

PSYCHOLOGICAL MECHANISMS OF ADULTS INTELLECT AND SUBJECTNESS DEVELOPMENT

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INTRODUCTION

This Chapter considers the problems of developing mental features such as intellect and subjectness that are crucial to forming of all the mature professionals in any professional spheres. After all, these categories characterize an adult as a carrier of a certain mental model of the world, ready to solve professional and life problems, in other words, they create a psychological basis for mastering any professional competencies, as well as their inclusion in the competing systems that already exist in specialist in order to enrich the latter and, accordingly, professional growth. The latest research on subjectness examines the notion of a professional entity as organized integrity. According to V. Bykov and G. Bykova¹ (Bykov & Bykova, 2013), the subject of professional activity is a personality, which is characterized by professional subjectness as an integrative socio-psychological phenomenon. The latter provides the possibility to understand the meaning of the activity, set and implement within its scope its goals and initiate professional communication. A. Bodaliyov² (Bodaliyov, 1998), considering the concept of “professionalism” in terms of psychology, noted that the professional is the subject of activity, which has such stable characteristics of the mind, feelings, will, or, in other words, such mental features that allow him to perform the activity of his specialization at the high level of productivity. Along with the necessity to have the appropriate stable features, their development in the process of forming and renewing of professional activity is of no less importance.

¹ Bykov, V. M., & Bykova, A. V. (2013). *Sotsialno-psihologicheskaya koncepciya formirovaniya yadra subektnoj aktivnosti v obrazovatelnom processe vuza* [Socio-psychological concept of formation of nucleus of subjective activity in educational process of university]. Moscow [in Russian].

² Bodaliyov, A. A. (1998). *Vershina v razvitii vzroslogo cheloveka: kharakteristiki i usloviia dostizheniia*. [Apex in the development of an adult: characteristics and conditions of achievement]. Moscow: Nauka. Publ. [in Russian].

Postclassical methodology considers the category of development as relevant not only to human development, but also to the development of systems and, accordingly, their systemic self-organization. The concept of a bifurcation point, that is, non-returning, has emerged. Having passed this point, any system, and a person, too, is not able to return to the previous state, which, incidentally, very accurately characterizes the situation of serious life choices. In addition, modern psychology pays much greater attention to the internal aspects of development and self-development than environmental influences, and accordingly places emphasis on the individual trajectory of development, the authorship of one's own life. Therefore, modern approaches to the human development and self-development are also largely oriented towards systems theory.

1. The concept of development in the contemporary psychology

The main provisions for the construction of a dynamic model of development based on the theory of systems self-organization were developed by S. Piankova³ (Piankova, 2009). She notes that a human as an organism and a personality are an open self-organizing system characterized by non-linear processes. The hierarchy of psychic carriers (psychological system), which is self-organizing, is the substrate of psychological development and is characterized by its own internal system dynamics.

Demographic changes, the obvious aging of society promote actualization of approaches to the life-span development. The latter concept is nowadays widely used instead of ontogenetic development. It is clear that the analysis of the developmental processes of the adult and the elderly people requires slightly different approaches than the development of a child, a teenager, a young person and so on. For them, development is, as noted by D. Leontiev⁴ (Leontiev, 2013), a

³ Piankova S. D. (2009). *Kognitivnoe razvitie i samoorganizaciya* [Cognitive development and self-organization. Development Theory: Differential Integration Paradigm]. Moscow: Yazyki slavyanskikh kultur Publ. [in Russian].

⁴ Leontiev, D. A. (2013). Lichnostnoe izmerenie chelovecheskogo razvitiya [The personal dimension of human development]. *Voprosy psihologii – Psychological issues*, 3, 67–80 [in Russian].

form of existence, but this is a so-called universal component of human development (before the completion of socialization), in contrast to the optional component associated with the statement and addressing the individual developmental challenges of adults.

Finally, we are witnesses and active participants in change, moreover, the active breakdown of standard social situations and universal development – from pre-school to postgraduate, since non-formal learning, home-based learning, distance learning and other virtual education environments, inclusive training, all kinds of professional and non-professional (in every sense of the word) trainings, etc. have appeared and are spreading rapidly.

On the other hand, the concept of development is an eternal psychological concept, and V. Zinchenko rightly said: “Outside the category of development, psychology as a science is hardly possible, since a person is never equal to himself. He is either bigger or smaller than himself and his time”⁵ (Zinchenko, 2010, p. 131).

Modern psychological terminology offers a wide range of synonyms for the concept of “development”, for example, genesis, change, formation, training, amplification, crisis, etc.

There is a difficulty with the antonyms of the concept “development”. If the subject is not developing, what happens to him / her? Stagnation, degradation, dementia or just a normal life without changes and cataclysms?

It should be noted here that psychology has received the analyzed concept of “gift” from philosophy, which links approaches to the concept of development with the dialectical concept of development in the struggle of contradictions. In our opinion, the definition of development, proposed by E. Yudin⁶ (Yudin, 1983a), is still not really lost, according to which development is an irreversible, directed, regular change of material and ideal objects. Only the simultaneous presence of all these properties distinguishes the processes of development among other changes, – says the author, – because, first, the inverse of changes characterizes the processes of functioning.

⁵ Zinchenko, V. P. (2010). *Soznanie i tvorcheskij akt* [Consciousness and the creative act]. Moscow: Yazyki slavyanskih kultur Publ. [in Russian].

⁶ Yudin, E. G. (1983). *Razvitie* [Development. Philosophical Encyclopedic Dictionary]. Moscow: Soviet Encyclopedia Publ. [in Russian].

Accordingly, the antonym of the concept of development is not degradation, but rather functioning, that is, the cyclic reproduction of a constant system of functions. In other words, lack of development, although characterized by “quiet stable functioning”, cannot in any way be regarded as a positive characteristic of a life situation.

Secondly, the lack of regularity is characteristic of random catastrophic processes and, thirdly, in the absence of directionality, changes cannot accumulate, and therefore the process loses the development of a single, interconnected line. As a result of development, a new quality emerges that changes the composition or structure of the development entity (that is, the emergence, transformation or disappearance of its elements and relationships).

