

**PRRAEPGDA 2020****Personal and Regulatory Resources in Achieving Educational and Professional Goals in the Digital Age****DIAGNOSTICS OF PERCEPTIVE AND EMOTIONAL COMPONENTS OF PSYCHOLOGICAL READINESS FOR SELF-REGULATION IN PROFESSIONAL ACTIVITY**

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***Abstract***

Psychological readiness is a complex phenomenon that includes a variety of motivational and regulatory components, a system of cognitive patterns for future activities and working conditions, predictive assessments, as well as managing one's own emotional reactions. In the technical occupational area the subject of work operating a complex technical system must have a high level of stress resistance and self-regulation. In this context, vocational diagnostics and selection becomes particularly important. Subjective criteria can help identify "subtle" emotional experiences, nuances of cognitive-affective processes that occur simultaneously in the mind of the individual. Objective criteria often require a rather complex and time-consuming research procedure. In this regard, diagnostic techniques combining time-effectiveness and validity are required. To test the effectiveness of such techniques, a study of psychological readiness for professional activity was conducted among novice drivers and cadet civil pilots starting their training flights. "Falling words" and "show-up words" tests reveal perceptual mechanisms underlying the subject's interpretation of the situation as potentially stressful and detect perceptual alertness/defense. The subject of professional activity with a high ability to interpret the received signals as stressful will recognize these words faster, which will be reflected in the objective criterion - short signal recognition time. Comparing the data with the results of coping tests demonstrated that for novice drivers, perceptual alertness prevails over perceptual defense. More experienced drivers often relieve suppressed emotions (usually hostility, anger), directing them at objects that are less dangerous or more accessible than those that caused negative emotions and feelings.

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**Keywords:** Stress resistance, self-regulation, technical professional area.



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## 1. Introduction

Psychological readiness is a complex phenomenon that includes a variety of motivational and regulatory components, a system of cognitive patterns for future activities and working conditions, predictive assessments of one's prospective success/failure, possible mistakes and ways to correct them, as well as managing one's own emotional reactions and stress resistance. By tradition research on stress resistance is mostly associated with social occupational area (Bogdanova & Andreeva, 2018; Mikhailova & Rubtsova, 2019). In technical occupational area the subject of work, that is an individual operating a complex technical system must have a high level of stress resistance and self-regulation. In this context, vocational diagnostics and selection becomes particularly important. In contrast to professions from social occupational area, where stress is commonly related to coping with social pressure or emotional burnout, in the technical occupational area stress factors are mostly associated with physical and psychological overload, limited time for decision making, heavy consequences of wrong decisions, etc. This imposes demanding requirements on psychological and psychophysiological resistance of subjects operating technical systems. Vocational selection for "technical" professions in general, and civil aviation piloting in particular, has been an object for existing research (Rozaynenko & Podverbnikh, 2015; Volkova, 2019). A few studies have focused on cognitive sphere, particularly, on strict requirements to attention, its concentration, distribution and shifting, as well as on requirements to different kinds and forms of memory and thinking (Usatov, 2017). The relevance of the current research is also determined by the fact that psychodiagnosticians often have to choose which criterion of stress resistance assessment they should give priority to – an objective, i.e. measurable, or a subjective one. Subjective criteria can help identify "subtle" emotional experiences, nuances of cognitive-affective processes that occur simultaneously in the mind of the individual. Objective assessment criteria, however, often require a complex and time-consuming research procedure, therefore, making it impossible to capture the moment of the stressful situation itself.

