

ASSESSMENT OF VIABILITY UNDER EXTREME CONDITIONS

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In the present-time turbulent world, people involved in extreme types of activities are perpetually challenged by their professional duties. Many promising studies address preservation of mental health and career longevity, prevention of destructive professional factors. Searching for coping mechanisms that operate due to the internal mental resources was conducive to develop the concept of viability. This concept becomes increasingly demanded in Russian psychology in both theoretical and practical terms. It is most important to study viability of specialists involved in extreme types of activities that deal with catastrophes of different origins where it is necessary not only to cope with an extreme situation and fulfil the assigned task, but also to stay viable, in the profession, too. The world “viability” denotes universal individual human ability to keep up health, control emotional-volitional spheres against the background of specific cultural-environmental conditions reflected on the quality of life, which allows to cope with present situation and adequate for tolerance to influence in future. The present paper describes highly informative (diagnostic accuracy 88.9%. model sensitivity 96.0%, model specificity 52.1%) and, at the same time, simple and understandable approach to assessing the viability of strenuous professions people. The approach may be used for aptitude screening, correction and prevention measures in specialists involved in extreme types of activities. Empirical and statistical data state that negative components of viability factor include distrustful-skeptical type of interpersonal relationships, dysthymia, anxiety, and paranoid traits.

Keywords: *viability, approach to assessing, regression index, tough professions people, extreme activities sphere.*

Introduction. Life activities of a modern strenuous occupation specialist proceeds in extreme conditions stimulating the evolution of stress due to professional, political, informative, social-political, and ecological factors. Psycho-emotional stress is the main component of extreme professional activities [8, p. 4]. The safety of each person depends upon mankind life safety,

homeland security, and personal safety. Life activity safety culture is possible after the settlement of problematic issues concerning each citizen of the Russian Federation through qualitative changes of viability, in spheres of science, education and health protection by means of definition and development of human reasoning mechanisms for managing health resources using individual, family, society, and culture in socially acceptable manner.

In spite of a large range of organizational measures designed for viability support, life activities protection, human loss reduction, reduction of moral and material damage by crash, and by natural, technogenic and sociogenic accidents, these measures have been inadequate without human factor integration since human factor is the reason of crashes and accidents in 70-85% of cases [2 p. 40; 6, p. 15].

Here and abroad, lots of promising studies aim at searching for factors of psychological resilience to extreme factors influence, body recovery, early diagnostics of destructive genesis of human profession and also at coping strategies training (by Dikaya L.G., Mahnach A.V., Zeer E.F., Simanyuk E.E., Rean A.A., Baranov A.A., Bodrov V.A., Doroshev V.G., Orel V.E., Maclakov A.G., Vodopianova N.E., Starchenkova E.S., and others).

Issues of especially difficult and extreme life situations were studied by N.V. Tarabrina, M.Sh. Magomed-Eminov, M.M. Reshetnikov, N.N. Puhovsky, F.E. Vasilyuk and others [1, p. 83]. V.A. Bodrov paid great attention to the professional psychological stress. He was a founder of the informative stress concept in "subject-object" type specialists [4, p. 25]. L.G. Dikaya and A.V. Mahnach had analyzed international experience of studying the factors that determine individual assessment of stress genesis and human relation to them, and defined such situation as unfavorable life events [5, p. 139]. A number of domestic psychologists defined stressful, conflict, frustrating, traumatic, extremal and other tense situations as "difficult situations" (A.V. Libin, A.V. Libina, A.G. Maklakov, V.L. Blinova, E.G. Surkova, and others) typifying them by impossibility to satisfy one's needs using earlier developed models due to the external and internal changes, which had broken previous adaptation, and by demand for developing new patterns and constructs. In E.E. Surkova's opinion, in a difficult situation a person tries to solve a problem in usual manner at first. At this time, the person undergoes tough emotional stress [9, p. 225]. In case when a situation is admitted as a crisis and its hopelessness is denied, the person continues with searching for problem settlement through cognitive rumination that results in insight (searching for the ways out of a difficult situation) and with verification in practice. In L.V. Blinova's opinion, one's own assessment of oneself physical and mental health is an important criterion for subjective choice of a way out of a difficult situation forming a vector of personality [3, p. 378].