Note that, according to E. Yudin⁷ (Yudin, 1983b), the essential characteristic of development processes is time: firstly, any development takes place in real time, and secondly, only time reveals the direction of development. This point is of fundamental importance for the development of the aged and old man, since the apparent scarcity of the vital resource highlights many relevant specific problems.

In his contemporary view of the problems of developmental psychology, O. Sergiienko proposes new methodological principles, including the principle of continuity and subjectness. Continuity of development refers to the interconnection of all stages of human development, the self-development of the systematic organization of the psyche, the genetic and environmental coordinates of mental change. Accordingly, the principle of anticipation of development insists on the necessary preparation of the next stages of development by the previous ones, which is inherent in all mental processes in their development. Subjectness is the principle of authorship of one’s own development, uncertainty and uniqueness of the ways of development of the psyche⁸ (Sergiienko, 2012).

⁷ Yudin, E. G. (1983). *Razvitie* [Development. Philosophical Encyclopedic Dictionary]. Moscow: Soviet Encyclopedia Publ. [in Russian].

⁸ Sergiienko, E. A. (2012). *Principy psikhologii razvitiya: sovremennyj vzglyad* [Principles of Developmental Psychology: A Contemporary View]. *Rsihologicheskie issledovaniya – Psychological research*, vol. 5, 24 [in Russian].

The principle of authorship of our own development, that is, unique self-development, self-movement corresponds to the approach to this problem by G. Kostiuk⁹ and S. Maksimenko¹⁰ (Kostiuk, 1969; Maksimenko, 2006) which we take into consideration in our research. Subjective self-development is seen as one in which the subject sets his or her own goal of development, and uses various opportunities and potentials to achieve it – his own personal potential as well as the one proposed by the external environment. We interpret self-development as a change in the mental model of the world, or the system of mental models (mentality); and also, as a new meaning; as a reinterpretation of personal experience. Self-development is defined by restructuring, amplification, reinterpretation, reconstruction of mental models of the world, restructuring of connections between them at all levels in the metamental model (that is, the system model, which defines personality)¹¹ (Smulson, 2009a).

We cannot disagree with O. Sergiienko that developmental psychology is not so much a separate branch of psychology as a way of studying psychic phenomena in their development. Interestingly, at this point in the analysis, the contemporary approaches of the followers (in the third or even the fourth generation) of S. Rubinshtein overlap with the approaches of L. Vygotskyi's successors, who believed that "only in genesis the true structure of psychic functions can be revealed: when they are already finally formed, their structure becomes indistinguishable"¹² (Galperin, 1977).

We support the new interpretation of modern psychology of regression as an antipyretic development. It is clear that development throughout life can certainly not be uniform, necessarily accompanied by ups and downs, plateaus, etc. Regressive and deadlocked lines of

⁹ Kostiuk, G. S. (1969). *Princip razvitiya v psihologii* [The principle of uncertainty in the psychology of choice and risk. Methodological and theoretical problems of psychology]. Moscow: Nauka Publ. [in Russian].

¹⁰ Maksymenko, S. D. (2006). *Henezha zdiisnennia osobystosti* [Genesis of personality realization]. Kyiv: TOV "KMM" Publ. [in Ukrainian].

¹¹ Smulson, M. L. (2009). *Intelekt i mentalni modeli svitu* [Intellect and mental models of the world]. *Naukovi doslidzhennia kohnityvnoi psykhologii – Scientific and cognitive psychology*. Ostroh: Natsionalnoho universytetu "Ostroh" Publ., vol. 12, 38–49 [in Ukrainian].

¹² Galperin, P. Ya. (1977). *K ucheniyu ob interiorizatsii* [To the doctrine of internalization.]. *Voprosy psihologii – Psychological issues*, 6, 21–29 [in Russian].

development are possible, but they are not manifestations of degradation, since regressive development is also a qualitative transformation of the system. The fundamental point in considering regression as antipyretic development is the non-transition through the bifurcation point, the possibility of returning with amplification to higher levels (as, for example, in overcoming adolescent self-centeredness – to intellectual decentration), or overlapping of regressing functions by others or their conglomerate (in case of memory defects in old age).

At the same time, this is why regress is interpreted as the anticipative development that it envisages (anticipating), after a temporary recession, a new upswing, but not necessarily in the same direction in which the development took place earlier.

B. Elkonin notes that, according to such a new understanding of the course of development, sensitivity is created when the emergence of new formations is at the same time the destruction of obsolete structures, it must be built as a sway. Therefore, “the completion of the correct formation is at the same time once-design, once-ordering of the schematism of the existing actions”. “In the horizon of development, it makes sense to talk about the result and its relation to the future, to talk about what opens when something else ends. Autonomy and initiative must be “placed” on the verge of completion-opening and understood as the energy of the manifestation of a new space of opportunities”¹³ (Elkonin, 1994).

The question remains of the criterion basis of development. V. Zinchenko is sure that the essence of development lies in the appearance of new formations (otherwise – functional organs). According to O. Ukhtomskyi, a functional organ of the individual is a temporary combination of forces that can make a certain achievement. It should be understood that the creation of functional organs is the result of great work, efforts that have been made in the history of mankind and carried out by each person. D. Leontiev emphasizes on this aspect when pointing to the specifics of personal development as opposed to its social and biological moments¹⁴ (Leontiev, 2013). There are no instruments for

¹³ Elkonin, B. D. (1994). *Vvedenie v psikhologiyu razvitiya* [Introduction to developmental psychology]. Moscow: Trivola Publ. [in Russian].

¹⁴ Leontiev, D. A. (2013). *Lichnostnoe izmerenie chelovecheskogo razvitiya* [The personal dimension of human development]. *Voprosy psikhologii – Psychological issues*, 3, 67–80 [in Russian].

functional organs created by man, thus their accounting is difficult. Moreover, the problem is the timing of the creation of these tools under the task, which requires special work on their fixation in crystallized intelligence, because, according to V. Zinchenko, these tools are not subject to external observation, and only in the course of their activity, they manifest their external as well as internal nature.

