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Enjoy your reading!

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Challenge of the Pandemic

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ОТ РЕДКОЛЛЕГИИ

Вызов пандемии

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The start of 2020 was marked by the emergence of a new coronavirus infection, which radically changed all spheres of human life, regardless of their territorial and national affiliation.

The emerging situation of the coronavirus pandemic has had an impact not only on the somatic health and socio-economic status, but also on the mental state of the population, provoking the risk of developing anxiety and depressive symptoms.

Personal determinants of anxiety and depression during the pandemic reflect unfavorable past experience, the availability of psychological resources, social and demographic characteristics of subjects. In other words, the specifics of the people's mental response in pandemic situations is determined by individual, personal, psychosocial and situational factors.

Moreover, the situation with the pandemic has clearly highlighted the peculiarities of modern society: uncertainty, turbulence and digitalization. It is common to perceive these characteristics negatively, but we forget that instability is often a sign of growth, development, change, and life. Turbulence is often a necessary jolt for a person, a push to new achievements.

Digitalization is an ability to continuously manage information, receive and process large databases that are a foundation for objective conclusions.

Of course, the current situation is a challenge for specialists in all fields, and especially for psychologists. The ability to make quick decisions and bear social responsibility, to provide mobile assistance and support becomes the main focus.

As the current situation tends to aggravate, we can expect a further increase in the need for psychological assistance aimed at training in self-regulation of mental states, developing and popularizing forms of active coping with them that are available within the pandemic context. Therefore, it is important to develop individualized and specialized strategies for psychological assistance in the situation of a coronavirus pandemic.

In the current pandemic, patients with comorbid health problems of all ages are at risk for serious health problems or sadly, have succumbed to COVID-19. Isolated case studies of pregnant women such as that of Hosier et al. (2020) recently reported two cases suggesting that the SARS-CoV-2 virus may cross the placental barrier, infecting the fetus. In Texas' Nueces County in the USA, 85 infants under the age of 1 year have tested positive for the novel coronavirus. In adults in particular, the impact of the virus has been varied with acute changes in breathing and hypoxia to blood clots and strokes, and microbleeds (Fitsiori, Pugin, Thieffry, Lalive, & Vargas, 2020), in many instances, requiring ICU management and ventilation. The delayed effects of COVID-19 on neuropsychological functioning are unknown. Although the significant death-rate worldwide has triggered alarm and anxiety as well as fear of impending death particularly in the absence of a vaccine, psychological distress and other cerebral effects are reported. The impact on cerebral functioning is anticipated in view of two possible effects. Since SARS-CoV-2 uses the angiotensin converting enzyme 2 (ACE2) receptor (Li et al., 2020) as an access portal to the lungs, the indirect effects of low blood oxygen saturation levels or hypoxia may on cerebral functioning is unknown. On the other hand, ACE2 and its receptors are also found in the brain especially in CNS neurons and glial cells thus making it a potential target for possible direct infiltration by SARS-CoV-2 virus. Individuals infected with SARS-CoV-2 virus have complained of loss of taste and smell with infection

of the olfactory bulb suspected to be pathway of entry into the cerebral structures. Since the medical management of COVID-19 is improving with ventilation, corticosteroids and other supportive measures, a large proportion of these patient is expected to recover from the disease. For patients who recover, the possibility of lingering cognitive and behavioral effects are unknown although they are likely to be present. Therefore, the post-acute and long-term effects of COVID-19 on the cognitive and behavioral functioning of individuals are expected to constitute an important area of neuropsychological research and clinical practice in coming months and years.

Using Luria's Syndrome Analysis to study the neuropsychological profiles of individual COVID-19 patients, ranging in age from infancy to late adulthood, affords a unique opportunity to track the neuropsychological changes of patients recovering from the disease, identify areas of the brain that are susceptible to hypoxic brain damage, predict their outcomes and contribute to the development of future neuropsychological rehabilitation and medical control of long-term sequelae of future viral pandemics impacting the brain.

The time of discovery seemed to be over, but life has shown that there is a lot of unknown things ahead of us, and it is still too soon for researchers to stop there. In the current situation, it is extremely important to be able to think systematically. And we hope that a reader will find useful information in our journal.

With wishes of health and well-being,
Lurian Journal.

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RESEARCH PAPERS

НАУЧНЫЕ ИССЛЕДОВАНИЯ

Promoting Neurocognitive Development in Childhood

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Содействие нейрокогнитивному развитию в детском возрасте

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Abstract. The main psychological aspects in promoting holistic health are related to attention, care and love within the relations. It all starts in early childhood when important bonds are built between parents and child. This bond will constitute this baby as a human being who will internalize the world as it is presented to him transforming objectivity into subjectivity. This work is based on the Social Historical theory founded by Luria, Vygotsky and Leontiev, who established that psychology would provide means to acknowledge how a natural process connected to a cultural process can produce the superior mental functions. It uses didactically the principles of mediation and zone of proximal development. Considering that relations are the key for this development of superior mental functions it is important to orientate parents, teachers and community itself so that conditions are provided, with knowledge and conscience, for this development to occur. When you are present in a relation nervous connections are promoted. Results are observed qualitatively focusing that each person is an individual self and that relationships are essential to produce development. Interactions between the brain and the formation of mental functions require the maturity of the nervous system as well as an active process which emphasizes relations of two or more human beings.

Therefore, the most important is not what to do but how to do. The brain grows better within a stable environment of support and low levels of stress. Affirms that safe relations are the key to healthy growth of the brain as well as emotional regulation that stimulates learning and adaptation to reality.

Keywords: *relationship; bond; development; psychology; children; zone of proximal development; brain; learning disabilities; social historical theory*

Аннотация. Основными психологическими факторами, способствующими комплексному здоровью, являются внимание, забота и любовь близких людей. Формирование основ здоровья начинается в раннем детстве, когда закладывается связь между родителями и ребенком. Эта связь формирует ребенка как личность; ребенок видит мир глазами близких ему людей, превращая объективную реальность в субъективную. В основе данной статьи лежит социально-историческая теория, разработанная А. Р. Лурия, Л. С. Выготским и А. Н. Леонтьевым; они установили, что психология предоставляет средства для понимания того, как естественные процессы в совокупности с культурными могут порождать высшие психические функции. Дидактическими основаниями являются принципы опосредствования и зоны ближайшего развития. Изучение взаимоотношений является ключевым фактором для развития высших психических функций у ребенка; необходимо профессионально и грамотно скоординировать взаимоотношения между родителями, учителями и обществом таким образом, чтобы сформировать условия для этого развития. Когда человек находится во взаимоотношениях, формируются его нервные связи. В статье дается качественный анализ результатов исследования, акцент делается на индивидуальность каждого человека и на то, что взаимоотношения необходимы для развития. Основой установления связей между мозгом и формированием психических функций является зрелость нервной системы и активный процесс, который включает в себя взаимоотношения между двумя и более людьми. Соответственно, наиболее важным представляется не то, что нужно делать, а как это нужно делать. Мозг формируется лучше в условиях стабильной поддержки и низкого уровня стресса, поэтому безопасные взаимоотношения являются залогом здорового развития мозга и эмоциональной регуляции, которая стимулирует развитие познавательной способности и адаптации к действительности.

Ключевые слова: *взаимоотношение; связь; развитие; психология; дети; зона ближайшего развития; мозг; нарушения обучаемости; социально-историческая теория*

Introduction

The main preventive measures to promote holistic health and enhance neurocognitive development are related to primary attention, care and love within the relations. It starts in early childhood when important bonds are created between parents and child. Relation is a key aspect on the promotion of holistic health. It effects the regulation of strong

emotions and the social, cognitive and behavioral spheres, in this way it is fundamental for the global development in childhood.

Vygotsky (1962/1994) states that man constitutes himself within social interactions. Relations will constitute this person as a human being who will internalize the world as it is presented to him transforming objectivity, the external world, into subjectivity, the internal world.

The author explains this when he affirms that instruments, actions and social relations are presented to the child, in first hand, in an interpsychological and social level, which involves the insertion into the cultural context and a cooperative behavior and only afterwards, it will occur in an intrapsychological, internal and subjective level through the process of internalization.

This work is based on the Social Historical theory founded by Luria, Vygotsky, and Leontiev, who established that psychology provides means to acknowledge how a natural process connected to a cultural process result in the acquisition of the superior mental functions: attention, memory, psychomotricity, language, perception and executive functions — goals, planning, organization, initiative, focus, perseveration, monitoring, flexibility, inhibition, regulation and the solving of problems. All of these functions are based on the baby's interaction with the environment as well as his capacity to absorb the world's stimulation by all the sense organs. So, it is very important for the human development to have someone to interact with this baby and be very concerned on how this interaction will occur. How a person who knows more, an adult or another older child, will interact with the baby, regardless if there is or is not any kind of compromise or impairment in the baby's capacity to connect, hear or see. All of this interaction is made when in relation with this significant Other who will show the world and the culture to the baby, it will happen by means of language which will be transmitted in different ways: language, body language, voice timbre and others.

Glozman (2014), affirms that there is always a way to stimulate, even if we talk about very serious damage, there are ways to work with the potential capacities, we can always do something. In the case of impairment such as a brain damage, we can work with the child as well as when we have limitations due to vision and hearing. Of course, there will be difficulties, but if professionals are able to orientate and propose to parents, caregivers and teachers to stimulate the child, certainly this will be a very important form of intervention, fundamental in terms of prevention as well as development.

Both development and overcoming possible delays will be conditioned to genetic and environmental factors, which also refer to social stimulation and interaction, as explained. Thus, several factors can interfere in this development we know that the more stimuli is given to the brain, the more physical activity is performed, the more attention and relational experience is provided to the person, the more he will develop. Luria (1991, 1992, 2001) affirms that a child who lacked experiences and stimulus can have delay on his speech, reading, singing and dancing. He affirmed that it is essential to children to have shared experiences with adults to enhance language and communication.

Therefore, according to Glozman (2014), even if there are limitations and difficulties, it is always possible to advance in development and overcome difficulties. She emphasizes that it is never too early nor too late to start a remediation process. The intervention in the early age is very efficient due to the window of opportunity regarding the neuroplasticity of the brain. If difficulties are noticed the sooner, they can be addressed by the stimulation needed, the better.

In this way the author states that the social historical approach in neuropsychology looks for the origin of the human conscience within the social human life. Therefore, it is fundamental to consider the function of social behavior.

Brain Maturation

Luria (1981) mentions that it is important to analyze deeply the zones which work in the brain, that regulate complex forms of mental activity, to certify the place of each functional area on the system and the proportion of the change of these zones which work together in the brain to establish the mental activities in the different stages of development.

The maturation of the brain and the development of the superior mental functions should be considered in terms of a structural-functional organization of the brain. In one hand the appearance of differentiated brain structures and neuropsychological mechanisms for its actions and in the other hand the formation of mental processes as systems that constitute several components in which each one executes a specific task within the mental functional system (Glozman, 2014).

The author postulates that different brain structures reach maturity in different ontogenetical stages, therefore in each age there are neurophysiological conditions of development and execution of the mental functions corresponding to the potentials of the child. Although there are some guidelines and parameters of development expected on each age, we have to remember that each child is different one from the other.

Glozman (2014) cites Korsakova who explains that the relation of the brain and mind during ontogenesis is not linear, but circular in its nature. The body permits the functioning which influences the development of the body and the expansion of a big range of abilities. The formation of mental functions consists in discovering the equilibrium and the interaction between brain structures during the maturation process and mental functions that develop based on these brain structures.

So, the acquisition of these functions which are considered higher because of the immersion in culture, start during social interaction and become an individual mental function. In this way we understand that biological factors, which are natural and related to physical maturation, and social factors, which are immersed into cultural determined processes, are interrelated and interdependent and that the environment has an important influence on the formation of mental functions as well as stimulate the maturation of brain structures (Glozman, 2014).

In this way the author points out that the development of the child is gradual, periods of relative stability and equilibrium alter with periods of functional jumps, a transition to a new stage of maturity. The most active connections among various places of the functional system occur in the critical or sensible period of development and are consistent with the quality of behavior and mental reconstructions.

According to Vygotsky (1934/2003), the child in his developmental process uses the same forms of behavior that other people initially used in relation to him. From the first days of life, this happens based on the activities that he/she experiences and that acquire their own meaning in a social behavior system, evidenced in their cultural environment, which helps them to meet his goals. Therefore, through social life, the constant communication is established between children and adults, and the experience of many generations is passed on and incorporated in the formation of thought.

The author states that since birth, man already lives as a developing social being and all his actions happen because there is another social one. Even before acquiring oral language, the child is already interacting and becoming familiar with the environment in which he lives. In this sense, learning does not happen in an isolated way, the individual is part of a social group and, as he lives with other people, exchanges information, builds his knowledge and inserts himself in the symbolic world.

Higher psychological functions — perception, language, memory, attention, psychomotricity, reasoning, executive functions — of socio-cultural origin, arise from elementary psychological processes — such as sensation, of biological origin — through the child's interaction with more experienced participants of culture. In this interaction, the child is given the opportunity to internalize symbolic mediators and the social relationship itself. Thus, from elementary organic structures of the child, basically determined by maturation, new and more complex mental functions are formed, depending on the social experiences through which the child has undergone (Vygotsky, 1934/2003).

The author emphasizes that the acquisition of knowledge occurs from the interaction of the subject with the environment within a cultural historical process. Through the mediation process, the subject acquires knowledge when in relation to the environment. In this sense, the relationship between human development and learning is associated with the fact that human beings are in constant interaction with the reality around them and the environment, leveraging both development and learning. Thus, immersion in a social universe promotes development in general as well as the internalization of concepts, configuring an internal world, generating a man who alters his biological dimension, making him symbolic, constituting a singular, historical and social subject.

Bock, Furtado, and Teixeira (2008) state that for Vygotsky, man is not seen as being passive in society, but as an active human being in interpersonal and social relationships. Man acts on the world and transforms social actions. In this way we understand that everyone learns, however in different ways, it depends upon the environment, the culture, the social and the symbolic environment in which that person is inserted.

Therefore, for Vygotsky (1962/1994) social interaction play a central role in human development and in the internalization process, since the path between the object and

the child always passes through and is mediated by another person. In this sense, interaction plays a fundamental role in the development of the mind. From the interaction between people, learning processes are established and there is an improvement of mental structures that exist since birth. Human development occurs during a gradual appropriation and internalization of cultural practices that are shared between people who are immersed in the same culture.

In this development process, the human being needs to establish contact with other people, in a dynamic process, to develop new ways of understanding the world. In this way, the social Other is extremely important and significant for children, as he assumes the role of one who can serve as a reference, helping in the transformation and development of these children.

Luria postulated that the brain is a highly differentiated system and that its parts, together and interacting, are responsible for aspects of the whole. This information is different from what was thought in previous studies, based on localizationism, when each different part of the brain was responsible for a certain function. In this way he did a didactic separation of the five stages of development in order to have a better understanding of this complex machine (Bork, 2017).

According to A. M. Jr. Horton and A. M. Horton III (2008), Luria's five stages of development are:

- first stage: is the first to occur in life, the development of the structures of the lower brain stem, which determines the activation of the reticular system;
- second stage: refers to the activation of the sensory areas;
- third stage: deals with the individual modalities in the areas of secondary association of the brain, that happens when the child is in preschool and is already able to reproduce symbolic materials;
- fourth stage: begins in elementary school and in this phase environmental stimulation is particularly important;
- fifth stage: begins in adolescence, it is when we observe the development of abstract thinking, the execution, monitoring and evaluation of complex learning behavior.

As we can see, there is a gradual development, where each of the different stages is fundamental for the development of the next phase, and therefore, it is necessary to be very attentive and provide precise orientations for parents and caregivers to stimulation appropriately.

Zone of Proximal Development

Vygotsky (1962/1994) explains the zone of the proximal development in which someone who knows more helps and promotes the passage from a level of potential development, when the child still needs help, to real development, when the child is already able to do the activity himself. Joenk (2002) paraphrases this concept by emphasizing that this

zone is divided into these two parts: real and potential. What the child is able to do with the help of an adult is within the potential part because it enables to recognize the process of development until that moment of life including the maturation processes and those which are still developing; and the real zone is the observed capacity of what the child can do by himself, his competency, which is not always so clear.

The zone of proximal development can be different in each age period defining specific characteristics of development of the child which should be taken into consideration in the individual process of learning.

Bork (2017) points out that Vygotsky affirmed that it is necessary to first occur the neurological maturation for learning to occur as a consequence of it. But we understand that within the interaction, learning already happens interfering directly on the process of maturation. The process of maturation, interaction and construction happens all together during development. In this way, it is important to promote learning experiences and stimulation at all times enhancing cognitive development.

This stimulation and the enhancement of development can occur within public areas such as gardens or squares in different parts of the world. We were able to participate of a community experience in Cuba which provided shared shantala and free bond meetings daily in a public square to all community. Shantala is a massage technique used to stimulate, relax and also provide proprioceptive body experience to the baby, but more than that it gives opportunity for relational exchange. As an adult touches the body of a baby, he relates with him in a tender and affectionate way as well as talks to the baby stimulating communicative experiences as well.

We understand that this kind of initiative is very important and nice and it could be established in other public places around the world. We believe that parents do not have to be experts or even know about all theories of development to help the development of their children, they just have to be there, alert and providing attention and feedback to the child's initiative. Trained professionals can help to indicate the next step of development of the child emphasizing only the need for the parents to be present within the relations. Be able to look at this baby and be the external resource and trustful significant Other that will provide conditions for him to develop. Little by little this baby will organize all the experience lived externally as an internal part of his own self.

This statement uses didactically the principles of mediation and zone of proximal development. Considering that relations are the key for this development of superior mental functions it is important to orientate parents, teachers and community itself so that conditions are provided, with knowledge and conscience, for this development to occur. In this way it is really important that the parents, or who takes care of the baby, understand the principles of the zone of proximal development, so that they will be able to promote a better development for the child.

The school, community programs and family itself serve as mediators of knowledge and education. Well prepared teachers, facilitators and caregivers will work in zone of proximal development to complement and promote the development of children. That's

why it is so important for them to understand deeply these studies and have this knowledge to use it on helping the babies and children to grow healthy and adequately develop.

Baby — Mother Relation

Winnicott (1935/1978), in his work, points out the importance of the relationship between a baby and his mother. The author brings us the concept of a good enough mother. This mother is the person who presents the world to the baby, welcomes and sustains him, but also makes mistakes, which must be gradually borne by this child, who learns to deal with the failures of the environment. The good enough mother is the person who gives support to the child. The author often states that is important that it is the mother who gave birth to this child because she will have an internal preparation and a connection both with her feelings and with her baby that grew inside her.

