

## Structure of Psychic States among People with Different Style Preferences During Information Processing

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**Abstract:** The relevance of the investigated problem is conditioned by the significance of the mental state image study as it defines the regulatory capabilities of a subject. The purpose of the study is to reveal an image structure depending on the intensity of an individual cognitive style study in particular, the structural indices of coherence, divergence and an overall organization of an image. The leading method of this problem study is the method of processing and analysis of statistical relationships, differences and the structural analysis of the data. It is shown that the image of a mental state correlates with the characteristics of such cognitive styles as field dependence-field independence, a narrow-wide range of equivalence, the impulsivity-reflectivity, the Verbal-Sensory-Perceptual Method of information processing and also has a specific structure depending on an individual style preferences. The impulsivity-reflectivity style has the greatest number of relationships with the image of states. Also, the characteristics of physiological responses and the characteristics of the image reflecting the transcendence/metaphorical descriptions are the most related ones with cognitive styles. The largest index of a state image structure organization is demonstrated by reflective subjects in all time continuum. The image of the field dependence person mental states is the most holistic, integrated and highly organized. The study material may be the basis for a training course development concerning the self regulation of a person mental states.

**Key words:** Mental state image, structure, cognitive styles, regulatory, field dependence

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### INTRODUCTION

The image of a mental state is caused by such psychological components as feelings and impressions, events and situations, experiences, past experience, memory and cognitive styles as the derivatives of a subjective experience which determines the selectivity and the specificity of incoming information processing about an experienced state (Dikaya, 2004; Dikaya and Semikin, 1991). The newly formed state image and the image stored in the memory as a subjective experience component are the information base and have certain qualities (Prokhorov, 2014; Artischeva, 2014a, b). The image of a state includes the experience and is an element of its content. The experience structure and content has a close relationship not only with human activities but also with his perceptual and cognitive processes (Prokhorov, 2013; Artischeva, 2014a, b; Artemyeva, 2007; Akhmetzyanova, 2014a, b; Znakov, 2004; Iser, 2006; Shkuratova, 2004). The image of a mental state causes the feedback, regulates the state flow and changes and the behavioral responses of an individual. The degree of an image brightness in a mind influences the process of self-regulation states (Akhmetzyanova, 2014a, b; Velichkovski, 2006). Since, a mental state image largely determines the

regulatory capabilities of a subject, the study of its structure, dynamics, temporal characteristics and relationships with a personality cognitive styles will allow to develop the adequate and effective systems of regulatory means use. The study of cognitive styles allows to describe more accurately the regularities and the features not only of an individual psychological development but also the mechanisms of its integrity as the styles are between its procedural and structural, cognitive and motivational aspects (Richardson, 2006; Thagard, 1996; Panov, 2004).

In this context, the study was conducted aimed at the structural organization determination of the subject states with different stylistic poles in the time continuum. The structure is a set of links with various levels of reliability which form the corresponding pleiades and shows the extent of their sustainability. The structure is characterized by structural indices, the coherence, divergence and the overall organization indices.

### MATERIALS AND METHODS

Total 93 people were involved in the study. On the 1st day of the test the subjects described introspectively the current mental state in a free format (self-report) as

well as assessed the state by using the questionnaire “Mental state relief” (Prokhorov, 2013, 2014). The questionnaire includes 40 indicators investigating the basic aspects of a mental state: the mental processes, the physiological reactions, the feelings and behavior. During the subsequent meetings each subject described and assessed their mental state, named at the 1st day of the study but taking into account its experience in the past: a week ago a month ago, a year ago as well as the experience of a state in the future: a week ahead, a month in ahead, a year ahead. The self-reports were subjected to content analysis which resulted in the provision of 18 indicators that reflect the physiological reactions, the mental and cognitive processes, the behavioral reactions, the cognitive, emotional and imaginative sphere and the sphere of needs as well as the events, situations and natural phenomena. Then an individual research was performed with each tested subject. We studied the following poles of cognitive styles:

- Impulsivity reflexivity (“Comparison of similar figures” procedure by J. Kagan)
- The field dependence the field independence (“Gottshaldt figures” procedure)
- Wide narrow range of equivalence (“Free sorting of objects” procedure)
- The verbal-sensory-perceptual method of information processing (The method of word-color interference also known as the Stroop test, the Stroop task)

The analysis of the obtained data included: the analysis of correlated links for a psychic state indicators with the characteristics of cognitive styles, the calculation of structure organization indices concerning the state images.

## RESULTS

Let's determine the specifics of a psychic state relationship with cognitive styles. To do this let's analyze this correlation links of state image characteristics (58 indicators) and styles (5 indicators) shown in Table 1.