That is why we propose to conditionally unite them under the auspices of the mental model of the subject's world, and to speak of development only if it is substantially fundamentally changed. This aspect is especially true of intellectual development and self-development in adulthood¹⁵ (Smulson, 2009b).

2. Psychological mechanisms of development and self-development of the subjectness

It should be noted that the current consideration of the development category is impossible without focusing on the problems of self-development. In an article by M. Shchukina¹⁶ (Shchukina, 2018), which offers an overview of contemporary foreign studies of intentional self-development, self-development is rightly defined as a specific form of intentional, self-determined, self-directed development.

The systematic approach involves the analysis and use in the organization of processes of development of appropriate psychological mechanisms¹⁷ (Smulson, 2014). The concept of psychological mechanism is not a metaphor, but a theoretical construct, and the difference between them, as noted by Y. Mashbits, – in the heuristic

¹⁵ Smulson, M. L. (2009). Intellect i mentalni modeli svitu [Intellect and mental models of the world]. *Naukovi doslidzhennia kohnityvnoi psykhologii – Scientific and cognitive psychology*. Ostroh: Natsionalnoho universytetu “Ostroh” Publ., vol. 12, 38–49 [in Ukrainian].

¹⁶ Shchukina, M. A. (2018). Evristichnost subektnogo podhoda v psihologicheskikh issledovaniyah samorazvitiya lichnosti. [The heuristic nature of the subjective approach in psychological studies of personal self-development]. *Psihologicheskij zhurnal – Psychological journal*, vol. 39, 2, 48–57 [in Russian].

¹⁷ Smulson, M. L. (2014). Psykholohichni mekhanizmy v kontseptsii navchannia Yu. I. Mashbytsia [Psychological Mechanisms in the Concept of Teaching Y. Mashbits]. *Tekhnolohii rozvytku intelektu – Intellectual Development Technologies*, vol. 1, 6. Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/article/view/123 [in Ukrainian].

value, that is, the value for staging and conducting relevant psychological research, the implementation of approaches to psychological and pedagogical substantiation of didactic solutions. According to Y. Mashbits, the mechanism can be talked about only when it comes to the system. In other words, he proposes to consider psychic phenomena and processes in the context of considering psychological mechanisms as systems and subsystems. It should be noted at the same time that Y. Mashbits never undertook a general psychological definition of the mechanism, and always stopped to consider the psychological mechanisms of teaching. (Accordingly, our further attempt to extrapolate the concept of psychological mechanisms to other components of the subject of psychology, in particular, to development, remains solely on our responsibility). “We understand by the mechanism of the learning system,” he wrote, “a theoretical construct that describes the interaction of the components of the system that ensures its functioning. If the system is the subject of psychology, these mechanisms should describe interaction at the psychological level, that is, act as psychological mechanisms”¹⁸ (Mashbits, 2019, p. 7). Therefore, the first aspect that is fundamental to understanding the psychological mechanisms of learning is the systematic learning. An important point here is the decomposition of training, in other words, which subsystems are included and how exactly these subsystems interact. Like any systemic education, learning involves many ways of membership (for example, student-teacher, or knowledge, skills, etc., competent structure), but not all of them allow the psychological mechanisms of learning to be analyzed. Y. Mashbits views education as a system of activities – learning and teaching. It is clear that learning activity is the activity of the student in the system of education, and teaching – the activity of the teacher. Therefore, psychological mechanisms of learning describe the interaction of a teacher and a student at the level of their activities. In the learning concept of Y. Mashbits, this interaction is interpreted as management. The student’s activity is a managed system, and the teacher’s is a managing one. Management means are the educational influences

¹⁸ Mashbits, Yu.I. (2019). *Psykhologichni mekhanizmy i tekhnolohiia navchannia* [Psychological mechanisms and technology of teaching]. Kyiv: Interservis Publ. [in Ukrainian].

(basic and auxiliary), and the ways of functioning, of the student's activity are the student's tasks and learning activities of the pupils. Therefore, the key notions in the concept of psychological mechanisms of Y. Mashbits are system, interaction, management, activity, etc. The next step in the consideration of psychological mechanisms of learning is three leading mechanisms proposed by Y. Mashbits, namely feedback, defining the learning task, as well as the dynamic distribution of the functions of managing learning activity between the student and the teacher.

In our opinion, the concept of psychological mechanisms operationalizes the processivity of the psyche and mental formations as formations primarily systemic. On the other hand, the movement (development) of the system is impossible without the mechanisms of the system, which certainly concerns both the professional activity and the subject of professional activity.

The concept of "subject" in modern psychology is viewed in the context of post-classical science and is associated with its interpretive, or otherwise reflective, capabilities in different environments of life^{19,20} (Lepskii, 2013a; Stepin, 2003). The key to post-classical science is the subject-oriented paradigm ("subject – polysubjective environment") and the environmental paradigm ("self-evolving environment"). These include socio-humanitarian scientific technologies that provide a number of functions of subjects of cognition: communicative, representative (providing reflection of subjects), ontological (connection of the subject of cognition with the realities of being) and integrative (integration of the space of knowledge)²¹ (Lepskii, 2013b).

¹⁹ Lepskii, V.E. (2013). Potencialy razvitiya psihologii v kontekste postneklassicheskoy nauchnoj racionalnosti [The potentials of the development of psychology in the context of post-non-classical scientific rationality]. Proceedings from Ideas O. K. Tikhomirova and A. V. Brushlinskii and fundamental problems of psychology (to the 80th birthday) '13: *Vserossijskoj nauchnoj konferencii (s inostrannym uchastiem – The All-Russian Scientific Conference (with foreign participation))* (pp. 63–65). Moscow: Publisher Moscow State University named after M. V. Lomonosov [in Russian].

²⁰ Stepin, V. S. (2003). Samorazvivayushiesya sistemy i postneklassicheskaya racionalnost [Self-developing systems and post-non-classical rationality]. *Voprosy filosofii – Problems of Philosophy*, 8, 5–17 [in Russian].