According to Winnicott (1935/1978) this can be performed by a responsible adult, who takes care of this baby and gives him the necessary support. This adult stays with the baby in a dedicated and constant manner. This commitment cannot be distributed among several other persons because she must be the one who will be the reference.

A sufficient good mother promotes conditions of trustfulness which permits the baby to feel secure so that he can integrate and constitute himself in the world. This trust established in a facilitating environment promotes a healthy development (Winnicott, 1935/1978).

It is through this interaction that babies develop and this is what gives them emotional structure. It is possible to refer, within the emotional aspect, to Vygotsky's relational approach and his concept of zone of proximal development. In the field of development within this zone, the adult must do externally what will gradually be built internally, according to the baby's conditions throughout his development. Learning takes place in a process, until the baby can build inside what has been presented externally.

We can draw a parallel and understand that the support given to the baby from this adult caregiver, for example, in the case of dealing with the failures that need to be lived, can be received by him to the extent that it is possible for him to deal. When it is not anymore possible, it would be the role of this caregiver to lend to the baby an external support, while he is still not able to cope with it and over time, he will build this internally. This construction, according to Winnicott, is the construction of the mental world of babies.

When we think about the human being, we conceive the idea that we are integrated human being, however, according to Winnicott (1935/1978) this integration is built. At the beginning babies are in a state of non-integration. The integration process takes place in the relationship between the baby and the environment including the way the mother holds and supports him and transmits her emotions while she is doing so.

Winnicott (1935/1978) calls this holding and he uses another term to explain when the mother gives support to the baby, it is called handling. These concepts are much more complex than just physically holding the baby. The integrated and emotional constitution

is based on corporal and good child care. We can understand that the mother will be the one who carefully presents and decodes the world to the child. All the information and stimuli that comes from the external world will need to be understood and decoded by the internal world (it's the same process that we usually think about when we talk about the proximal zone of development), the mother will help her baby in this process. There's no way to think about the human being without realizing how much this exchange between the external and internal world, both regarding psychic and cognitive construction, are processed. They are intertwined and occur simultaneously and one completely interferes on the other.

Bowlby (2002) considers that a child experimenting a positive maternity will have an adequate brain structure, will develop a safe system of attachment and will have trust internalized. This way the child will be able to have a relation with the world in a trustful way, with courage to face the challenges and dangers that will arise while he is brought up becoming resilient. Resilience suggests flexibility and elasticity to deal with adversities and get over them reaching good results independently of the events of life and of circumstances.

Orientations to Parents Regarding Early Childhood

Considering the importance of this bond Anauate (2017) suggests some simple and basic, but very important, orientations that are not always carefully performed by parents and caregivers. It is fundamental for them to have these orientations in mind when interacting with a baby:

- be very attentive to all initiatives of the baby and return them showing that you are present within the relation;
- hold the baby tidy to pass security;
- look and smile to the baby in all times;
- emphasize the emotions that emerge giving names to them;
- be complete within the relation playing with the baby in shared experiences;
- touch the baby and name all the parts you touch;
- when the baby does a gesture or points to something look at where he is pointing and name it showing you are aware of his demands;
- when the baby emits a sound repeat the sound back to the baby, do a baby talk and name the sounds and gestures back to the baby and include the parents, brothers and sisters in the care with the baby, the more he has opportunity of relational experiences, the better;
- it is important to look at the baby as a unique human being, considering his rhythm and reach him in his needs. As the baby looks in his mother's eyes, he sees himself reflected back as a unique human being.

Considering all these points, when thinking about babies from a young age, it is essential that there is always an interaction between the adult and the baby with proximity

and eye contact. Shantala massage, which involves both, is very important providing skin contact. Other stimulation can also be done in each distinct stage of development of the child. When we consider that all brain functions are supported by the sense organs, the more areas we stimulate, such as doing activities that stimulate attention to sounds, kinesthesia, visual stimuli and olfactory stimuli, the better. It is also important, with regard to auditory and even emotional stimuli, recalling Winnicott (1935/1978), that the baby's caregiver, in addition to the activities performed, talk to him, be affectionate and give name to what is being experienced. As the baby develops, we can add other activities that respect his development and stimulate him in a way that reaches his possibilities, in the phase in which he is in at that moment.

Luria's Functional System and Orientations to Caregivers/Teachers

Caregivers can stimulate babies based on studies proposed by scholars such as Vygotsky, Leontiev, Luria and those who had these authors as inspiration. It is important to understand the expected stages of development of a child and consider the particularities of each one and in this way manage to develop to the fullest of their potential.

Strategies will be pointed out in this article so that the teacher, facilitator or family can provide for a better development of the superior mental functions of his pupils. It is important to emphasize that significant relation and interpersonal contact promote development. Consider that each individual person has different characteristics of personality. Teach each person individually because they are different people therefore unique and particular. Respect the initiatives of each person and try to respond to them always leaving a pause for the next initiative to emerge.

Leal (2003) suggests to work in a go-and-come-back rhythm in which there is an initiative from the child that will be responded and then a pause will be given so that a new initiative can occur. Look the person in the eyes and be sensible to his needs. Propose a team work where two people work together, people working together exchange information and practice relational experiences.

Leontiev (1975/1978) affirms that all activities proposed should have a meaning to the person who is executing them. The activities should be driven to a specific objective already foreseen by the parent, teacher or caregiver. Meaningful activities are more easily internalized because they make sense to the person who is assimilating them.

Well orientated teachers, facilitators and family should use strategies to promote the development of the three functional units or blocks of Luria (1981) (see *Figure*).

The first block is the activation block of the cerebral cortex, it is responsible for the supply level and constancy of energy, keeping it stable. This area provides energy to work. It includes non-specific structures of different levels: reticular formation of the brain stem, non-specific structures of the diencephalic region, limbic system, medial basal areas of the frontal and temporal cortex and other subcortical structures. This unit

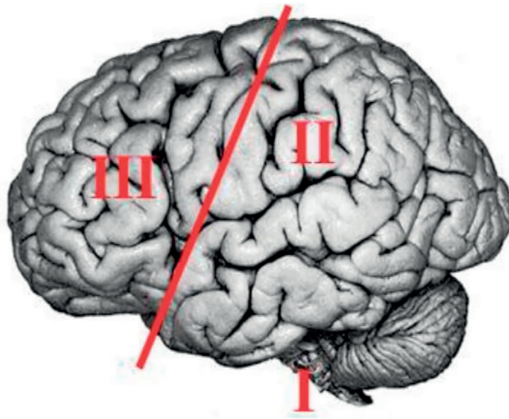


Figure. Luria's Functional Blocks

regulates two types of activation processes: general activation of the brain and changes of local selective activation (Glozman, 2014).

Exercises such as physical activities are recommended! Several psychomotor exercises should be done to promote attention and activation of the brain. Exercises as: "Simon says touch your nose... Simon says touch your elbow... Simon says put your hands up... put your hands down." Another movement exercise to activate the brain of a child is "head, shoulder, knees and toes, knees and toes..." Then take away the words and just do the movements.

Another play activity that works with brain activation is called — *guess where?* (it is a typical Brazilian game), in which children sit in a circle, all must look towards the center, one of them stands outside and must walk around, or even go dancing around that circle singing the song of the game. The child has an object in his or her hand that will put behind one of the children sitting in the circle. At some point the child who is walking should drop the object behind a person and stop singing, which will be the sign that he has already left the object and the other child, who has the object behind him, must get the object and run after the other child until he catches him or until he or she sits himself in the place of the one who got up and then the game must start again. If the one who dropped the object is reached, he must do everything again, if he or she is not, then the other one starts the game again.

Hard or soft is another game in which children stroll in the park, or in the classroom. When the teacher speaks the word hard, everyone must keep their body and muscles very tight, so when the teacher tries to raise, for example the child's arm, she will not be able to due to how hard it is. After the teacher will say the word soft and all the bodies must be very relaxed.

Another game is the game of chairs. In this game the children and teacher must arrange the chairs in a straight line, putting one seat facing one side and the next seat facing the other side, and so on. The number of children must always be one more than the number of chairs available. The game starts with the children walking or dancing

around the line of the chairs, previously assembled, to the sound of music. When the music stops, everyone should try to sit in a chair, there will always be a child left without sitting, the game will continue until there are two children and one chair and one of them will be left without a chair. These are just a few suggestions to activate the cortex in a pleasant way through the use of games or activities.

Memory exercises such as: "John went to the fair and bought an orange..." and the next person on the circle or on line will continue saying: "John went to the fair and bought an orange and a pear..." and so on. All these exercises, both physical and mental, activate the child's brain promoting a good field of attention to enhance learning abilities.

The second functional is localized on the posterior part of the brain including the following lobes: parietal, temporal and occipital. This unit is responsible for the reception, processing and storage of information that arrives from the outside world. The parietal lobe is responsible for identifying tactile sensory impressions, the temporal lobe is responsible for identifying auditory information and the occipital lobe is responsible for identifying visual information.

Information, or input stimuli come from the outside world through waves of physical energy which are transformed into chemical energy when they enter the body and are transported to the brain straight to the thalamus, the only exception is for olfactory information which goes straight to the olfactory bulbs for recognition. The thalamus distributes the information to the specific lobes cited above for identification and perception. This process is called transduction.

It is important to use all these areas and stimulate all of the senses of the children. All of them together will help on the codification and storage of the information in the memory. Repeat all the information given during the activity to encourage the persons to participate. The teacher, facilitator or family should do a "to do list" of the day and as he gives the activity fill in the list with information so that the people will have all the important information of that day in a systematized and organized way for posterior study and/or recall.

Activities such as exploring the reception of external stimuli and recognizing them can be a lot of fun. Among these we can play with blindfolds to identify sounds and where they come from as well as work with tactile perceptions such as which is cold, hot, dense, soft or even gustatory stimulation.

In relation to visual stimuli, activities that involve differences in color tones, perception of differences in figures such as the game of the seven errors, where we compare two equal figures with differences that can be more or less subtle according to the age group. The teachers can use situations with different types of illumination, such as, light and dark, using flashlights, when stories are told that working with creativity and curiosity.

Other interesting activities can be done such as manipulate different textures with varied sandpaper, from the finest to the roughest, always with great care so that the child does not get hurt, or even make use of a bowl for materials such as gel, water, flour, cream, among others. Materials for manipulation and construction of shapes also can be used such as: homemade clay, which can be worked by the children themselves with edible items (flour, filtered water and food coloring).

The third functional unit located on the frontal lobe is the unit responsible for the organization, regulation, verification, planning of the mental activity, as well as the anticipation of the action, problem solving, correction of errors and postponement of impulses — it is the core of the executive functions. The proper interaction of the three blocks with the environmental stimuli culminates in the high cortical functioning which will be perceived through language, memory, intention and abstract thinking.

The use of games and activities to stimulate the thought and the planning from a psychomotor point of view and also to improve cognitive aspects are important. Before you do a motor exercise or speak you have to plan all the details of your action and this third part of the functional system is responsible for doing it.

Some advised games which work the executive functions are: chess and mastermind, which need planning sequencing, concentration and non-verbal comprehension. They are interesting activities to use regarding executive functions. Other possibilities are Set and Sudoku which explore the visual perception to discover patterns and train problem solving abilities. Another interesting game is Panic Lab which trains mental flexibility requiring close attention and reaction.

We also suggest other activities which practice control and inhibition, such as stop and go exercises. Body movements have to have planning and are also important for control, orientation and for interhemispherical interactions. These exercises can be done at school or with private professionals such as speech therapists, neuropsychologists, psychologists, private teachers, etc.

Luria (1981) affirms that the brain works as in a concert, all of the three units work together forming the Functional System. One unit helps the other in an interdependent way.

Learning Disabilities and Emotional Reactions

According to the DSM-V (American Psychiatric Association, 2014), learning disabilities is a kind of Neurodevelopment Disorder that impairs the ability to learn or use specific academic skills, for example reading, writing or arithmetic. Based on DSM-V this kind of problem may appear in preschools, but it's easier to diagnose when the formal school starts.

Learning disabilities are very common to be present in children's lives. It happens by something that affects the brain development and it could start before birth, during the birth or after, it could be also a combination of more than just one cause. The causes are biological, most of the times, genetic, and social. Some of the common learning disabilities are: dysorthography related to writing skills and also dysgraphia in which, according to Di Mauro, Bevilacqua, Colizzi, and Di Pierro (2020), is a learning disorder that causes difficulties in reproducing alphabetical and numerical signs. Children with this disability write irregularly, it is very usual for them to write in an inadequate body position, with their elbows not placed on the table and they incline their back. Dyscalculia is related to math skills, and according to Kaufmann and Aster (2012) is a difficulty asso-

ciated to the acquiring basic arithmetic skills which is not explained in any way through low intelligence or inadequate schooling and the child can't get better without treatment. According to these authors, difficulties to write, read and learning mathematics are common disorders in children. Dyslexia is related to reading skills and are mainly referred to as the difficulty on the ability of learning how to read (Petretto & Masala, 2017), and it is the most studied learning disability. According to DSM-V (American Psychiatric Association, 2014) there are three differences within the concept of ADHD: with attentions symptoms priority, with impulsivity and hyperactivity or with both together. In all of these cases the symptoms must have persisted for six or more months, with negative impacts in both social and academic activities. It must start before 12 years old and it should occur in every place or situation within the child's life and relations: at home, with friends or relatives and at school. In all these cases it has to be related to attention skills, as well as laterality difficulties and difficulty with the organization and planning of the activities: executive functions.

These learning disabilities can lead to, and they frequently do, emotional disturbances. Barreto, Freitas, and Prette (2012) correlate social skills and learning disabilities. Children with difficulties present high frequency of performance indicating internal and external problems according to their own teachers. Developmental disturbances are related to affective-emotional aspects which can be a result of the learning disabilities or of adverse conditions of life on the child's relation with the world around. These can develop: anxiety, attention deficit, depression, etc.

The fundamental is that the teacher and facilitator is alert to the emotional signs given by the person so he will be able to help, these signs that can be showing, among other things, domestic violence. Everybody is responsible and it is the main role of the teacher and facilitator to provide conditions for the pupil to advance and progress. Be alert also to direct the pupil, the sooner the better, to an indicated professional, so that the person suffers the less damage possible.

Reactions such as aggressiveness, cry, quietness, as well as agitation, difficulty to pay attention, etc. can be signs of affective-emotional disturbances. When the caregiver notices something, it is important to talk to the child. Create a bond of trust so that you are able to help the child to speak about his sorrow. Remember that a child, most of the times, stays more time with the teacher, during the day, than with his own parents, therefore attention to the emotional attitudes of the child is fundamental.

The brain develops better within a stable environment of support and low levels of stress. Safe relations are the key to healthy development of the brain as well as emotional regulation that encourages learning and adaptation to reality. It is very important to produce a cozy and welcoming environment so that the child can establish significant relations to consolidate himself as an autonomous and capacitated being which builds significant subjective concepts in life. We understand that it is very important that teachers and facilitators permit children to be authentic, truthful and that they have their decisions respected always within parameters and limits previously established. This has the objective of forming an original and spontaneous human being.

Cozolino (2013) postulates that relationships are fundamental for the formation of the brain, which is always social — it does not form with its multiple powers without significant human interactions. Therefore, for the relation of teacher and students it is important to emphasize the care, respect and attention necessary within this bond. The insertion in a qualified environment with significant adults promotes the humanization of these babies, that is, it helps in the constitution with a historical and cultural subject. We understand, therefore, that the brain's functionality is closely related to our social relationships. Thus, the brain, as a social organ, corroborates the fact that the influence that relationships have on the health/disease dialectic, on neuroplasticity, on learning, among other things. The ability to learn, in itself, connects our brain and our bodies to our physical, emotional and social survival.

Education and Remediation

Glozman (2014) explains that an education which remediates determines development. She points out that remediative and formal education has two objectives which differ. General education relates to the acquisition of knowledge and remediative education is related to the formation of functional organs or of a new functional system that permits mental process to be done. For a child with learning disabilities it is important to do a remediative process prior to formal education so that a base is built for further education because new basic functional systems are formed during remediation that will allow future independent learning. The role of the neuropsychologist is not to teach school subjects, but to work on the formation of higher mental structures, which will provide conditions for formal school learning.

The basic systems cited above include voluntary regulation, control of child's own behavior, spatial orientation, verbal phonemic and kinesthetic analysis and synthesis, motor ability, volume and stability of visual and verbal memory as well as logical thinking and communicative abilities (Glozman, 2014).

The cultural-historical approach in neuropsychological remediation of learning disabled children consists of further development of the theory of mediation. Vygotsky proved that mediation is a natural way of cognitive development in children and of the psychological compensation of cognitive and physical deterioration in children. This last principle results in a search for mediation methods in remediation instead of direct training of underdeveloped functions (Glozman, 2013, p. 156).

Therefore, the main task of remediation according to Glozman (2014) is to create, together with the patient, who actively participates during all the process, ways to compensate and overcome the underdeveloped mental functions. During remediation we must use the strong brain structures to stimulate the weak ones. The activities proposed should be playful and interesting to motivate the child, bringing legitimate results.

Remediation, in this sense, is a holistic process, in which flexible strategies should be created according to the child's psychological age and type of difficulty as well as external

orientation should be provided by an adult. These strategies must be based on the concept of the zone of proximal development and include the general activity and the personality of the child (Solovieva & Quintanar, 2015).

Neuropsychological remediation consists of two complementary orientations of work with the child: the first aims at forming a basic framework for cognitive functions, the second at the development and remediation of cognitive functions and their components. Both orientations include effects on emotional and personal aspects of the mental activities of children (Glozman, 2013, p. 149).

The principles of remediation according to Solovieva and Quintanar (2015) are related to: gradual formation of weak brain mechanisms using the strong mechanisms as a base; inclusion of weak mechanism in orientated actions with goal and motive; take into consideration the psychological age and the rector activity instead of the chronological age; through mediation, starting with the external level, gradual internalization of actions; constant orientation and mutual dialogical and interactive cooperation within the process of remediation.

In Glozman's (2013) point of view, neuropsychological remediation is a form of child's social protection. It is based on Vygotsky's and Luria's principles as follows:

1. An assessment reveals deficits and strengths of his development plus the zone of proximal development and the possibilities to improve results with the help of the examiner characterizing Luria's principle of using dialogue in the assessment.
2. The complex remediation combines cognitive, motor, respiratory and emotional methods in order to form a mental function.
3. The systemic remediation relates to a program organized for the child focuses on the balance of the whole personality of the child.
4. Play activity in which the child is a subject of appropriation of a play experience. It unites affect and intellect and releases tension increasing the overall activity of the child raising his potential promoting awareness of the action.

The process of remediation's goal is to accomplish the following tasks: improve behavior and school performance by enhancing cognitive development, remediation of negative personality traits, development of communicative skills and psychological intervention to assist parents. Remediation should promote opportunities for achieving cognitive health developing a person as a whole. In this way parents should understand the importance of the remediation task and what the professional who are working with their child is doing because it depends also on this the success of treatment.

