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Cognitive Resources of Psychoemotional Stability of a Personality in Difficult Living Conditions

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Abstract

Introduction. The article explores the cognitive resources of the psychoemotional "response" to the difficult living conditions of the Covid–19 pandemic period (DLC). DLC is defined as the challenges of a global existential crisis that reflected in the image of the human world, in which a person experiences the limitations of subjective activity and self-realization in the main aspects of being: personal, environmental and socio-psychological. Cognitive resources in the context of DLC are considered as a set of certain aspects of the cognitive sphere, the mobilization of which determines the formation of programs and strategies in the mind of the subject aimed at ensuring personal adaptation in difficult living conditions. Objective: identify the cognitive resources of a psychoemotional "response" to difficult living conditions using the method of comparative analysis. **Methods.** The study involved 112 respondents - civil aviation pilots and medical workers. We used the "Anxiety and Depression" questionnaire (Spielberger), the test for assessing the motivational orientation of the individual (Kuhl), the "Assessing personality reflexivity" questionnaire (Karpov, Ponomareva), and the "Multidimensional-functional diagnostics of responsibility" technique (Pryadein). **Results.** According to the criterion of stability of mental states, two groups of subjects were identified: equilibrium (85 people; n1) and nonequilibrium (27 people; n2). An invariant component of cognitive resources has been established: reflection of activity. Specific resources have identified. In group n1 there were five factors (77.34%): reflection of activity (33.26%); cognitive responsibility (13.34%);

metacognitive control of failure activities (12.68%); responsible metacognitive control of planning activities (9.72%); metacognitive control of failure of retrospective and prospective activities (8.33%). The lack of cognitive resource provision in group n2 is due to three factors (70.30%): control of failure and self-centered responsibility (32.33%); cognitive awareness (23.15%); metacognitive control of activity planning and its success was based on reflection of retrospective activity and communication (14.82%). Specific cognitive resources for civil aviation pilots and medical workers are also highlighted. Discussion. The study made it possible to determine the factors of cognitive resource support for stable and nonequilibrium psycho-emotional states, which contributes to the verification of the concepts of semantic regulation of mental states, metacognitive, resource, subject-resource approaches in modern times.

Keywords

difficult living conditions, mental states, reflection of activity, metacognitive control, responsibility, cognitive resources

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Introduction

The study which we started in the midst of the pandemic of the new coronavirus infection Covid-19 has indicated its relevance in the current period. Human life activity is increasingly being realized in crisis conditions of biogenic, man-made, sociogenic risks. The stable image of the world "yesterday" is opposed by the complexity of the world "today" and the world "tomorrow" – the world of the future.

During the years of the pandemic and in the post-quarantine period, there were various psychological studies, including those involving established original concepts and approaches (e.g. Aspinwall & Taylor, 1992; Ivashkina & Dorofeeva, 2023), actively studied the resources of coping behavior (Kuftyak & Bechter, 2020), the resilience of doctors of "red zones" (Yasko et al., 2021); post-traumatic stress phenomena (Zihan, 2021),

images of individual and public consciousness formed under the stress of the pandemic (Yurevich, 2021). The various data obtained on the phenomenology of the psychological aspects of human life during the period of total biogenic threats they have not lost their relevance today. Moreover, they have the status of regular, stable phenomena in prolonged conditions of difficult life, the established psychological phenomena require further generalization and addition.

Problems

A person's experience of life periods in which he/she is faced with a set of stressful factors it is usually considered in modern literature in the context of concepts of difficult life situations (DLS). Despite the widespread using of the concept of "difficult life situation", it is difficult to talk about its clear operationalization. In V.S. Merlin's works, DLS was considered as a conflict of contradictions which is experienced by a personality between "various sides, properties, relationships and actions of a personality" (Merlin, 2005, p. 103). S.A. Lipatov attempts to identify elements of a difficult life situation, determining that this system is represented by a relatively stable set of needs, skills, values, ideas and the external conditions of life (Lipatov, 2004, p. 13). E.Y. Korzhova focuses especially on the concept of "life situation". The author considers the life situation as a system of objective and subjective elements (external and internal conditions) that combine in human activity at one time or another in his life (Korzhova, 2000, p. 156). Nowadays the concept of "difficult life situation" is used as a unifying for a wide range of phenomena that describes various life difficulties ("extreme situation," "crisis situation," "critical situation," "traumatic situation," "tense situation," "stressful situation," "conflict situation," "fruitful situation," etc.). Each of these concepts is used by different authors to clarify the content specifics of the phenomena being studied and described. Despite the differences in the available approaches, an essential component that unites them is obvious: reliance on the concept of "situation". From all the definitions, there is a very essential quality of the situation which is not clear: time limitation. It is this temporal concentration of the situation which can stimulate a person quickly, subjectively interpret its contents and meanings, and encourages immediate activity (Ermine & Titarenko, 2001, p. 116). During crisis periods of life, when a person's adaptive resources cannot cope with distress, time is refracted through the prism of emotions and feelings, reflection of what is happening. It is stimulate an increased activity in finding ways to overcome contradictions.

As the events of 2020-2022 showed, when the human world plunged into the trials of survival by an attack related to a new coronavirus infection, the analysis of psychological phenomena from the standpoint of a situational approach is not productive enough. The conducted research (Yasko, Babichkova & Pokul, 2021) became the basis for the introduction of the concept of difficult living conditions (DLC).

DLC is a challenge reflected in the image of the human world, a global existential crisis in which a person experiences unpredictably prolonged limitations of subjective

activity, self-realization in the main aspects of being: personal, environmental and socio-psychological. The established content of these aspects shows the pronounced existential and suprasituative nature of the DLC. A central component of all aspects of DLC is anxiety in the face of threats to health and life.

Two significant differences between DLC and DLS can be noted.

- **Temporal characteristic.** If a difficult life situation is limited in time and depends on the content of the crisis that caused it can be predicted in the time space of life, then the duration of the intensity of both the entire cycle and the individual phases of threats that cause difficult living conditions is difficult to objectively predict.
- **A difficult life situation is an individual or group phenomenon.** Difficult living conditions cover wide population segments (racial, national, demographic – gender, age, etc.), which are subjected to permanent anxiety for their own life and the lives of loved ones, for the prospects of the professional path, restriction or radical change in social activity (Yasko, Babichkova & Pokul, 2021).