²¹ Lepskii, V.E. (2013). Potencialy razvitiya psihologii v kontekste postneklassicheskoy nauchnoj racionalnosti [The potentials of the development of psychology in the context of post-non-classical scientific rationality]. Proceedings from

Studies of subjectness and subjective activity are consistent with the subject-activity concept that comes from S. Rubinshtein²² (Rubinshtein, 1989). According to S. Rubinshtein, it is known that man as a subject is introduced into being, he continues himself into the world, restructures the space of his being in accordance with personal meanings. Thus, A. Brushlinskii points out that the humanistic interpretation of a person as an individual helps to fully and systematically reveal his / her specific activity in all types of interaction with the world (practical, purely spiritual, etc.). With adulthood, self-development and self-education occupy an increasing place in human life, and accordingly, greater proportion belongs to internal conditions as a basis for development. It insists on the uniqueness, activity, responsibility, independence, integrity of the individual as a subject²³ (Brushlinskii, 1994a).

Analyzing A. Brushlinskii's approach to the understanding of the subject and subjectness, which became widespread in psychology at the beginning of the XXI century, O. Sergiienko, the author of the system-subject approach, notes, in particular, that "the subject is a person at the highest level of his / her activity, integrity (systematicity), autonomy. At this level, the subject is extremely individualized, that is, shows the peculiarities of their own motivation, abilities, mental organization as a whole. The subject is a qualitatively defined method of self-organization, self-regulation of a personality, a way of reconciling external and internal conditions of performing activities in temporal scope, the center of coordination of all mental processes, states, properties, as well as the abilities, opportunities and limitations of the individual with respect to objective and subjective goals, ambitions and tasks of vital activity. Integrity, unity, integrativeness of

Ideas O. K. Tikhomirova and A. V. Brushlinskii and fundamental problems of psychology (to the 80th birthday) '13: *Vserossiiskoj nauchnoj konferencii (s inostrannym uchastiem – The All-Russian Scientific Conference (with foreign participation))* (pp. 63–65). Moscow: Publisher Moscow State University named after M. V. Lomonosov [in Russian].

²² Rubinshtein, S. L. (1989). Printsip tvorcheskoi samodeyatelnosti [The principle of creative activity]. *Voprosy filosofii – Problems of Philosophy*. 4, 88–96 [in Russian].

²³ Brushlinskii A. V. (1994). *Problemy psikhologii subekta* [Problems of psychology of the subject]. Moscow: Institut psikhologii RAN Publ. [in Russian].

the subject are the basis for the systematicity of his / her psychic properties”²⁴ (Sergiienko, 2018).

A. Brushlinskii offers criteria for the subject, including isolation of the self from the environment, self-opposition to the reality as an object of action and cognition. The above criteria also include forming and constructing concepts, interaction with other people as subjects, and, finally, the integrity, unity, integrality of the subject’s actions and all kinds of his / her activity²⁵ (Brushlinskii, 1994b), which is of fundamental importance when considering the professional activity.

The content of the concept “*subject*” by A. Brushlinskii pushes the personality’s boundaries to view different types of a collective subject and, accordingly, differently compose the one²⁶. M. Guseltseva rightly notes that there are not only age and individual differences in subjectness, but also cultures differ in the degree of their subjectness and autonomy. Thus, “the birth of a nation in the course of human history psychologically means the acquisition of subjectness by the people”²⁷ (Guseltseva, 2018a).

V. Tatenko also emphasizes subjectness, autonomy, self-determination, spontaneity, integrativeness, and creativity of the subject²⁸ (Tatenko, 2006a). However, in his view, the concept “*subjectness*” has nothing to do with the above properties. It bears knowledge of the “holistic ontopsychological project of human existence”, as well as “orients to searching the internal sources and

²⁴ Sergiienko, E. A. (2018). Princip razvitiya v rabotah A. V. Brushlinskogo i ego sovremennoe osmyslenie [The principle of development in the works of A. V. Brushlinskii and his Contemporary Understanding]. *Psichologicheskij zhurnal – Psychological Journal*, vol. 39, 2, 14–24 [in Russian].

²⁵ Brushlinskii A. V. (1994). *Problemy psihologii subekta* [Problems of psychology of the subject]. Moscow: Institut psikhologii RAN Publ. [in Russian].

²⁶ *Problema sborki subektov v postneklassicheskoy nauke* (2010). [The problem of assembly of subjects in post-non-classical science]. Otv. red. V. I. Arshinov, V. E. Lepskii. Moscow: IF RAN Publ. [in Russian].

²⁷ Guseltseva, M. S. (2018). Rozhdenie subektivnosti iz duha chelovekoznaniya [The birth of subjectivity from the spirit of human knowledge]. *Voprosy psihologii – Psychological issues*, 1, 3–15 [in Russian].

²⁸ Tatenko, V. O. (2006). *Subiektno-vchynkova paradyhma v suchasnyy psykholohii* [Subject-action paradigm in modern psychology]. *Liudyna. Subiekt. Vchynok: Filozofsko-psykholohichni studii* [Man. Subject. Action: Philosophical and Psychological Studies]. Kyiv: Lybid Publ. 316–357 [in Ukrainian].

motive impulse of its development, emphasizes its copyright, the ability to start a causal series from itself and bear personal responsibility for the actions committed”²⁹ (Tatenko, 2006b).

According to V. Tatenko to be the subject of one’s life for a person means to choose to be, strive and be a true human; to be determined in the space and time of his existence, to create his new meanings and forms, to reflect his creations, to acquire and increase experience, to design new forms and contents of being, and purposefully to realize the essential project of his being as a whole³⁰ (Tatenko, 2006c).

In our opinion, full-fledged subjectness corresponds to O. Losiev’s understanding of intelligence. According to it “intelligence is an individual life, or a function of the personality, who is accepted as a clot of natural-social-historical relations, who lives ideologically for the purposes of human well-being, does not stand by, but transforms the imperfections of life, which imperatively demands from a person a potential or actual feat to overcome these imperfections”³¹ (Losiev, 1988a).

