



Research Article

UDK [331.102.24:004]:316.614.6:159.95

NEUROPERSONALITY APPROACH TO THE ISSUE OF COGNITIVE SECURITY AS A NECESSARY CONDITION FOR WORK-RELATED SOCIALIZATION OF IT-SPECIALISTS

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Abstract

The post-classical paradigm of understanding the system of personality potentials due to virtualization and informatization of most spheres of natural life emphasizes the need to rethink the many positions of determining personal development and resourcefulness of specialists. The conceptual principles of cognitive security research of specialists in the field of IT technologies, whose professional activity is directly related to information culture, information, and cognitive security of others, need to be clarified.

Methodology. An empirical study was conducted on two randomized groups of IT specialists. The groups are differentiated according to the criterion of professional experience. Accordingly, two groups were formed: EG1 (n 76) - IT specialists with experience of up to five years and group EG2 (n 83) - IT specialists with experience of more than five years (6-10 years). To generalize the structure of the relationship of categories that reveal the range of factors of cognitive-stylistic determination and neurodynamic conditionality of cognitive security of IT specialists, an expert evaluation was conducted. Research technology involved the assessment of IT experts (22 specialists with 15-22 years of experience) the importance of parameters that identified three main strategies for cognitive security of IT specialists

Results. Sixteen neuropersonality types of solving professional problems and ensuring cognitive security of IT specialists differentiated by professional experience were identified. Three strategies of cognitive security of IT specialists: "Life-sustainability-strategicity", "Metacognitive knowledge - control over action" and "Positive refocusing - Metacognitive activity" are specified.

Keywords: cognitive security, metacognitive activity, self-regulation, coping, IT-specialists, occupational activity, professional stress, professional mobility, modeling.

Relevance

The post-classical paradigm of understanding the system of personality potentials due to virtualization and informatization of most spheres of natural life emphasizes the need to



rethink the many positions of determining personal development and resourcefulness of specialists. The conceptual principles of cognitive security research of specialists in the field of IT technologies, whose professional activity is directly related to information culture, information, and cognitive security of others, need to be clarified.

Modern IT technologies and virtual networks open a new channel for human communication and self-expression and professional activity. According to research, this format of interaction helps to increase vitality, which helps to better adapt to change. This format of virtual interaction can provide personalized home therapy with interactive communication between patients and clinicians (Choi, Paik, 2018), the effectiveness of training (Kyaw, Posadzki, Paddock, Car, Campbell, Tudor Car, 2019), in the context of the COVID-19 pandemic (Warrier, Shankar, Belal, 2021; Lunov, 2021; Melnychuk, 2022).

In addition, users of social networks and virtual interactions can increase their social capital, through civic and political activism, social trust, relationships, and improved life satisfaction (Virtual Social Activities to Stay Connected, 2021). Social networks also bring their users the benefits of psychological well-being, including raising self-esteem and overall living standards (Fejes-Vékássy, 2017; Palenzuela-Luis, 2022).

However, there are not always obvious consequences of excessive use of social networks. One of such important consequences is fatigue from social networks, which indicates a subjective and self-esteem feeling of fatigue from using social networks. Extensive use of social networks creates widespread expectations that people are obliged to respond to other people's posts and comments. To meet these expectations, the user must pay constant attention to the social network and thus be exposed to an extremely large number of social requirements. This increased need for resources causes fatigue from social media, which can lead to physical and mental exhaustion (Reynolds, 2015; Lee-Falcon, 2014).

Therefore, the key problem of ensuring cognitive security is the timely replenishment of the information space with more effective new technologies to accelerate economic development, further formation, and development of society.

However, the issues of ensuring cognitive security of specialists in the field of IT technologies from the standpoint of subject-object relations remain unresolved. The author's position defines the latter as subjects, mediators and objects of information and psychological influence, and therefore requires clarification of the methodological principles of their subjectivity, information culture, resource, and, above all, the development of their personal and cognitive spheres.