In the psychology of stress and in determining strategies for overcoming it, maintaining viability, the methodology of resource, subject-resource approaches have been developed (Vodopyanova, 2009, 2016; Larionova, 2017; Tolochek, 2023; Masten & Reed, 2002; Taylor, 2018; Hobfoll 2002, 2003, etc.). Nowadays resources are generally understood as human capabilities (physical and spiritual), mobilizing which the subject implements certain programs and strategies to prevent stress or effectively counteract it (Bodrov, 2006). S. Hobfoll defines resources as objects that are "either very valuable in themselves or act as a means to achieve other important values" (Hobfoll, 2002, p. 307). He identifies four types of resources: objective, social, energy, personal. Personal resources, S. Hobfoll believes, play a crucial, primary role in overcoming stress, and ensure an individual's ability to adapt. The loss of resources or the threat of their loss is the cause of stress (Hobfoll, 2003).

One of the aspects of the search for psychological resources to preserve psycho-emotional stability in crisis periods of life is the analysis of the role of the cognitive sphere in the formation and implementation of the individual's resource base. The research analyzes the reflexive mechanisms actualized by the subject in the processes providing different types of activity (Bodrov, 2006; Karpov & Ponomareva, 2000; Kholodnaya, 2019); substantiates the structure and role of metacognitive activity control (Kuhl, 1981, 1983; Bokovikov, 1999). It is noted that developed reflection is a prerequisite for the "rejection" of direct, often impulsive reactions to what is happening (Kholodnaya, 2016, 2019), and a stressful situation creates conditions for the actualization of an action-oriented motivational disposition, if it is expressed in the system of personal qualities of the subject (Kuhl, 1981).

Crisis phenomena is produced by the challenges of an unstable world destructively affect the self-awareness of the person, the design of self-realization spaces by it, the formation of psychological mechanisms for confronting biogenic, technogenic, sociogenic threats. In this regard, the question of the cognitive resources of the subject's

preservation of psychoemotional stability acquires pronounced relevance both in the research and in the practical aspects.

In the study we relied on the theoretical and methodological foundations of resource (Hobfoll, 2002, 2003), subject-resource (Vodopyanova, 2015) approaches, the concept of reflection (Karpov & Ponomarev, 2000) and metacognitive activity control (Kuhl, 1981, 1983), semantic regulation of mental states (Prokhorov, 2009). The indicated theoretical and methodological orientation allows, in the context of our research, to consider cognitive resources as a set of certain aspects of the cognitive sphere, the mobilization of which determines the formation in the mind of the subject of programs and strategies aimed at ensuring personal adaptation in difficult living conditions.

Aim of the study

The current the study's aim is to identify the cognitive resources of a psychoemotional "response" to difficult living conditions.

We tested the following **hypothesis**: in difficult living conditions, cognitive resources affect indicators of psychoemotional stability both in invariant content and specifically for subjects with stable and non-equilibrium states, as well as different types of professional activities.

Methods

The study was conducted in 2020–2021 during the pandemic of the new coronavirus infection Covid-19.

Sample

The total sample consisted of 112 respondents who answered positively during the initial survey to the question: "Is the current period of life or its individual stages difficult for you?". To conduct a comparative analysis, two professional segments were included in the sample:

- 58 people are civil aviation pilots (hereinafter referred to as CA pilots); all respondents are men;
- 54 people – medical workers of hospitals in Moscow and Krasnodar (doctors, nurses; 35 people / 64.8% – women; 19 people / 35.2% – men).

Methodology

Analysis of mental states in difficult living conditions

- The questionnaire "Anxiety and depression" (Ch. Spielberger).

The methodology allows us to determine the level of neuropsychic reaction to the stress of difficult living conditions (Vodopyanova, 2009, 137–138).

Study of cognitive resources

- Test for assessing the motivational orientation of a person (J. Kuhl; adaptation by A. Bokovikov).

The questionnaire of J. Kulya is based on the concept of metacognitive control and is designed to assess the ratio of national (AO) and situational (CO) control modes in situations of success (CSA), failure (CFA) and planning (CPA) activities. The sum of points on each scale (max. the value of 20 points) is a numerical expression of AO and CO-dispositions. An indicator of less than ten is interpreted as a manifestation of the CO mode; more than ten is the AO mode of control (Bokovikov, 1999).

- Questionnaire "Assessment of personality reflexivity" (A. Karpov. In Ponomareva, 2000).

The methodology allows us to establish the features of the respondents' critical assessment of their activities. Four types of reflection of activity are analyzed: communication and interaction with other people (RC); retrospective (RPA); perspective / future (RFA); actual / present (RRA), as well as the general /integral level of reflection (IR) as the sum of indicators for all statements of the questionnaire. Each type of reflection is diagnosed by eight statements evaluated on a 7-point scale (from "absolutely wrong" / 1 point) to "absolutely right" / 7 points). When interpreting the test results, we relied on the standardization data provided by the authors of the methodology (Table 1).

Table 1
Ranges of diagnostic indicators for determining levels of reflection

Types of reflection	Levels		
	Low	Average	High
General reflection (IR)	≥ 80 – 122	123 – 147	148 – 189
Partial reflection	≥ 35	36 – 44	45 – 56

- The methodology of "Multidimensional functional diagnostics of responsibility" (V. Pryadein, 2014).