Glozman (2013) mentions Soboleva who considers that the formation of high mental functions in the play remediation goes together with the improvement of school achievement developing both emotional and communicative abilities. Luria's studies confirms this statement and adds that brain activity shows the value of communication to the mental development of children in which language is one expression of reality (Luria, 1991).

Conclusion

When you are present in a relation nervous connections are promoted. Results are observed qualitatively focusing that each person is an individual self and that relationships are essential to produce development. Interactions between the brain and the formation of mental functions require the maturity of the nervous system as well as an active process which emphasizes relations of two or more human beings.

Lashley (1920): affirms that engrams (traits of memory) produce changes on the brain associated with long term memory. Two possible changes are: the *functioning of the neuron can alter with chemical changes* — there is an increase on the quantity of neurotransmitters produced by the neuron and the *structure of the neuron can be altered with physical changes* — the number of ramifications which interconnect the neurons increase, this way increasing the number of synapses or points of communication of each ramification.

Therefore, we believe that the more stimulation given to the brain, the more physical activity is done, the more attention and relational experience is provided to the person, the more he will develop overcoming possible delays and underdevelopment. Luria (1991, 1992, 2001) considers that the experiences lived by the child from 0 to 3 years has potential force in brain development.

The family and school, with their significant adults, will act as mediators, promoters of interventions aimed at advancing, progressing, going beyond. Respecting the pace and stage of each one, attentive, participative and committed, but most of all, affective adults can provide qualitative leaps in the learning, social and emotional skills of a child resulting in neuropsychological development.

As we have written during our text, all the adults that interact with their babies and children should understand the importance and the responsibility of this relation between them and the child regarding brain development, the emotional well-being and the psychic health of this child.

In this way we believe that the most important is how you relate to the person and not only what you do. A team work among school, community and family is fundamental. Parents, teachers and community in general, such as the work done in public squares in Cuba, should establish a good relation with their people, children and students, considering them as unique individuals providing development to occur. Parents and teachers with a good orientation and interested on the well-being of the child are able to promote a holistic health to the child which will include: a healthy environment, a healthy community, a healthy infrastructure, a healthy family, forming a healthy individual.

Bock, Gonçalves, and Furtado (2002) considers, within a Social Historical point of view, that man which experience relations transforms and is transformed in a constant process. In this way we believe that human interaction involve exchange, in both ways, one human constitutes the other, transforms the other, in a dialogical process which focuses the best way to promote holistic health and adaptation to reality.

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Relationship between Intelligence and Executive Functions in Preschoolers

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Связь интеллекта и исполнительных функций у дошкольников

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Abstract. The paper raises the problem of the relationship between executive functions and intelligence in preschool period of the development. Based on the discussion about the components of executive functions proposed by different authors, two components (inhibitory control and working memory) were selected for analysis. Raven Coloured Progressive Matrices were chosen for the assessment of the intelligence. We chose this method due to the fact that there are a lot of preschoolers who have speech problems that prevent an adequate assessment of verbal intelligence. The go/go and go/no-go paradigms to evaluate inhibitory control of Vergunov and Nikolaeva, and a test of Razumnikova and Savinykh aimed at evaluating working memory were used. The specificity of the test aimed at the level of inhibitory control

assessment was a fractal structure of the sensory flow. Both go/go and go/no-go series included two identical parts, but children did not know about this. Some children, however, showed better results in the second part of the series rather than the first one. This could indicate that children intuitively discovered the structure of the sensory flow and learned to respond more effectively. In go/go series, children were asked to respond to each presented stimulus (circles of different colors). In the go/no-go series, they were forbidden to respond to a target stimulus (red circles). Calculating the mistakes (reactions to the red circles), we could assess the inhibitory control level. To assess a working memory, the subjects were offered three series including the same set of visual stimuli, and the order of the stimuli was changed in each series. The number of recalling stimuli in each series and interference inhibition resulting from the presentation of the same set of stimuli were calculated. The study involved 90 preschoolers (average age 6.5 ± 0.4 years) of normative development, parents of all children signed informed consents, and all children were told about the goals of the study. It was shown that nonverbal intelligence has no correlation with any parameters of the inhibitory control or parameters of working memory in preschool age. Immaturity of the prefrontal cortex at this age was suggested to be the main reason for the lack of such a link. The low levels of both inhibitory control and interference inhibition could not provide a high level of correlation with intelligence. It was proved that nonverbal intelligence is associated with greater performance in the second part of the go/go series. This suggests that the higher the child's intelligence is, the better they are able to navigate the sensory flow.

Keywords: *go/no-go paradigms; working memory; inhibitory control; interference inhibition*

Аннотация. В статье рассматривается проблема взаимосвязи исполнительных функций и интеллекта. Анализируются компоненты исполнительных функций, предлагаемые разными авторами, выбирается два компонента, включенных практически во все исследования: тормозный контроль и рабочая память. Для оценки интеллекта применяется тест Дж. Равена, направленный на описание невербальной памяти. Такой выбор обусловлен тем, что в дошкольном возрасте еще достаточно много детей, имеющих речевые проблемы, препятствующие адекватной оценке вербального интеллекта. Для оценки тормозного контроля использовались парадигмы go/go и go/no-go Е. Г. Вергунова и Е. И. Николаевой и тест О. М. Разумниковой и М. А. Савиных, направленный на оценку рабочей памяти. Специфика теста, определяющего уровень тормозного контроля, состояла в том, что сенсорный поток, который предлагался ребенку, имел фрактальную структуру и состоял из двух одинаковых частей, о чем ребенку не сообщалось. Некоторые дети тем не менее вторую часть теста выполняли лучше, чем первую. Это могло свидетельствовать о том, что дети интуитивно обнаружили закономерность и научились реагировать эффективнее. В рамках серии go/go у детей вырабатывалась реакция отвечать на каждый предъявляемый стимул. В рамках серии go/no-go запрещалось реагировать на целевой стимул, на который ранее уже была выработана реакция. Предполагалось, что так можно оценить тормозный контроль. При оценке рабочей памяти испытуемым предлагалось три серии, включающие один и тот же набор зрительных стимулов, в каждой серии порядок их предъявления

менялся. Оценивались объем воспроизведения материала в каждой серии и интерференционное торможение, возникающее вследствие предъявления одного и того же набора стимулов. В исследовании приняли участие 90 дошкольников (средний возраст 6.5 ± 0.4 года), их всех знакомили с целями исследования. Родители детей подписывали информированное согласие. Было установлено, что в этом возрасте невербальный интеллект не связан ни с параметрами тормозного контроля, ни с параметрами рабочей памяти. В качестве основной причины отсутствия такой связи можно предполагать незрелость префронтальной коры в данном возрасте, что приводит к низким оценкам как тормозного контроля, так и интерференционного торможения. Было показано, что невербальный интеллект связан с большей эффективностью выполнения второй части теста go/go. Это позволяет предположить, что чем выше интеллект ребенка, тем лучше он ориентируется в сенсорном потоке вокруг него.

Ключевые слова: дети старшего дошкольного возраста; невербальный интеллект; простая и сложная сенсомоторные реакции; рабочая память; тормозный контроль; интерференционное торможение

Introduction

A. R. Luria was one of the first scientists who studied the role of the frontal lobes (1973). He showed their slow maturation in ontogenesis and significance in behavior (Nikolaeva, 2015). Currently, their functions are associated with executive functions, that is, functions that are responsible for the behavior change managing (Diamond, 2013). Different authors described different contents of executive functions. But most of them agreed that executive function included two components: inhibitory control and working memory (Nikolaeva & Vergunov, 2017). It is the executive functions that ensure the effectiveness of education when a child goes to school. However, when checking a child's school readiness, most psychologists assess the level of the child's intelligence but do not assess the level of executive functions development. Therefore, knowledge of the relationship between intelligence and executive functions could help psychologists to predict child problems that might occur in elementary school more accurately. Despite a lot of research, there is still a significant contradiction regarding the relationship between executive functions and intelligence, especially in preschool age.

Working memory is defined as a higher-order cognitive system, memory, which maintains the necessary information in an accessible form while solving a specific task related to complex cognitive processing (Baddeley, 2007). Inhibitory control is described as an ability to keep irrelevant or misleading information away from interfering with performance, it allows a person to suppress a proponent or automatized response (Bari & Robbins, 2013; Brydges, Reid, Fox, & Anderson, 2012; Luna, 2012; Nigg, 2000). Although inhibiting control appears in infancy (Johnson, 1995), the level of errors associated with controlling functions decreases in childhood and adolescence (Bjorklund & Harnishfeger, 1995; Diamond & Lee, 2011). Studies based on functional magnetic resonance imaging,

aimed to analyze the age differences in the activation of the main systems of inhibitory control, have shown that the prefrontal cortex of the brain is responsible for it. However, the specific influence of the prefrontal cortex on the development of inhibitory control is unclear, since its development is uneven, and the number of errors increases and decreases in different periods of the development (Marsh et al., 2006; Rubia et al., 2006). Moreover, some studies suggest that working memory and inhibitory control can take distinct developmental trajectories (Jurado & Rosselli, 2007). Therefore, each of these components of executive functions may have different types of relations with intelligent parameters.

Preschool age in this context is important because the development of intelligence occurs in a period of immature prefrontal areas of the cerebral cortex, that are responsible for the formation of different inhibitory processes. It is known, that the dorsolateral prefrontal cortex is a necessary region for controlling inhibitory control (Angius, Santarnecchi, Pascual-Leone, & Marcora, 2019); medial prefrontal structures, in turn, are included in frontolimbic and frontoparietal networks, which are necessary to create a connection between intelligence and executive functions (Faul, Fogleman, Mattingly, & Depue, 2019). The immaturity of these structures in preschool age could be reflected in various ways in the relationship between the components of executive functions and intelligence.

Since both intelligence and inhibitory control are formed unevenly, this also leads to different results from different authors. That is why the studies examining the connections between intelligence and executive function in preschoolers (Uka, Gunzenhauser, Larsen, & von Suchodoletz, 2019) have found complex patterns that depend on age. At the age of 4.5 years, children had no connection between inhibitory control and intelligence, this connection appeared in six months, and in the next six months this connection disappeared. This connection with working memory was only 5.5 years later, according to the authors (Uka et al., 2019).

Inhibitory control is considered to be a key component of self-regulation. A huge role in its formation is associated with the processes of brain maturation, as well as environmental influences: first of all, upbringing in the family. Parental self-efficacy is a key parameter of the parental behavior which is related to children's achievements. However, studies of the interaction of parental coregulation, self-efficacy and child's inhibitory control in early childhood are insufficient. Gärtner and co-authors (Gärtner, Vetter, Schäferling, Reuner, & Hertel, 2018) studied to what extent positive and negative parental coregulation and domain-specific and domain-general self-efficacy assessed in the first test (T1) predicted inhibitory control of infants after six weeks (T2). The results are based on data from 90 parent-child dyads (age of children 24–35 months). All indicators of parents were assessed with a questionnaire. Children's inhibitory control was measured using a behavioral inhibition rating scale for executive functions' assessment. According to these data, negative parental coregulation and domain-specific self-efficacy predict infants' inhibitory control. Thus, the child's inhibitory control development is influenced with the conditions of the entire development of the child (including in the womb) and both genetic and epigenetic factors impact on it.

That is why a greater number of works are devoted not to preschoolers, but to older children, who have more certainty in their results due to the greater maturity of their brain networks.

In 96 primary school children, aged 10–13 years, the relationship (Nęcka & Lulewicz, 2016) of intelligence with inhibitory control and working memory were studied. Intelligence was assessed with the Raven Coloured Progressive Matrices. Intelligence was shown to be related to inhibitory control, but was not related to the volume of working memory.

It has also been shown in adults that the function of suppressing undesirable actions is related to the number of extrastriatal D2 receptors (Colzato, van den Wildenberg, & Hommel, 2013), and this relationship is enhanced with the age by increasing the role of inhibitory control (Rozas, Juncos-Rabadán, & González, 2008).

All these results predetermined the task of this study: to identify the relationship between intelligence and inhibitory processes in preschool age.

Materials and Methods

Subjects. The study involved 90 children (50 boys and 40 girls, the age range 6.5 ± 0.4 years) of normative development, attending kindergartens in Saint Petersburg. The parents of all participants gave informed consent, and child participants provided informed assent.

Methods. The go/go and go/no-go paradigm was first proposed by Lappin and Eriksen in 1966, and further developed by G. Logan and colleagues (Logan, Cowan, & Davis, 1984; Logan, 2015). In this version of testing subjects were trained for certain reactions, and then this reaction was forbidden to perform. For this purpose, the REBOS method (reflexometry with biofeedback) was used (Vergunov & Nikolaeva, 2009). The technique consists of 3 series: training, simple (go/go) and complex (go/no-go) sensorimotor reactions. The training session is conducted so that the experimenter can determine how well the subject understood the instructions and correctly performed the task. Circles of different colors were shown to the children on the computer at the same interval. According to the instruction, one had to press the enter key as quickly as possible when the circle appeared. In the go / go series, as in the training series, the participant was asked to react to all stimuli (circles of different colors) that are presented on the screen, and press the enter key when they appeared on the screen. Unlike the training series, in which stimuli were presented at the same interval, in this series the structure of the stimuli flow was a fractal one. In the go/no-go series, the subject was required not to react to a key stimulus (not to press the enter key when red circles appeared on the screen), whereas the subject must respond to all other stimuli. The last series was the assessment of the quality of inhibitory control: the subject had to suppress the desire to perform the previously learned actions.

It is worth noting that the peculiarity of this version of the test is that the signals flow consists of two identical parts. However, the subjects are unaware of this. Some children guess about this, because they do the second part of series better than the first one.

We calculated the time of simple and complex sensorimotor reactions, the number of missed stimuli, and the number of errors (reactions to a forbidden signals).

To estimate the volume of working memory and interference processes in it, an original computerized method was used (Razumnikova & Savinich, 2016). Subjects were offered three series included the same set of visual stimuli, and the order of the stimuli was changed in each series. The total number of the presented objects was 30 pieces. At the first presentation, the subject saw three objects and according to the instructions had to “mark the object with the mouse cursor that was not marked earlier.” Then new objects were added to the objects already seen, and the time for selecting a new object was not regulated. As soon as the subject made a mistake, that is, clicked on an object that he had already selected earlier, a new series with the same instruction began. In each series, the same objects were presented, but in a different sequence and in different combinations, which created a basis for interference of the already presented information and new one. The number of correctly recalled objects in each of the three series was recorded, as well as interference, i. e. overlapping of one information with another. In this case, the number of correctly reproduced stimuli in the second and third series was subtracted from the number of correctly reproduced objects in the first series, and the number of correctly reproduced objects in the third series was subtracted from the number of correctly reproduced objects in the second series.

Interference also represents inhibitory processes in working memory, since the reproduced information in one series prevents it from being reproduced in another series due to the proximity of the presented objects (Razumnikova & Nikolaeva, 2019).

The intelligence was assessed with Raven Coloured Progressive Matrices (Raven J. C., Court, & Raven J., 1984). Children were asked to identify the piece required to complete a figural pattern from six variances. This test uses a multiple-choice response and children have to identify the missing component in figural patterns out of six alternatives. The test consists of 36 figural patterns, divided into three series (A, AB, C), each series, in turn, consists of 12 tasks (Raven J. C. et al., 1984). The total score represents the total number of correct responses.

Matrices allow us to evaluate the process of making a logical decision in such conditions that the decision is associated with choosing the best option in the shortest possible time. The results obtained are not determined by the erudition of the subjects and do not depend on their level of education. The result depends only on the ability to logical analysis, spatial imagination, and the features of a person's holistic perception of the image.

When performing test tasks, a person activates the processes of perception, attention and imaginative thinking. Performing the color matrix test requires maximum concentration and attention, since reducing these indicators will inevitably lead to errors. All this assumes the importance of inhibitory control for the quality of the test. In series A, the task is to supplement the main image with one of the following fragments that match the specific image. Successful completion of the task requires a thorough analysis of the components of the main image and the detection of similar details in one of several fragments.

Tasks in series B are based on the principle of finding similarity in pairs of figures. It is necessary to understand the principle according to which the figure is constructed and select the missing fragment. The definition of the axis of symmetry is essential, according to it the main sample contains the figures. The test was conducted individually.

Regression analysis was performed to assess the impact of the variables studied with using the SPSS-22 program. All tests were two-tailed and were analyzed using a set level of significance of $p \leq .05$. The data was first checked for outliers, normality of variables, and for violations of statistical assumptions of Linear Regression Models.

Results

Table 1 shows data of the level of nonverbal intelligence and the volume of working memory in three recalls. The data shows that the level of intelligence of preschool children is within the age norm. The first recalling is the best one and then mechanism of interference inhibition begins work. There are no any significant differences due to the high standard deviations.

Table 1

The level of nonverbal intelligence (scores) and working memory (numbers of objects) in preschoolers (means and standard deviations)

Intelligence	Working memory		
	V1	V2	V3
21.2±5.4	16.0±7.3	10.1±6.0	10.4±5.2

Note. V1, V2 and V3 — the first, second and third recalls respectively.

Table 2 shows the results of the go/go series in which the child had to react to all the stimuli presented on the computer screen. We have already said that the second part of the test repeats the first one. A fairly large variance of responses indicates that a small number of children still guessed the structure of the presented flow, and most of the children were simply tired by the end of the series.

Table 2

The results of the first and second parts of the go/go series (means and standard deviations)

Part 1		Part 2	
Time of reaction (ms)	Missing reactions	Time of reaction (ms)	Missing reactions
394.3±77.3	4.4±3.4	420.7±71.3	5.6±3.8

In *Table 3* there are the information about the go/no-go series. Since the inhibitory control at this age was not yet formed, you can see that both the reaction time to the stimulus and the number of skips increases. The reaction time was increased significantly in comparison ($p \leq .05$, t -test criterion) with the reaction time in the previous series. At the same time, children make quite a big number of erroneous reactions. At the same time, it is worth noting the high degree of deviations in the number of errors and omissions, which indicates that inhibitory controls have different developmental levels in children.

Table 3

The results of the first and second parts of the go/no-go series (means and standard deviations)

Part 1			Part 2		
Time of reaction (ms)	Missing reactions	Mistakes	Time of reaction (ms)	Missing reactions	Mistakes
552.4±78.5	9.2±6.3	9.0±4.2	563.6±85.9	8.6±5.7	9.0±4.5

A *linear regression analysis* of the influence of the independent variable IQ (Intelligence) on all the studied parameters was performed. The results are presented in *Table 4*.