Methodology

An empirical study was conducted on two randomized groups of IT specialists. The groups are differentiated according to the criterion of professional experience. Accordingly, two groups were formed: EG1 (n 76) - IT specialists with experience of up to five years and group EG2 (n 83) - IT specialists with experience of more than five years (6-10 years).

The following psychodiagnostics techniques were used in the empirical study: "Diagnosis of psychological security of the individual" (Prihodko, 2013); Scale of professional autonomy and Scale of professional mobility (Maksymenko, Kokun, Topolov, 2011); Scale of professional stress and Scale of professional workload (Maksymenko, Kokun, Topolov, 2012); Scale of self-assessment of metacognitive behavior (LaCost, 1998) in Karpov's adaptation (2005); "Self-assessment of metacognitive knowledge and metacognitive activity" (Skvortsova, Kashapov, 2012); AHS scale - analytical-holistic (Apanovich, etc., 2017); Methods of diagnosis of cognitive style of personality (Dudnikova, Volkova, 2017); Methodology "Prognostic task" (Regush, 2003); Methods for diagnosing the ability to predict (Somova, 2002); Methodology "Cognitive-behavioral coping strategies" (Sizova, Filippchenkova); Cognitive Regulation of Emotions Questionnaire (Garnefsky, Craig, 2007); Methodology "Style of self-regulation of behavior - 98" (Morosanova, Kono, 1998); Questionnaire "Control of action" (Kuhl, 1991, adaptation by Shapkin, 1997); Questionnaire "Differential type of reflection" (Leontiev, 2009); Questionnaire of formal-dynamic properties of individuality (Rusalov, 1997).

To generalize the structure of the relationship of categories that reveal the range of factors of cognitive-stylistic determination and neurodynamic conditionality of cognitive security of IT specialists, an expert evaluation was conducted. Research technology involved the assessment of IT experts (22 specialists with 15-22 years of experience) the importance of parameters that identified three main strategies for cognitive security of IT specialists.

Results

The concept of cognitive-stylistic determination and neurodynamic conditionality of cognitive security of specialists in the field of IT technologies at: personal-professional, clinical-psychological, formal-neuro-dynamic, and neuropsychological levels is substantiated. The author's concept is based on the idea of the structure of cognitive security of the IT specialist and provides for the definition of such factors as: professional autonomy, professional mobility, professional stress, professional workload; cognitive, metacognitive and cognitive-stylistic predisposition to psychological security; reflexive-prognostic continuum of information security; functioning of analytical-holistic; metacognitive behavior, metacognitive knowledge, metacognitive activity, differentiation of cognitive style of individuality; mechanisms for ensuring the cognitive security of IT specialists; action control, behavioral self-regulation styles, cognitive-behavioral coping strategies, cognitive regulation of emotions; neurodynamic features of individuality.

It is noted that to generalize the structure of the relationship of categories that reveal the range of factors of cognitive-stylistic determination and neurodynamic conditionality of cognitive security of IT specialists, an expert evaluation was conducted. Research technology involved the assessment of IT experts (22 specialists with 15-22 years of experience) the importance of parameters that identified three main strategies for



cognitive security of IT specialists: "Sustainability- strategicity", "Metacognitive knowledge - control over action" and "Positive refocusing - Metacognitive activity".

The content of the first factor of the model "Sustainability-strategicity" summarizes the relationship between the factors of strategic planning (0.845) and the actual sustainability as a motivational and volitional predictor of cognitive security (0.866). The leading psychological factors play a leading role: professional autonomy (0.754), comprehension of achievements (0.744), perspective of consequences (0.743), metacognitive activity (0.740), ability to determine the significance of causal relationships (0.700). It should also be noted that such cognitive security strategies are characterized by: perspective forecast (0.752), programming (0.711), cognitive rehearsal (0.701), specific conceptualization (0.689), control over action during planning (0.674), including the completeness of planning operations (0.722), refocusing on planning (0.709), intellectual ergic (0.703), communicative ergic (0.665) and forecast-oriented (0.717).