Since 1973, foreign periodical editions represented the results of some academic research works on psychological resilience (resilience is the French for psychological resistance), which

suggests an active use of mainly internal sources of a person with the view of coping with unfavorable difficult situations. This is the resilience that copes with present situation and represents the factor adequate for tolerance to influence in future, contributes to mental health, and impacts on the quality of life

Searching for recovery resources, psychological resilience factors favorable for stability and levelling out stress factors impact was an actual problem in the light of International Statistical Classification of Diseases of the 10th revision where the column “Stress related with difficulties of maintenance normal lifestyle” is admitted one of the factors, influencing health status and contact with health service. In connection with this fact, the problems of psychological resilience have been dominating. As was represented at a European conference of the World Health Organization (in 2005), the work-related stress had been an important problem for about 1/3 of working people in European countries, and cost of solving the problems with psychological health due to this fact ~~is~~ was 3-4% of gross national income. Economic losses resulted from production stress and stress-induced problems with mental health of specialists were quite high.

Since 2003, intensive increasing in number of experimental works that study risk factors, outside coping criteria, effectiveness of protection mechanisms, and coping strategies resulted in forming the category of “viability” in domestic psychology where while experts worked on the project “Methodological and contextual issues in study on child and adolescent viability: international collaboration in study of mental health in children and adolescent at risk”, the best suited Russian-language scientific expression has been offered for the term “resilience”.

Historically, the creation of the expression “viability” underwent five stages of development:

1. Studies by N. Garnezi on project “Competence”;
2. Longitudinal research of “invulnerable children” by E. Verner and her staff;
3. Emphasis of scientific views on comparison of individual and social resources roles;
4. Study of human individual ability to search for human and society mental health resources within specific culture in his own way;
5. Forming four aspects (micro-, meso-, exo- and macroscopic system) of ecological model by U. Bonfenbrenner.

At the present time, the expression “viability” begins gradually becomes overtheoretic metaconcept (according to A.V. Mahnach’s data [7, c. 64]).

Viability definition underwent staged development period and gradually formed in universal individual ability of a person to maintain the health, control his emotional, perceptive and conative spheres against the background of specific cultural-environmental conditions reflected on the

personal quality of life, which not only allows to cope with present situation, but also promotes and adequate for tolerance to such an influence in the future.

The study was focused on determining of approach of viability level definition.

Materials and methods of study. Basing on viability definition, a range of methodologies was used: the burnout test by V.V. Boiko for assessment of emotional sphere; the “S-test” for assessment of ability to operation with spatial patterns and thought rate for definition of cognitive sphere; the Lusher color test in 9 directions using mathematical processing offered by I. Tsyganok for conative factor; authorial social-psychological questionnaire for appraisalment of satisfaction with the quality of life and perception of conditions of professional activity.

The following were criteria for entry in test group with high viability level: high ability to operation with spatial patterns, high thought rate (according to the data of the “S-test” methodology), absence of the burnout and formed or forming stages of stress (according to the data of Boiko’s burnout test), absence of stress status, high capacity for work (according to the Lusher test), subjective perception of the professional stress as a usual one and satisfaction with the quality of life (according to the data of social-psychological questionnaire).

The following were criteria for entry in test group with low viability level: low ability to operation with spatial patterns, low thought rate (according to the data of the “S-test” methodology), presence of the burnout and formed or forming stages of stress (according to the data of Boiko’s burnout test), presence of stress status, low capacity for work (according to the Lusher test), subjective perception of professional stress as an extreme one and dissatisfaction with the quality of life (according to the data of social-psychological questionnaire).

Approach for definition of viability level was based on studying some personality traits of the representatives with a high and a low level of viability. Basing on the study of the personality traits, the multivariate regression analysis was used for the purpose. The dummy variable between a high viability level and a low viability level was used as a predictable pattern. Patterns for considering them in the multivariate regression analysis were selected by means of an univariate analysis. The Mann-Whitney test for non-normally distributed spaced-responding conditions–was used for the purpose. During regression analysis, the method of backward selection of variables was applied. The result processing was carried out using standard methods of statistics SSPS 17.0.