According to V. P. Pryadein's concept, responsibility should be considered as a personal quality in which operational (naturally defined) and meaningful (lifetime acquired) responsibility are integrated. In the conducted research, the content sphere

was analyzed, which, according to the plan. B. Pryadeina includes three components: motivational; cognitive and productive. Each component includes two scales that allow you to see how socio- or self-centered the analyzed component of responsibility is. The results presented consider a cognitive component that contains two poles: "cognitive meaningfulness" – "cognitive awareness." Cognitive meaningfulness (CM) represents the sociocentric side of responsibility. A person with pronounced cognitive comprehension has the ability to comprehend responsibility holistically, the ability to grasp its core basis; considers responsibility from the standpoint of duty, conscience. Cognitive awareness (CA) refers to the self-centered side of responsibility. It is characterized by a lack of understanding of responsibility, focusing on one sometimes non-specific side of the case. From the point of view of V. Pryadein, responsibility here can be masked by diligence as a personal trait (Pryadein, 2014). The schools of CM and CA include five statements out of 30, representing the diagnosis of a meaningful area of responsibility in the questionnaire. The assessment is based on the use of a 7-point scale, respectively, the maximum score on each scale of the questionnaire is 35 points. The predominance of socio- or self-centered cognitive responsibility is determined by comparing the results of calculating diagnostic indicators.

The methods of parametric (M; SD; t-Student's criterion; r-Pearson's criterion), nonparametric (φ*-Fisher's criterion), multidimensional mathematical statistics (Varimax-rotation; estimation of the uniformity of variance in the data for the analyzed groups of subjects was carried out using Levin's F-criterion) were used in data processing. The standard SPSS-26 package is used for statistical data processing.

Results

Descriptive Statistic

Analysis of anxiety and depression

From the data obtained we can state that despite the positive average values of the coefficients indexing the levels of anxiety and depression in the whole sample there is a significant variance in individual values (Mkt = 4.47 $\pm$ 3.71; Mkd = 3.78 $\pm$ 3.24). Sorting showed that 75.9% of subjects (85 people) respond to difficult living conditions with stable (equilibrium) states do not experience increased anxiety or depression (Mkt = 6.1 $\pm$ 2.00; Mkd = 5.30 $\pm$ 1.69). However, 24.1% of the respondents (27 people) found nonequilibrium states which is reflected in the average values of the coefficients: Mkt = 0.92 $\pm$ 2.56; Mkd = -1.10 $\pm$ 1.77). The comparison shows that at a high level of significance ($p < 0.001$), the indices is determining the degree of stability of emotional states in subgroup n1 are higher than in subgroup n2 (for the state of "anxiety" $t = 13.01$; for the state of "depression" $t = 16.65$).

The obtained result provides a basis for further analysis to differentiate the sample by levels of stability of mental states into two subgroups: n1 (85 people) and n2 (27 people) – Table 2.

Table 2
The results of the analysis of diagnostic data for anxiety and depression

Samples	Anxiety (Mkt)	Depression (Mkd)
N (112 people)	4,47 ± 3,71	3,78 ± 3,24
n_1 (85 people)	6,10 ± 2,00	5,30 ± 1,69
n_2 (27 people))	0,92 ±2 ,56	–1,10 ± 1,77
t (n_1 ⇿ n_2)	*13,01***	*16,65***
	n_1 (85 people)	
pilots- CA (49 people)	6,38 ± 2,46	5,42 ± 2,26
med.workers(36 people)	5,80 ± 1,54	5,28 ± 1,12
t (pilots ⇿ m/w)	*1,52*	*0,16*
men (68 people.)	6,92 ± 1,64	5,90 ± 2,06
women (17 people)	5,18 ± 2,36	4,70 ± 1,32
t (m ⇿ w)	*2,87**	*2,96**
	n_2 (27 people)	
pilots CA (9 people)	0,98 ± 2,68	0,86 ± 1,14
med.workers (18 people)	0,86 ± 2,44	–2,90 ± 2,38
t (pilots ⇿ m/w)	*0,11*	*5,65***
men (9 people)	0,98 ± 2,68	0,86 ± 1,14
women (18 people.)	0,86 ± 2,44	–2,90 ± 2,38
t (m ⇿ w)	*0,11*	*5,65***

Note. *The level of significance of the differences: * p < 0.01; ** p < 0.001. assessment according to the t-Student criterion.*

If we consider the composition of the selected subgroups by leading activity and by gender we note that of the 85 people included in subgroup n1, 57.6% (49 people) are CA pilots, and the remaining 42.4% (36 people) are medical workers. By gender, the n1 subsample included 80.0% (68 people) of men and 20.0% (17 people) of women. Of the

27 people included in subgroup n2, 33.3% (9 people) are respondents representing CA pilots, the remaining 66.7% (18 people) are medical workers. 33.3% (9 people) are men; 66.7% (18 people) are women.

Analysis of the results according to the data of the subsample n1 (stable, equilibrium states)

There are no significant differences in the indices determining the severity of anxiety in comparison with "pilots and medical workers" (at $t = 1.52$ $p > 0.05$). At the same time both indicators exceed the threshold of the boundary of uncertain values and a stable level (5.36): the Mkt for pilots is 6.38 ± 2.46, and for medical workers 5.80 ± 1.54.

A comparison of the indicators of the anxiety index in the female and male parts of the n1 subsample shows that women are characterized by a manifestation of situational anxiety, since the Mkt of women is below the threshold of the boundary of uncertain values and a stable level ($Mk = 5.18 \pm 2.36$). Of the 17 women who made up the n1 subsample, the indicators are in the range of boundary values (from -1.28 to 5.36) 8 people (47.1%) were found. Among men, $Mkt = 6.92 \pm 1.64$, and boundary values were noted in 12 individual indicators (10.5%). These data also determine the reliability of the differences in the indices determining the level of severity of anxiety in comparison with "men and women": at $t = 2.87$, $p < 0.05$.

There are also no significant differences in the indices of depression in comparison with "pilots and medical workers" ($t = 0.16$). However, the indicator in the group of medical workers is at the threshold of the boundary of uncertain values and a stable level: $Mkt = 5.28 \pm 1.12$. The situational manifestation of the state of psychological depression was shown by 8 employees of polyclinics (22.2%), but all indices have a positive value (from 3.18 to 5.04).

A comparison of the depression index in the female and male parts of the n1 subsample shows not only more pronounced stability in men ($Mkd = 5.90 \pm 2.06$ versus 4.70 ± 1.32; $t = 2.96$, $p < 0.05$), but also differences in the ranges of depression intensity. In women, the indicator is in the zone of uncertain values that is depression can manifest itself situationally. A comparison of the proportions of the representation of indicators of uncertain values shows that women have a significantly predominant tendency to situational manifestation of psychological depression (at $f^* = 2.58$, $p \leq 0.003$).

