), indicators of *mental structures* (0.713**) and self-attitude: *isolation* (0.601**) and *self-acceptance* (0.548**). Among the self-regulatory measures, *passive rest* (0.442**) and *activation of positive imagery* (0.467**) are used.

By Tuesday, the proportion of respondents experiencing psychological states of optimal activity (calm, interest, etc.) began to decline (67%). This group of states correlates with *self-suggestion* (0.385**). For unbalanced states of high mental activity (tension, anxiety, etc.), a negative correlation with the *life process* was found (-0.876**). For states of low mental activity (fatigue, drowsiness, etc.), correlations were found with self-attitude characteristics: *self-management* (0.800**) and the self-regulatory measure of *activating positive imagery* (0.768**).

Figure 3

Functional structure of self-regulation of psychological states of production workers on Wednesday



Note. Legend: 1 – life purpose, 2 – life outcome, 3 – self-confidence, 4 – self-blame, 5 – states of optimal mental activity, 6 – unbalanced states of low mental activity, 7 – unbalanced states of high mental activity. Self-regulatory measures: 8 – self-suggestion, 9 – activation of positive images, 10 – communication, 11 – active relaxation, 12 – passive rest

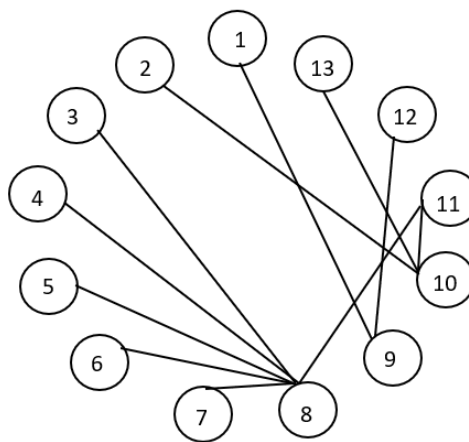
On Wednesday, the number of respondents experiencing psychological states of optimal activity continued to decline (53%). This group of states correlates with the *life purpose* (0.540**) and *self-confidence* (0.537**) scales, as well as with the *self-suggestion* self-

regulatory measure (0.507**). For unbalanced states of high mental activity, a correlation was found with the life purpose indicator (0.643**) and the self-regulatory measures including passive rest (0.628**), self-suggestion (0.568**), activation of positive images (0.607**), and communication (0.591**). For unbalanced states of low mental activity, correlations were found with the life outcome (0.944**) and self-blame (-0.954**) indicators, and with the active relaxation self-regulatory measure (0.855**).

On Thursday, 59% of employees experience states of optimal mental activity. For this group of states, correlations were found with self-management (0.484**), mental structures (0.479**), and the overall reflection level (0.448**). For unbalanced states of high mental activity, a correlation was found with the life purpose scale (0.639**). For unbalanced states of low mental activity, a negative correlation was found with external locus of control (-0.941**), as well as positive correlations with the passive relaxation (0.896**) and shutdown/switching (0.971**) self-regulatory measures.

Figure 4

Functional structure of self-regulation of psychological states of production workers on Friday



Note. Legend: 1 - life purpose, 2 - internal locus of control, 3 - life outcome, 4 - self-management, 5 - self-worth, 6 - self-attachment, 7 - recognition process (reflection), 8 - states of optimal mental activity, 9 - unbalanced states of low mental activity, 10 - unbalanced states of high mental activity. Self-regulatory measures: 11 - thinking, 12 - self-suggestion, 13 - passive relaxation.