Table 4

Influence of the independent variable IQ on go/go reaction parameters

Dependent variables	R^2	β	p
Reaction time in the second part of the go/go reactions	.056	-.237	.024
Omissions in the second part of the go/go reactions	.057	-.238	.023

Table 4 shows that the higher the child's level of the intelligence is, the faster he (she) reacts to the appearance of a stimulus in the second part of a simple sensorimotor reaction, and the fewer stimuli are missed in the second part of the go/go series. It is worth remembering that the signal flow in this version of the study consists of two identical parts. This result of the regression analysis indicates that the higher the child's intelligence is, the more likely he (she) guesses that the second part of the test repeats the first one.

There were no relations between intelligence and go/no-go reaction parameters. It is important to note that the regression analysis did not reveal a connection between intelligence and all the parameters of working memory under study.

Discussion

The study tested the hypothesis of the relationship of intelligence with the parameters of the executive functions. To test intelligence, we used Raven Coloured progressive matrices, whereas in the literature we can find an assessment using this test as well as the D. Wechsler test. It is obvious that both intelligence and executive functions are not a single process, but each of them includes many components. Executive functions and intelligence refer to similar processes and there is a discussion to which extent they are tied to each other (Duggan & Garcia-Barrera, 2014).

Our data shows that intelligence relates to the ability of a child to navigate a sensory flow, but is not consistent with research arguing that intelligence is related to inhibitory mechanisms (Ardila, Pineda, & Rosselli, 2000; Pascual-Leone, Amedi, Fregni, & Merabet, 2005; Roca et al., 2010; Salthouse, Atkinson, & Berish, 2003). Our data does not agree with studies that claim a close relationship between working memory and interference control with intelligence. Moreover, Blair (2006) concludes that intelligence, executive functions and working memory form a unitary construct. It is worth emphasizing that all researchers talk about very moderate relations between components, it does not allow them to be attributed to a single phenomenon (Anderson, 2006; Tillman, Bohlin, Sörensen, & Lundervold, 2009).

We believe that the lack of a connection between intelligence and the parameters of executive functions is associated with the age of subjects in whom the structures responsible for these processes have not yet matured.

The condition for connecting executive functions with intelligence may be their general dependence on social and demographic family factors. The fact that memory changes significantly depending on the child's living conditions in the family is shown in the work of a large team of authors (Belolutska et al., 2018). It was found that the quality of working memory depends on sensorimotor integration (Cowan, Li, Glass, & Scott, 2018), speech and mathematical abilities (Atkinson, Waterman, & Allen, 2019; Chamandar, Jabbari, Poorghorban, Sarvestani, & Amini, 2019; Gunzenhauser, Saalbach, & von Suchodoletz, 2017). Moreover, it changes significantly with age (Razumnikova & Nikolaeva, 2019), and age-related changes depend on morphological changes, in particular, in the early school age (7–10 years old), when a considerable role is played by the corpus callosum, and later by the thickness of the occipital-temporal cortex (Bathelt, Gathercole, Johnson, & Astle, 2018). It is obvious that at preschool age the child is more influenced by the conditions of stay in the family (Nikolaeva, 2017). Previously, it was shown that the older the father at child's birth is and the higher the mother's education is, the higher intelligence the child has. And with a lower order of child's birth and number of children in the family the child intelligence is higher (Nikolaeva, Goncharov, & Borisenkova, 2017). This data could be explained by the fact that the older the father, the more likely it is that the mother will eat better during pregnancy, she will have a more prosperous family environment, because typically with age a person has a larger salary. If the mother has a higher education, it is likely that she values the education, which means that she

will pay more attention to the development of cognitive processes in the child (Engle & Kane, 2004). The more children in the family, the less attention is paid to each of them, although intelligence is determined by communication with adults, but not with peers. And, of course, in a typical family, more attention is paid to the first child, because for a while he (she) is the only child in the family.

In terms of working memory and inhibitory control, things may not be as straightforward. It is known that the genetic component is generally more important for memory (Cowan et al., 2018), although the significance of the social and demographic components of influence may also be great (Ekerim-Akbulut, & Selcuk, 2018).

No less significant is the study of the influence of family factors on the formation of inhibitory control. In a large group of German children (263 people), no family factors were found to predict the development of inhibitory control (Gunzenhauser et al., 2017). However, there are works that have found a link between inhibitory control and particular experience of a child in the family (Roell, Viarouge, Houdé, & Borst, 2017; Santillán & Khurana, 2018). All these results need further research, that would include more parameters of both executive functions and working memory.

Conclusions

The current study is aimed to identify the relationship between preschool-age children's executive functions (working memory and inhibitory control) and intelligence. It was shown that a close relationship was found only between intelligence and the child's ability to navigate the sensory flow. No associations were found between intelligence, inhibitory control, and working memory parameters. A possible explanation is the immaturity of the prefrontal cortex at this stage of ontogenesis, which is responsible for both inhibitory control, working memory and intelligence.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional and/or National Research Committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Limitation

This study has a considerably big sample to conduct statistical analysis and get meaningful results. However, it is possible that the description of family circumstances and their inclusion in the results would reveal the influence of family on all the parameters under study. It would explain

the high standard deviations in the number of errors in the series not only by the slow maturation of the prefrontal cortex, but also by the specifics of intra-family relationships.

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Space in Luria Neuropsychology: Ideas, Clinical Phenomenology, Research Methods

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Пространство в луриевской нейропсихологии: идеи, клиническая феноменология, методы исследования

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Abstract. The article discusses various aspects of research on spatial functions in Russian neuropsychology. According to the author, spatial functions are those mental processes whose main purpose is to obtain information about the spatial properties of objects and perform spatial actions and operations. The author analyzes some aspects of the neuropsychological approach to the perception and understanding of violations of the mental reflection of space. The article discusses some cultural and historical prerequisites for the emergence of a neuropsychological approach to the study of spatial functions. There are also data on references to spatial disorders in the works of the founders of clinical psychology in Russia — S. S. Korsakov and V. M. Bekhterev. The author writes that A. R. Luria's interest in space arose even before the emergence of neuropsychology as an independent science. In the research on the mental development of children, conducted by him in the second half of the 20s of the last century together with L. S. Vygotsky, the attentive reader will find data on the development of various spatial representations. Long-term study of violations of spatial functions in local brain lesions allowed A. R. Luria, his colleagues and students not only to describe various symptoms of disturbances of spatial components of perception, memory, thinking, and

voluntary movements, but also to significantly clarify the idea of the complex brain organization of the so-called spatial factor. In addition, Luria neuropsychology was able to develop an original integrative model of the spatial organization of the human brain, in which various cerebral zones and structures work in concert to ensure the fulfillment of various mental and behavioral tasks. Analyzing the work of A. R. Luria, the author, along with undoubted achievements, notes some discrepancies and gaps in the study of spatial disorders. It is shown that in the fundamental monographs of A. R. Luria, violations of the spatial aspects of tactile and auditory perception and spatial memory were discussed very concisely. Ideas about the “vertical organization” of spatial functions, i. e. the contribution of not only cortical areas of the brain, but also subcortical structures to their implementation, also developed gradually. This statement is also true when it comes to a comparative analysis of violations of spatial functions in local lesions of the right and left hemispheres of the brain. A significant contribution to the development of the problem of functional asymmetry of the brain hemispheres in the processes of spatial analysis and synthesis was made not only by Moscow neuropsychologists, but also by their Leningrad colleagues — L. Ya. Balonov, V. L. Deglin, E. P. Kok, Ya. A. Meerson and others. After the death of A. R. Luria his followers (N. K. Korsakova, Yu. V. Mikadze, E. G. Simernitskaya) began to develop new areas of neuropsychological science — the neuropsychology of childhood and aging. The article discusses in detail the history of creation and current state of the complex of empirical methods used for neuropsychological diagnostics of spatial functions. Special attention is paid to the possibility of using the chronotope category in neuropsychological research.

Keywords: *neuropsychology; spatial functions; diagnostics; brain dysfunctions; time*

Аннотация. В статье обсуждаются различные аспекты исследований пространственных функций в отечественной нейропсихологии. По мнению автора, пространственные функции — это те психические процессы, основной целью которых является получение информации о пространственных свойствах объектов и выполнение пространственных действий и операций. Автор анализирует некоторые аспекты нейропсихологического подхода к восприятию и пониманию нарушений психического отражения пространства. В статье обсуждаются культурно-исторические предпосылки возникновения нейропсихологического подхода к изучению пространственных функций. Также приводятся данные об упоминаниях пространственных расстройств в работах основоположников клинической психологии в России — С. С. Корсакова и В. М. Бехтерева. Автор напоминает о том, что А. Р. Лурия проявлял интерес к пространству еще до возникновения нейропсихологии как самостоятельной науки. В исследованиях психического развития детей, проводимых им во второй половине 20-х гг. прошлого века совместно с Л. С. Выготским, уже содержатся данные о развитии различных пространственных представлений. Многолетнее изучение нарушений пространственных функций при локальных поражениях мозга позволило А. Р. Лурия, его коллегам и ученикам не только описать разнообразные симптомы нарушений пространственных компонентов восприятия, памяти, мышления, произвольных движений, но и существенно уточнить представления о сложной мозговой организации так называемого

пространственного фактора. Кроме того, луриевской нейропсихологией разработана оригинальная интегративная модель пространственной организации человеческого мозга, ученые установили, что для обеспечения выполнения разнообразных психических и поведенческих задач в мозге согласованно действуют различные церебральные зоны и структуры. Анализируя работы А. Р. Лурия, автор, наряду с несомненными достижениями, отмечает некоторые диспропорции и лакуны в изучении пространственных расстройств. Показано, что в фундаментальных монографиях А. Р. Лурия весьма лаконично обсуждались нарушения пространственных аспектов тактильного и слухового восприятия, пространственной памяти. Лишь постепенно складывались представления о «вертикальной организации» пространственных функций, т. е. о вкладе не только корковых зон мозга, но и подкорковых структур в их реализацию. Так же постепенно происходило обращение к сравнительному анализу нарушений пространственных функций при локальных поражениях правого и левого полушарий мозга. Существенный вклад в разработку проблемы функциональной асимметрии полушарий мозга в процессе пространственного анализа и синтеза внесли не только московские нейропсихологи, но и их ленинградские коллеги — Л. Я. Балонов, В. Л. Деглин, Е. П. Кок, Я. А. Меерсон и др. Ученики А. Р. Лурия (Н. К. Корсакова, Ю. В. Микадзе, Э. Г. Симерницкая) уже после его смерти начали разработку новых направлений нейропсихологической науки — нейропсихологии детского возраста и старения. В этих исследованиях довольно существенное место занимает изучение возрастных особенностей пространственных функций. В статье подробно обсуждается история создания и актуальное состояние комплекса методик, которые используются для нейропсихологической диагностики пространственных функций. Спектр этих методик постоянно расширяется; создаются и апробируются новые методы изучения пространственной памяти, внимания и оптико-конструктивной деятельности. Наиболее интенсивно этот процесс разворачивается сегодня в нейропсихологии детского возраста. Особое внимание в статье уделяется возможности использования категории хронотопа в нейропсихологических исследованиях. Известно, что во многих гуманитарных и естественных науках уже несколько десятилетий применяется это понятие, постулирующее закономерную связь пространственных и временных характеристик разных явлений окружающего мира и человеческой личности. Применение категории хронотопа в нейропсихологии перспективно в двух отношениях. Во-первых, подобный методологический подход может раскрыть те мозговые зоны и структуры, которые реализуют восприятие и пространства, и времени. Фактически это означает уточнение представлений о мозговой организации двух важнейших нейропсихологических факторов: пространственного и временного. Во-вторых, категория хронотопа раскрывает новые ракурсы культурно-исторической нейропсихологии и может стать тонким инструментом анализа постоянно изменяющихся условий функционирования мозга и психики в социальной реальности.

Ключевые слова: *нейропсихология; пространственные функции; диагностика; мозговые дисфункции; время*

Introduction

In this article, the author will try to highlight some aspects of the neuropsychological approach to the perception and interpretation of the vast phenomenology of “break-downs” of the mental reflection of space, which has been attracting the attention of neuropsychologists for several decades. We will talk about violations (or changes) the so-called spatial functions are those mental processes that implement a multi-level and multi-stage analytical and synthetic processing of information about various spatial properties and features of the external world and your own body. These are mental functions aimed at obtaining information about the spatial properties of objects, at performing spatial transformations as their main goal. This is how we can talk about spatial memory, spatial organization of movements, and spatial perception.

Space Before Neuropsychology

Before turning to the field of neuropsychological research, I would like to briefly touch on the history of the issue (and quite a long history). This story suggests that the need to experience various changes in space has been inherent in man for thousands of years. In ancient times, it was realized in the myths, fairy tales, and fantasies of many peoples. Just imagine how many intriguing spatial transformations the reader can easily find in familiar fairy tales from childhood. For example, why such uncertainty in specifying the spatial coordinates of events occurring in fairy tales? They happen in a certain Kingdom, in a far-away state. The space seems to be marked, but with a peculiar “inaccuracy.” One can only guess at the reasons for this inaccuracy, among which there is an attempt to protect the narrator from accusations of fiction, and the aesthetic impossibility of operating in a mythological-fairy-tale context with accurate units of distance measurement.

Another fact is that myths and legends repeatedly present hardly possible real transformations of space. In them, you can become a dwarf or a giant; turn into a Laurel tree, a bird, a snake, a spider, a frog, an ugly giant Troll or a celestial constellation; even become invisible, while maintaining the ability to actively and successfully influence events. These spatial and temporal transformations have different meanings and different goals; they are a demonstration of divine power, a punishment, a reward, a way to escape from trouble. Note that the fantasy plan for the development and interiorization of space that arose many millennia ago still exists today in numerous literary works, films and computer games, where space, solving artistic and commercial problems, becomes the object of innumerable and striking manipulations. Such a level of ideas about space in the consciousness of modern man quite successfully coexists with scientific ideas about this category.

As for clinical psychology, which has a history of almost a century and a half, it has a special relationship with space. From the first years of its existence, this field of science is faced with various psychopathological phenomena related to space. For example, in the works of S. S. Korsakov, one of the founders of clinical psychology in Russia, devoted

to various mental disorders in the so-called alcoholic polyneuritis, along with memory disorders, there is a mention of difficulties in orientation in space and time inherent in this disease (Korsakov, 1954). S. S. Korsakov suggests that these difficulties may be due to memory disorders. In the works of V. M. Bekhterev, dating back to the beginning of the last century, there are descriptions of violations of the «body schema» in mental disorders (Bekhterev, 1954). Let's emphasize an interesting fact: already in the clinical and psychological research of the XIX century, space seems to have a double meaning. On the one hand, scientists are interested in changes in the perception of space that occur in mental disorders (and subsequently in other mental processes that include spatial components). On the other hand, space acts as a factor, a cause, on the action of which, perhaps, depends the nature and qualitative features of mental disorders. Referring to the works of S. S. Korsakov already mentioned above will easily allow us to find evidence for this thesis. For example, analyzing the pathological mechanisms of memory disorders, S. S. Korsakov attracts explanations that have a spatial subtext. In his opinion, the dissociation between the violation of remembering current events and the preservation of memory for the past is due to the fact that images of long-ago events have managed to form a wide system of connections with the entire mental life of the subject (Korsakov, 1954).

Luria's Neuropsychology in Search of Space: Achievements and Problems

Of course, among all the areas of Russian clinical psychology, it is in neuropsychology that the interest in the study of space is most clearly expressed. Long-term study of local brain lesions allowed A. R. Luria, his colleagues and students not only to describe various symptoms of violations of spatial components of perception, memory, thinking, and voluntary movements, but also to significantly clarify the idea of the complex brain organization of the so-called spatial factor (Korchajinskaya & Popova, 1977; Luria, 1962, 1973; etc.). Luria's neuropsychology has developed an original integrative model of the spatial organization of the human brain, in which different cerebral zones and structures act in concert to ensure the fulfillment of various mental and behavioral tasks. We will reveal in more detail some important aspects of these studies.

First of all, it should be noted that A. R. Luria's interest in space appeared, apparently, long before the emergence of neuropsychology as an independent science. Even during his collaboration With L. S. Vygotsky, his attention was drawn to the facts concerning the heterochronous folding of spatial representations and skills in cultural and ontogeny. In the early 30s of the last century, a book written by him in collaboration with L. S. Vygotsky *Etudes on the History of Behavior*, which, in particular, describes the authors' most interesting research on the development of ideas about form, number, and space coordinates in childhood (Vygotsky & Luria, 1993). Note that these studies were not neuropsychological. A few decades later (after the death of Alexander Romanovich), his followers — E. G. Simernitskaya, Yu. V. Mikadze and others will have to study the features

of the brain organization of spatial functions in childhood (Glozman, 2019; Korsakova, Mikadze, & Balashova, 2017; Mikadze, 2008; Simernitskaya, 1985).

It should also be said that the place of space in the scientific work of A. R. Luria is very significant, although we do not find in his literary heritage monographs or textbooks dedicated specifically to this psychological phenomenon. In the mid-40s of the last century, A. R. Luria published several articles that analyze violations of the understanding of number and counting operations in brain pathology (Chomskaya, 1992). In any monograph of the 1960s — 1970s. (*Higher Cortical Functions in Man and Their Disturbances in Local Brain Lesions*, *The Basics of Neuropsychology*, etc.) the reader will find chapters devoted to the syndrome analysis of violations of spatial aspects of visual perception, voluntary movements, memory, thinking, speech in brain lesions (Luria, 1962, 1973). Much attention is paid to spatial disorders and ways to overcome them in the case study *Lost and Returned World* (Luria, 1971). All these studies contain a detailed qualitative analysis of the symptoms of spatial disorders detected during neuropsychological research. Of course, not all mental functions were studied by A. R. Luria in the same detail. For example, describing in the monograph *Higher Cortical Functions in Man and Their Disturbances in Local Brain Lesions* syndromes of damage to the occipital and occipital-parietal parts of the brain, Alexander Romanovich describes in great detail the various manifestations of visual spatial agnosia, violations of orientation in space, constructive apractagnosia. At the same time, violations of tactile perception of the form of objects, “skin reading”, tactile attention are described by him very briefly; he refers in this small section to the works of other authors and directly says that “he does not have his own research on tactile syntheses” (Luria, 1962, p. 127). The spatial aspects of auditory perception are also practically not disclosed in the text of this book.