## 2. Problem Statement

Many recent technological disasters have provoked a lot of public discussion on the need for more strict requirements to future drivers as well as to people operating complex technical systems. On the other hand, the accessibility and ease of use of various technical appliances have contributed to the illusion that operating a technical system is an easy job. The truth, in our view, is somewhere in between. Regardless of the specifics of each professional activity special training can help to achieve a certain (or acceptable - in case of non-hazardous occupations) level of crucial professional skills and personal qualities. In other words, in order to diagnose stress resistance as an occupational requirement not only initial, but also processual and final diagnostics are needed. The problem with occupational selection by the stress resistance criterion is that a technical college enrollee, as well as a recent graduate, hasn't yet experienced the occupational stress, resistance to which they must demonstrate. Accident simulation or driving practice (training flights) doesn't give the future driver (or pilot) the real idea of the actual danger, hence the crucial importance of processual stress-resistance diagnostics conducted throughout the whole

training period. Equally important is the study of a whole range of personal qualities involved in coping, as well as shaping the vision of a technical specialist that is resistant to occupational stress.

### **3. Research Questions**

The idea of complex stress-resistance diagnostics can be found in the research that recognize the existence of subtle psychic mechanisms comprising the phenomenon of psychological readiness of a technical system operator, among them mind-setting, transfiguring the representation of the information received, manifestation of mobilization states. For instance, the construction of conceptual mental representation is treated as process and result of concept functional organization that defines the productivity of human activity (Kuvaeva, 2018). The study of the drivers' coping behavior and cognitive attitudes should take place on all stages of their professional training. On the one hand, it is naturally related to the acquired and used experience, on the other hand, it seriously affects the emotional status of the operator, his mobilizations, emotional experiences and psychological needs.

### **4. Purpose of the Study**

To maintain the balance between objective accuracy and subjective-intuitive consistency in describing the phenomenon under study, a psychodiagnostician has to employ the procedures and techniques that are time-efficient on the one hand, and valid and reliable on the other. To test the effectiveness of such techniques, a study of psychological readiness for professional activity was conducted among novice drivers. Another study has been planned to test the psychological readiness of cadet civil pilots at the initial stage of their flight training. Cadet pilots' psychological readiness for training flights needs a further study of perceptual and emotional components to be used in self-regulation of resistance to emotional and psychological stress associated with upcoming professional activities.

### **5. Research Methods**

“Falling words” and “show-up words” tests developed as software “Experimental studies in psychology” scientists of St. Petersburg University (Filippova et al., 2010) were used as objective diagnostic techniques in this study. The tests reveal perceptual mechanisms underlying the subject's interpretation of the situation as potentially stressful or neutral. In the “falling words” test the time of reaction on “dangerous” words exceeding the time of reaction on neutral stimuli is treated as perceptual alertness (“loitering” at the word). The reaction time shorter than standard is treated as perceptual defense (the desire to take the word out of sight). The “show-up words” test consists in the words semantically associated with difficulty, trouble, failure that appear on the computer screen. For instance, the word “junction” or “road accident” will be “stressful” for a novice driver. It will reveal perceptual alertness, as some stimuli require shorter time of exposure to be identified than neutral ones. According to the authors of the technique, the subject with a higher readiness to interpret the signals they receive as stressful and dangerous will identify these words faster, which will be reflected in the objective criterion, i.e. shorter recognition time (Ivanchei et al., 2019; Shcherbakova et al., 2018). Plutchik et al. (1979) method “Diagnostics of psychological defense typology” adapted to Russian sample (as cited in Fetiskin et al.,

2002), Folkman and Lazarus's (1988) "Coping test" adapted to Russian sample by Kryukova and Kuftyak (2007) were used as subjective methods. The results were interpreted according to Mann-Whitney's U-test. More than 60 people, among them driving school students, novice drivers with less than 2 years of driving experience and drivers with more than 2 years' experience (Emelianenkova & Kisina, 2013) participated in the study.

## 6. Findings

The results of the study among drivers with different driving experience demonstrated that more experienced drivers have a much higher perceptual defense, and their threshold of perception of "unpleasant" stimuli (as compared to that of neutral or "pleasant" sensory stimuli) is also higher. In contrast to this, among those who were just learning to drive or had a driving experience of less than 2 years, perceptual alertness prevailed over perceptual defense, and their threshold of perception of "unpleasant" stimuli was lower. They were more perceptually prepared for the danger, because the activity was new for them and it required more of their active attention.