Furthermore, “for an intelligent person, work is a celebration of eternal youth and joyful service to universal happiness”³² (Losiev, 1988b). Therefore, one cannot resist agreeing with the experts who put the category of the subject at the forefront in the dialogue of psychology and human sciences^{33, 34} (Guseltseva, 2018b; Znakov,

²⁹ Tatenko, V. O. (2006). *Subiektno-vchynkova paradyhma v suchasniï psykhologii* [Subject-action paradigm in modern psychology]. *Liudyna. Subiekt. Vchynok: Filozofsko-psykholohichni studii* [Man. Subject. Action: Philosophical and Psychological Studies]. Kyiv: Lybid Publ. 316–357 [in Ukrainian].

³⁰ Tatenko, V. O. (2006). *Subiektno-vchynkova paradyhma v suchasniï psykhologii* [Subject-action paradigm in modern psychology]. *Liudyna. Subiekt. Vchynok: Filozofsko-psykholohichni studii* [Man. Subject. Action: Philosophical and Psychological Studies]. Kyiv: Lybid Publ. 316–357 [in Ukrainian].

³¹ Losiev, A. F. (1988). *Derzanie duha* [Boldness of the Spirit]. Moscow: Politizdat Publ. [in Russian].

³² Losiev, A. F. (1988). *Derzanie duha* [Boldness of the Spirit]. Moscow: Politizdat Publ. [in Russian].

³³ Guseltseva, M. S. (2018). Rozhdenie subektivnosti iz duha chelovekoznaniiya [The birth of subjectivity from the spirit of human knowledge]. *Voprosy psihologii – Psychological issues*, 1, 3–15 [in Russian].

2017). M. Guseltseva offers an interesting synthesis of Western psychology several concepts to express the unique meaning of the concept “*subject*”: “selfness, actor and creator”³⁵ (Guseltseva, 2018c).

It should be noted that intellect and subjectness determine the indicator of creative, anti-manipulative and anti-crisis potential of the individual and, obviously, require constant development and psychological support. We will briefly recall the main provisions of the concept of adult intelligence developed by us³⁶ (Smulson & oth., 2015a).

3. The place of intellect in the professional development

By intellect we mean a holistic (integral) mental formation that is responsible for the creation, construction, and restructuring of mental models of the world by setting and solving tasks. The holistic and integral nature of intellect does not preclude its structure, that is, the presence of a number of components (structural elements) that define intellect as a mental formation. These are, above all, basic cognitions, among which are the basic mental processes (sensation, perception, memory, attention as control), cogitation and imagination, language and speech. However, intellect is not limited to the system of cognitions, but also includes metacognitions, metacognitive integrators, among which the leading ones are intellectual initiation (self-assignment), decentration, reflection and strategic fit. The dynamic of metacognitions, in its turn, determines the potential for the development and self-development of intellect as a whole. All intellect structural components, both cognitive and metacognitive, interact and integrate (create coalitions in intellectual activity) in accordance with

³⁴ Znakov, V.V. (2017). Novyi etap razvitiia psihologicheskikh issledovaniia subekta [A new stage in the development of psychological research of the subject]. *Voprosy psihologii – Psychological issues*, 2, 3–16 [in Russian].

³⁵ Guseltseva, M. S. (2018). Rozhdenie subektivnosti iz duha chelovekoznaniiya [The birth of subjectivity from the spirit of human knowledge]. *Voprosy psihologii – Psychological issues*, 1, 3–15 [in Russian].

³⁶ Smulson, M. L. & oth. (2015). *Intelektualnyi rozvytok doroslykh u virtualnomu osvithnomu prostori: monohrafiia* [Adult intellectual development in the virtual educational space: a monograph]. Kyiv: Pedahohichna dumka. Publ. Retrieved from: <http://lib.iitta.gov.ua/10064>. [in Ukrainian].

“the task” at any given moment, providing the corresponding amplification and transformation of mental models of the world that determine intellectual development.

Intellect plays a crucial role in finding new ways of effective activity, decision making in a situation of uncertainty and high cost of error, finally, in the construction of adequate projects of their own crisis management, in renewal of self-development potential. This implies not only the level of intellect, but its dynamic, the development of cognitions and especially metacognitions under new non-standard anti-crisis tasks. After all, even a high level of intellect will not work for the anti-crisis effect and will not be able to focus on constant “changes of changes” as a modern discourse, if it is not enriched and developed, but concentrated on “idle” processing crisis memory data, on stereotypical means of solving problems³⁷ (Asmolov, 2015).

Intellect is even more prone to self-development than other psychic structures because it creates a space of development for itself (taking into account and reflecting on its mental, genetic and environmental factors). In other words, the development of adult intellect functions as a mentally self-determined and self-initiated process, that is, as a self-development.

Intellect has an interprocessual and metacognitive nature and different modalities depending on the specific tasks and the particular context in which they are carried out. The development of intellect does not imply its willingness to work only at certain tasks, but always offers a wider repertoire of application.

How do metacognitions or, in other words, metacognitive intellect integrators work?

To trigger intellectual processes, it is necessary to have a problem that the subject feels, spots, etc., converts it into a task and begins to fulfill it, to solve it. In other words, a metacognitive process, which we call “intellectual initiation”, takes place. And “intellectual initiation” corresponds to spontaneous problem setting. When the process of intellectual initiation is started, reflective processes are connected.

³⁷ Asmolov, A. G. (2015). *Psihologiya sovremennosti: vyzovy neopredelennosti, slozhnosti i raznoobraziya* [Psychology of modernity: challenges of uncertainty, complexity and diversity]. *Psihologicheskie issledovaniya – Psychological researches*, 8(40). Retrieved from: <http://psystudy.ru> [in Russian].

Reflection as the basis for the development and change of the mental model of the world is supported by the notion of reflexive output and changes in reflective position. Intellect strategy, in its turn, involves the adequacy of any choice in the process of problem solving: the choice of the direction of the problem setting, the choice of concept or hypothesis, ways of testing them (if time permits), as well as the final choice, decision making and its implementation into the activity. In situations of intellectual interaction, joint decision-making, as well as in the analysis of one's own choices, intellectual decentralization attains fundamental importance. It assumes that a person begins to understand: there is not only his / her own, but also another (the second, and the third, etc.) point of view on a problem, and they can and should be understood. It is not necessary to accept, to agree, but by understanding the opposite (other) point of view, one enriches one's own. He / she may stand their ground, but intellectual decentration makes their own point of view richer, stronger, more voluminous, and more convincing.