These facts reveal to us some features of the style of scientific work of A. R. Luria. The first feature is the author’s excellent familiarity with the research of other scientists. His works necessarily contain numerous and detailed historical excursions that precede not only fundamental monographs, but also individual sections of these monographs. In these excursions, Luria focuses on the results of medical, physiological, and psychological research by Russian and foreign scientists. And this is not just a detailed, narrative and unbiased description of the numerous theories proposed by various scientists and the phenomena they observe. For him, the presentation of the “question’s history” is not the main goal, but an important stage of thinking about the problem, a necessary prerequisite for moving on to the presentation of the results of his own experimental or neuropsychological research. These reflections often sound emotional notes; they often become a critical analysis of concepts, hypotheses, and clinical observations. Luria’s view (biased in the good sense of the word) easily finds in the ideas of other authors theses that need experimental verification, correction, and understanding from other positions. Moreover, this view “is set” not only to debate; he finds joy in other people’s works, ideas and facts that corresponds to the theory of systemic dynamic localization of mental functions, the syndromic analysis of violations or cultural-historical theory of the development of mentality.

The second feature is a clear definition of the priority areas of their own research. For example, in the above-mentioned monograph *Higher Cortical Functions in Man and Their Disturbances in Local Brain Lesions*, A. R. Luria, based on the dominant role of the cerebral cortex in the cerebral maintenance of the psyche, practically does not include in the syndromes described by him manifestations of dysfunction of subcortical structures (Luria, 1962). Interestingly, this term is absent even in the subject index of the monograph. At the beginning of the 60s, this position seems quite reasonable: while neuropsychology almost nothing is known about the role of various deep subcortical structures in mental processes. The reader is well aware that in the second half of the 60s there was a decisive revolution in this area. A. R. Luria, his graduate students and colleagues turn to intensive comprehensive research of memory disorders. Recall that in the previous period, they studied mainly memory disorders as mnestic activity (the so-called higher forms of memory) in lesions of the frontal lobes, arising as a result of a lack of motivation, arbitrary regulation, control, as a result of the inability to use memory-mediating techniques and strategies (Luria, 1962). And now, new research reveals a surprising fact. It turns out that the grossest memory disorders (amnesic syndrome) can be observed in lesions of the median structures of the brain. And they include not only the medio-basal cortex of the frontal and temporal lobes, but also deep subcortical formations (Kiyashchenko, 1973; Luria, 1973).

This significant event leads to the gradual formation of ideas that any mental function has a vertical organization, provided by the joint activity of the cortex and subcortical structures. Moreover, sometimes lesions of subcortical structures cause no less severe disorders than lesions of the cerebral cortex. As an example, we can mention such functions as dynamic praxis, gnosis of rhythms (evaluation and reproduction of rhythmic structures of varying complexity), and perception of time. Colleagues of A. R. Luria also come to the conclusion that in subcortical structures lesions severe disturbances of spatial functions can be observed, for example, manifestations of unilateral spatial agnosia (Korchajinskaya & Popova, 1977).

The interest of neuropsychologists in subcortical structures has not weakened to this day: it concerns the functional specialization of various subcortical structures, their contribution to the “energy” provision of mental activity, in the work of memory, voluntary movements, attention, affective sphere, in the pathogenesis of neurological and mental diseases (Buklina, 2016; Balashova, 2016).

It should be emphasized that no less interesting studies of spatial functions unfolded during the Luria era not only in Russia, but also in foreign countries. These studies concerned spatial perception (in particular, the phenomenon of unilateral spatial neglect, memory, attention, orientation in space, spatial organization of movements). A. R. Luria and his colleagues often cited books and articles of foreign scientists in their works devoted to the mental reflection of space (Korchajinskaya & Popova, 1977; Luria, 1962, 1973; and others). For example, in *Higher Cortical Functions* A. R. Luria mentions the research of J. de Ajuriaguerra, H. Head, H. Hecaen, K. Kleist, H. L. Teuber, O. L. Zangwill, and other modern authors. At the same time, it is important to understand that foreign stu-

dies of space in most cases are based (both in the past and in the present) on a different methodological basis than the work of the Luria's school. The Lurian approach necessarily provides for a syndrome analysis of violations of the spatial factor. This means that the researcher analyzes the state of spatial components of various mental functions and finds common features in the symptoms of their disorders. Often such research is supplemented by special methods and tasks aimed at studying a particular spatial function. All the results obtained are necessarily compared with clinical data on the localization and other characteristics of brain damage.

In the research of foreign authors, we see a different approach. Most publications are based on the use of one (rarely — several) experimental methods, and the researcher studies how their performance is disrupted in various brain dysfunctions. Today, such studies often make comparisons with neuroimaging data. This approach allows you to see a lot of interesting facts. However, collecting these facts together, generalizing them, and describing the holistic syndrome of spatial disorders is quite a difficult task. Therefore, there are very limited number of such fundamental works.

Space and Functional Asymmetry of the Brain

Another example concerns the problem of functional asymmetry of the brain hemispheres. Interest in this problem (and, consequently, in the regularities of the right hemisphere activity) began to appear in the research of Russian neuropsychologists quite late in comparison with their foreign colleagues. This only happened in the late 60s and the first half of the 70s. In the already mentioned monograph *Higher Cortical Functions in Man and Their Disturbances in Local Brain Lesions*, Luria devotes a relatively small text of about 4 pages to the so-called subdominant (right) hemisphere (Luria, 1962).

The text, by the way, is rich in information. It deeply analyzes the brain organization of speech function; arguments are put forward in favor of the priority role of the left hemisphere in speech processes. However, it he writes about the connection of certain aspects of speech activity (for example, “elementary functions of automated speech”) with the right hemisphere of the brain (Luria, 1962, p. 76–77). A. R. Luria mentions various data from foreign authors in this text. These data concern assumptions about the dominance of the right hemisphere in the perception of music, in tactile gnosis.

But the role of the right hemisphere in the implementation of spatial aspects of mental processes is practically not discussed. He's writing:

It is easy to see that the lack of our knowledge about the degree of hemispheric dominance in different individuals with respect to different functions creates significant difficulties in the clinical study of patients with local brain lesions. Therefore, some important issues can only be solved in the first approximation... In this book, we deliberately leave all these problems out of our consideration, maintaining the confidence that with the accumulation of the necessary knowledge, their solution will be possible (Luria, 1962, p. 79).

And this attitude is consistently implemented throughout the book: it deals mainly with the localization of mental functions. The problem of their lateralization is not specifically discussed, although the description of individual clinical cases necessarily contains data on the lateralization of the pathological process in the right or left hemisphere.

Ten years later, a new fundamental monograph by A. R. Luria *The Basics of Neuropsychology* (Luria, 1973) is published. And the setup is basically the same: only part of a small Chapter (about 6 pages) is dedicated to the right hemisphere. The volume of the book is 373 pages. But if you read carefully, you will notice that the list of cited foreign authors has significantly expanded. Moreover, there were mentions of new research on the right hemisphere by Russian neuropsychologists: E. S. Bein, L. G. Chlenov, E. P. Kok, V. I. Korchajinskaya, E. G. Simernitskaya and others. Facts directly related to spatial disorders also begin to “sound.” Luria mentions violations of the “body schema,” ignoring the left half of space, violations of orientation in real space, and “apraxia of dressing” (Luria, 1973, p. 225).

Thus, we can assume that one of the important personal qualities of A. R. Luria as a scientist was the ability to “build” a hierarchy of their scientific interests, to determine their main and secondary. Tasks that seemed to him not very important or relevant, he deliberately pushed into the future. Sometimes this future was very remote; it became not his personal future, but the future of his students or other scientists. Maybe it was a shift not only to another time, but also to another space — outside the sphere of the most significant personal scientific interests. Note that the followers of Alexander Romanovich managed to fill in many gaps in their knowledge of space.

Today, in the context of the neuropsychological approach, the processing of spatial information at the Gnostic, mnesic and semantic levels has been studied in depth. The complex of brain zones and systems involved in the implementation of spatial analysis and synthesis is clarified. According to scientists, the brain supply of the spatial factor is provided not only by the cortical zones of the posterior parts of the cerebral hemispheres, but also by various deep subcortical structures, interhemispheric commissures and premotor parts of the brain. The role of the right and left hemispheres of the brain in the perception of visual and auditory space, in visual constructive activity is studied in detail (Balonov & Deglin, 1976; Bragina & Dobrokhotova, 1988; Meerson, 1986). An extensive array of data on the features of spatial functions in normal and pathological aging was obtained (Balashova, 2015a, 2015b). Scientists are studying individual differences in brain organization of spatial functions and communication the success of spatial samples with the character profile of the lateral organization of the brain (Chomskaya, Efimova, Budyka, & Enikolopova, 2011).

Methods for Studying Spatial Functions

Research on spatial functions in Luria’s neuropsychology would not be possible without appropriate diagnostic techniques. An important part of the scientific heritage of A. R. Luria is an extensive set of diagnostic methods, which are used to study optical-

spatial perception, constructive activity, spatial praxis, understanding of spatial and quasi-spatial patterns of speech, spatial components of mental operations (Luria, 1962). These techniques were mostly created by A. R. Luria. They are partly borrowed by Luria and his colleagues from other Russian and foreign authors (for example, some methods aimed at studying the spatial organization of movements, tactile perception, etc.). They are logically integrated into the methodology of the syndrome analysis of disorders of mental functions. The range of methods used by Russian neuropsychologists is constantly expanding; new methods for studying spatial memory, attention, and optical constructive activity are being created and tested. It seems that this process is most intensively unfolding today in the neuropsychology of childhood (Glozman, 2019). All these methods are aimed primarily at identifying broken or insufficiently formed links of spatial functions. Their complex application allows us to obtain results that complement and refine each other (Balashova & Kovyazina, 2019).

For example, when studying the spatial factor in memory processes, such “cross” control can be expressed in the study of the features of memorizing not only visual-spatial stimuli, but also the possibilities of capturing the localization of individual subject images or word order when memorizing auditory-speech stimuli. Let’s not forget about the classic Luria’s method of drawing a geographical map, the use of which allows us to judge the possibility of updating the reserves of long-term spatial memory strengthened in individual experience of knowledge. The use of spatial neuropsychological methods allows us to evaluate not only the final result of activity, but also the neurodynamic, motivational, regulatory and operational components of the process of their implementation. In neuropsychological diagnostics of spatial functions, the analysis of the qualitative features of detected disorders is necessarily combined with a quantitative assessment of the severity of symptoms (Balashova & Kovyazina, 2019). For example, when interpreting the results of determining time by a “silent” clock, more than five possible errors are identified (coordinate “mirror” errors, dysmetric errors, ignoring part of the dial, etc.). The type and frequency of errors made will depend on the assumptions of the neuropsychologist about the localization and lateralization of brain dysfunction, the degree of severity of spatial deficits. At the same time, we never forget that any symptom acquires its true meaning only in the syndrome of violations of higher mental functions. Therefore, the correct interpretation of spatial symptoms and the determination of their “primary” or “secondary” character are impossible outside the context of the syndrome analysis.

Space and Time in Luria Neuropsychology

Another issue that is interesting to discuss when considering space research in Luria neuropsychology is the question of time. In many Humanities and Natural Sciences, the concept of a chronotope has been actively used for many decades — in the words of A. A. Ukhtomsky, determined by the laws of nature connection of space-time coor-

dinates. Therefore, the question arises: can there be a similar methodological approach in neuropsychological research?

Analysis of neuropsychological data on which brain structures participate in the mental reflection of space and time, how this reflection is disrupted in brain lesions of various localization and lateralization shows us a rather ambiguous picture. It bizarrely combines fairly deep characteristics of the phenomenological manifestations and brain mechanisms of spatial disorders and very fragmentary information about disturbances of certain aspects of temporal perception. To illustrate this statement, just give a few examples. Thus, in the above-mentioned monograph of A. R. Luria *Higher Cortical Functions in Man and Their Disturbances in Local Brain Lesions*, less than a page is devoted to violations of time perception, and more than 50 pages are devoted to the description of violations of spatial perception (Luria, 1962). He only briefly writes about the existence of chronology and chronognosia; Luria formulates the assumption that chronognosia (sense of time, his immediate perception) is the right hemisphere, and the chronology (the verbal-symbolic level of representations of the time) — left hemisphere. A careful reading of the book gives the impression that time as an independent object of neuropsychological research actually either does not exist, dissolving into other mental processes — speech, memory, movement, conscious regulation, or becomes some variant, a secondary analog of space.

In the works of A. R. Luria and his colleagues, even the determining of time by the clock was considered exclusively as a visual-spatial problem! This approach completely ignores the obvious fact that performing this test requires not only spatial operations, but also the presence of ideas about what exactly the clock measures, the duration of various time periods, the rules of symbolic description of the clock readings, and so on. Another example: logical-grammatical speech expressions that express temporal relations were called *quasi-spatial*!

The proportion of empirical methods traditionally included in the procedure of complex neuropsychological diagnostics is also disproportionate. As part of a clinical conversation, the subject is asked questions that allow him to assess how time-oriented he is (Luria, 1962); at the end of the survey, he may be asked to estimate the duration of work with the psychologist or the current time without looking at the clock. And that's all about time. Note that the situation regarding the integration of time perception research methods into the procedure of neuropsychological diagnostics has changed only in the last two decades (Balashova & Kovyazina, 2019). A. R. Luria pays much more attention to space: the description of the methods used to study the spatial components of various mental functions takes up more than a dozen pages in the *Higher Cortical Functions* (Luria, 1962). This ignoring of time by Russian neuropsychologists, the reasons for which can only be guessed, seems strange and unfounded, because in local brain lesions, various violations of orientation in time, its perception and emotional experience are very common.

What are the reasons for this neglect of time in classical neuropsychological research? There are probably several reasons for this. The first lies in the lack of certainty, the blurring of psychological ideas about time and its neural substrate. The second reason for the priority treatment of neuropsychologists of the Luria era to the study of space,

apparently, could be due to the fact that many spatial disorders that occur in local brain lesions are well accessible to observation and fixation. They are clearly shown in drawing, writing, constructive activity, movements, perception, and thinking of the patient. Processes, related to the perception and experience of time, occur mainly in the “inner” plane of the mentality, and therefore their study inevitably faces a number of technical and methodological difficulties.

Nevertheless, since the second half of the 80s of the last century, Russian neuropsychologists constantly turn to research on various aspects of time perception. As an example, we can mention the fundamental research of N. N. Bragina and T. A. Dobrokhotova (1988). It was the first time in Russian neuroscience that a comprehensive analysis of human motor, sensory and mental asymmetries was performed. We also studied the features of mental disorders and behavior in different lateral organization of the brain. This analysis allowed us to put forward a hypothesis that the left and right hemispheres take a differentiated part in the formation of a time perspective, in processing information about the past and future of the individual, about the predominant “orientation” of the brain hemispheres to the past or to the future (Bragina & Dobrokhotova, 1988). The authors also raised the question of the possibility of spatio-temporal description of mentality and consciousness.

As for the cerebral organization of the time factor, neuropsychological concepts are still far from being clearly defined in this area. On the one hand, if we adhere to Lurie’s idea of the similarity of space and time, we can assume that the time factor is localized in the same place as the spatial one. However, the idea of a single space-time factor has not yet been confirmed by neuropsychological data (Chomskaya, 2005). On the other hand, a number of modern classifications of neuropsychological factors highlight the factor of successive organization of higher mental functions (i. e., their sequential, smooth deployment in time), which correlates with the work of the premotor zones of the left hemisphere of the brain (Chomskaya, 2005).

Different in nature and severity of violations of orientation in time, time perception, evaluation and measurement of time intervals can be observed in lesions of the right and left hemispheres, various cortical zones, and the median structures of the brain (Bragina & Dobrokhotova, 1988). Psychophysiological studies demonstrate the activation of complex complexes of cortical zones and subcortical structures (mainly the right hemisphere of the brain) when evaluating the time intervals and duration of their own activity under different semantic settings in healthy subjects (Portnova, Balashova, & Vartanov, 2006). Thus, over the past decades, neuropsychological studies of the mental reflection of space and time are constantly enriched with new clinical data and new methodological techniques. There is no doubt that the range of studies in which the chronotope category is present in a hidden or explicit way will expand in the future. First of all, because this epistemological category reveals new perspectives of cultural and historical neuropsychology and is a subtle tool for analyzing constantly complicated and changing psychological realities.

Of course, the study of the chronotope in the neuropsychological paradigm is impossible without forming ideas about the brain organization of time perception as a complex, multicomponent mental function. Unfortunately, in the works of A. R. Luria and his

contemporaries, time, in contrast to space, was studied very little (Balashova, 2015a). The situation began to change only three decades ago. Currently, Russian neuropsychologists are actively investigating the features of time perception at different stages of ontogenesis (in particular, in childhood and in normal and pathological aging), in people with different variants of lateral brain asymmetry. The perception of time, according to many modern psychologists, is a complex functional system. This system includes orientation in the past and current time, the ability to evaluate and measure intervals of various durations, understanding the sequence or simultaneity of events, as well as verbal and figurative representations of time, structuring and experiencing the temporal perspective of the individual as a continuum of the past, present and future. Today, the role of subcortical structures of the brain, frontal and parietal-temporal-occipital zones in providing various components of this complex functional system is actively studied.

Conclusion

Luria's neuropsychological approach, without a doubt, and today is a lively, rapidly developing science. This also applies to the study of spatial functions. Seeking a deeper and more accurate understanding of the nature of the spatial factor, neuropsychology turns to research of new clinical models (in particular, mental disorders). Neuropsychologists study age-related features of spatial functions, their individual differences due to social and cultural-historical determinants. All these studies will help to clarify the current understanding of the brain mechanisms of spatial functions, their psychological structure and the laws of their formation and functioning at different stages of ontogenesis.

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Ways of Development of the Russian Methodology: Answers and Questions of the Psychology of Thinking

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Пути развития отечественной методологии: ответы и вопросы психологии мышления

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Abstract. The article refers the formation and development of the Russian methodology in the frame of which the theory of thinking has been built. The exposition of the theory developed in the twenties-nineties of the 20th century becomes topical because of two factors.

The first factor of the demand from the intensively developing neuroscience. Various directions in this field aiming to studying thinking disorders, particularly in schizophrenia, are lacking theoretical concordance. That is why the specialists come to the conclusion on necessity of a common scientifically justified platform: the development of the theory of thinking. We would like to mention that the attention for an impaired function is typical for a physician, whereas for a psychologist the problem of revealing unusual strength of thinking is schizophrenia is significant. Solving this problem is important for the theory of thinking itself.