The content of the second factor of the model "Metacognitive knowledge - control over action" is generalized. It is established that it is represented by load factors: metacognitive knowledge (0.700), control over the action during implementation (0.712). The structure of the factor also included: the value-semantic block of cognitive security (0.698), professional workload (0.694), awareness of the stages of the forecasting process in establishing cause-and-effect relationships (0.688). It is also necessary to point out the importance of the following psychological features for such a strategy of cognitive security of IT specialists: conscious decision making (0.680), concentration (0.677), tolerance for contradictions (0.670), breadth of search for hypotheses (0.666), definition of terminology (0.662), information acquisition (0.654), reflectivity (0.650), field independence (0.644), giving a situation of non-trivial meaning (0.635), intellectual plasticity (0.630), moving into perspective (0.634) and intellectual emotionality (0.631). Accordingly, it is possible to state the focus of this strategy of cognitive security of IT specialists on metacognitive knowledge and control over action.

The content of the factor "Positive refocusing - Metacognitive activity" is presented. It is established that the third strategy of cognitive security of IT specialists is based on metacognitive activity (0.628) and positive refocusing (0.624). The content of the factor also includes professional stress (0.620), paraphrasing and summarizing information (0.600), systemic reflection (0.595), time management (0.590), coping focused on changes in personal characteristics (0.588), forecasting based on the variability of associations (0.582), considering the requirements of the conditions for hypotheses (0.579), independence (0.570), flexibility of the forecast (0.567). The narrow range of equivalence (0.565), the width of the associative field (0.564) and communicative plasticity (0.550) are important. Thus, this strategy of cognitive security of IT specialists has resources in positive refocusing and metacognitive activity. The presented results testify to the heuristic value of the empirical model and the author's concept of the research.

The research involved two stages.

The first stage of the empirical study, aimed at clarifying the metacognitive and professional conditionality of cognitive security of IT specialists was conducted in two random groups. The groups are differentiated according to the criterion of professional experience in the field of IT. Accordingly, two groups were formed: EG1 (n 76) - IT specialists with experience of up to five years and group EG2 (n 83) - IT specialists with experience of more than five years (6-10 years).

At the second stage - neuropsychological research - 16 subgroups of 8 in groups EG1 and EG2 were differentiated within one neuropersonality type by B.Tkach' concept (2018; 2022): with functional weakening of the dorsolateral part of the prefrontal cortex, with functional weakening of the orbito-frontal cortex weakening of the ventromedial part of the prefrontal cortex, with functional weakening of the anterior cingulate cerebral cortex, with functional strengthening of the dorsolateral part of the prefrontal cortex, with functional strengthening of the orbito-frontal cortex. ventromedial part of the prefrontal cortex, with functional enhancement of the anterior cingulate cerebral cortex.

Discussion

Models of cognitive-stylistic determination and neurodynamic conditionality of cognitive security of specialists in the field of IT technologies (EG1 and EG2) are presented. It was found that the general index of cognitive security of the studied EG1 corresponds to the functional strengthening of the dorsolateral part of the prefrontal cortex, which actualizes the role of focused emotional response in the decision-making system. Three leading trends in cognitive security of specialists in the field of IT technologies (group EG1): positive review as a strategy of cognitive regulation of emotions: metacognitive behavior, focused on understanding the achievements; concentration of metacognitive knowledge and metacognitive activity. The importance of the following factors of the "first order" in ensuring cognitive security of the studied IT specialists in the EG2 group: systemic reflection; refocusing cognitions on planning; reduction of catastrophic as a strategy of cognitive regulation of emotions; enhancement of metacognitive behavior by type of modeling; breadth of hypotheses; professional mobility; overcoming subjective limitations and understanding achievements as strategies of metacognitive behavior; constructive transformational strategy of overcoming by the type of "comparisons going up (increased activity)"; variability of associations in relation to the prognostic task. It is proved that the decrease in the integrative indicator of cognitive security of the studied EG2 corresponds to the functional weakening of the dorsolateral part of the prefrontal cortex. The obtained results generalize the metacognitive orientation and neurodynamic conditionality of cognitive security of IT specialists.