Analysis of the results based on the data of the n2 subsample (unstable, nonequilibrium states)

The sub-sample with unstable mental states (n2) represents less than a quarter of the total sample (27 people; 24.1%). It included 9 CA pilots (men) and 18 medical workers (women).

The level of anxiety both in general and in the subgroups "CA pilots", "medical workers" is represented by average group indicators within the range of intermediate values (from

-1.28 to + 1.28): CA pilots: Mkt = 0.98 ± 2.68; medical workers: Mkt = 0.86 ± 2.44. At the same time there are no statistically significant differences in the indicators (t = 0.11). The marks "often" or "almost always" prevail when answering questions about feeling anxious and worried about someone or something; about sleep disorders; about the appearance of nervousness while waiting.

A comparison by professional subgroups shows that depression is more characteristic of medical workers (Mkd = -2.90 ± 2.38). CA pilots included in the n2 subsample also showed a tendency to psychological depression (Mkd = 0.86 ± 1.14), but at the same time 6 people have index indicators close to the boundary of situationality (1.16 = cd ≤ 1.22). Statistical analysis confirms a higher severity of depression among polyclinic workers (at t = 5.65, p < 0.001).

Analysis of the cognitive sphere of personality with different indicators of psychoemotional stability

The results of diagnostics of the specifics of metacognitive control of activity with different indicators of psycho-emotional stability. In the average indicators of metacognitive control in both compared subgroups, the predominance of the action-oriented mode (AO-mode) is recorded, however, a qualitative analysis reveals a number of specific characteristics of this side of cognitive processes at different levels of psycho-emotional stability (Table 3).

In the group of people with stable conditions (n 1), the emphasis is most pronounced on nationally oriented metacognitive control of failure activity (CFA: M =15.70 = 2.99). This type of control prevails in more than 90.0% of respondents; only 6 people (7.10%) from this sample found a CFA CO-mode in individual indicators.

Table 3

The results of the diagnosis of the motivational orientation of the personality (Kul's test)

Samples	M ± SD	t; p	Control modes (people/ %)		φ*; p
			AO-mode	CO-mode	
control of failure activity (CFA)					
n_1 (85 people)	15,70 ± 2,99		79 / 92,90	6 / 7,10	
		t = 9,54;			φ* = 4,16;
n_2 (27 people)	10,0 ± 2,56	p < 0,001	15 / 55,60	12 / 44,40	p ≤ 0,001

Samples	M ± SD	t; p	Control modes (people/ %)		φ*; p
			AO-mode	CO-mode	
control of success activity (CSA)					
n_1 (85 people)	11,10 ± 2,42	t = 2,53;	61 / 71,80	24 / 28,20	φ*= 0,45;
n_2 (27 people)	12,70 ± 3,07	p < 0,01	18 / 66,70	9 / 33,30	p > 0,05
control of planning activity (CPA)					
n_1 (85 people)	13,10 ± 3,36	t = 2,74;	68 / 80,0	17 / 20,0	φ* = 1,72;
n_2 (27 people)	11,40 ± 2,61	p < 0,01	17 / 63,0	10 / 37,0	p ≤ 0,04

Note. *The indicators that significantly prevail in comparison are highlighted in bold.*

In the subsample of persons with unstable conditions (n2), the AO mode has an advantage in situations of monitoring successful activity (CSA: = 12.70 ± 3.07). However, in individual indicators, the AO orientation of the metacognitive directive in the control of success activity prevails only in 66.7% of respondents (18 people); the remaining 33.3% (9 people) are focused on situational control, without forming a field of cognitive efforts to find ways to overcome the discrepancies between what is and what should be as follows from the content of the relevant statements of the questionnaire.

In general, according to the testing data the motivational activity of the AO mode for all types of cognitive control prevails among people with a stable psycho-emotional sphere, while the proportion of people with pronounced AO motivation according to CFA and CPA is significantly higher than in the sub-sample with non-equilibrium states. In the mean values for all scales in the n1 subsample, only 8.2% of respondents (7 people) found a predominance of situationally oriented metacognitive control, and in the n2 subsample, such a proportion of respondents was 37.0% (10 people): at f* = 3.29, p ≤ 0.001 (Table 3).

Comparisons in groups differentiated by type of activity ("CA pilots ⇹ medical workers") in both samples (n1; n2) do not show significant differences.

Correlation analysis indicates the relationship of indicators of anxiety and depression with the AO mode of cognitive control (Table 4).

High values in the measurements of mental states as indicators of their stability correspond to high values in the measurements of metacognitive control corresponding to the AO-directive of motivation of activity. At the same time, it is noted that the predominance of the CFA CO-mode in 44.4% of respondents of the n2 subgroup was reflected in a negative correlation coefficient (r = -0.277).

Table 4

Correlation matrix (r) of interrelations of indicators of components of metacognitive control and psychoemotional states

Samples	Control of failure activity (CFA)	Control of success activity (CSA)	Control of planning activity (CPA)
n1 (85 people)	0,479***	0,482***	0,627***
n2 (27 people)	-0,277*	0,493**	0,327*

Note: *The level of significance of the differences: * p < 0.05; ** p < 0.01; *** p < 0.001. Assessment by Pearson's r-criterion. For the correlation analysis, the average index of anxiety and depression was calculated: M (kt+kd).*

The results of the diagnosis of the specifics of reflection of activity with different indicators of psychoemotional stability. The indicators of the general level of reflection (IR) in the compared samples differ significantly (Table 5). If in the group of respondents with psychoemotional stability, the average group data is in the range of the average level (M = 123.40 ± 14.00), then in respondents with non-equilibrium states they correspond to the range of the low level: M = 111.30 ± 12.80 (at t = 4.18, p < 0.001).

In sample n1, the emphasis is on two types of reflection: communication (RC: M = 37.40 ± 5.85) and future activity (RFA: M = 37.20 ± 5.78), while the general data on the reflection of actual (real) activity, as well as on RC and RFA, correspond to the indicators of the average level. Data on the reflection of past activities are reduced (M = 33.40 ± 5.25).