The second factor of the demand for designing the theory of thinking is the change of paradigm in the science and education during the nineties of the 20th century, which has stimulated the variety of theoretically unjustified approaches to interpretation of nature of thinking. That is why when reviewing the theory of thinking we consider the significant events which defined the vector of its development beginning with Rubinstein's article of 1922 *The Principle of Creative Self-Activity (To the Philosophical Foundations of Modern Pedagogy)*, where methodological justification of the conception of subject is given. In 1930 he

formulates the principle of thinking as the “unity of consciousness and activity.” At the same period Luria explains the positions which are in tune with the future cultural-historical methodology of Vygotsky. The research of thinking as a process is given in the Soviet psychology by the school of Rubinstein in the Fifties-Sixties and after his death in 1969. The works with description of meaning, sense and nature of the word became Luria’s contribution in the analysis of the structure of thinking process when solving problems. We consider the common idea of solving problematic situations as the result of creative thinking to be its lowest stage, immature form, as in the frame of solving the given tasks, i. e. *stimulus-projective* model in which the whole psyche had been studied, it is impossible to come to analysis of the phenomenon of creativity. That succeeds only in designing a new method. In the course of the experiment, the Creative Field method allows revealing the ability of a person to develop the accepted ability by his initiative. The levels of cognition to be reached by the testee are described. They correspond to the level of displays of creativity or to its absence. This approach finds its theoretical basis in the cultural-historical psychology (Vygotsky). We have revealed the highest mature form of creativity as development of the activity by one’s initiative which is the unit of analysis where, according to Vygotsky, “the meeting of affect and intellect occurs.” The examples of children who have shown the highest level of creativity are described. Among them there is a nine-year boy with the diagnosis of schizophrenia, who spontaneously formulated very precise and capacious definition of creativity.

Keywords: *thinking; theory; creativity; development of activity; unit of analysis*

Аннотация. В статье рассматриваются основные этапы становления и развития отечественной методологии, в рамках которой создавалась теория мышления. В 20–80-е гг. XX в. теория мышления вновь стала актуальной в связи с запросом со стороны бурно развивающейся нейронауки. Множество разрабатываемых в ее рамках направлений по изучению нарушений мышления, в частности, при шизофрении не были теоретически согласованы. Поэтому специалисты приходят к выводу о необходимости разработки единой научно обоснованной теории мышления. Заметим: для медика естественно внимание к нарушениям функции, но для психолога значима также проблема раскрытия необычности мышления при шизофрении. Решение данной проблемы значимо и для самой теории мышления. В 90-е гг. интерес к построению теории мышления был связан со сменой парадигмы в науке и образовании, что породило множество теоретически не обоснованных подходов к интерпретации природы мышления. Поэтому, излагая теорию мышления, мы рассматриваем значимые события, определившие вектор ее развития, начиная с анализа статьи С. Л. Рубинштейна 1922 г. «Принцип творческой самостоятельности (К философским основам современной педагогики)», где дается методологическое раскрытие понятия субъекта. В 1930 г. ученый формулирует принцип познания как «единство сознания и деятельности». В тот же период А. Р. Лурия излагает позицию, созвучную будущей культурно-исторической методологии Л. С. Выготского. В 50–60-е гг. исследование мышления как процесса представлено в отечественной психологии школой Рубинштейна, работа продолжалась и после его смерти, до 1969 г. Исследования по описанию значения, смысла и природы слова

стали вкладом А. Р. Лурия в анализ структуры мыслительного процесса при решении задач. Вопреки распространенному представлению о решении проблемных ситуаций как результате творческого мышления, мы рассматриваем этот процесс как низшую ступень, поскольку на основе «стимульно-реактивной» модели, в рамках которой изучалась вся психика человека, нельзя выйти на анализ феномена творчества. Нам удалось это сделать лишь в результате разработки нового метода. Метод «креативного поля» позволяет во время эксперимента выявить способность человека развивать деятельность по собственной инициативе и определить уровни познания, на которые выходит испытуемый, чтобы диагностировать у него отсутствие способности к творчеству или уровень ее проявления. Теоретическое обоснование данного подхода находит в культурно-исторической психологии (Л. С. Выготский). Нами выделена высшая форма творчества как развития деятельности по собственной инициативе, выступающая единицей ее анализа. По словам Л. С. Выготского, в процессе творческой деятельности «происходит встреча аффекта с интеллектом». Мы приводим примеры того, как дети проявляют высший уровень творчества (так, 9-летний мальчик с диагнозом шизофрении спонтанно смог выйти на точное, емкое определение творчества).

Ключевые слова: мышление; теория; творчество; развитие деятельности; единица анализа

Introduction

Schizophrenia is one of the common mental diseases and it is also a topical problem of the psychology of creativity. Quite often the scientific hypotheses advancing the knowledge of their time are considered as the displays of geniality or — of schizophrenia: time will show.

The research of thinking disorders in schizophrenia has been carried out in medicine and psychophysiology in a wide range of directions. In the Cherednikova's book *Modern Neuropsychological, Neurogenetic and Neuromathematic Conceptions of Thinking Disorders in Schizophrenia* a brief review of foreign conceptions in these fields is introduced. Emphasizing the importance of ideas of complex multilevel system organization of neurobiological mechanisms of thinking disorders the author mentions the variety of theoretical views in the modern neuroscience and frequently observed lack of concordance of opinions in the sphere of research of thinking disorders (Cherednikova, 2011).

Contributing to the problem, this variety of conceptions along with their contradictions brings to the conclusion on the necessity of designing general psychological theory of thinking. Obviously, it is impossible to create the theories of thinking disorders without understanding the normal thinking.

It is even more difficult to answer the question about not the disorder of thinking but about the abnormal strength of generalization of thinking in schizophrenia. In this article we will try to mark our approach or, rather its vector, in putting this question.

The Russian Theory of Thinking

The Formation Period

In 1922 Rubinstein's article *The Principle of Creative Self-Activity (To the Philosophical Foundations of Modern Pedagogy)* the concept of Subject is set as a significant vector: "In his actions, in the acts of his creative self-activity the subject is not only found and shows himself, he is created and defined by them. By what he makes can be defined what he is" (Rubinstein, 1922/1986, p. 105). Further on, in the Thirties Rubinstein (1922/1986) formulates on this foundation the basic principle of cognition as the "unity of consciousness and activity."

In tune with that, we read in an early Luria's work (2003): "When studying real human psyche we should not isolate a person from the world where he lives, from the environment under the influence of which he is forming, from the historical moment during which his life passes" (p. 316). This effort to understand the structure of a mental function makes him the closest co-worker of Vygotsky, who explained how the evolution results build the psyche.

Studying Thinking as a Process

In 1950 Rubinstein starts lecturing for the group of psychologists in the philosophical faculty of the Moscow State University.

During the same year Luria is giving lectures in general psychology in the philosophical department of the same faculty. When making definition of the process of thinking, Luria mentions that human thinking, which is based on the object activity and means of language, not only organizes the person's perception and allows making a leap from sensual to rational, not only allows transferring a message using the means of language, coding the thought in the verbal expression, revealing its internal meaning but to be also a special form of productive activity. Luria emphasizes that thinking that leads to new conclusions is a theoretical activity because a thinking human is capable to reason and to solve logical problems not including the practical activity in this process. In absence of univocal algorithms, a man should find a way of solving a complex task himself. It characterises creative thinking. The way Luria analyzes further the process of solving is of crucial importance. He starts from the point:

The problem always sets an aim in the question. This question does not contain the answer itself. The aim is given in certain conditions and the subject solving the problem first of all should orientate himself in its condition; to mark out the most important things from its contents by comparing the included parts. Only such work representing the orientation basis of the intellectual action allows create the hypothesis of the way the solving has to follow, in other words, the strategy of solving, its general scheme (Luria, 2006, p. 312).

He indicates the factors included in problem solving which are the main conditions of the full-fledged intellectual activity. First of all, it is establishment of a logical relation

between the word and the final question. He explains the meaning of this factor by dominating meaning of the question of the problem; without this “subordination to the question various associations and a choice from many possible alternatives can arise. That way the intellectual activity dissociates” (Luria, 2006, p. 312).

The second factor for retention of the intellectual activity is pre-orientation in the conditions of the problem. It provides the review of all elements of the condition and building a general scheme of problem solving.

The consecutive realization of the principle of cognition as the “unity of consciousness and activity” leads Rubinstein to the necessity of studying thinking not as the activity considering its motives, orientation, aims, but as a process as well. It is realized in the Fifties. After the cycle of the empirical research of thinking by the members of the school in 1959 he gives the exact wording:

The initial in thinking is the synthetic act — comparison the conditions and demands of the problem. The analysis is carried out in the frame of this comparison and by means of it... The transfer from one act of the analysis to the next one is defined in each case by the correlation of the result received by the analysis in the previous stage and the demands of the problem remaining unfulfilled. The initial determination of the process by the comparison of the conditions and demands of the task representing itself every time in new forms remains (emphasis added) during the whole process (Rubinstein, 1946, p. 97).

It should be mentioned that the doctrine of thinking as a process is the final stage of development of his theory, and I become his last student. Having known that I, the student of the philosophical department, am allowed to study at both departments at the same time, he said decidedly: “In this case we have to reveal the mechanism of insight.” That is why my research started in the models of *creative thinking* — the brainteasers.

The first fact that drawn our attention in the course of the experiment was learning the conditions by a subject by using intensive verbal activity (several recitations of the conditions). After verbalization we have observed the transfer of the conditions to the object (subjective) code that provided the opportunity of transformation, addition and interpretation of the information coming as the problem, according to the information being kept in memory. That way the restoration of the object as the real contents of the problem occurs. That subjective vision of the conditions of the problem situation represents *the image of the problem situation*.

The real mechanism of this process is given by Luria in his description of the function of *word* as “reduplication of the world” by its object association, by generalization defining the meaning of the object and its meaning in presence of alternatives (Luria, 2006, p. 243).

But the figurative representation of the situation is just the first stage of mastering the conditions of the problem. It does not yet correspond to those conditions in a strict sense. Actually, the conditions of the problem are isolated in the process of this comparison of the figurative representation of the situation and the conditions of the problem. This moment seems to be extremely important as it becomes obvious that the demand

defines the aspect, according to which the relevant sides of the objects are singled out in the initial material (the image of the problem situation). When using the well-known Helm's problem in our experiments, the demand to calculate the way defines the corresponding conditions: speed, distance, vectors of motion.

According to Rubinstein, the basis for comparison of the data can be the united system of concepts established in the process of correlation of the conditions and demand. Discretion behind this united conceptual system a certain non-linguistic representation (different from the expression in the natural language) of the conditions of the problem in the united field defines its heuristic value. This representation is being reached by abstracting from the irrelevant sides of objects in the problematic situation: due to this the conditions become heterogeneous and, as a consequence, comparable. The heterogeneity of the conditions allows leaving behind their qualitative contents and, in its turn, to come to the character representation of the conditions of the problem: "I see how beautiful bicyclists push pedals but then see them as line bars." The cyclists and the fly are represented as the line bars because now only the fact that they are moving bodies is important. The *transfer to language of signs* allows building the system of their relations in given problematic situation — its model (in the terms of gestalt-psychology the gestalt closure occurs). Alongside with that, the built-up system of relations is not a reflecting structure only, but *the generating* one as well. From it as from the result of the analysis of the problematic situation the hypothesis, the principle of solving is being read. The further analysis of this fact has led to the conclusion that the instantaneity of a guess is connected with the generating functions of the visual structure, named by us later *the conceptual model of the problematic situation*. It is really the *viewing thought* — by Goethe's expression. It is its first and the most important, *heuristic* function (Rubinstein, 1958).

It explains the idea guesstimated by Rubinstein already in the 1946 when he wrote about "special schemes that seem to anticipate verbally yet not unfold system of thoughts" (Rubinstein, 1946, p. 348).

The introduced aspect of analysis of thinking (comparing with its previous description in Rubinstein's school) indicates the character of language which has a strict functional meaning and is defined by the contents of the stage of thinking process. The described process allows solving another profound problem of our psyche: the correlation of its languages. The discretion in the K-model (conception model) the hypothesis of way of solving: the discretion as understanding, i. e. verbalizatiotin (the internal speech). It is finely formulated by Hunt as the "sensed sense" (Hunt, 2004, p. 235). Considering figurative-spatial structure outside thinking has been criticized by Wecker (1998). The Arnheim's term *visual thinking* is also oriented against the rapture of languages realizing thinking. This unity of the languages of thinking Hunt explains by the role of intermodal translation, realized by the neocortex in humans (Hunt, 2004, p. 23). This phenomenon has been fixed by Heidegger as well, when he said that the hidden unity of vision and hearing defines the essence of thinking (Heidegger, 1991). *It is important to consider it if a "patient" has impairment in interhemispheric coordination.*

The most topical idea is Rubinstein's analysis is the middle link of determination of thinking process: "The initial determination of the process by the correlation of the conditions and demands of the problem is being kept during the whole process coming out every time in new forms" (Rubinstein, 1959, p. 97). The *expression coming out in new forms* means reformulating the task connected with arising the main contradiction and its analysis in another, corresponding to its nature, system of relations. The transfer to it (the new system of relation) is called by Rubinstein the "basic nerve" (Ibid.) of the thinking process as it leads to solving the problem. It can be seen clearly in solving of the Dunker's problem: to build three equilateral triangles of six matches. The side is equal to the match. Even the graduates of the Moscow State University could not solve it for hours! The emotional burst is needed to give up the repetition of unsuccessful efforts and to make *think*!

"The problem cannot be solved as for four equilateral triangles twelve matches are needed. But we have six only. It too little, and every side should be common. And how is it possible?" Finally, the main contradiction comes clear and the analysis of it is transferring to another system of relations — geometry. How a side can be common?

If a persistent interest to the problem, meaning the presence of a dominant in the attention field, is kept at this stage, the appearance of an object of not a plane form to the field of view of the subject leads to the *insight*: the instant understanding of the way of solving problem in space (Bogoyavlenskaya, 2017c). If this speeding up of solving process does not occur, then in the end it becomes clear that a line in the plane is their common line. The problem is solved in space.

The fact of solving the problem by transfer of analysis into system of relations is empirically repeated and becomes a central condition in the system of revealing creativity in Guilford's theory (Guilford, 1965). The defect of such approach in the behaviorism paradigm is the fact that the choice of decisive system of relations is being reached not by a previous analysis of the problem, but by a width of the range of associations, including random coincidence.

On the Nature of Creativity

The Ways of Realization of the Russian Methodology

For understanding the conclusions of the research of character of thinking process determination it is important to make clear that it was carrying out by Luria and Rubinstein in solving problematic situations, i. e. in the frame of dominating stimulus-reaction model of studying the whole psyche. According to this model as soon as the demand of the problem is fulfilled the initial determination of the thinking process ceases to be. Arguing that "thinking initiates from the problem situation" Rubinstein emphasizes that "having the beginning it has the end as well" (Rubinstein, 1946, p. 235). But the revealed determination of thinking process has a relatively particular character covering the process of solving problematic situations, but not the cognition in general. In the situation of passion for a certain activity the activity can develop by subject's initiative. And it is here

where we face the phenomena of “creative self-activity” and “spontaneous discoveries.” Obviously, Rubinstein understood the significance of personality as the internal conditions of determination of thinking (Rubinstein, 1959, p. 116, 125). However, in the period of Fifties-Sixties this position was not realized operationally.

Designed only in 1969, the Creative Field method is nowadays the only technique built up not in the frame of the model *stimulus — reaction*. Its advantage is modelling the opportunity of the research activity of a person in real time conditions in the frame of the laboratory experiment. This method has been built up as a system of the problems of the same type. That provides two-level model of activity. The first, shallow level concerns solving certain problems allowing estimation of the intellect level of a person using all the parameters of educability. The second one is not obvious for a testee. The activity of revealing hidden regularities of the system of problems, the discovery of which is not needed to solve them, allows fixing the process of activity development by initiative of the testee (Bogoyavlenskaya, 2017b, 2019; Bogoyavlenskaya D. B., & Bogoyavlenskaya M. E., 2018). But this “*selmovement of activity*” cannot be explained by mere qualities of intellect. According to Rubinstein (1922/1986), the realization of the attitude of a person to the world in the activity allows understanding the logic of the process.

In the frame of this article where we do not consider the mechanisms of thinking disorders but the opposition of them, the highest achievements in the field of creativity, some methodological principles based on the Vygotsky’s theory are important. Vygotsky is the first one who has indicated that all sciences are developed two ways. The direct way is based on empirically discovered characteristics. The opposite way comes out of the knowledge of the highest form and demands theoretical justification of the highest form of the phenomenon to be studied. It is on the “opposite” way the realization of Vygotsky’s (2016) principle becomes possible: “Psychology, willing to study complex psychic phenomena should change the methods of reducing to elements by the method of analysis reducing to units” (p. 8). The ability of developing activity by one’s initiative answers the methodological demands of the “unit of analysis” of creativity, where according to Vygotsky “the meeting of affect and intellect” occurs and abstraction of one of the sides is impossible as it is “indecomposable” (Ibid.).

Finally, we can talk about mechanism of creativity not as of the mystical creating “of nothing” — a special creative ability, but as development of further reconsidering the activity to which we are committed.

The total number of participants of the experiments including the Creative Field method is more than 10 000 persons in the age from five to eighty years, and that includes a longitudinal research lasting more than 50 years.

Typology of Creativity

The Creative Field method allows tracing how the exploratory search develops or does not develop in the frame of the activity a person masters a new. The direction of the analysis can be traced in three levels of cognition and it allows building its typology.

We consider the activity of a person including the level of the highest skilfulness, as belonging to the *first* level if it is stimulated from outside. The motivation of a wide range can influence successfulness of work. It is the motive of achievements, level of aspirations and everything that provides self-realisation of a person. The process of thinking on this level stops as the problem is solved. According to Hegel, it is solving on a single level. We name it the stimulus-productive level. Unfortunately, four fifths of the sample belong to it.

The activity developed by the initiative of a person belongs to the *second* — the heuristic level. Motivation at this level is limited by domination of the cognitive need in the structure of subject of activity. The motives of achievement are in conflict with the need of cognition. This is the level of art and discovering laws, which Rubinstein described as blasting the layers of the matter. Even great scientists survive the feeling of delight, when they discover a new regularity in our simple experiment: “It is rather plain, but it’s mine...” This is the process of cognition at the level of the special. In the philosophical literature this is the way of characterizing the talent. Less than twenty per cent of the sample belong to this level.

The *third* level, the creative one (we use the Latin word in order to distinguish it from the heuristic and stimulus-productive levels), is characterized not by discovering new regularities but their theoretical proving as well. This is the level of building theories and setting new problems. The process of cognition occurs on the level of the whole. Such process provides the cognition of the essence of object. But having cognized the essence of a phenomenon it is possible to foresee qualitative leaps in its development and that defines the prognostic abilities of a subject. It is this ability that, according to philosophers, characterizes the genius, who can foresee centuries ahead (Bogoyavlenskaya, 2019; Bogoyavlenskaya D. B., & Bogoyavlenskaya M. E., 2018). We would like to remind, that it is the presence of a theoretical thought correctly reflecting reality that is connected to forming Noosphere, according to Vernadsky.

Nature of the Process of Creation

In this part of the article the most typical displays of the highest level of creativity are described. Three first protocols demonstrate the manifestations of creativity. The fourth protocol shows why a patient with schizophrenia can not learn in a common school. The description of behaviour of a nine-year boy with the diagnosis schizophrenia puts an important question which science can not answer yet.

