



Reflexive Foundations of Cognitive Mental States

Alexandr O. Prokhorov & Lira V. Artishcheva

*Kazan (Privolzhskiy) Federal University
Institute of Psychology and Education*

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Abstract

One of the most important topics studied in cognitive psychology is cognitive activity associated with the acquisition, organization and use of knowledge. The question of qualitative and quantitative features of the relationship between reflection and cognitive states remains open. Nevertheless, there is no doubt that for more successful assimilation of new information, an individual, regardless of one's age, must experience certain mental cognitive states in the process of cognition. In particular, attention is drawn to the states of interest, reflection, passion for the object of cognition. This is one of the cognitive states that perform preliminary motivational function. Reflexivity has an impact on various characteristics of the subject (behavior, activity, personality). Reflection allows to realize, evaluate, compare actual state with the desired one, to predict the state in different situations of life, to rebuild the ways of action, etc. that is, the regulation of mental states, their alignment in the desired direction is provided by reflection. Reflection interacting with mental states creates a new quality – awareness and experience of states. It allows students to predict the results obtained, adjust their cognitive activity. As the level of reflection increases, the intensity of mental states increases in persons with high levels of courage and determination, while the intensity of “timid” states decreases as the level of reflection increases. The productivity and success of the development of educational material by students, self-management of their behavior and activities, as well as their own state largely depend on the inclusion of reflection in the educational process. The aim of our research is to identify the specifics of the relationships between the level of reflection and the intensity of cognitive states, determining the intensity of cognitive states depending on the level of reflection. Students of Kazan Federal University (Volga region) were used as the subjects of the research. Students retrospectively evaluated the cognitive states of interest, reflection, enthusiasm. Three methods were used to measure reflexive processes: the technique for diagnosing reflexivity (A. V. Karpov, V. V. Ponomareva), M. Grant's technique and the original technique for diagnosing reflexive processes which reveals the features of recognition, awareness and identification (A. O. Prokhorov, A. V. Chernov). The research data analysis revealed that different characteristics of reflection form significant connections with characteristics of cognitive states. Retrospective reflection seriously determines behavioral reactions in the process of cognition. Reflection of the actual activities, consideration of future activities, identification of the experiences contribute to cognitive characteristics such as emotions, physiological and behavioral responses.

Keywords: cognitive states, reflection, students, reflexive regulation.

1. Introduction

1.1 *Cognitive activity*

One of the most complicated problems in cognitive psychology is cognitive activity associated with the acquisition, organization and the use of knowledge. The issue of qualitative and quantitative features of the relationship between reflection and cognitive states remains open. Nevertheless, there is no doubt that for more successful assimilation of new information a person, regardless of age, must experience certain cognitive states in the process of cognition – in particular, the state of interest, reflection, enthusiasm, etc. These are cognitive states that perform a benchmark-motivational function (Prokhorov & Yusupov, 2015).

From theoretical point of view, the study of cognitive states is relevant for the development of “mental state” category since it affects the problematic issues of phenomenology, composition, structure, functions, dynamics, classification of mental states, etc. It can be assumed that cognitive states are the common background of cognitive activity – a psychological variable integrating all levels of cognitive reflection and regulation, which is manifested in all spheres of human praxis.

The issue concerning the content of cognitive states, their structure, functions, dynamics, connections with other psychic phenomena (processes and features), including the states of other classes, is still open. As a consequence, the states specific to cognition – for example, interest, surprise, meditation, etc., are identified with motivational, emotional or volitional states, or the very existence of cognitive states is being questioned.

While studying the structural and functional organization of cognitive states, we found that the states manifest themselves as functional structures, including subsystems of metacognitive regulation, emotional activation of cognitive activity, intrapsychic activity and emotionally-personal regulation of thought processes. We collected important data that allow us to consider that the functions of cognitive states are associated with the actualization of cognitive activity, the development of the cognitive sphere, metacognitive regulation, and with the change in the subject's relationship to objective activity and the society (Prokhorov, Chernov & Yusupov, 2011).

In our opinion, the manifestation of these functions in the psyche and life activity of the subject is determined by the mental regulation of cognitive states: by the influence of semantic structures of consciousness (personal meaning, values, constructs, mindsets and orientations, etc.), motivation, reflection, orientation, subject's experience, categorial structures of consciousness, mental representations as a part of the knowledge structure, as well as person's subjective (mental) experience – its reproduction in problematic life situations is manifested in the actualization of a cognitive state of a certain quality. It can be assumed that self-concept system of the subject, whose dispositions define “bias” and cognitive activity in the life activity of a person acts as the central generator of the integral regulatory system of mental regulation that influences the actualization, intensity, duration and other characteristics of cognitive states.

Cognitive states are actualized in a problem situation in the interaction of the subject and the object of cognition, stimulating intrapsychic (cognitive) activity, activating a wide spectrum of intellectual manifestations integrated in the functional structure of states under the action of mental structures. Thus, the effect of subject's involvement in solving certain problem or problem situation which is adequate to the goal of activity is achieved.