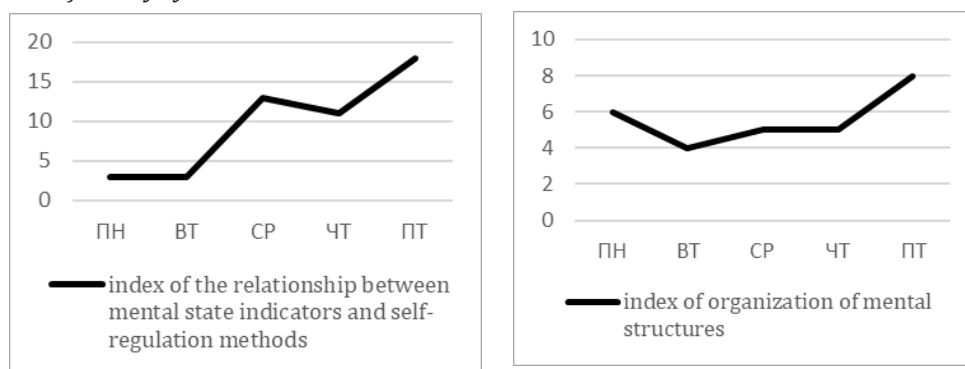
On Friday, the proportion of respondents experiencing states of optimal mental activity increases to 69%. This group of states is characterized by correlations with the indicators of *life outcome* (0.413**), *self-management* (0.434**), *self-worth* (0.400**), *self-attachment* (0.456**),

and *recognition of reflective processes* (0.408**). For unbalanced states of high mental activity, a correlation was established with *thinking* (0.835**). For unbalanced states of low mental activity, a correlation was established with *self-suggestion* (0.833**).

For a general understanding of the relationship between mental structures of self-regulation and psychological states, let us consider the dynamics of the indices of structures organization.

Figure 5

Dynamics of the indices of organization of the structures of mental regulation of psychological states in a five-day cycle



Note: The vertical axis represents the index of the organization of mental structures of self-regulation; the horizontal axis represents days of the week.

Figure 5 shows that the greatest number of relationships between psychological state indicators and self-regulatory measures occurs in the second half of the week, probably indicating the growing role of self-regulation in maintaining optimal states required to perform work functions. An increase in the number of unbalanced states in the middle of the work week leads to an increase in the number of self-regulatory measures. Thus, Monday is characterized by relationships of states with four self-regulatory measures (passive relaxation, thinking, activation of positive imagery, and passive rest), Tuesday – with two measures (self-suggestion and activation of positive imagery), Wednesday – with five measures (self-suggestion, passive rest, activation of positive imagery, communication, and active relaxation), then this indicator begins to decline, Thursday – with two self-regulatory measures (passive relaxation and shutdown/switching attention), Friday – with three self-regulatory measures (thinking, self-suggestion, and passive relaxation).

Table 2

Number of correlations between mental structures and psychological states across days of the week

Indicators	Mon	Tue	Wed	Thu	Fri	Total		
Meaning-related sphere	1	2	0	2	1	1	6	
	2	1	0	1	0	1	3	
	3	0	0	0	1	0	1	12
	4	0	0	0	0	1	1	
	5	0	1	0	0	0	1	
Reflection	6	1	0	0	0	0	1	
	7	0	0	0	0	1	1	6
	8	0	0	0	1	0	1	
	9	2	0	0	1	0	3	
Self-attitude	10	1	0	1	0	0	2	
	11	1	1	0	1	1	4	
	12	0	0	1	0	0	1	
	13	0	0	0	0	1	1	12
	14	2	0	0	0	0	2	
	15	0	0	0	0	1	1	
	16	1	0	0	0	0	1	
Total	11	2	5	5	7	30	30	

Note: Legend: 1 – life purpose, 2 – life outcome, 3 – external locus of control, 4 – internal locus of control, 5 – life process, 6 – identification (reflection), 7 – recognition (reflection), 8 – awareness (reflection), 9 – overall reflection level, 10 – self-confidence, 11 – self-management, 12 – self-blame, 13 – self-attachment, 14 – self-acceptance, 15 – self-worth, 16 – isolation

Let's examine the distribution of relationships between mental structures and psychological states across days of the week, as presented in Table 2.

The data presented suggest that the greatest involvement of mental structures is typical for Monday and Friday, i.e., the beginning and end of the work week. The greatest number of correlations was found for the following indicators: life purpose, life outcome, self-management, and overall reflection level. Among these, indicators of meaningfulness in life are somewhat more prominent in the mental regulation of psychological states during the work week.