Protocol No. 1. “The second math-school,” 10th form, 1970. A boy finds the way of solving at the first problem and solves the second one very quickly. On the third problem the time of solving is one-two minutes longer. As if making an excuse, he explains: “I have proved the theorem.” I am stricken by the speed of reaching the third level, so I thank the boy and tell him that the experiment is over. He is surprised and shows me blank forms. I explain that they are meant for a larger number of problems. The boy asks what so many problems are for. “We are taught this way: if you see regularity, then prove it.” Comparing with usual concern of the boys, who is faster, this lack of self-affirmation looked very promising.

After finishing the post-graduate study, he wrote a book, compared by its significance with a chapter from the famous Landau series. In the beginning of 2000s, he was elected in the Russian Academy of Science (RAS). Two years ago, being a director of a leading institution of the RAS he came to me for the next experiment (Bogoyavlenskaya, 2017a).

Protocol No. 2. School 91. 2nd form. On the adapted to the abilities of the age chart imitating a structure of the circus, a child should find a place for a cat catching a performing mouse that run from the stage. The child finds this place quickly and after presenting him a range of similar problems comes to generalization and explains how the cat's place should change depending on the mouse's position. The experiment continues and suddenly the boy's eyes flash of excitement and slightly gasping for breath because of agitation (I understand that he came to the proof of the revealed regularity) he says: "Such a *clever cat!*" It is not him, who is clever — it is the cat. That says for the fact, that domination of the need for understanding saves his personality, his moral sphere from deformation and searching different ways of self-affirmation.

Protocol No. 3. School 57. The experiment with a boy from a 10th form has passed at ease. He is polite and restrained as a grown-up. Sequentially moving in the analysis of the material the boy steadily reaches the highest creative level. It was pleasant to chat with him after the experiment. We have discussed the forthcoming Olympiad in Australia as he had been prepared for it. I was delayed in the classroom packing the experimental materials and when I left the room, I heard his voice from the open door of the staff room. He asked to change the date of his duty in the class as he was not going to be in Moscow due to his trip to Australia. I remember that joy and feeling of pride for that good boy. I understood why his classmates talked of him with delight: I also experienced that feeling. Those children do not need to be "best of all." They need to think and to understand.

On this favourable background the sharper is the feeling of regret for the children whose achievements are subject of rapture, but then a tragedy follows.

On the request of the vice-president of the Russian Academy Science I was asked to sort out the problems of a gifted child. In the beginning of the experiment, before starting the work he mentions that two different forms: the square of the chess-board and lined circle, represent the same figure. Nobody, even academicians have not seen it. At first it takes my breath away, but after that I have got lump in my throat. What should I say to his mum? His tone of addressing to me demonstrates social inadequacy. In combination with such strength of the generalization the diagnosis is clear to me. I visit his school to understand why he can not learn there. Instead of the second form he is in the fourth one. Explaining the types of number, the teacher says that there are many stars in the sky and there are many students in the class. Vanya raises his hand. "What's the matter, Vanya?" — asks the teacher. "Mariya Ivanovna, your example is incorrect. The number of stars in the sky is infinite, but the number of students is finite." The teacher blushes, she is close to tears; stammering she continues the lesson. Passing Vanya during the break everybody pushes him. When he leaves the classroom, I follow him and it is the right time.

Observation

In 1986 I visited the “Socrat” school as a member of a large committee. We were present at the lesson of physics, conducted by two teachers with the PhD Degree in physics and math, who were teaching the students of nine years old. Due to their enthusiasm for physics they studied the curriculum of the eighth form. But the members of the committee were surprised not by the volume, but the deepness of knowledge of the children. Their reasoning was so professional that sometimes we forgot that they were children, not adults. When the lesson was over everybody was speechless. Finally, the inspector of the Ministry of Education addressed to a boy of a small height: “Oleg, tell me please which creative tasks have you performed in math today?” The answer: “None” perplexed everybody. “And what about physics?” — continued she questioning. She got the same answer: “None.” Seeing everybody’s bewilderment, Oleg with explained them a childish directness that the creative tasks in math, physics and biology could not exist. The distrust on our faces made him to explain that the creative tasks existed in the lessons of Russian only. There was even a header the “Creative work” on a sheet of paper.

The animation in the class was treated by the boy adequately. “You should not mix the level of performance with the name — the creative work” — he argued passionately. Wishing to prove his case he asked for a minute for reflexion. A minute later he pronounced proudly: “Everything is correct. The creative work is a set expression.” At that moment we remembered that out of mouth of babes comes truth. The emotional shock we experienced at that moment could not go away quickly. Probably, it is getting stronger as time passes. The boy’s words have caught the definition of creativity fixed in practice, but having become commonplace and loosen its original meaning.

Conclusion

Ex ore parvulorum ehrs veritas (Out of mouths of babes comes truth) — Latin expression.

In 1997 as a prologue to the book *The Main Modern Conception of Creativity and Giftedness* prepared by me with the grant of the President Programme “The Children of Russia” I included the description of above-mentioned meeting with Oleg (p. 5). I did it because in passing along with highlighting inadequacy of naming *the creative work* something without guarantee of creativity manifestations, he gave a capacious and precise definition of creativity. “You should not mix the level of performance with the name — the creative work,” he reveals the essence of what is creativity. It is amazing how the boy of nine years not specially reflecting on this problem, reflexes involuntary that when solving physical and mathematical problems his thought does not stop at the answer, but often goes further. The question of the *creative works* in mathematics actualizes the process of movement by the levels of cognition. Perhaps, I understand Oleg best of all as the conception of creativity as the ability for developing activity (the thinking activity) by one’s initiative I consider is equal to his thought. There is no creativity except the spontaneous movement of one’s thought.

After the above-mentioned meeting with Oleg I received the permission for diagnostics in the “Socrat” school a year later. According to my calculations, Oleg should have been finishing the 10th form at that moment. Having come to school I learned that Oleg was not visiting school and due to acute condition of his disease he could not learn anymore. This loss made the feeling of responsibility for the sick children and unfairness of observing their abilities from outside sharper. That is why not to sound unsubstantiated, I would like to draw the attention to the fact the what has been reached by psychology of thinking and creativity in the advanced Russian methodology for a hundred years, has been formulated by a nine-year child with schizophrenia. What is its mechanism and why its development leads to the death of the child? Is the result of a powerful inflow of neurons as by the dominant, but unfinished mielinogenesis of the brain leads to its death? Can it be prevented? The answer to this question is important for defining the ways of development of psychology of thinking.

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Educational Environment and Indicators of Child Development

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Образовательная среда школы и показатели детского развития

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Abstract. The article presents the author's approach to the interpretation of the concept of the educational environment of the school, based on the activity theory of A. N. Leontyev and on learning activity theory of D. B. Elkonin — V. V. Davydov. Significant features of two types of educational environments — the developing educational environment and the environment based on traditional educational content — are highlighted. A broad diagnostic research into the indicators of cognitive, social and personal development of students of these two types of educational environments was carried out. The study involved 2,304 students in the 5th and 9th grades from 24 schools.

To assess cognitive development, data from two tests is used: CFT2 and the “Transposition” method (author A. Z. Zak). An original diagnostic procedure has been developed to distinguish the role of factors of biological maturation and the educational environment of a particular school in the process of cognitive development of students.

Several sources were used to diagnose the social aspects of student development. This is a sociometric test, analysis of interactions in the system “students-teacher,” recorded in the course of observation at the lesson (based on the author's “scheme of lesson analysis” — authors I. M. Ulanovskaya, N. I. Polivanova, E. V. Vysotskaya) and content analysis of children's essays on the topic “My school.”

Indicators of personal development of students were determined by the scale “self-assessment and level of aspiration” test and the test of school anxiety (A. Prihodjan).

All data was subjected to statistical and qualitative analysis. The results obtained showed a high efficiency of the developing educational environment in the cognitive development of students. This is an expected result, since the programs used in developing educational environment are aimed at developing theoretical thinking based on the development of special educational content and appropriate forms of organization of the learning process.

Our results showed that educational environment developing qualitatively changes the sociometric structure of the class, making it more psychologically comfortable for students, increases cognitive motivation and reduces educational anxiety, makes self-assessment and level of aspiration more differentiated.

Keywords: *school educational environment; developing educational environment; traditional educational environment; diagnostics; cognitive development; social development; personal development*

Аннотация. В статье представлен авторский подход к интерпретации понятия образовательной среды школы, основанный на теории деятельности А. Н. Леонтьева и учебной деятельности Д. Б. Эльконина–В. В. Давыдова. Выделены существенные особенности развивающей образовательной среды и среды, основанной на традиционном образовательном содержании. Проведена широкая диагностика показателей когнитивного, социального и личностного развития учащихся, обучающихся в этих двух типах образовательной среды. В исследовании участвовали 2304 учащихся 5-х и 9-х классов из 24 школ.

Для оценки когнитивного развития использовались данные двух тестов: CFT2 и методики «Перестановки» (автор А. З. Зак). Разработана оригинальная диагностическая процедура, позволяющая различить роль факторов биологического созревания и образовательной среды конкретной школы в процессе когнитивного развития учащихся.

Для диагностики социальных аспектов развития учащихся использовалось несколько источников. Это социометрический тест, анализ взаимодействий в системе «учащиеся — учитель», зафиксированных в процессе наблюдения на уроке на основе авторской схемы анализа урока (авторы И. М. Улановская, Н. И. Поливанова, Е. В. Высоцкая), и контент-анализ детских сочинений на тему «Моя школа».

Показатели личностного развития учащихся определялись по шкальной методике «Самооценка и уровень притязаний» и тесту школьной тревожности (А. Прихожан).

Все данные были подвергнуты статистическому и качественному анализу. Полученные результаты показали высокую эффективность развивающей образовательной среды в когнитивном развитии учащихся. Это ожидаемый результат, так как программа развивающего обучения направлена именно на развитие теоретического мышления на базе освоения особого учебного содержания и соответствующих форм организации учебного процесса.

Наши результаты показали, что развивающая образовательная среда качественно изменяет социометрическую структуру класса, делая ее более психологически комфортной для учащихся, повышает познавательную мотивацию и снижает учебную тревожность, делает более дифференцированными самооценку и уровень притязаний.

Ключевые слова: образовательная среда школы; развивающая образовательная среда; традиционная образовательная среда; диагностика; когнитивное развитие; социальное развитие; личностное развитие

Developing the concept of the educational environment was started with research into the provisions of the theory of activity (Leontyev, 1981) and the theory of learning activity (Davydov, 1996; Davydov, Slobodchikov, & Zuckerman, 1992; Elkonin, 1974; Elkonin & Davydov, 1962).

We define the educational environment as an integral qualitative characteristics of the school internal life (Rubtsov & Polivanova, 2007; Rubtsov & Ivoshina, 2002). It is determined by the goals that a precise school sets and achieves in its activity. It is manifested in the choice of tools (means) that help to achieve these goals. These tools include peculiar properties of educational content, lesson organization, type of teacher-student interaction, extracurricular school life, class design, evaluation and school marks, etc. And it leads to the personal, social and cognitive development of students. We identified and described seven types of school educational environment and showed their developing potential (Rubtsov & Ulanovskaya, 2010; Ulanovskaya, Polivanova, & Ermakova, 1998). All these types of school educational environment are present in current educational practices. But in general, two educational paradigms should be distinguished. They represent different approaches to the problem of dependence between the processes of education and psychological development. In general, we can distinguish traditional teaching-learning paradigm and developing teaching-learning paradigm (developing educational environment).

Traditional teaching-learning paradigm is based on the principles of teacher's transmission of knowledge and its reproduction by students. Usually they also include skills as an object of transmission. Educational technologies based on the principles of transmission provoke mostly reproduction abilities of students (including simple cognitive stereotypes of perception, memory and thinking and complicated personal stereotypes of social behavior). In this paradigm creative and productive abilities of students, their personal features develop spontaneously.

The other approach is based on construction of special educational programs and organization of "learning to learn" situations (engineering of learning activity). This engineering is based on the theory of learning activity (D. Elkonin, V. Davydov) in the aspect of determination and organization of the learning content. Educational environment includes:

- creation of learning conditions in which a student can find out new interests and implement new creative abilities;

- conditions for complex development of different abilities and personal features (physical, emotional, cognitive, personal) depending on individual peculiarities of students.

Knowledge and skills in the content of this approach are not any more the goal of education. They are just the means of development. Social positions of teacher and students also undergo changes: a student becomes a teacher's partner in educational interaction. A teacher now orientates not only on the problems of acquisition of knowledge, he becomes an organizer of learning situations based on interaction and cooperation with students.

Thus, developing educational environment is based on both students' and teachers' opportunity to become a subject of one's own development as a partner in the system "students-teacher." Apart from a traditional subject-object type of interaction this system must acquire a subject-subject type of interaction so that each of the participants becomes a condition and a means of development of the others. One of the necessary steps is formation of a reflective position of both a teacher and students towards each other.

It means that relations between didactic and psychological components of learning process organization change. Priority is shifted from didactics to psychology. Of course, it doesn't mean that teaching-learning activity must be implemented by psychologists instead of teachers. But it means that working out of the learning programs and implementation of these programs in a system of lessons must, first and foremost, correspond to the purpose of students' psychological development. And the didactic content must be used as a means of cognitive, personal, art, physical development.

In general, the main features of developing educational environment are:

- acquisition of skills and knowledge is no more treated as the main goal of education but as a means of development of child's abilities;
- a traditional subject-object type of teacher's influence over students' changes to co-action, cooperation, in which a teacher and students become partners in joint activity;
- developing education lays stress on psychological substantiation of teaching-learning activity, changes traditional relations between didactics and psychology, uses new psycho-didactic (instead of traditional didactic) criteria in construction of learning situations. Psycho-didactics means priority of psychological laws of development in construction of educational technologies (Davydov & Rubtsov, 1995; Elkonin & Davydov, 1962; Rubtsov & Polivanova, 2007).

Modern tendencies in educational paradigms' development (from traditional towards developing) make it actual to solve problems of projecting and modeling of educational environments, on the one hand, and of evaluating developing effectiveness of existing educational environments, on the other. This second aspect (psycho-didactic expertise of existing educational environments) is the main subject of this article.

Research Hypothesis. Diagnostic Procedures and Methods

The research hypothesis: the characteristics of cognitive, social and personal development of students are determined by the quality of the school's educational environment.

The expertise of educational environments of different schools was held using two groups of procedures:

- 1) procedures for (a) determination of a type of educational environment and (b) qualitative description of specific features of its implementation in a precise school;
- 2) procedures for evaluation of developmental effectiveness of school educational environment. These procedures and their results will be the subject of analysis in this article.

A set of procedures for evaluation of developmental effectiveness consists of three groups of methods.

The first group of methods deals with characteristics of thinking and cognitive processes. It was based on comparison of two tests. The first test permits to evaluate basic intellectual abilities that do not depend on the content of education or the type of organization of the teaching-learning activity. The second test evaluates the level of development of specific thinking operations that appear and function in a process of learning (Zak, 2019a, 2019b). We treated them as indicators of learning activity organization effectiveness. Comparison of the results in both tests permits to detect and evaluate the influence of the specific features of educational environment of a concrete school on development of students' cognitive abilities.

Basic intellectual abilities were detected using CFT2 test. This test uses nonverbal graphic material, differentiated in difficulty. Capacities, demonstrated by students in this test, are treated as inner (their own) ones. Briefly we shall call them "natural intellect."

Qualitative evaluation of thinking processes, connected with students' participation in teaching-learning activity, was based on diagnostic procedure named "Transposition" (Zak, 2019b).

In "Transposition" test the tasks are organized in a way that permits to evaluate cognitive activity based on a criterion of integral planning in problem solving. The test consists of 20 tasks. Each of them includes an initial position of graphic elements, a fixed number of mental transformations (from 1 to 5) and a sample of result position of elements. The number of problems solved correctly permits to evaluate the level of integral planning in problem solving. Each level is characterized by empirical or theoretical way of problem solving, depth and quality of analysis, content reflection.

The second group of methods deals with evaluation of social development (From joint activity..., 2018; Polivanova, Rivina, & Ulanovskaya, 2017). We analyzed two groups of data: "objective" data showed real relations between students in class and between students and teachers and "subjective" data reflects the students' attitudes towards their educational environment.

Relations between students were studied with the help of sociometrical procedure, that included general, business and emotional criteria. Its results permit to evaluate level

of adaptation of each student in the systems of business and emotional relations in the class group. It also permits to detect main motive orientation of the class (towards cognitive, creative, communicative or other types of activity).

Fixing of type and content of relations between students and a teacher at the lesson was based on a special "scheme of lesson analysis" (Rubtsov & Ulanovskaya, 2010). It includes 31 concrete positions for fixation during the lesson (by observer) and permits to analyze lessons in three levels: content, organization, interactions.

Level of content deals with peculiarities of school subject presentation. Interactions here are analyzed from the point of view of their role in content acquisition, for example, type of questions (problem question or concrete one), number of questions, who is the initiator of questions (students or teacher), etc.

Organization level characterizes the way in which a concrete teacher solves content problems. It shows how the teacher reacts to the students' questions, how he instructs individual students' activity or organizes group work, how he influences group discussion, controls knowledge, etc.

Interaction level deals with ways by which a concrete teacher stimulates and motivates students' activity, puts grades, encourages and punishes students, demonstrates his personal reaction towards students' behavior and his personal style of interaction.

In order to find out "subjective" aspect of students' socialization we held content-analysis of students' compositions on the topic "My school." We used five groups of categories: school, lessons, teachers and staff, classmates, the author about himself — all marked as positive, negative or neutral.

The third group of methods deals with evaluation of personal development. We used data of self-assessment and level of aspiration test, content-analysis of compositions, questionnaire of school anxiety.

For studying self-assessment and level of aspiration we used scaling procedure. Students evaluated their actual position (self-assessment) and desired position (level of aspiration) on five scales: intellect, communication and social norms.

Content-analysis of compositions permitted us to detect leading motives of students that determine their activity (cognitive, training, success, communication, etc.).

Questionnaire of school anxiety permits to evaluate anxiety, connected with school life. All these methods are described in detail in the book *Technology for Assessing the School's Educational Environment* (Rubtsov & Ulanovskaya, 2010).

The expertise of educational environments was held in 24 schools (most of them are in Moscow). In each school we tested students of the 5th grades (graduates from junior school), average age 10,5 years old, and of the 9th grades (graduates from secondary school), average age 15,4 years old. Each of the students participated in all six test procedures. In general, 2,304 students took part in this work.