Subjectively significant goal (or useful result) is a systemically important factor of actualization of states – it is formed under the influence of a functional complex of constituent mental structures: motives of activity and semantic structures of consciousness, reflection, experiences, categorial structures, representations, subjective (mental) experience and self-

concept system. Self-concept determines the inclusion of mental structures in the actualization of states and their manifestations.

1.2 Reflexivity and mental states

It is no secret that reflexivity affects the various characteristics of the subject (behavioral, activity-based, personal). Reflection enables to realize, assess, compare the actual states with the desired ones, to predict the states in various situations of life, rebuild the ways of actions, etc. That is, the regulation of mental states, their alignment in the necessary direction is ensured by reflection (Chernov, 2012).

In our concept of reflexive regulation of mental states (Prokhorov, 2013; Prokhorov & Chernov, 2012, 2013), the reflection is “included” as the central, basic link in the regulatory process of the subject, as a self-determinative and self-regulatory beginning of one’s regulatory actions. The reflection helps to improve awareness, evaluation, comparison of the current state with the desired state and, accordingly, if necessary, helps the subject to correct the applied methods and methods of regulation. Reflection enables to predict, “replay” possible options and results of the regulation of states in various circumstances and situations of life, to reconstruct the existing ways of actions, to analyze the structure of actions that do not lead to success, to work out the final decision and proceed to executive actions: using the selected methods and methods of regulation of conditions adequate to current or projected situation, event or activity. Inclusion of reflexive mechanisms is determined by the purpose of regulation – the necessity of changing the mental state as an inadequate to the situation, event, purpose of activity, etc. (the need for a state change is realized by the subject through reflection).

Regulatory process is performed with active participation of the basic cognitive processes (perception, representations, mnemonic processes, thinking, etc.), integral (goal-forming, anticipation, decision-making, forecasting, planning, programming, control, self-control) and metacognitive (metacognitive awareness, metamemory, metathinking etc.) based on personality traits (temperament, character, etc.) and meta-properties, it is not very effective in the absence of appropriate motivation of the subject and the absence of personal meaningfulness.

The inconsistency of the experienced states with life situations “launches” basic, integral and metacognitive processes, which result in awareness, comprehension and rethinking alongside with subsequent planning, forecasting, strategy development, decision making and updating of operational self-regulation tools and their further verification (metacognitive strategies). We should note that reflection also activates the semantic structures of consciousness, causing their inclusion in the regulatory process.

We can assume that reflexive mechanisms (strategies, plans, etc.) form stable functional complexes consisting of operational means, intentional models, metaprocesses (cognitive and regulative), and meta-properties that form in the current time and in recurring or similar life situations. Functional complexes are the basis of a more complicated level of regulation, causing the prolonged actualization of “prescribed” states with certain parameters from the sign, quality, intensity, duration, etc. The deployment of such a reflexive complex, as well as its parameters is determined by the requirements of subject’s social functioning, events and situations of life (ordinary or tense). Functional complexes can be reconstructed during regulation when social aspects of life change and if they are not effective enough.

Regulation is carried out in a specific social environment, against the backdrop of cultural, ethnic, professional and other influences, in a specific social situation of life associated with the place of the subject in a small group: with one’s social roles, statuses, etc. The direction of subject’s life “sets” (creates) integral structure of reflexive regulation of states. It manifests itself in the change of operational means in case of their inconsistency with current or predicted

situation, in ensuring the adaptation of the subject to the changing conditions of life through restructuring the regulation strategies, in developing new meanings of life and being, in making appropriate decisions.

The following levels of reflexive activity can be identified in the regulatory processes: at a low level, individual executive actions for regulating states are reflected and monitored, at a higher level the subject displays oneself as “self-structure” (self-concept) that produces planning and evaluation of one’s own actions. It is associated with the actualization of internal regulatory schemes and processes (metacognitive strategy), developed during ontogeny (regulatory schemes different in efficiency determine different qualitative and quantitative limitation of subject’s activity in the regulation of states). The inclusion of reflexive levels allows the subject to move from operational to mental aspects of state regulation and vice versa: self-monitoring of states in the current situation is carried out, regulation techniques are updated, operational tools and strategies for regulating states in past situations and activities are retrospectively evaluated and analyzed including their effectiveness in certain life circumstances, probable future conditions and means of their control are planned and forecasted, etc.

These processes are influenced by models and images of the world, by semantic structures of consciousness, experiences, mental representations, and other components of consciousness, as well as social mediation: the subject’s role in particular large or small social group, one’s roles and status, etc. Depending on level of reflexivity, as well as the degree of its development in the subject, the manifestation of situational, retrospective and perspective regulation of mental states will be different.