During the weekly cycle, changes in the level of organization of mental structures are also observed, with the highest indicators occurring on Monday and Friday, reaching their maximum on Friday. The data obtained relate to the dynamics of unbalanced states during the week. Thus, Monday is characterized by the greatest number of unbalanced states of low mental activity (fatigue, drowsiness, apathy, indifference, etc.), while Friday is characterized by the greatest number of unbalanced states of high mental activity (tension, anxiety, agitation, etc.).

Discussion

Based on the results obtained, the following generalization can be formulated: The increased incidence of high- and low-intensity unbalanced states in the middle and end of the work week is compensated by increased regulatory activity, which is achieved in two ways – through the increased involvement of mental structures in the self-regulation of states (at the beginning and end of the week) and through the increased correlation of regulatory actions with unbalanced states (from the beginning to the end of the weekly cycle). Self-regulation is aimed both at maintaining psychological states of optimal activity and at overcoming the negative effects of low-intensity (at the beginning of the week) and high-intensity (at the end of the week) negative states. Thus, we have obtained an important result – the involvement of certain mental characteristics in the regulatory process contributes to an increased incidence of optimal states and, at the same time, a decrease in the incidence of negative unbalanced states.

The characteristics of self-attitude and meaningfulness in life are most prominent in the structure of mental regulators of psychological states, which is consistent with our previous results obtained in a student sample (Prokhorov, Chernov, Yusupov, Basina, 2023).

The main result of the study is the following: Mental regulatory mechanisms are most fully developed at the beginning and end of the work week. Apparently, this reflects the general pattern of mental regulation of states identified in our previous studies. Thus, the greatest activity of students' mental regulation of states is observed at the beginning and end of seminars (Prokhorov, Chernov, Yusupov, Basina, 2024), and for working students (students attending evening classes), it is at the beginning of the circadian cycle (morning hours) and during rest periods (evening hours) (Prokhorov, Valiullina, Yusupov, 2025).

In our study, we found that an increasing level of integration of mental indicators is an indicator of the functioning of conscious state regulatory mechanisms: The higher

this organization, the more differentiated the selection of regulatory tools and the more pronounced the positive effect of self-regulation. This characteristic of mental regulation has also been demonstrated in studies on the self-regulation of functional states (Kuznetsova, Titova, Zlokazova, 2019).

The results presented can be useful for the psychological services of production teams. They can be used in particular to formulate a number of recommendations for maintaining the optimal psychological states of employees during work activities.

Limitations

The study did not take into account the actual motivation of employees for work activities, nor did it take into account the age- and gender-related characteristics of self-regulation among production workers.

Conclusion

1. The dynamics of the level of organization of mental structures for self-regulation of psychological states change parabolically during the work week, with the highest values observed on Mondays and Fridays, probably due to the change in a work-rest regimen. The strongest interaction between mental structures of self-regulation and psychological states is characteristic of Monday and Friday.

2. The greatest involvement in the interaction with psychological states during the work week is demonstrated by indicators of meaningfulness in life (life purpose and outcome), self-attitude (self-management), and the overall reflection level.

3. The highest incidence rates during the work week are typical for optimal mental activity states, with their highest indicators at the beginning and end of the week. These states are more closely related to indicators of meaningfulness of life and self-esteem. Unbalanced states are mainly associated with indicators of meaning in life and reflection.

4. From the beginning to the end of the week, the degree of involvement of regulatory measures in the regulation of psychological states increases; the latter are aimed both at maintaining optimal activity states and at regulating unbalanced states.

5. The most common self-regulatory measures used by employees during the weekly cycle of work are reflection, activating positive imagery, shutdown/switching attention, and working out. The highest number of self-regulatory measures is observed in mid-week (Wednesday).

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Natalya Yurjevna Kayumova conducted the empirical study, contributed to data processing and interpretation (25%).

Albert Valentinovich Chernov contributed to research design, prepared the Introduction section (25%).

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Conflict of Interest Information

The authors have no conflicts of interest to declare.