Reflection of communication prevails in the n2 sample (RC: M = 34.70 ± 5.15). This is the only indicator whose value is at the upper limit of the low level. The rest are interpreted as indicators of a low level of reflection (Table 5).

An obvious phenomenon is the actual absence of indicators of a high level of reflection for all analyzed species in group n2 and their insignificant representation in group n1. Comparative analysis shows a significant predominance of the severity of the average level of reflection among people with stable conditions, and a low level among subjects with non–equilibrium states (Table 5).

Table 5

Descriptive statistics of the results of diagnostic reflection of subjects with non-equilibrium and stable mental states

Samples	M ± SD	Indicators of the proportions (abs. / %) of the severity of reflection levels		
		high	average	low
	reflection on past activities (RPA)			
n_1 (85 people)	33,40 ± 5,25	2 / 2,40	24 / 28,20	59 / 69,40
n_2 (27 people)	30,10 ± 5,21	-	4 / 14,80	23 / 85,20
differences:	t = 2,81 p < 0,05	-	ϕ* = 1,49 p ≤ 0,06	ϕ* = 1,40 p ≤ 0,08
	reflection on real activity (RRA)			
n_1 (85 people)	36,7 ± 5,09	5 / 5,90	38 / 44,70	42 / 49,40
n_2 (27people.)	33,0 ± 5,28	-	8 / 29,60	19 / 70,40
differences	t = 3,19 p < 0,05		ϕ* = 1,42 p ≤ 0,07	ϕ* = 1,96 p ≤ 0,02

	reflection on future activities (RFA)			
n_1 (85 people.)	37,20 ± 5,78	8 / 9,40	36 / 42,40	41 / 48,20
n_2 (27 people)	33,40 ± 5,92	1 / 3,70	6 / 22,20	20 / 74,10
differences:	t = 2,85 p < 0,05	-	ϕ* = 1,98 p ≤ 0,02	ϕ* = 2,43 p ≤ 0,006
	reflection on communication (RC)			
n_1 (85 people)	37,40 ± 5,85	9 / 10,60	45 / 52,90	31 / 36,50
Cn_2 (27 people)	34,70 ± 5,15	-	13 / 48,10	14 / 51,90
differences:	t = 2,33 p < 0,05		ϕ* = 0,43 p > 0,05	ϕ* = 1,41 p ≤ 0,08
	integral index of reflection (IR)			
n_1 (85 people)	123,40 ± 11,16	5 / 5,90	36 / 42,40	44 / 51,80
n_2 (27 people)	111,30 ± 12,80	-	5 / 18,50	22 / 81,50
differences:	t = 4,18 p < 0,001	-	ϕ* = 2,39 p ≤ 0,007	ϕ* = 2,92 p ≤ 0,001

Note. *Indicators that are significantly predominant in comparison are highlighted in bold; indicators in bold italics, the predominance of which is expressed as a trend (0.06 ≤ p ≤ 0.08).*

A comparison of reflection indicators in the subgroups "pilots of CA" – "medical workers" in the samples reveals a predominance of reflection activity of actual (real) activity and the general index of reflection among pilots of CA in the data on the sample with stable mental states ($p < 0.05$). In the environment of persons with non-equilibrium states (n2), CA pilots also have significantly more pronounced reflection of present and future activities, as well as the general level of reflection ($p < 0.05$) (Table 6).

Table 6

Comparison of indicators for measuring reflection of activity in groups differentiated by types of activity

Groups by type of activity	RPA	RRA	RFA	RC	IR
			n_1 (85 people)		
pilots CA	33,90 ± 5,69	37,70 ± 5,38	37,40 ± 6,12	37,50 ± 5,85	128,60 ± 11,83
med. workers	32,80 ± 4,58	35,40 ± 4,37	36,90 ± 5,36	37,40 ± 5,92	120,50 ± 10,47
differences:	t = 1,04 p > 0,05	t = 2,19 p < 0,05	t = 0,37 p > 0,05	-	t = 2,10 p < 0,05
			n_2 (27 people)		
pilots CA	30,60 ± 6,15	33,60 ± 7,42	35,60 ± 3,04	34,40 ± 6,37	118,60 ± 10,94
med. workers	29,90 ± 4,86	32,80 ± 4,07	32,40± 4,73	34,80 ±4,63	110,20 ± 7,51
differences:	t = 0,26 p > 0,05	t = 0,29 p > 0,05	t = 2,10 p < 0,05	t = 0,16 p > 0,05	t = 2,09 p < 0,05

Note. *The indicators that significantly prevail in comparison are highlighted in bold.*

The results of the diagnosis of the cognitive component of the meaningful sphere of responsibility with different indicators of psychoemotional stability. In the group of people with a stable system of psychoemotional "response" to difficult living conditions (n1), the socio-centered type of the cognitive component of responsibility – cognitive meaningfulness (CM) - prevails: M = 26.60 ± 4.89 versus 16.4 ± 4.23 according to the

CA component. In the sample presented by respondents with non-equilibrium states of anxiety and psychological depression, on the contrary, the orientation in the formation of the disposition of responsibility towards the ego–centered aspect - cognitive awareness (CA) is more pronounced: M = 21.10 ± 4.03 versus 19.50 ± 4.02 for the CM component. Statistical analysis shows significant differences in the average group indicators in the surveyed samples for both components of the cognitive component of the meaningful sphere of responsibility ($p < 0.001$) – Table 7.