We should also note that the reflexive processes of the subject and reflection, in general, generate new meanings, new relationships, creating and defining emerging strategies and plans, ways and means of regulating states. The main psychological mechanism of reflection, which determines the transforming and generative functions and increases the measure of the subjective regulation is the internal dialogue. It leads to voluntary mental manipulation of the ideal content based on the experience of the distance between one’s consciousness and its intentional object, connected with orientation of this process towards itself as an object of reflection. Such actions (looking at oneself from the outside) allow to see the maximum number of elements (variants) of state regulation and choose the optimal one which is adequate to situation. In this context, we should also distinguish differential aspect of the reflexive regulation of states associated with different focuses of consciousness orientation: on the external intentional object, on oneself, on oneself and the object. These actions involve self-distancing, the ability to look at oneself from outside and outside objects beyond the actual situation. We can assume that integration and extensiveness of these mechanisms in the structure of the reflexive regulation of states ensures its effectiveness in the life of the subject.

Interacting with mental states, the reflection creates a new quality – the awareness and experience of states. It enables students to predict the results they receive, correct their cognitive activity. For instance, the intensity of mental states in individuals with high rates of courage and determination increases with the growth of the level of reflection while the intensity of the states of “timid ones” decreases with the increase of reflection (Chernov, 2013).

The productivity and success of mastering the educational material by students, self-control of behavior and activity, as well one’s own state largely depend on the inclusion of reflection in the cognitive process.

1.3 Research objective

The objective of our research is: to identify the specifics of the relationship between the level of reflection processes and the intensity of cognitive states of interest, reflection and

enthusiasm; the identification of the specifics of the relationship between cognitive conditions of students in learning situations (lecture and examination) and reflexive processes; to reveal gender differences in the relationship between the processes of reflection and cognitive states.

2. Research methods

2.1 Research participants

The study involved students of humanitarian specialties of the Kazan Federal University (Volga Region) aged 18-21 92 people took part in the research.

2.2 Research methods and techniques

The intensity of cognitive mental states was determined using the technique called “mental state relief” (A. O. Prokhorov). Three methods were used to measure reflexive processes: the technique for diagnosing reflexivity (A. V. Karpov, V. V. Ponomareva), M. Grant’s technique and the original technique for diagnosing reflexive processes which reveals the features of recognition, awareness and identification (A. O. Prokhorov, A. V. Chernov).

2.3 The course of the research

The subjects retrospectively evaluated cognitive conditions, more often experienced in learning activity, *interest, reflection, and enthusiasm*. The research was conducted on lectures, seminars and examinations in the process of student learning activities. A single cognitive condition was evaluated during single meeting. In other meetings, respondents were given tests for reflection. The obtained data were included in the summary protocol and the correlation analysis was performed using SPSS 16 program. The analysis included only significant correlations ($p \leq 0.05$, $p \leq 0.01$, $p \leq 0.001$).

Structural analysis was carried out using the coherence index of structure (CIS). The coherence index is calculated as follows: the number of significant links multiplied by the significance level.

The data were grouped by gender and analyzed.

3. Results

3.1. The relations of reflexive processes and cognitive states in educational situations (lecture, examination)

It was discovered in the process of students’ educational activities that at the seminars the reflexive processes of recognition, awareness and identification are not connected with cognitive mental states. The opposite situation was revealed at the lecture where reflexive processes (identification, awareness and recognition) correlate with the indices of mental processes that make up the structure of cognitive states, and the results mostly refer to the reflection of one’s own experiences (Figure 1). This is explained by the fact that it is psychic processes that play the most important role in the structure of cognitive mental states of students during the lecture. We should also note that the identification processes during the lecture are associated with experience, physiological responses and the average value of all state indicators. In the structure of relationships the processes of awareness correlate with behavior as a constituent of the structure of cognitive states. Thus, the reflexive processes of identification,

recognition and awareness of one's own experiences are associated with actual cognitive states at the lecture.

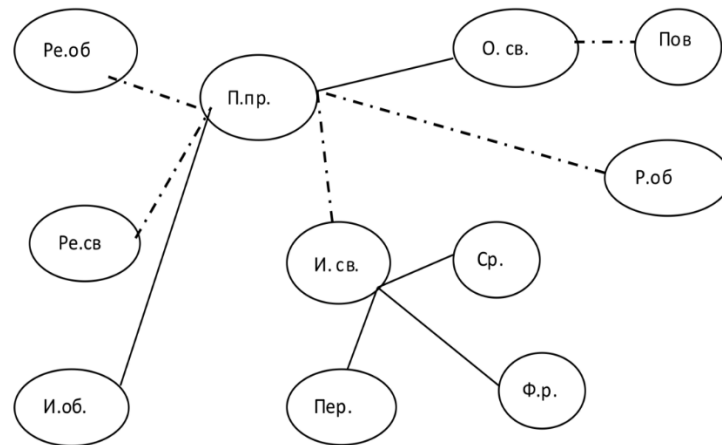


Figure 1. The relationship between the characteristics of cognitive states and reflexive processes of students at the lecture

Note: ----- $p \leq 0.01$; - - - - - $p \leq 0.05$.