Therefore, there is an urgent need to disclose and analyze the activity of an adult subject who independently searches for and finds problems for intellectual processing and solving, and acts both in real life and in virtual reality. The developmental aspect of subjectness is significant for the intellectual development of adults as well as for the development of personality in general^{38, 39, 40} (Kostiuk, 1969; Maksymenko, 2006; Smulson, 2016). In doing so, many aspects of considering the category of subjectness and subjective activity are consistent with our approach to intellect, intellectual development and self-development. We capture the main points of this connection.

³⁸ Kostiuk, G. S. (1969). *Princip razvitiya v psihologii* [The principle of uncertainty in the psychology of choice and risk. Methodological and theoretical problems of psychology]. Moscow: Nauka Publ. [in Russian].

³⁹ Maksymenko, S. D. (2006). *Henezha zdiisnennia osobystosti* [Genesis of personality realization]. Kyiv: TOV "KMM" Publ. [in Ukrainian].

⁴⁰ Smulson M. L. (2016). Rozvytok intelektu ta subiektnosti doroslykh u virtualnomu prostori [The development of adult intelligence and subjectness in virtual space]. *Tekhnolohii rozvytku intelektu – Technologies of Intellectual Development*, vol. 2, 2 (13). Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/issue/view/18 [in Ukrainian].

We consider enrichment and restructuring of the mental model of the world as well as enhancement of human interpretative and reinterpreted potential as a leading criterion of intellectual development⁴¹ (Smulson & oth., 2015b). There is no doubt that it is about the growth of subjectness as a potential for an independent and original understanding of the world and its transformation. In doing so, virtually all of the intellectual metacognition described above works for the development of subjectness.

Therefore, there is no doubt that the connection between the problem of subjectness and subjective activity and the leading intellectual metacognitions, namely: intellectual initiation (self-assignment), strategic fit (choice), reflection and decentration, as well as with the functions of intellect: reflective, oriented and especially prognostic-transformative ones⁴² (Smulson, 2003). It is specified that the formation of prognostic-transformative function of intellect is the least studied one in psychology. However, this aspect needs special attention in terms of acquiring subjectness during life, in particular, adults' life and professional decision-making, choice of a life strategy, counteraction to lowering subjectness in difficult life circumstances.

CONCLUSIONS

To sum up, a theoretical analysis of the problem of intellect and subjectness development in adulthood has shown that these mental properties are the leading principles of professional development. (By an adult, we mean a person as an adult, conditionally after 20–22 years old, and the elderly, without defining the upper limit of adulthood and, accordingly, the point of onset of old age). This conclusion was experimentally confirmed by our researches of adult intellectual development in the virtual educational space, as well as the development of adult subjective activity^{43, 44, 45, 46, 47} (Smulson & oth.,

⁴¹ Smulson, M. L. & oth. (2015). *Intelektualnyi rozvytok doroslykh u virtualnomu osvithomu prostori: monohrafiia* [Adult intellectual development in the virtual educational space: a monograph]. Kyiv: Pedahohichna dumka. Publ. Retrieved from: <http://lib.iitta.gov.ua/10064>. [in Ukrainian].

⁴² Smulson, M. L. (2003). *Psykhohohiia rozvytku intelektu* [Psychology of Development of Intellect]. Kyiv: Nora-Druk Publ. [inUkrainian].

⁴³ Smulson, M. L. & oth. (2015). *Intelektualnyi rozvytok doroslykh u virtualnomu osvithomu prostori: monohrafiia* [Adult intellectual development in the

2015c; Smulson & oth., 2018; Kovalenko-Kobylianska, 2016; Ditiuk, 2017; Nazar & Meshcheriakov, 2017).

It is safe to say that professional development is first and foremost facilitated by an integrative intelligence based on a system of cognition and intellectual metacognition. In advanced professional activity, an important role is played by intellectual initiation, that is, the ability of a professional staff member to independently spot the problem and the task in the activity stream. This is precisely the property that distinguishes, for instance, an inventor from even a very hard-working and diligent worker, but not intellectually creative technician or engineer. The ability to spot and get an understanding of any problem on time – technical, organizational, communicative, etc. – and find the right solution by oneself or with the team can sometimes save a very sophisticated situation. At the same time such ability in its advance form does not in any way diminish the level of performing discipline, activity efficiency, etc.

virtual educational space: a monograph]. Kyiv: Pedahohichna dumka. Publ. Retrieved from: <http://lib.iitta.gov.ua/10064>. [in Ukrainian].

⁴⁴ Smulson, M. L. & oth. (2018). *Rozvytok subiektnoi aktyvnosti doroslykh u virtualnomu prostori* [The development of adult subjective activity in virtual space]. Kyiv: H. S. Kostiuk Institute of Psychology of the National Academy of Pedagogical Sciences of Ukraine. Retrieved from [http://lib.iitta.gov.ua/712119/1/ The development of adult subjective activity in virtual space.pdf](http://lib.iitta.gov.ua/712119/1/The%20development%20of%20adult%20subjective%20activity%20in%20virtual%20space.pdf) [in Ukrainian].

⁴⁵ Kovalenko-Kobylianska, I. H. (2016). Subiektna aktyvnist liudyny v period herontohenezu v umovakh osvithnoho prostoru Internet [Subjective activity of man in the period of gerontogenesis in the conditions of educational space Internet]. *Tekhnologii rozvytku intelektu – Technologies of Intellectual Development*, vol. 2, 2 (13). Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/issue/view/18.

⁴⁶ Ditiuk, P. P. (2017). Sytuatyvna aktyvnist, vidnosna subiektnist ta svoboda vyboru [Situational activity, one of submission and freedom to vibrator]. *Tekhnologii rozvytku intelektu – Technologies of Intellectual Development*, vol. 2, 5 (16). Retrieved from: http://psytir.org.ua/upload/journals/2.5/authors/2017/Dityk_Pavlo_Pavlovych_Sytuatyvna_aktyvnist_vidnosna_subiektnist_ta_svoboda_vyboru.pdf [in Ukrainian].