Table 7

Descriptive statistics of the results of the analysis of the cognitive component of the meaningful sphere of responsibility

	Cognitive meaningfulness (CM)		Cognitive awareness (CA)	
	n_1 (85 people)	n_2 (27 people)	n_1 (85 people)	n_2 (27 people)
M ± SD	26,60 ± 4,89	19,50 ± 4,02	16,40 ± 4,23	21,10 ± 4,03
differences:	t = 7,51; p < 0,001		t = 5,19; p < 0,001	
	M (kt + kd) ↔ CM:		M (kt + kd) ↔ CA:	
r:				
	r = 0,022	r = 0,500**	r = –0,302*	r = 0,351*

Note. *M (kt + kd) is the average value of anxiety and depression indices; The indicators that significantly prevail in comparison are highlighted in bold; * p < 0.05; ** p < 0.001. Pearson's r-test score.*

A comparative analysis of the data on measuring the cognitive aspect of responsibility in the subgroups "CA pilots" – "medical workers" shows that among people with stable mental states, CA pilots and medical workers have the same pronounced predominance of the CM-component. The picture is different among respondents with non-equilibrium

states. Here, the predominance of the CA component in the data on occupational groups is confirmed, as well as in the n2 sample as a whole, however, in the group of CA pilots, both components are represented by higher average group values ($p < 0.05$) – Table 8.

Table 8

Descriptive statistics of measurements of the cognitive aspect of the meaningful sphere of responsibility in professional groups

	CM		CA	
	Pilots CA	Med. workers	Pilots CA	Med. workers
n_1	26,70 ± 5,06	26,40 ± 4,72	16,10 ± 4,21	16,90 ± 4,28
differences:	t = 0,24; p > 0,05		t = 0,90; p > 0,05	
n_2	22,40 ± 3,40	**18,1 ± 3,54**	23,60 ± 2,35	**19,90 ± 4,19**
differences:	t = 3,12; p < 0,05		t = 2,91; p < 0,05	

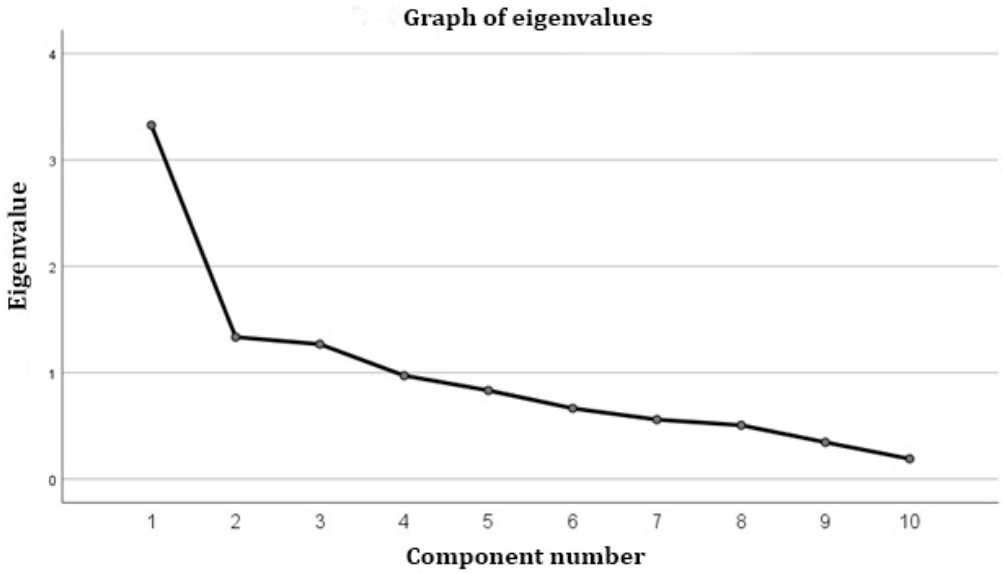
Note. *The indicators that significantly prevail in comparison are highlighted in bold.*

At the final stage of the search for cognitive predictors of a psychoemotional "response" to difficult living conditions, arrays of 10 variables from the compared samples were subjected to factor analysis by the Varimax rotation method. The results of the analysis showed the following.

For subjects with stable conditions, 5 factors were identified, with a total variance of 77.34% (Figure 1; Table 9). As we can see from the configuration of the eigenvalue graph, the first factor has the greatest load (33.26%). Meaningfully, in the first factor, all types of reflection play a leading role, with the predominant value of the integral index of reflection (R = 0.892), which in this sample, as shown above, is expressed mainly at the average level. It is associated with the control of failure activity (R = 0.245) and cognitive comprehension (R = 0.319).

Figure 1

A graph of the eigenvalues of factors identified by a set of variables in a group of respondents with stable psychoemotional states



In the second factor (13.34%), the cognitive component of the meaningful sphere of responsibility plays a formative role (CM: R = 0.830; CA: R = 0.685) with a predominance of the influence of cognitive meaningfulness, which is most pronounced in the diagnostic data in this sample. The CM is in mutual influence with the reflection of past activity (R = 0.285) and the reflection of communication (R = -0.291).

The third factor (12.68%) is influenced by metacognitive control of success activity (R = 0.908). Three types of reflection interact with it: past (R = -0.221); present (R = 0.230) activity and communication (R = 0.222).

The high correlation index in the fourth factor (9.72%) has control over planning activities (R = 0.974). This metacognitive process forms two interactions: with cognitive meaningfulness (R = 0.277) and a negative one with cognitive awareness (R = -0.217).

The fifth factor (8.33%) is formed by metacognitive control of the failure activity (R = 0.851), which is negatively associated with reflection of past activity (R = -0.367) and positively with reflection of future activity (R = 0.250). In addition, there is a tendency for a stable relationship with the reflection of communication (R = 0.208).

Table 9

The matrix of components (factors) in the Varimax rotation data of variables in the sample n1

Rotated matrix of components*					
	components				
	1	2	3	4	5
CFA	,245	,109	-,180	,064	,851
CSA	,050	,068	,908	-,005	-,136
CPA	,004	-,042	,001	**,974**	,049
RPA	,711	,285	-,221	,011	-,367
RRA	,743	,008	–,230	,021	,053
RFA	,781	,066	,131	,037	,250
RC	,688	-,291	,222	,022	,208
IR	**,892**	,114	,100	,005	,155
CM	,319	,830	-,201	,277	,209
CA	-,111	,685	,223	-,217	-,017

The method of factor extraction: the method of principal components.