Legend: R.o. – recognition of one's own experiences and motives of behavior, R.op. – recognition of other people's experiences and motives of behavior, A.o. – awareness of one's own experiences and motives of behavior, A.op. – awareness of other people's experiences and motives of behavior, I.o. – identification of one's own experiences and motives of behavior, I.op. – identification of other people's experiences and motives of behavior, G.r. – general recognition, G.a. – general awareness, G.i. – general identification, R.o. – reflection of one's own experiences and motives of behavior, R.op. – reflection of other people's experiences and motives of behavior, G.re. – general reflection, Be. – behavior in the structure of cognitive states, Exp. – experiences in the structure of cognitive states, Ave. – average indicator of the structure of cognitive states, P.r.– physiological responses in the structure of cognitive states, P.p. – psychic processes in the structure of cognitive states.

As for the exam, the relationship between reflection and cognitive states is as follows: for the students, the most significant were the scales of state recognition of another person (presumably the teacher), as well identifications of one's own state and overall intensity of the awareness processes (Figure 2). These scales presumably correlate with all the parameters of cognitive mental states of students and, in particular, with mental processes. Thus, the ability to recognize the mood of another person, to recognize and identify one's own experiences and motives, their general intensity affect the student's cognitive state during the exam. We should note that during the exam cognitive states are affected by reflexive processes, which emphasizes their special significance and influence on the structure of cognitive states in subject's difficult situation.

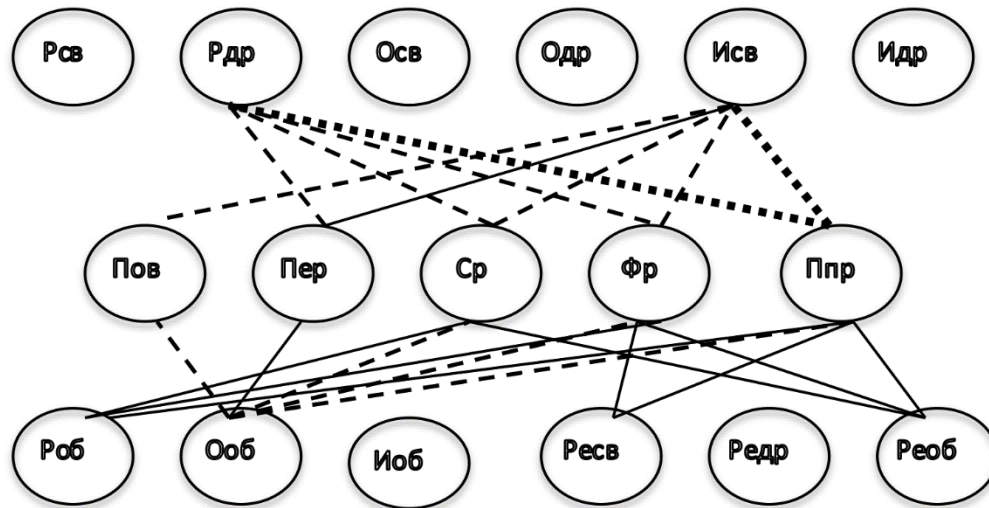


Figure 2. The relationship between the characteristics of cognitive states and reflexive processes of students during the exam

Note. ----- $p \leq 0.01$; - - - - $p \leq 0.05$; $p \leq 0.001$.

Legend: R.o – recognition of one’s own experiences and motives of behavior, R.op. – recognition of other people’s experiences and motives of behavior, A.o – awareness of one’s own experiences and motives of behavior, A.op. – awareness of other people’s experiences and motives of behavior, I.o. – identification of one’s own experiences and motives of behavior, I.op – identification of other people’s experiences and motives of behavior, G.r. – general recognition, G.a. – general awareness, G.a. – general identification, R.o. – reflection of one’s own experiences and motives of behavior, R.op. – reflection of other people’s experiences and motives of behavior, G.re. – general reflection, Be. – behavior in the structure of cognitive states, Exp. – experiences in the structure of cognitive states, Ave. – average indicator of the structure of cognitive states, P.r. – physiological responses in the structure of cognitive states, P.p. – psychic processes in the structure of cognitive states.

Let us address the integral results of structural characteristics (Table 1). The obtained results allow us to assume that during the examination there are more close interrelations of cognitive mental states and reflexive processes (15/37). The structure of cognitive states is somewhat permeated with reflection. This fact indicates that in a “difficult” situation reflexive processes are more actively involved in interaction with cognitive states than in the everyday learning situation.

The biggest number of correlation links in a lecture (10 of 15) occurs in the total (summary) characterization of mental processes in the structure of cognitive states.

The basic element in the structure of reflexive processes at the *lecture* is the identification and awareness of one’s own experiences and motives of behavior. More even distribution of values of the index of structure coherence (ISC) is observed at the exam: reflexive processes are closely related to the major aspects of the structure of cognitive states, however, the prevalence of mental processes remains. There are 3 main structure-forming elements at the exam: recognition of another person’s state, identification of one’s own experiences and general intensity of identification processes.