The obtained data was in line with the world statistics demonstrating that experienced drivers more often have car accidents. With experience many motional, sensory, mnemonic, etc. manipulations become automatic. Bigger driving experience makes a person more self-confident about their driving, which can result in loss of perceptive alertness. However, novice drivers track every stimulus and quickly react to it.

Apart from the perceptual level, other major differences between driving school students and drivers with over 2 years of experience can be identified on the psychological defense level. In particular, more experienced drivers relieved their suppressed emotions (usually anger, fear or sense of guilt) directing them at the objects that were more accessible or less dangerous ( $U = 143, p < 0.05$ ). At the same time they demonstrated subconscious transformation of their drive states into their subjective counterparts, i.e. they made active use of the projection mechanism. According to the data obtained in this research, driving school students more often demonstrated denial as a kind of psychological defense, that is they subconsciously denied some circumstances that were frustrating for them ( $U = 142.5, p < 0.05$ ). They tried to distance themselves from these situations pretending to themselves that "this can happen to anyone but myself", "it's okay, nothing bad has happened", etc.

The research also showed that drivers with over 2 years of experience frequently resorted to such constructive coping-strategy as "problem-solving planning" ( $U = 230, p < 0.05$ ) and seldom used the destructive "escape/avoidance" strategy. This means that experienced drivers more often use problem-oriented analysing the coping situation like a game of chess and planning their actions and effort. In these situations problem-oriented coping, unlike emotion-oriented, can most effectively help the driver interact with the environment. It's a positive process that should not only be encouraged, but actively facilitated from the early stage of learning to drive, moving from perceiving the situation as a whole to analysing in detail its components and cause-and-effect relationships between them. This should help avoid minor car accidents which, according to statistical data, novice drivers often get into.

## 7. Conclusion

The study of drivers with different length of experience demonstrated the difference in cognitive-perceptual mechanisms they use to interpret potentially stressful stimuli, as well as in coping strategies they use to deal with stress.

Cadet pilots' psychological readiness for training flights need further study of perceptual and emotional components to be used in self-regulating the resistance to emotional and psychological stress related to future professional activity. The study was planned but not conducted due to the imposition of quarantine measures.

Diagnostic techniques making use of self-reports, psycho-projective mechanisms, etc. have a certain potential, provided they are combined with the objective criteria of evaluating mental conditions under study.

Diagnostics of professionally important personal qualities in the technical occupational area is complicated by the ambiguity of the terms "stress" and "stress resistance". Initial diagnostics of individual psychophysiological characteristics as a criterion of stress resistance is justified only upon condition of additional educational work aimed at forming a characterological value system appropriate for a certain profession, its priorities and ethics.

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## References

- Bogdanova, N. V., & Andreeva, S. N. (2018, April 16). Osobennosti stressoustoichivosti u predstavitelei razlichnykh professional'nykh grupp v sfere "chelovek-chelovek" [Features of resistance to stress among representatives of various professional groups in the field of "person-person"]. *Proceedings of the VII international scientific and practical conference 'Actual issues in science and practice'*, 161-166. <https://elibrary.ru/item.asp?id=35431142>
- Emelianenkova, A. V., & Kisina, A. A. (2013, September 26-28). Osobennosti koping-strategii i mekhanizmov psikhologicheskikh zashchit u nachinaushchikh voditelei [Features of coping strategies and psychological defense mechanisms for novice drivers]. *Proceedings of the III International scientific-practical conference 'Psychology of stress and coping behavior'*, 230-233. <https://elibrary.ru/item.asp?id=24204466>
- Fetiskin, N. P., Kozlov, V. V., Manuilov, G. M. (Eds.). (2002). Diagnostika tipologii psikhologicheskoi zashchity (R. Plutchik v adaptatsii L.I. Vassermana, O.F. Erysheva, E.B. Klubovoĭ i dr.) [Diagnostics of typologies of psychological defense (R. Plutchik in adaptation of L. I. Wasserman, O. F. Eryshev, E. B. Klubova et al.)]. *Sotsial'no-psikhologicheskaiâ diagnostika razvitiâ lichnosti i malykh grupp [Socio-psychological diagnostics of the development of personality and small groups]* (pp. 444-452). Institute of Psychotherapy Publishing House.
- Filippova, M. G., Chernov, R. V., & Miroshnikov, S. A. (2010). Vytesnenie ugrozhaushchei informatsii: izuchenie vozmozhnosti izmereniâ neosoznavaemogo strakha [Exclusion of threatening information: measuring of unconscious fear of death]. *Bulletin of St. Petersburg University. Series 12. Psychology. Sociology. Pedagogy*, 2, 143-158. <https://elibrary.ru/item.asp?id=15252603>