⁴⁷ Nazar, M. M., Meshcheriakov, D. M. (2017). *Rozvytok subiektnoi aktyvnosti pry dystantsiinii hrupovii roboti z postrazhdalymy v zoni ATO* [Development of subjective activity in remote group work with the victims in the ATO zone]. *Aktualni problemy psykholohii* [Current problems of psychology. V. 11. Psychology of personality. Psychological assistance to the individual]. H. S. Kostiuk Institute of Psychology of the National Academy of Pedagogical Sciences of Ukraine (Vol. 15, 363–372). Kyiv [in Ukrainian].

What is really related to the subjectness of a professional, their own view of life, their own activity, and their ability to set goals, to creatively design their own activity as well as functioning is high level of intellectual initiation.

Reflection as an intellectual metacognition contributes to the construction and development of an adequate mental model of the specialist (i.e., the system of professional attitudes towards the world, others and themselves), and decentralization, respect for another point of view does not allow this mental model to become stiffened, i.e. to lose the capability for self-development. This point is of fundamental importance in the context of the general properties of the mental world model, including, in particular, the rigidity of change, as well as in the context of the peculiarities of the professional subject as the bearer of the mental model.

Finally, strategic fit as an intellectual metacognition affects all professional situations and not only ones, which require choice. Since every moment of any professional activity usually implies a certain choice, it can be said that the developed intellectual strategic fit along with the metacognition analyzed above, together with subjectness as a personality trait, is mainly responsible for the professional development of the individual.

SUMMARY

The article is devoted to theoretical and methodological analysis of psychological mechanisms of adult intelligence and subjectness. These categories have been featured to provide a psychological basis for mastering any professional competency as well as for professional growth. Development, unlike other changes, means unreversed, directed, regular changes of material and ideal objects that occur simultaneously. We interpret self-development as a change in the mental world model, or the system of mental models; and also as a new meaning acquisition; as a reinterpretation of personal experience. Self-development is determined by restructuring, amplification, reinterpretation, reconstruction of mental world models, restructuring of connections between them. Intelligence and subjectness ensure the creative, anti-manipulative and anti-crisis potential of a person's professional growth. Professional self-development is determined by the most dynamic constituents of intelligence – metacognitions, namely intellectual initiation, reflection, decentration and strategic fit.

REFERENCES

1. Asmolov, A. G. (2015). Psihologiya sovremennosti: vyzovy neopredelennosti, slozhnosti i raznoobraziya [Psychology of modernity: challenges of uncertainty, complexity and diversity]. *Psihologicheskie issledovaniya – Psychological researches*, 8(40). Retrieved from: <http://psystudy.ru> [in Russian].

2. Bodaliyov, A. A. (1998) *Vershina v razvitii vzroslogo cheloveka: kharakteristiki i usloviia dostizheniia*. [Apex in the development of an adult: characteristics and conditions of achievement]. Moscow: Nauka. Publ. [in Russian].

3. Brushlinskii A. V. (1994) *Problemy psihologii subekta* [Problems of psychology of the subject]. Moscow: Institut psikhologii RAN Publ. [in Russian].

4. Bykov, V. M., & Bykova, A. V. (2013). *Socialno-psihologicheskaya koncepciya formirovaniya yadra subektnoj aktivnosti v obrazovatelnom processe vuza* [Socio-psychological concept of formation of nucleus of subjective activity in educational process of university]. Moscow [in Russian].

5. Ditiuk, P. P. (2017). Sytuatyvna aktyvnist, vidnosna subiektnist ta svoboda vyboru [Situational activity, one of submission and freedom to vibrator]. *Tekhnolohii rozvytku intelektu – Technologies of Intellectual Development*, vol. 2, 5(16). Retrieved from: http://psytir.org.ua/upload/journals/2.5/authors/2017/Dityk_Pavlo_Pavlovych_Sytuatyvna_aktyvnist_vidnosna_subiektnist_ta_svoboda_vybor_u.pdf [in Ukrainian].

6. Elkonin, B. D. (1994). *Vvedenie v psihologiyu razvitiya* [Introduction to developmental psychology]. Moscow: Trivola Publ. [in Russian].

7. Galperin, P. Ya. (1977). K ucheniyu ob interiorizacii [To the doctrine of internalization]. *Voprosy psihologii – Psychological issues*, 6, 21–29 [in Russian].

8. Guseltseva, M. S. (2018). Rozhdenie subektivnosti iz duha chelovekoznaniya [The birth of subjectivity from the spirit of human knowledge]. *Voprosy psihologii – Psychological issues*, 1, 3–15 [in Russian].

9. Kostiuk, G. S. (1969). *Princip razvitiya v psihologii* [The principle of uncertainty in the psychology of choice and risk.

Methodological and theoretical problems of psychology]. Moscow: Nauka Publ. [in Russian].

10. Kovalenko-Kobylanska, I. H. (2016). Subiektna aktyvnist liudyny v period herontohenezu v umovakh osvithnoho prostoru Internet [Subjective activity of man in the period of gerontogenesis in the conditions of educational space Internet]. *Tekhnologii rozvytku intelektu – Technologies of Intellectual Development*, vol. 2, 2(13). Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/issue/view/18.

11. Leontiev, D. A. (2013). Lichnostnoe izmerenie chelovecheskogo razvitiya [The personal dimension of human development]. *Voprosy psihologii – Psychological issues*, 3, 67–80 [in Russian].

12. Lepskii, V. E. (2013). Potencialy razvitiya psihologii v kontekste postneklassicheskoy nauchnoy racionalnosti [The potentials of the development of psychology in the context of post-non-classical scientific rationality]. Proceedings from Ideas O. K. Tikhomirova and A. V. Brushlinskii and fundamental problems of psychology (to the 80th birthday) ‘13: *Vserossijskoy nauchnoj konferencii (s inostrannym uchastiem – The All-Russian Scientific Conference (with foreign participation)* (pp. 63–65). Moscow: Publisher Moscow State University named after M. V. Lomonosov [in Russian].