Table 1. Relationship between the constituents of structure of cognitive states and reflexive processes during lectures and examinations

Indicators	ISC at the lecture	ISC at the exam
Recognizing the experiences and motives of the behavior of another person	–	10
Awareness of one's own experiences and motives	3	–
Identification of one's own experiences and motives of behavior	5	10
General recognition (intensity)	2	3
General identification (intensity)	1	9
Reflection of one's own experiences and motives of behavior	2	2
General reflection (intensity)	2	3
Total ISC	15	37
<i>Mental processes</i>	10	11
<i>Physiological responses</i>	1	9
<i>Experiences</i>	1	4
<i>Behavior</i>	2	5
<i>Average by parameters</i>	1	8

Note: ISC – Index of structure coherence.

Depending on the *gender* characteristics of the subjects, the interaction of cognitive states and reflexive processes is as follows. In the group of men, the high rates of recognition of one's own experiences and motives of behavior correlate with the low intensity of the structure of cognitive states ($p \leq 0.05$). In the group of women, the awareness of one's own experiences is positively correlated with the generalized characteristic of behavior in the structure of cognitive states, the significance of the correlation is $p \leq 0.05$. That is, the decrease in the behavioral activity of women is associated with a decrease in the reflexive process of awareness of one's own experiences and motives of behavior.

Thus, the results indicate a situational mediation of the interaction between reflexive processes and cognitive states which, in turn, is related to the gender characteristics of the subject.

3.2. Interrelation of cognitive states of interest, reflection, enthusiasm and reflexive processes

The results of data analysis allowed us to discover that various characteristics of reflection form significant links with the characteristics of cognitive states. Retrospective reflection mostly determines behavioral reactions in the process of cognition. Reflection of actual activity, consideration of future activity, social reflection, identification of one's own experiences cause such characteristics of cognitive states as experiences, physiological and behavioral reactions.

As an illustration, let us take a look at the revealed correlations on the example of the state of *interest* (Figure 3).

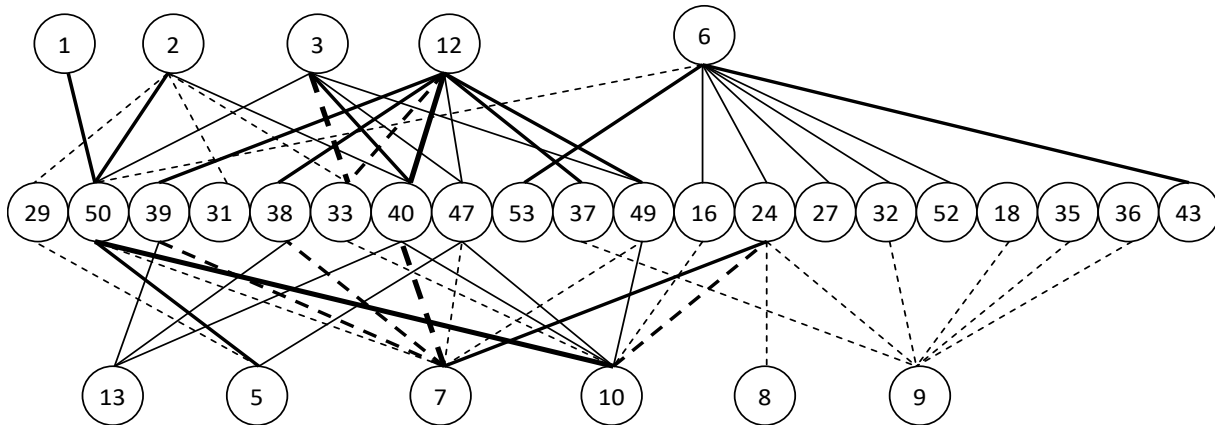


Figure 3. Interrelation of the processes of reflection with the cognitive state of *interest*

Note: — $p \leq 0.05$; - - - $p \leq 0.05$; ——— $p \leq 0.01$; - - - - $p \leq 0.01$; ———— $p \leq 0.001$; — — — $p \leq 0.001$.

Being in a state of interest, a high level of self-reflection determines the relaxedness of experiences, confidence, relaxedness and openness of behavior, motor activity, and clarity of memory. High level of social reflection, on the contrary, determines the tenseness of behavior, lethargy and immersion of experiences, rashness and inadequacy of behavior.

The difficulty in the appearance of images, pallor, coldness of the limbs, tenseness, deliberate and adequate behavior, elevated feelings in the state of interest contribute to a more clear awareness of one's own conditions. Cheerfulness, vivacity, activeness and highness of feelings, deliberate and adequate behavior in the state of interest cause correct identification of one's own conditions. In the state of interest, with a decrease in the intensity of a number of physiological parameters, in the process of thinking and in the strength of experiences, the probability of recognizing the states of other people increases.

We should note that such characteristics of the cognitive state of *interest* as relaxedness or tenseness, rashness or foresight of behavior, the orientation of experiences and temperature sensations determine the intensity of the processes of reflection (consideration of future activity, reflection of current activity, self-reflection and social reflection, awareness and identification of one's own conditions).