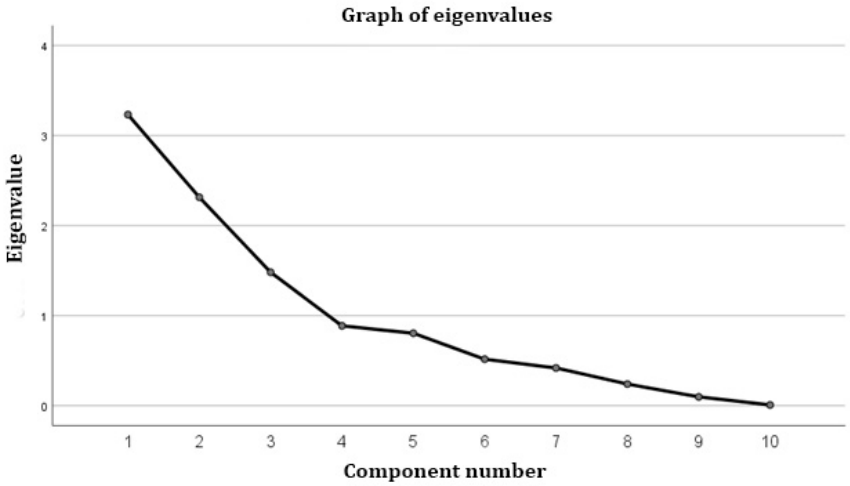
Rotation method: varimax with Kaiser normalization.

* – The rotation converged in 7 iterations.

For subjects with nonequilibrium states, taking into account the smallness of the sample (27 people), 3 factors were identified, with a total variance of 70.30% (Figure 2; Table 10).

Figure 2

A graph of the eigenvalues of factors identified by a set of variables in a group of respondents with non-equilibrium psychoemotional states



The most pronounced factorial effect on the cognitive sphere of a personality with an unbalanced psycho-emotional sphere is exerted by the first factor (32.33%) with a high correlation of general reflection (R = 0.969) and all its components with the control of failure activity (R = 0.419) and cognitive meaningfulness (R = 0.208).

The second factor (23.15%) is formed by a symbiosis of both poles of the cognitive component of responsibility (CM: R = 0.796; CA R = 0.792), "attracting" with a negative correlation control of the activity of failure (R = -0.791), as well as control of the activity of success (R=0.206) and reflection of actual activity (R = 0.285).

In the third factor (14.82%), metacognitive control of planning activities (R = 0.865) is of central importance, closely related to the control of success activities (R = 0.643). They are interconnected with two types of reflection – communication (R = -0.682) and past activity (R = 0.271).

Table 10

The matrix of components (factors) in the Varimax rotation data of variables in the n2 sample

Rotated matrix of components*			
	Components		
	1	2	3
CFA	,419	-,791	-,039
CSA	,088	,206	,643

Rotated matrix of components*			
	Components		
	1	2	3
CPA	,137	,011	,865
RPA	,793	,028	,271
RRA	,806	,285	-,005
RFA	,700	-,164	,033
RC	,514	-,044	-,682
IR	,969	-,059	-,166
CM	,029	,796	,049
CA	,208	,792	,187

The method of factor extraction: the method of principal components.

Rotation method: varimax with Kaiser normalization.

* – The rotation converged in 4 iterations.

Discussion

The analysis of mental states in difficult living conditions, prolonged over a period of more than a year, showed that a significant part of the respondents (75.9%) gives a psychological "response" in the form of stable indicators of anxiety and depression. CA pilots and men are more confident in adapting their emotional sphere to difficult living conditions. The experience of anxiety and psychological depression is especially noted in women and in medical workers. It can be assumed that this phenomenon is the result of activation of the mechanisms of psychological adaptation (Medvedev, 2003). However, in fact, a fourth of the surveyed (24.1%) found non-equilibrium states. Since human adaptation is conditioned by a set of personality properties and qualities, on which the specifics of the mental regulation of the experienced state depend (Bodrov, 2007, p. 50), it is advisable to allocate two groups of subjects according to the criterion of stability of mental states for consistent verification of the empirical hypothesis.

The assumption about the invariant component of cognitive resources influencing the indicators of psychoemotional stability has been confirmed. This is the reflection of activity which plays the most pronounced predictive role in both groups of respondents.

The second part of the hypothesis (about the specifics of the cognitive sphere of subjects with different levels of psycho-emotional stability) was confirmed in the following results of the analysis.

The second part of the hypothesis for people with a stable psycho-emotional sphere, a specific cognitive resource for the formation of a psychological "response" to difficult living conditions, hypotheses (about the specifics of the cognitive sphere of subjects with different levels of psycho-emotional stability) were confirmed in the following results of the analysis:

- a nationally oriented (AO) control mode with a predominance of control over the failure activity (M = 15.70 = 2.99). Such a cognitive position motivates the subject to actively control those aspects of life in which adequate decisions are required with subsequent planning of step-by-step actions, including in the direction of relieving stressful threats (Bokovikov, 1999, 218-219);
- the average level of reflection (M = 123.40 $\pm$ 14.00), with a pronounced emphasis on reflection of communication (M = 37.40 $\pm$ 5.85) and reflection of future activities (M = 37.20 $\pm$ 5.78), which allows you to analyze your own activities and the actions of other people, think about and carefully plan your activities in detail, as well as predict all possible consequences (Karpov, Ponomareva, 2000);
- the predominance of a socio-centered type of cognitive component of responsibility – cognitive meaningfulness (M = 26.60 $\pm$ 4.89), which indicates the ability to comprehensively comprehend responsibility, the ability to grasp its core basis; to consider responsibility from the standpoint of duty, conscience (Pryadein, 2014).

The established relationships are confirmed by the data of factor analysis. The identified factors play the role of psychological resources to ensure psychological adaptation to life in conditions hindered by biogenic threats. According to the leading cognitive mechanism that forms each of the five identified factors, they can be conditionally designated as follows: the factor of reflection of activity (1); the factor of cognitive responsibility (2); the factor of metacognitive control of failure (3); the factor of responsible metacognitive control of planning activities (4); the factor of metacognitive control of the failure of retrospective and prospective activities (5).