Conclusion

The scientific novelty of the study is to determine the phenomenon of cognitive security of the individual in the context of determination and interdependence of cognitive



and stylistic features, metacognitive activity, coping and neuropsychological properties of the individual;

For the first time:

- empirically identified sixteen neuropsychological types of solving professional problems and ensuring cognitive security of IT specialists differentiated by professional experience, in particular: with functional weakening of the dorsolateral part of the prefrontal cortex; with functional weakening of the orbito-frontal part of the prefrontal cortex; with weakening of the ventromedial part of the prefrontal cortex; with functional weakening of the anterior cingulate cortex; with functional strengthening of the dorsolateral part of the prefrontal cortex; with functional enhancement of the orbito-frontal part of the prefrontal cortex; with functional enhancement of the ventromedial part of the prefrontal cortex; with functional enhancement of the anterior cingulate cerebral cortex;

- the correlates of cognitive security of IT specialists are determined and its content is supplemented with factors: professional autonomy, professional mobility, professional stress, professional workload; cognitive-stylistic predisposition; reflexive-prognostic continuum; functioning of analytical-holistic; metacognitive behavior, metacognitive knowledge; control over action, styles of self-regulation of behavior, cognitive-behavioral strategies of overcoming, cognitive regulation of emotions; neurodynamic and neuropsychological properties of personality;

- three strategies of cognitive security of IT specialists are specified: "Life-sustainability-strategicity", "Metacognitive knowledge - control over action" and "Positive refocusing - Metacognitive activity";

- developed models of cognitive-stylistic determination and neurodynamic conditionality of cognitive security of specialists in the field of IT technologies at the level of predictors and effectors;

- recommendations for the development of cognitive security of IT specialists were further developed.

The practical significance of the obtained results is to concretize the ideas and determine the criteria of psychodiagnostics and neuropsychological assessment of metacognitive and neurodynamic conditionality of cognitive security of specialists in the field of information technology in accordance with the stages of professional genesis. Based on the obtained generalizations, it becomes possible to differentiate approaches to the forecast of cognitive security as a "functional organ" of the individual. Its proposed models can be targets of psychological intervention and the basis for the creation of programs in psychoeducation, psych-prevention to ensure the functioning of personal resources.

So, cognitive security is considered as a state provided by the activity of functional complex - personal formation, represented by a specific reflection of professional activity, reflexive and prognostic abilities, resource structure, cognitive styles, metacognitive activity, and metacognitive activity. on the information context of life. The peculiarities of

information and psychological security of specialists in the field of IT technologies as subjects, mediators and objects of information influence are determined.

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Competing interests: Any competing interests were declared by authors.

Disclaimer: The authors declares that their opinions and views expressed in this manuscript are free of any impact of any organizations.



ABOUT THIS ARTICLE

Cite this article

Lunov Vitaliy, Abdryakhimov Georgiy NEUROPERSONALITY APPROACH TO THE ISSUE OF COGNITIVE SECURITY AS A NECESSARY CONDITION FOR WORK-RELATED SOCIALIZATION OF IT-SPECIALISTS 2023 Socialization & Human Development journal 1. DOI 10.37096/SHDISJ-23-1.1-0004

Submitted on 13 Jul 2023 / Revised 15 Sep 2023 / Approved 1 Nov 2023

Published: **20 Nov 2023**

DOI: 10.37096/SHDISJ-23-1.1-0004

Managing editor - *Nataliia Dembytska*.

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