Analysis of the correlation of reflection with cognitive state of *reflection* showed the following (Figure 4).

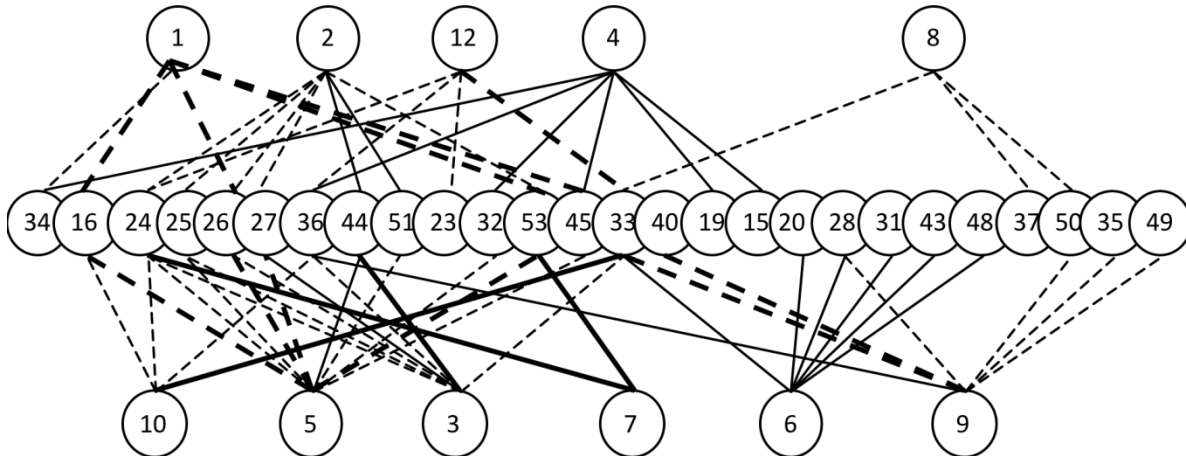


Figure 4. Interrelation of the processes of reflection with the cognitive state of *reflection*

Note: — $p \leq 0.05$; - - - $p \leq 0.05$; ——— $p \leq 0.01$; - - - - $p \leq 0.01$; ———— $p \leq 0.001$; - - - - - $p \leq 0.001$.

The biggest number of connections with the characteristics of the state of reflection has a general indicator of reflection, combining the retrospective reflection of activity, the reflection of current activity, the consideration of future activity, the reflection of communication and interaction with others. In the state of reflection in respondents with a decrease in the intensity of physiological processes and behavior, the effectiveness of the reflection of activity increases. That is, the reflection of activity (present, future, etc.) is caused by the difficulty of the appearance of images, the reduction of temperature sensations, muscle tone, coordination of movements and motor activity, as well as by closeness, instability, inconsistency and activity of behavior.

Being in a state of reflection, lowering of temperature sensations, motor activity, muscle tone and coordination of movements, activity and stability of behavior determine the reflection of current activity and consideration of the future one. Recognition of the states of other people is mediated by the specifics of experience and behavior (relaxation, decreased adequacy of behavior, immersion in experiences and their cheerfulness).

Analyzing the relationship between reflection and the state of reflection, we revealed that the indicators of the cognitive state (temperature sensations, sadness/cheerfulness of experiences) have a large number of connections with reflection. That is, their intensity is determined by consideration of future activity, awareness of one's own states and identification of one's own states.

Let us take a look at the correlation of reflection and cognitive state of *enthusiasm* (Figure 5).

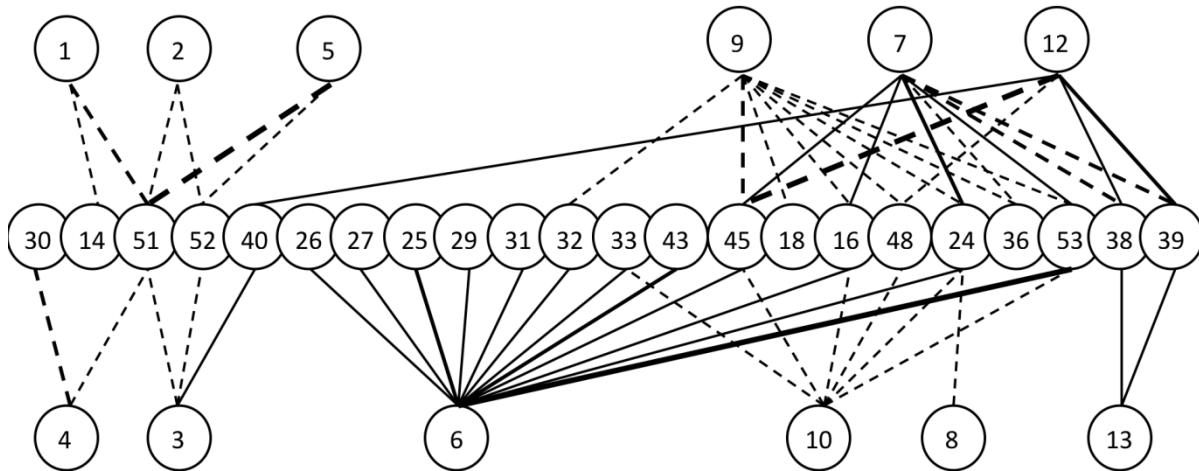


Figure 5. Interrelation of the processes of reflection with the cognitive state of *enthusiasm*

Note: — $p \leq 0.05$; - - - $p \leq 0.05$; ——— $p \leq 0.01$; - - - - - $p \leq 0.01$; ———— $p \leq 0.001$; — — — $p \leq 0.001$.