The inconsistency of the interaction of cognitive resources in the formation of a stable response of the individual to the stressogenicity of difficult living conditions causes the development of non-equilibrium states. This is evidenced by:

- a situationally oriented (SO) mode of control, which, unlike the AO mode, does not form barriers to the appearance of emotional states of anxiety and depression that disorganize human life (Kuhl, 1981; Bokovikov, 1999, 218-219).
- 66.7% of respondents focus on AO-mode of monitoring successful activities. In the context of the concept of semantic regulation of mental states (Prokhorov, 2009), according to which in non-equilibrium states the previous organization of the semantic system and its components - the structure of semantic characteristics - is "shaken," the established phenomenon can be considered as an activation of the rationalization mechanism, giving subjective meaning to the events taking place. The result of this process is a higher indicator of indices of anxiety and depression - with negative values expressed in the rest of the sample to the range of indeterminate values in the indicated 66.7% of subjects;
- predominantly low level of reflection ($M = 111.30 \pm 12.80$), with predominance of communication reflection ($M = 34.70 \pm 5.15$) - cognitive qualities indicating difficulties in understanding the events, their consequences, causes of their actions and actions of other people, impulsiveness in decision-making (Karpov, Ponomareva, 2000). To a certain extent, the low level of activity reflection is obviously compensated by more developed abilities to understand another person (communication reflections), to predict his response to certain stimuli (actions);
- the predominance of an ego-centered type of cognitive component of responsibility – cognitive awareness ($M = 21.10 \pm 4.03$), characterized by a lack of understanding of responsibility, focusing on one, sometimes non-specific side of the matter; possibly, the substitution of responsibility for performance as a personal trait (Pryadein, 2004).

The insufficiency of cognitive resource provision for the formation of psycho-emotional stability in the environment of persons with non-equilibrium states is confirmed by the data of factor analysis. According to the leading cognitive mechanism that forms each of the three identified factors, they can be conditionally designated as follows: the factor of control of the activity of failure and self-centered responsibility

based on reduced abilities of reflection of activity (1); the factor of cognitive responsibility with a predominance of cognitive awareness (2); a factor of metacognitive control of activity planning and its success based on reflection on the retrospective of activity and communication (3).

The study confirmed the final part of the empirical hypothesis which consisted in the assumption of the presence of invariant and specific cognitive resources of psycho-emotional stability for subjects of different types of professional activity.

Equilibrium, stability of mental states of a personality in difficult conditions of life can be provided by the resource role of the formed psychological properties of the higher substructures of personality in the form of resilience, developed sociocentric responsibility, the action orientation of metacognitive control of activity, developed abilities of reflection, as well as a harmonious combination of processes of arbitrary self-regulation.

Invariant resources include the proven absence of differences in the emphasis of metacognitive activity control on action (AO), as well as the predominance of cognitive meaningfulness (CM) as a cognitive aspect of responsibility among CA pilots and medical workers with stable psychoemotional conditions.

How specific resources can be considered:

- for civil aviation pilots, it is an activity of reflection on actual (real) activity and a medium-high general level of reflection; the predominance of meaningfulness in the cognitive aspect of responsibility (regardless of the level of stability of mental states). The presented conclusions are largely consistent with previously published data on the features of the higher substructures of the personality of civil aviation pilots, acting as psychological resources for balance, stability of mental states of the individual in difficult living conditions (Babichkova, 2022).
- for medical workers, it is based on reflection on present and future activities, as well as mainly an average, and in some individual manifestations a low, general level of reflection; orientation to cognitive awareness in the segment of specialists experiencing non–equilibrium states.

Conclusion

The scientific novelty of the study is consisted in the empirical operationalization of the previously introduced concept of "difficult living conditions" through the justification of the resource role of cognitive processes in the formation of a psychoemotional "response" to the stress of the Covid–19 pandemic. It is established that reflection of activity is an invariant predictor of cognitive resources in groups differentiated by the level of psycho-emotional stability. The invariant predictor role in the stability of mental states in professional groups of civil aviation pilots and medical workers of action-oriented metacognitive activity control, as well as cognitive meaningfulness

among CA pilots and medical workers with stable (equilibrium) psychoemotional states is shown.

This study allowed us to determine the factors of cognitive resource provision of stable and non-equilibrium psycho-emotional states which contributes to the verification of concepts of semantic regulation of mental states, metacognitive, resource, subject-resource approaches in modern psychology.

The results obtained correspond in different ways to the results of empirical studies presented in publications. In particular, data on the compensatory role of the AO-mode of control of successful activity under non-equilibrium mental states in stressful living conditions are not presented in the scientific publications of D. Kul and his followers. This can be explained by dynamic processes in the life of modern society, which during the years of experimental research D. Kul (80s of the twentieth century) had no analogues.

A significant result of the study was the identification of intercorrelational relationships between various cognitive mechanisms: metacognitive control, activity reflection, cognitive aspect of the substantive sphere of personal responsibility. These data reflected in the data of factor analysis can serve in the future for experimental research in the field of cognitive psychology.

In general, based on the generalization of the results obtained, it is possible to identify "targets" of psychological impact for the development of counseling programs and psychological support for a person with increased psycho-emotional lability in difficult living conditions.

Limitations

It should be noted that this study has some limitations. First, the empirical sample includes representatives of only two professional groups. In the future, it makes sense to expand the professional composition of the subjects. Secondly, there was a certain imbalance in the composition of participants by gender: the group of pilots is represented only by males, unlike the group of medical workers. This circumstance did not allow us to set the task of determining the gender specificity of cognitive resources of psychoemotional stability of a person in difficult living conditions. We assume that these limitations will be overcome at the next stages of the ongoing research.

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Bela Aslanovna Yasko – the concept of research and its theoretical justification, methodological justification of empirical search, writing the text of the section "Introduction", scientific editing of the texts of the sections "Results"; "Discussion"; critical revision of the content of the article.

Ekaterina Sergeevna Babichkova – select and conduct of psychodiagnostic procedures, presentation of primary statistics. Mathematical and statistical processing; writing sections "Results", "Abstract"; design of the general text of the article; work with sources.

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Conflict of Interest Information

The authors have no conflicts of interest to declare.