Results and discussion. Regression coefficients for the patterns and values of their statistical significance are given in Table 1.

Table 1

Regression coefficients for independent prognostic patterns

Pattern	Code	B ¹	Wald statistic value	p-level
DMO-4 (incredulous–skeptical type)	X1	0.306	16.724	0.001
Scale 6 (paranoic type)	X2	0.038	5.248	0.022
Anxious type	X3	0.089	5.202	0.023
Dysthymic type	X4	0.176	11.864	0.001
Constant type		-6.968	48.173	0.001

Note: ¹ – coefficient of regression model

Distribution for 298 respondents depending on the level of their viability made by means of synthesized logistic model and selected separation point (0.5) is represented in Table 2.

Table 2

Distribution for the respondents predicted by means of synthesized logistic model in comparison with distribution in real situation

In real situation		Predicted by means of synthesized logistic model ¹		Total
		Viability		
		High level	Low level	
Viability	High level	240	10	96.0%
	Low level	23	25	52.1%
Total				88.9%

Note: ¹ – separation point 0.50.

Using this logistic model represented proper prediction of impact of psychological human characteristics on viability in 265 of 298 respondents that corresponds to diagnostic accuracy of 88.9%. Model tolerance was 96.0%, and its specificity – 52.1%. It allows to predict lineup of risk group of low-level viability with reasonable accuracy and propose appropriate psychocorrection and psychotherapy.

Thus, obtained approach appears as follows:

$$P(\hat{y}) = 1 / (1 + e^{-y}) \text{ or } P(\hat{y}) = 1 / (1 + 1/e^y)$$

where: $y=0.306*X1+0.038*X2+0.089*X3+0.176*X4-6.968$;

$P(\hat{y})$ – viability level ($0 \leq \hat{y} \leq 1$); values in the range from 1 to 0.7 show low level viability, values in the range from 0 to 0.3 - show high level viability, values in the range from 0.6 to 0.4 are considered as a mean level.

- X1 – value of incredulous/ skeptical type of interpersonal dealings (score, DMO);
- X2 – paranoid factor value (score, mini-mult);
- X3 – anxious factor value (score, K. Leongard);
- X4 – dysthymic factor value (score, K. Leongard);
- e – coefficient equal to 2.71.

Example.

A person A., his occupational life is 12 years. According to the data of K. Leongard methodology, aimed at revealing accentuation of personality traits, anxiety score was 14, dysthymia score– 14. According to the data of mini-mult methodology, the rigidity value equals to 60. Values of incredulous– skeptical type by DMO methodic are 14 score. Calculation of viability is made as follows:

$$P(\hat{y}) = 1 / (1 + 2.71^{-(0.306*14+0.038*60+0.089*14+0.176*14-6.968)}) = 1 / (1 + 2.71^{-3.306}) = 1 / (1+0.037) = 1/1.037 = 0.96$$

or

$$P(\hat{y}) = 1 / (1 + 1 / (2.71^{(0.306*14+0.038*60+0.089*14+0.176*14-6.968)})) = 1 / (1 + (1 / (2.71^{3.306}))) = 1 / (1+0.037) = 1/1.037 = 0.96.$$

Basing on the calculation and using the logistic model, the coefficient is equal to 0.96. Consequently, the person A. needs in special psychocorrective measures, and he has a low level of viability.

Conclusion. Based on the regression coefficients and weighted odds ratio values found for each of patterns, inference should be drawn that incredulous/ skeptical type of interpersonal dealings by DMO is the essential pattern (X1) representing the level of viability; next, disthymia (X4) and anxiety (X3) values by K. Leongard methodology aimed at revealing accentuation of personality traits, paranoia values (X2) by mini-mult methodology are arranged in order of importance.

The analysis carried out has allowed to establish highly informative and at the same time simple and understandable approach to assessing the viability of strenuous professions people that may be used for correction and preventive actions.

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