Looking at Figure 3, we can state that enthusiasm is hardly related to the processes of reflection. But there is another specificity. The biggest number of correlations of the state of enthusiasm is focused on self-reflection. In the state of enthusiasm, self-reflection is mediated by the intensity of physiological reactions (sensations in gastrointestinal tract, skin color, temperature sensations, the state of mucous membrane of the mouth, motor activity, muscle tone, respiratory effects, coordination of movements), by relaxed emotions, clarity and precision of representations and openness, consistency of behavior.

Recognition of the states of other people in the state of enthusiasm is associated with the characteristics of mental processes, physiological reactions, experiences and behavior. That is, the difficulty of the appearance of images, the decline of mental activity, temperature sensations and intensity of experiences, closeness, inconsistency and uncontrollability of behavior determine the recognition of mental states of other people. And social reflection is mediated by the clarity of the appearance of images, by the openness and consistency of respondents' behavior, as well as by immersion in the experiences.

The characteristics of the cognitive state of enthusiasm that have the greatest number of connections with reflection are revealed: instability/stability of behavior, inconsistency/consistency of behavior and temperature sensations. Changes in temperature sensations and in consistency/inconsistency of behavior are associated with self-reflection, social reflection, recognition of the states of others and awareness of one's own states. And the degree of stability of behavior in the state of enthusiasm is determined by the reflection of activity (retrospective reflection, reflection of current activity, consideration of future activity, reflection of communication and interaction).

4. Discussion

Reflection implies drawing the subject's attention to oneself and one's consciousness, in particular, to the products of one's own activity, as well as any of their reinterpretations. Speaking of reflection, we mean a thought process aimed at self-knowledge, the analysis of one's emotions, feelings, states and behavior. The level of reflection of mental states and the degree of its development determine the prospect of the regulation of states, the prospect of activity and interaction with others. Reflexive processes of the subject generate new meanings, creating and

defining emerging strategies and plans, ways and means of regulating mental states and behavior strategies.

With its signification, the mental state is objectified, becoming the object of reflection. Reflection and signification of mental state results in a certain meaning: reflection enables to recognize, assess, compare the actual states with the desired ones, to predict the states in various situations of life, rebuild the ways of actions, etc. The look “inside oneself”, the analysis of oneself is a process of cognition that is oriented on the inner world of the subject. That is, a person learns oneself showing cognitive activity thereby determining certain mental states that can be categorized as cognitive.

On the one hand, reflexive processes activate cognitive states; on the other hand, cognitive states are able to direct the subject's activity towards oneself and various spheres of life, reflecting on one's role in them, as well as on meanings, goals and results.

In our studies, we have identified frequently experienced states of students in educational activity and their connection with the processes of reflection. Our research has shown that the connection between reflection and the cognitive state of *interest* is determined through a series of characteristics of behavior and experiences that are manifested in the state and features of the reflection. Respondents, being in a state of interest, while reducing or increasing the intensity of certain characteristics of a given cognitive state, can activate the processes of self-reflection, social reflection, awareness and identification of their states and recognition of the states of other people.

Characteristics of the cognitive state of *reflection*, determining the course of physiological processes and sadness-cheerfulness of experiences, are most related to the processes of reflection. The reflection of actual activity, future activity, general indicator of the reflexivity of activity and recognition of the states of others are determined by the intensity of the cognitive state of reflection.

The cognitive state of *enthusiasm*, namely, the characteristics of physiological and behavioral reactions are more associated with reflection. In the actualization of certain characteristics of the state (reduction or increase of their intensity), students in a state of enthusiasm are capable of self-reflection of their actions, of social reflection, awareness of their states and their identification, as well as consideration of their future activities.

That is, being in this or that mental state belonging to the category of cognitive states, the subject of educational activity is capable of a certain reflection connected with human activity in the past, the present and the future, with the inner and the social world, with the processes of recognition, awareness and identification of their own states and states of other people. This relationship is based on a number of characteristics of the studied cognitive states, which reflect the specifics of the course of mental processes, experiences, physiological and behavioral reactions.