- Folkman, S., & Lazarus, R. S. (1988). *Manual for the Ways of coping questionnaire*. Consulting Psychologists Press.
- Ivanchei, I., Begler, A., Filippova, M., Kuvaldina, M., Chetverikov, A., & Iamschinina, P. (2019). A different kind of pain: affective valence of errors and incongruence. *Cognition and Emotion*, 33(5), 1051-1058. <https://doi.org/10.1080/02699931.2018.1520077>
- Kryukova, T. L., & Kuftyak E. V. (2007). Oprosnik sposobov sovladaniia (adaptatsiia metodiki WCQ) [Copying methods questionnaire: Adaptation of the WCQ methodology]. *Zhurnal prakticheskogo psikhologa [Practical Psychologist's Journal]*, 3, 93-112.
- Kuvaeva, I. O. (2018, November 8-10). Kontseptual'nye reprezentatsii stressa u operatorov kontakt-tsentra [Concept «Stress» among call center's operators]. *Proceedings of the Third international scientific conference 'Psychology of human states: actual theoretical and applied problems'*, 270-273. <https://elibrary.ru/item.asp?id=37353425>
- Mikhailova, I. V., & Rubtsova, Y. A. (2019). Strategii preodoleniia stressovykh situatsii molodykh pedagogov shkol'nogo i doskol'nogo obrazovaniia [Strategies for overcoming stress situations of teachers of school and pre-school education]. *Proceedings of the V International scientific conference 'Psychology of stress and coping behavior: challenges, resources, well-being'*, 191-195. <https://elibrary.ru/item.asp?id=41211564>
- Plutchik, R., Kellerman, H., & Conte, H. R. (1979). A structural theory of ego defenses and emotions. In C. E. Izard (Eds.). *Emotions in Personality and Psychopathology* (pp. 227-257). Springer. [https://doi.org/10.1007/978-1-4613-2892-6\\_9](https://doi.org/10.1007/978-1-4613-2892-6_9)
- Rozaynenko, I. Y., & Podverbnikh, O. E. (2015). Osobennosti professional'nogo otbora pilotov grazhdanskoï aviatsii [The features of the recruitment of civil aviation pilots]. *Actual Problems of Aviation and Astronautics*, 2(11), 721-723. <https://elibrary.ru/item.asp?id=25778102>
- Shcherbakova, O., Kirsanov, A., Nikiforova, E., Filippova, M., Blagoveshchensky, E., & Shtyrov, Y. (2018). Behavioural and erp-correlates of explicit and implicit acquisition of novel words. *Neurobiology of speech and language proceedings of the 2nd International workshop 'Neurobiology of speech and language'*, 25. <https://elibrary.ru/item.asp?id=36656738>
- Usatov, I. A. (2017). Gendernye osobennosti stressoustoichivosti sotrudnikov PAO "Rostelekom" [Gender features of stress resistance of employees of «Rostelecom»] *Scientific and methodological electronic journal Concept*, 39, 931-935. <https://elibrary.ru/item.asp?id=29760404>
- Volkova, L. M. (2019, November 28). Individual'no-psikhologicheskie osobennosti lichnosti pilota grazhdanskoï aviatsii [The individual psychological characteristics of the personality of a civil aviation pilot]. *Proceedings of the International scientific-practical conference 'Problems and prospects of experimental science'*, 102-104. <https://elibrary.ru/item.asp?id=41399830>