Thus, the largest number of image characteristics relations with cognitive styles is revealed in in the continuum a month ago a week ahead. These relations are developed by the indicators of the image substructures (mental processes, physiological reactions, emotions, behavior). In some time intervals, these relationships are not available. For example, there are no connections between the way of states and the style of field dependence-field independence a year ago, a month ahead, a year ahead as well as with the style of the narrow-broad equivalence range a month ago.

The greatest number of relationships with the state image of the states is within the impulsivity-reflectivity style at the intervals of a month ago, a week ago, a week ahead. These relations are established by four indicators of the image substructures. At that no links with the report indicators were found.

Table 1: The relationship of cognitive styles and the way of mental states in the time continuum

Time continuum	YA	MA	WA	ACT	WA	MA	YA
Impulsive-reflective	35-65*	8-65*	1-65*	7-65*	14-65*	17-65*	1-65*
		10-65*	2-65*	11-65*	15-65*	38-65*	9-65*
		11-65**	5-65*	12-65**	16-65*		21-65*
		12-65**	7-65*	20-65*	21-65*		25-65*
		15-65*	12-65*	60-65*	23-65*		31-65*
		17-65*	13-65*		28-65*		
		29-65*	22-65*		32-65**		
		31-65*	23-65*		35-65*		
		36-65*	27-65*		60-65*		
		59-65*	35-65*				
		60-65**	59-65*				
			60-65**				
Field dep.-indep.	---	18-66*	15-66*	20-66*	---	50-66*	---
		47-66*		50-66*			
Wide-narrow range equivalent	51-67*	---	47-67*	19-67*	48-67*	4-67*	10-67*
					25-67*	18-67*	41-67**
					41-67***	50-67*	
Word-sensor-percep means of data processing	19-68**	19-68*	47-68*	17-68*	13-68*	12-68*	46-68*
		33-68*	48-68***	56-68**	46-68***	16-68*	42-68*
		48-68***			48-68*	60-68*	43-68***
						63-68*	48-68***

“---”: Negative correlation; “-”: Positive correlation; \*: Significance level; Symbols: YA: a Year ago; MA: a Month ago; WA: a Week ago; ACT: Actual; WA: a Week ahead; MA: a Month ahead; YA: a Year ahead; 1-40: the characteristics of the image states according to the questionnaire “Mental state relief”; 41-58: image states characteristics according to self-reports; 59: mental processes substructure; 60: physiological responses substructure; 61: experience substructure; 62: behavior substructure; 63: the average of 40 indicators according to the questionnaire “Mental state relief”; 64: the average of 18 indicators from self-reports; 65: impulsivity-reflectivity; 66: field dependence-field independence; 67: wide-narrow range of equivalence; 68: verbal sensory-perceptual method of data processing

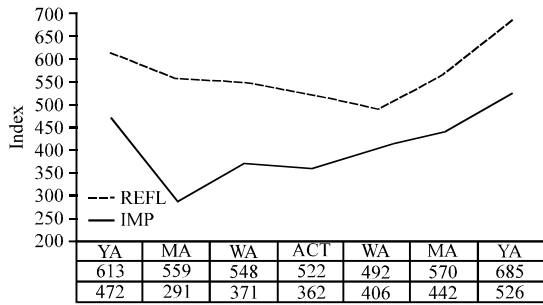


Fig. 1: The Index values of Structure Organization (ISO) of psychic state images for reflective, impulsive subjects in the time continuum of “past-present-future”; Symbols: YA: a Year ago; MA: a Month ago; WA: a Week ago; the ACT: Actual; WA: a Week ahead; MA: a Month ahead; YA: a Year ahead; REFL: a group of Reflective subjects; IMP: the group of Impulsive subjects

Such cognitive styles such as the Reflexivity-Impulsivity and Verbal-Sensory-Perceptual Method of data processing correlate with holistic image states. All the cognitive styles correlate with the individual characteristics of the state images. Note also that cognitive styles are related mostly with the substructure characteristics and physiological responses and the self-report characteristic of transcendence/metaphor.

The presence of cognitive style links with the image of a mental condition indicates the presence of a complex mechanism of emergence, consolidation and a mental state pattern recognition. It is associated with the mental (subjective) experience. The separate characteristics of an image state correlating with the cognitive style poles provide the mobility, the variability and the transformation of the image due to the stylistic features.

Then let's consider the degree of the state image structure organization for the persons with different poles of cognitive styles in the past-present-future time continuum. As an example, let us analyze the data of Fig. 1, reflecting the structure organization of the reflective and impulsive image states.