The relationship of cognitive states with reflexive processes is determined not only by the specificity of the cognitive states themselves and the intensity of their characteristics, but also by the situations of educational activity (lecture, examination). Reflexive processes during the lecture are correlated with mental processes included in the structure of cognitive states. This is quite understandable, since it is the mental processes (thinking, memory, perception, volitional processes, attention, etc.) that play an important role in the process of gaining knowledge in lectures, which is reflected in the structure of cognitive mental states of students. In the situation of the exam, which represents a stress factor for students, the leading role is taken by such reflexive processes as the ability to recognize the mood of another person, to recognize and identify one's own experiences, and motives, their overall intensity. Exactly these reflexive processes influence students' cognitive states during the exam.

That is, the situation of educational activities, depending on their level of stress, determines the specifics of the relationship between reflexive processes and cognitive states. It was also revealed that the structure of cognitive states is permeated with reflection. During the lecture, the students' reflection is more focused on themselves, on their own states and experiences, but during the exam reflexive processes are directed to recognize the states of others. Thus, we can state that the interaction of reflexive processes and cognitive states is situationally mediated.

5. Conclusions

The analysis of the research results aimed at revealing the specifics of the relationship between cognitive states and reflexive processes allows us to draw a number of conclusions:

(1) The interconnection of cognitive states and reflexive processes is caused by the intensity of the characteristics of cognitive states, by their structural organization, situations during educational activities and gender differences.

(2) In stressful life situations, the structure of communication and the inclusion of the components of reflection into relationships with states differs from everyday situations by greater frequency and complexity of interaction.

(3) Gender di-psychism is manifested in the fact that in men low intensity of states improves the recognition of one's own experiences and motives of behavior, whereas in women the awareness of experiences when actualizing the image of a state affects behavioral manifestations in life.

(4) In the educational situation of the lecture, the connection between reflection and the psychic processes that make up the structure of the students' cognitive states is most significant. In the situation of the exam, the ability to recognize the mood of another person, to recognize and identify one's own experiences, and the motives, their overall intensity, affect the cognitive states of students.

(5) The specifics of the relationship between reflection and cognitive states is revealed: the state of interest is associated with the processes of self-reflection, social reflection, awareness and identification of one's own states, recognition of the states of other people; a state of reflection with reflection of actual and future activity, general indicator of the reflexivity of activity and the recognition of the states of other people; a state of enthusiasm with the processes of self-reflection of one's own actions, social reflection, awareness of one's own states and their identification, as well as an analysis of one's own future activities.

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References

- Chernov, A. V. (2012). The influence of reflection on mental states of students during the educational process in the university. *Smolensk University News*, 4, 515-525.
- Chernov, A. V. (2013). The influence of regulatory skills on the mental states of students with different levels of reflection. *Psychology of mental states. Collection of Articles on the Results of the 7th Winter School on Psychology of States*, 22-23 February 2013, 3, 125-130.
- Prokhorov, A. O., & Yusupov, M. G. (2015). Phenomenological features of cognitive states of students of different years of education. *Education and Self-development*, 3(45), 39-46.

- Prokhorov, A. O., Chernov, A. V., & Yusupov, M. G. (2011). Structural and functional organization of intellectual states. *Scientific Notes of the Kazan University*, 153(5), 51-61.
- Prokhorov, A. O. (2014). Mental state representation: spatiotemporal characteristics. *American Journal of Applied Sciences*, 11(5), 866-871 doi:10.3844/ajassp.2014.866.871 Published Online 11(5) 2014 (<http://www.thescipub.com/ajas.toc>). Science Publications.
- Prokhorov, A. O. (2013). The concept of reflexive regulation of mental states. *The Collection of Articles on the Results of the 7th Winter School on Psychology of States*, 22-23 February 2013. Volume 3, 6-9.
- Prokhorov, A. O. (2013). Reflexive regulation of mental states. *Materials of the International Conference Dedicated to the 80th Anniversary of A. V. Brushlinsky*, 1, 427-430.
- Prokhorov, A. O. (2013). Reflexive regulation of subject's mental states. *Personality resource of the labor subject in a changing Russia. Materials of the III International Scientific and Practical Conference*, 17-19 October 2013: *Subject and personality in psychology of self-regulation – Symposium*, 2, 106-108.
- Prokhorov, A. O. (2013). Reflexive regulation of students' mental states in daily and stressful situations of educational activity. *Current Issues in Personality Psychology: A Collection of Scientific Articles*, 248-263.
- Prokhorov, A. O. (2013). The impact of reflection on students' mental states. *Personality and Existence: Subjective Approach (devoted to the 80th anniversary of the birth of A. V. Brushlinsky): materials of the VI All-Russian Scientific and Practical Conference (with foreign participation)*, 31-33.
- Prokhorov, A. O., & Chernov, A. V. (2012). The relationship between intellectual processes and mental states in various forms of educational activity. *V Congress of the All-Russian "Russian Psychological Society" Public Organization: Materials of the Participants of the Congress*, 1, 475-475.
- Prokhorov, A. O., & Chernov, A. V. (2013). Reflexive regulation of mental states in students' educational activities. *Education and Self-development*, 4(38), 11-16.