13. Losiev, A. F. (1988). *Derzanie duha* [Boldness of the Spirit]. Moscow: Politizdat Publ. [in Russian].

14. Maksymenko, S. D. (2006). *Heneza zdiisnennia osobystosti* [Genesis of personality realization]. Kyiv: TOV “KMM” Publ. [in Ukrainian].

15. Mashbyts, Yu. I. (2019). *Psykhologichni mekhanizmy i tekhnolohiia navchannia* [Psychological mechanisms and technology of teaching]. Kyiv: Interservis Publ. [in Ukrainian].

16. Nazar, M. M., Meshcheriakov, D. M. (2017). *Rozvytok subiektnoi aktyvnosti pry dystantsiinii hrupovii roboti z postrazhdalymy v zoni ATO* [Development of subjective activity in remote group work with the victims in the ATO zone]. *Aktualni problemy psykholohii* [Current problems of psychology. V. 11. Psychology of personality. Psychological assistance to the individual]. H. S. Kostiuk Institute of Psychology of the National Academy of

Pedagogical Sciences of Ukraine (Vol. 15, 363–372). Kyiv [in Ukrainian].

17. Piankova S. D. (2009). *Kognitivnoe razvitie i samoorganizaciya* [Cognitive development and self-organization. Development Theory: Differential Integration Paradigm]. Moscow: Yazyki slavyanskih kultur Publ. [in Russian].

18. *Problema sborki subektov v postneklassicheskoy nauke* (2010). [The problem of assembly of subjects in post-non-classical science]. Otv. red. V. I. Arshinov, V. E. Lepskii. Moscow: IF RAN Publ. [in Russian].

19. Rubinshtein, S. L. (1989). Printsip tvorcheskoi samodeyatelnosti [The principle of creative activity]. *Voprosy filosofii – Problems of Philosophy*, 4, 88–96 [in Russian].

20. Shchukina, M. A. (2018). Evristichnost subektnogo podhoda v psihologicheskikh issledovaniyah samorazvitiya lichnosti. [The heuristic nature of the subjective approach in psychological studies of personal self-development]. *Psihologicheskij zhurnal – Psychological journal*, vol. 39, 2, 48–57 [in Russian].

21. Sergiienko, E. A. (2012). *Principy psihologii razvitiya: sovremennyy vzglyad* [Principles of Developmental Psychology: A Contemporary View]. *Rsihologicheskie issledovaniya – Psychological research*, vol.5, 24 [in Russian].

22. Sergiienko, E. A. (2018). Princip razvitiya v rabotah A. V. Brushlinskogo i ego sovremennoe osmyslenie [The principle of development in the works of A. V. Bruschlinskii and his Contemporary Understanding]. *Psihologicheskij zhurnal – Psychological Journal*, vol. 39, 2, 14–24 [in Russian].

23. Smulson M. L. (2016). Rozvytok intelektu ta subiektnosti doroslykh u virtualnomu prostori [The development of adult intelligence and subjectness in virtual space]. *Tekhnologii rozvytku intelektu – Technologies of Intellectual Development*, vol. 2, 2(13). Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/issue/view/18 [in Ukrainian].

24. Smulson, M. L. & oth. (2015). *Intelektualnyi rozvytok doroslykh u virtualnomu osvithnomu prostori: monohrafiia* [Adult intellectual development in the virtual educational space: a

monograph]. Kyiv: Pedahohichna dumka. Publ. Retrieved from: <http://lib.iitta.gov.ua/10064> [in Ukrainian].

25. Smulson, M. L. & oth. (2018). *Rozvytok subiektnoi aktyvnosti doroslykh u virtualnomu prostori* [The development of adult subjective activity in virtual space]. Kyiv: H. S. Kostiuk Institute of Psychology of the National Academy of Pedagogical Sciences of Ukraine. Retrieved from [http://lib.iitta.gov.ua/712119/1/The development of adult subjective activity in virtual space.pdf](http://lib.iitta.gov.ua/712119/1/The%20development%20of%20adult%20subjective%20activity%20in%20virtual%20space.pdf) [in Ukrainian].

26. Smulson, M. L. (2003). *Psykhologhiia rozvytku intelektu* [Psychology of Development of Intellect]. Kyiv: Nora-Druk Publ. [in Ukrainian].

27. Smulson, M. L. (2014). Psykhologichni mekhanizmy v kontseptsii navchannia Yu. I. Mashbytsia [Psychological Mechanisms in the Concept of Teaching Yu. I. Mashbits]. *Tekhnologii rozvytku intelektu – Intellectual Development Technologies*, vol.1, 6. Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/article/view/123 [in Ukrainian].

28. Smulson, M. L. (2009). Intelekt i mentalni modeli svitu [Intellect and mental models of the world]. *Naukovi doslidzhennia kohnityvnoi psykhologii – Scientific and cognitive psychology*. Ostroh: Natsionalnoho universytetu “Ostroh” Publ., vol. 12, 38–49 [in Ukrainian].

29. Stepin, V. S. (2003). Samorazvivayushiesya sistemy i postneklassicheskaya racionalnost [Self-developing systems and post-non-classical rationality]. *Voprosy filosofii – Problems of Philosophy*, 8, 5–17 [in Russian].

30. Tatenko, V. O. (2006). *Subiektno-vchynkova paradyhma v suchasni psykhologii* [Subject-action paradigm in modern psychology]. *Liudyna. Subiekt. Vchynok: Filosofsko-psykhologichni studii* [Man. Subject. Action: Philosophical and Psychological Studies]. Kyiv: Lybid Publ. 316–357 [in Ukrainian].

31. Yudin, E. G. (1983). *Razvitie* [Development. Philosophical Encyclopedic Dictionary]. Moscow: Soviet Encyclopedia Publ. [in Russian].

32. Zinchenko, V. P. (2010). *Soznanie i tvorcheskij akt* [Consciousness and the creative act]. Moscow: Yazyki slavyanskih kultur Publ. [in Russian].

33. Znakov, V. V. (2017). Novyi etap razvitiia psihologicheskikh issledovaniy subekta [A new stage in the development of psychological research of the subject]. *Voprosy psihologii – Psychological issues*, 2, 3–16 [in Russian].

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