The image of reflective subject states has the largest organization of its structure within a year ahead and the slack of organization index graph is revealed within a week ahead. The dynamics of an image structure organization index structure for the impulsive subjects is as follows: the graph reaches its largest values within a year intervals of the past and the future. The noticeable slack is found out in the “month ago” section. Comparing the two groups of subjects, we note that in all time continuum the largest index of the structure organization for the

image states is demonstrated by the reflective subjects. The index reaches its lowest value during an actual period and within the past intervals among the impulsive subjects. That is the most integrated and connected image, states throughout the time continuum is among the reflective subjects.

Next, let's analyze in a similar way the organization of the subject image state structures with field dependence and field independence with wide and narrow ranges of equivalence with the Verbal and Sensory-Perceptual Method of information processing.

The structure of the field dependent subject psychic states reaches the maximum index of organization in the current period and within 1 year intervals of the past and the future. In the case of field independent subjects, there is a wave index decline from the past to the future. Comparing the images of two groups of subject states, we note that the structural organization of psychic state image is higher among field dependent subjects, compared with field independent ones within all the time continuum except for “a week ago” section where the trend is a reverse one. This difference is particularly important within the future intervals. That is the image field dependent subject mental states are the most holistic, integrated and highly organized.

Let's consider the data of the subject state structure organization with a narrow and a wide range of equivalence. The data analysis showed that the subject state image structure organization in the time continuum with a narrow range of equivalency has a U-shaped dynamics with the extreme points in the annual intervals of the past and the future. The significant graph slack is revealed in “a week ahead” study. The index of the subject image state structure organization with a wide range of equivalence in the time continuum shows a zigzag dynamics with a large spread of values. The largest values are achieved by the organization structures reaches in “a year ago”, “actual time” sections and the minimum values are achieved in all sections of the future. The compared graphs showed that all time sections except for the “actual time” have the most organized structures of the subject states with a narrow range of equivalence.

Then let's analyze the data reflecting the subject state image organization structure with a sensory-perceptual and a verbal way of data processing. The data show that the subject state image organization structure of two groups has a similar dynamics over time. At that the extreme points are located in different time sections. The subjects with sensory-perceptual information processing method have a more organized state image in “actual time” and “a year ago” sections and the minimum organization index is revealed in “future” sections (a week ahead, a

month ahead). The structure organization index of the subject state image with the verbal way of data processing reaches its maximum values in “a year ago”, “a week ago”, “a year ahead” sections and the minimum values are in “a month ahead” section. Comparing the state images of two subject groups, let’s note that in all sections the greatest organization and the cohesion of structures is produced by the subject state image with sensory-perceptual data processing.

### **DISCUSSION**

The issue about a psychic state problem was introduced in the works of Russian researchers Akhmetzyanova (2014a, b), Velichkovski (2006), Holodnaya, (2004), Dikaya (2004) and Dikaya and Semikin (1991) which define the regulatory role of a psychic state. They proved that the adequate methods of the state self regulation depend on the representation of an image in a mind and on its structural characteristics. The further studies showed that the formation of a mental state image may be understood as the acquisition of a subjective experience. The image of mental states has its different characteristics (Prokhorov, 2014; Artishcheva, 2014). T.E. John Richardson considered the cognitive aspect of a person mental images development in his researches (Iser, 2006).

This study is aimed at the revealing of the links between the mental state way and the cognitive styles, at the determination of the state image structural organization, depending on the style preferences of an individual. Such studies were not conducted before.

### **CONCLUSION**

By generalizing the obtained results, let’s note that the revealed links between the mental state images and the cognitive style of a person highlights the complexity of a mental state occurrence, consolidation and pattern recognition mechanism. It is associated with a mental (subjective) experience. The certain characteristics of a state image correlating with the cognitive style poles provide the mobility, the variability and the transformation of the image due to its stylistic features. The negative correlations are formed via self-reported values and are associated with the reflexive processes and above all, a cognitive assessment of a state and the positive relations are generated by “Mental state relief” method values and are associated with the mnemonic processes, fixed in the verbal descriptions of the state experience. A highly organized mental state image is conditioned by the

specifics of information processing: the strategies of intellectual activity and the rigidity to the changes of a generated experience.

### **RECOMMENDATIONS**

The results of the study may be used in psychological practice, in particular during the establishment of new regulation and self-regulation methods of mental conditions. The obtained results may be the basis for the creation of a training course on self-regulation and may help to find the application in practice when counseling people with mental sphere deterioration within health care, education, family counseling and the counseling of professional athletes. They may be used in the industrial sector: in operator labor and in ergonomics.

### **ACKNOWLEDGEMENTS**

The study was prepared within the frameworks of implementation of the “Plan of measures on implementation of the Program of improving the competitiveness of the FSAEI HVE “K(P)FU” among the leading international research-educational centers for the years 2013-2020.

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