The choice of the 5th and 9th grades permitted us to evaluate differentially the influence of junior and secondary school educational environments on different aspects of development of students. This aspect was of special importance for us, because, on the one hand, most of teaching-learning programs, based on the theory of learning activity, are imple-

mented in junior school. In secondary school they are not worked out as integral programs and are used mostly as a set of precise procedures while studying separate themes of school subjects (Ulanovskaya, Vysotskaya, & Yanishevskaya, 2019). On the other hand, schools working basically as traditional, are forced to use some methods of developing education in secondary school, because teenagers often reject traditional training. That's why differentiation of junior and secondary schools could give us more precise results.

Determination of a type of educational environment, held on the preliminary phase of research, showed that only four schools can be treated as schools working in developing paradigm. The other 20 schools work in a traditional paradigm. These two groups of schools formed a sample for our diagnostic survey.

Description and Analysis of Results

The aim of this article is to compare quantitatively and qualitatively results demonstrated by students of schools working in developing and traditional educational paradigms.

Quantitative analysis of experimental data was based on SPSS statistical procedures. We treated data separately for each class, for group of classes of the same age in one school, for classes of the same age in schools of the same educational paradigm and for all schools.

Qualitative analysis permits to connect results, demonstrated in tests, with concrete teaching-learning procedures used in different educational environments.

Thinking and Cognitive Processes

“Transposition” test allows to distinguish empirical and theoretical strategies of problems’ solving. The number and quality of problems solved by a student permits to distinguish three empirical and four theoretical levels of mental development.

Table 1 presents number of students (in %) using empirical or theoretical way of problems’ solving in two groups of schools: group 1 — developing schools, group 2 — other schools.

Table 1

The ratio of empirical and theoretical ways of problems’ solving in schools with a developing and a traditional educational environment, %

Grades	Group 1 — developing schools	Group 2 — traditional schools
	empirical / theoretical	empirical / theoretical
5th grades	27.25 / 72.75	58.95 / 41.05
9th grades	14.60 / 85.40	18.91 / 81.09

Results of “Transposition” test demonstrate that:

1. Advantage of schools with developing paradigm in theoretical thinking development in junior school is evident.

2. Comparison of these results with data received in CFT2 test (and statistical analysis proves it) shows, that theoretical thinking development is not determined by IQ level. For example, in one of the 5th grades of developing schools' ratio of students with empirical and theoretical way of problems' solving is 5.9 to 94.1. It means that only one student in the whole class couldn't solve "theoretical" problems. At the same time the distribution of IQ results was close to a curve of normal distribution (average — 108.9 in the interval from 95 to 137). No school of the second group (some of them are considered to be very effective and prestige) demonstrated results close to those of the developing schools.
3. In secondary school the difference in theoretical thinking development between developing and traditional educational environments is still statistically valid, though not as large, as in junior school.
4. We found out that in two schools of the second group (traditional educational environment) 9th-grade students demonstrate higher results, then in developing schools. In order to interpret these results, we compared "Transposition" test results with IQ values. We calculated the average IQ values for students, who demonstrated empirical and theoretical types of problem solving. Our hypothesis was that only in situations where students' results in "Transposition" test were higher than those expected according to their IQ values, we could treat data as a result of educational environment influence. So, in both traditional schools, mentioned above, average IQ in the 9th grades was 115 and 119, that is much higher than average IQ values for demonstrated levels of theoretical thinking. That's why we couldn't definitely treat data as a result of educational environment effectiveness.
5. "Transposition" test allows to distinguish the depth of planning and reflection as levels of theoretical thinking. According to a number of the solved problems we have allocated four levels of theoretical thinking (from the lowest 1st level to the highest 4th one). Taking all theoretical solutions as 100 %, results of developing schools are 21 % — 21 % — 44.5 % — 13.5 %. In traditional schools' distribution of results is 48 % — 26.25 % — 17.75 % — 8 %. It means that students of the 9th grades in developing schools demonstrate a much higher level of theoretical thinking development than students of other schools.
6. Cognitive development results in schools of the first group are quite predictable, because one of the main teaching goals in the theory of learning activity is to help students to work out a theoretical approach (general method) to the situations of solving precise learning problems. That's why the results prove that these schools effectively use their educational technologies.
7. On the other hand, the data obtained show that various teaching methods and procedures used in schools of the second group can not give a result in thinking development compared to the effectiveness of the learning activity technology.

Social Development

In sociometrical procedure we asked students to make choices of their classmates on general criterion, learning criterion, communicative and emotional criteria. No more than five choices were permitted.

Results of the sociometrical procedure show:

1. In developing schools (group 1) the structure of interpersonal relations in class groups is much more ramified than in schools of group 2. It means that students' interactions are more intensive. There are no restricted groups.
2. In schools of group 1 the gap in number of choices between the leaders and other students is much less than in schools of group 2. Even choices on learning criterion include middling students as well as students with excellent marks.
3. In traditional schools (group 2) the gap between the leaders and "average" students is very high and the number of leaders in the class group is limited by two or three students.
4. In schools of group 1 every student is chosen at least on one of the criteria. It means that there are no totally isolated students and each student is included into the system of interpersonal relations. In schools of group 2 in 97.5 % of classes there are totally isolated students.
5. Correlation between choices was made according to different criteria differs (a) in schools with different educational environments and (b) in junior and secondary school.
6. In schools of group 1:
 - learning and emotional choices coincide in 60 % in the 5th grades and in 32 % in the 9th grades. And only about 25 % of learning and emotional choices coincide with choices made on general criterion (both in the 5th and 9th grades). It means that in school with developing educational environment students have different and productive experience of interactions. That's why all students are included into different systems of preferences;
 - in no class a business leader is isolated on emotional criterion. It means that learning results are highly appreciated in these schools.
7. In schools of group 2:
 - in the 5th grades learning and emotional choices coincide in 87 %, and the choices are strictly determined by students' learning success;
 - both learning and emotional choices coincide with choices made according to general criterion;
 - in the 9th grades results present two alternative tendencies: in five schools learning and emotional choices coincide in 59 % and learning and general choices coincide in 77 % (the same tendencies as in junior school), and in 15 schools business and emotional choices coincide in 14 % and some of the learning leaders become emotionally isolated. It means that success in learning stops being important for success in interpersonal relations and even prevents it. Business and general choices coincide in 9 % and emotional and general choices coincide in 71 %.

In general, sociometrical results demonstrate effectiveness of developing educational technologies (practice in learning interaction, experience in group work) in creation of a wide network of stable and productive interpersonal relations.

Analysis of students-teacher interactions show that:

1. In schools of group 1 interactions are much more intensive: we fixed 101 units of interactions per lesson in the 5th grades and 79 in the 9th grades. In schools of group 2–24 and 37 units.
2. Interactions are qualitatively and functionally different: in schools of group 1 most of interactions deal with content and organization of learning activity; in schools of group 2 interactions mostly deal with organization of students' work (teacher's commands) and interpersonal relations (reproves and evaluation of results).
3. Evaluation is a very important part of teacher-students interactions. That's why in "the scheme of lesson analysis" we fixed different types of evaluations: aimed at personal features of a student or at his work; positive and negative. In schools of group 1 we fixed 7.2 times less number of evaluations, than in schools of group 2; 92 % of all evaluations were aimed at the content and result of students' work and 97 % of evaluations were positive. It doesn't mean, that a teacher evaluates positively mistakes or wrong results. It means, that he/she uses other procedures. For example, the teacher asks the other students questions whether they agree or can suggest another way of problem solving. Only in schools of group 1 we fixed practice of self-assessment of students according to criteria suggested by a teacher or students themselves. In schools of group 2 evaluation tremendously differs: we fixed from 2 to 76 marks for one lesson. But in general, a number of negative evaluations is higher than positive ones, and a number of "personal" evaluations is higher than a number of "work" evaluations.

As we mentioned above, subjective aspect of socialization was treated according to the results of content-analysis of students' compositions. Texts of compositions provide interesting information about different aspects of school environment.

In short, results of content-analysis of compositions show, that:

1. In schools of group 1 students' attitude towards school, teachers, lessons and schoolmates is much more differentiated than in schools of group 2. For example, in the texts of 5th-grade students gaps in their attitude towards a teacher and lessons of that teacher were fixed many times. And what is more, they try to analyze and explain their attitude. In schools of group 2 students of the 5th grades didn't distinguish these aspects ("I like drawing, because our teacher is very kind and always puts me good marks").
2. In schools of group 1 compositions include a lot of critical remarks (negative evaluations of concrete aspects of school life), but their general attitude towards school in 96 % of compositions is highly positive ("I really love my school"). In schools of group 2 we got a great diversity in results. For example, in three schools more than a half of 9th-grade students didn't mention lessons in their compositions and their attitude towards school correlated with relations with

their classmates. In six schools' attitude of 9th-grade students towards school is absolutely impersonal, based on formal criteria like "close to home" or prestigious factors like "Anyone would be proud of becoming a student of this school." In general, compositions of students in schools of group 2 are less reflective. Their judgments are more categorical (either "like" or "dislike").

In general, results prove that developing education is effective not only in the aspect of cognitive development, but also in socialization of students. The main mechanisms of social development used in developing schools are: joint forms of learning activity; intensive interactions of students and teacher initiated by teachers as well as students themselves; transfer of analysis processes, reflection and evaluation, formed in learning activity, to social sphere to analyze social relations.

Personal Development

Results of self-assessment and level of aspiration test permit us to make the following conclusions:

1. In schools of group 1:
 - in the 5th grades 88 % of students demonstrate adequate self-assessment on all the scales. Self-assessments are differentiated (different marks in different scales). Level of aspiration of all the students is higher than self-assessment and the largest gap is on "friendship" scale. 62 % of students demonstrate the highest level of aspiration on "friendship" scale and 71 % — on "good student" scale;
 - in the 9th grades 92 % of students demonstrate adequate self-assessment on all the scales. Self-assessments are more differentiated than in the 5th grades. Level of aspiration of all the students is higher than self-assessment on scales of intellect and "friendship" and the largest gap is on scales of intellect. 21 % of students are satisfied with their communication skills and 27 % have the same meanings of self-assessment and level of aspiration on "good student" scale. Nobody demonstrated the highest level of aspiration on any scale.
2. In schools of group 2:
 - in the 5th grades 43 % of students demonstrate adequate self-assessment on all the scales. Self-assessments on different scales are very close. Level of aspiration of all students is higher than self-assessment and the largest gap is on "good student" scale. 62 % of students demonstrate the highest level of aspiration on all scales and all the students demonstrate the highest level at least on one scale;
 - in the 9th grades 64 % of students demonstrate adequate self-assessment on all the scales. Self-assessments are more differentiated than in the 5th grades. Level of aspiration of all students is higher than self-assessment on intellect scales. The most contradictory data were on "good student" scale: in four schools about 56 % of students have the same meanings of self-assessment and level of aspiration on "good student" scale; in six schools we received the largest gap between self-assessment (very low) and level of aspiration (very high) on this scale. 22 % demonstrated the highest level of aspiration at least on one scale.

In general, results show that developing educational environment permits students (even in junior school) to “be satisfied” with their personal and social features and abilities, on the one hand, and to put real goals and perspectives for personal development (level of aspiration), on the other.

Questionnaire of school anxiety includes two main scales: (a) emotional stability and (b) cognitive interests. It permits to distinguish five levels of anxiety, connected with school life. Levels 1 and 2 characterize positive attitude, emotional stability and cognitive interests. Level 3 means neutral attitude towards school, unstable emotions and cognitive interests. Levels 4 and 5 mean negative emotional reactions, intensive anxiety and absence of cognitive interests.

Results of school anxiety measuring are given in *Table 2*.

Table 2

Levels of school anxiety in schools with developing and traditional types of educational environment, %

Group	Grades	Emotional stability	Cognitive interests
		levels	levels
		(1 / 2 / 3 / 4 / 5)	(1 / 2 / 3 / 4 / 5)
Group 1 (developing schools)	5th grades	46 / 34 / 16 / 4 / –	54 / 34 / 11 / 1 / –
	9th grades	33 / 50 / 11 / 6 / –	26 / 61 / 10 / 3 / –
Group 2 (traditional schools)	5th grades	4 / 42 / 31 / 16 / 7	9 / 24 / 52 / 5 / 10
	9th grades	17 / 27 / 40 / 7 / 9	12 / 33 / 46 / 1 / 8

Data, presented in table 2, shows that:

1. In developing schools (group 1):
 - for 80 % of students of the 5th grades and for 83 % of students of the 9th grades school is associated with positive emotions. And only for 4 % and 6 % of students different school situations correlate with negative emotions;
 - 88 % of students of the 5th grades and 87 % of students of the 9th grades demonstrate stable cognitive interests. Only 11 % and 10 % of students, respectively, demonstrate cognitive activity in separate learning situations (for example, at precise lessons or with precise teachers) and absence of cognitive interests in other situations.
2. In traditional schools (group 2):
 - in general, less than a half of students of the 5th grades (46 %) and of the 9th grades (44 %) have stable positive attitude towards different school situations. But this data differs significantly from school to school;
 - in general, cognitive interests are low both in the 5th and in the 9th grades. But these results differ in different schools significantly. There are some traditional schools where students demonstrate high and stable cognitive interests.

3. These results correlate with data of analysis of students' compositions. In schools of group 1:

- more than a half of the students of the 9th grades mention that they do not hurry to leave school after classes (emotional comfort);
- describing the lessons 92 % of students in the 5th grades and 70 % in the 9th grades use a category "interesting"; and 62 % in the 5th grades and 72 % in the 9th grades use categories "useful" and "necessary";
- only 7 % of students in the 5th grades and 22 % in the 9th grades mention marks and evaluations, describing lessons or relations with teachers.

In schools of group 2 we found different expressions of the level of emotional comfort at school, but in 32 % of compositions in the 5th grades and 52 % in the 9th grades students discuss marks using categories "unjust" and "too strict" that demonstrate their anxiety and dissatisfaction.

Discussion of Results

Results we received in measuring thinking development were rather unexpected. In the theory of learning activity, that is used as a basis in creation of developing educational environments, the construction of problem situations, in which a student discovers a general (theoretical) method of problem-solving is one of the major teaching technologies. The main direction in critics of this theory is that it deals with scientific knowledge rather than other aspects of students' development. That's why it was important to evaluate and compare characteristics of social and personal development using traditional procedures regardless of precise educational technologies. Our results show that in developing schools social and personal development of students doesn't happen spontaneously, independently of educational influence. Analysis, reflection, experience in learning interactions and group work are used by students not only in the sphere of learning problem-solving, but also in construction and analysis of social interactions and self-assessment.

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SCIENTIFIC LIFE

НАУЧНАЯ ЖИЗНЬ

Review of “Evaluation and Treatment of Neuropsychologically Compromised Children”

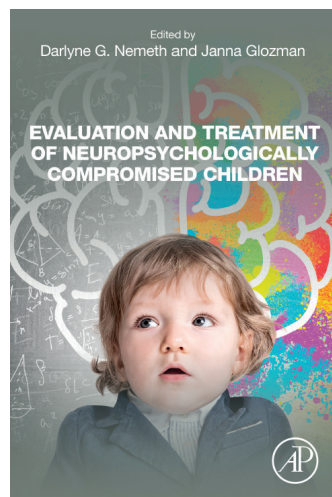
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Обзор книги «Диагностика и коррекция детей с нейропсихологическими проблемами»

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Abstract. The number of neuropsychologically challenged children throughout the world is of great concern. The book, *Evaluation and Treatment of Neuropsychologically Compromised Children* (London: Academic Press, 2020), edited by neuropsychologists Darlyne G. Nemeth from America and Janna Glozman from Russia, offers the most current expertise to ameliorate this situation. Chapters present the work of practitioners and researchers from around the world who acknowledge and apply the legacies of noted neuropsychologists Alexander Luria and Ralph Reitan, from Russia and the United States respectively, to effectively evaluate and treat neuropsychologically compromised children. The work by the authors is of greatly value to all health professionals about diagnosis and intervention and treatment approaches to address a wide range of brain-behavior challenges that children face. The contributions build on the foundation set by pioneers Luria and Reitan to present a new level of professional practice and vision that bodes well for the well-being of children and adults worldwide.

Keywords: *Luria; Reitan; neuropsychologically compromised children; neuropsychology evaluation; neuropsychology treatment*

Аннотация. Серьезное беспокойство вызывает большое количество детей с нейропсихологическими нарушениями во всем мире. Книга «Диагностика и коррекция детей

с нейропсихологическими проблемами» (Лондон: Academic Press, 2020) под редакцией нейропсихологов Дарлин Немет из США и Жанны Глозман из России предлагает современный опыт улучшения этой ситуации. В книге описывается опыт практиков и исследователей из разных стран, применяющих подходы выдающихся нейропсихологов — Александра Лурия из России и Ральфа Рейтана из США к нейропсихологической диагностике и коррекции детей с нейропсихологическими проблемами. Работы авторов представляют большую ценность для профессионалов в области здравоохранения, диагностики и лечения большого числа нарушений поведения и мозговых функций у детей. Эта книга, основанная на пионерских теоретических исследованиях Лурия и Рейтана, выводит профессиональную практику и теорию на новый уровень, что будет способствовать психическому здоровью и благополучию детей и взрослых во всем мире.

Ключевые слова: Лурия; Рейтан; дети с нейропсихологическими проблемами; нейропсихологическая диагностика; нейропсихологическая коррекция

The first I knew about this present impressive volume was at a psychology meeting in Moscow in 2016 at the First World Congress on Mental Health organized by the Union for Mental Health, which I and my dear friend Dr. Darlyne Nemeth attended as plenary speakers as we have done for many professional meetings over decades. One afternoon, Darlyne enthusiastically shared with me that she had a meeting with fellow neuropsychologists about the work of the founder of Russian neuropsychology, Alexander Luria. As a noted American neuropsychologist, Darlyne was especially excited. Her enthusiasm was warranted, as the meeting led to immediate bonding and collaboration with Russian developmental psychologist Dr. Janna Glozman that resulted in this anthology. When she returned from the meeting, Darlyne told me about an exceptionally exciting part of the visit: over tea and cookies, she was offered the honor to hold Luria's original hand-drawn pictures of patients' brain problem areas. Also, she was keen to get started on the project to collate chapters for an edited volume she and Dr. Glozman agreed to edit, about work derived from their respective mentors, Luria and American neuropsychologist Ralph Reitan, to represent the most up-to-date knowledge about the field of neuropsychology.

Now, psychologists and many associated professionals have the opportunity to take advantage of the outcome of their collaboration in this edited volume.

The contents are important, as the field of Clinical Neuropsychology is one of the fastest growing areas of psychology throughout the world. In America, neuropsychology represents the largest Division of the American Psychological Association. Further, the focus on children is crucial, as most of us know the increasingly critical importance of assessing and treating children with learning disabilities, behavior troubles, emotional imbalance, school maladjustment, and difficult parent-child inter-relationships. Also, awareness is increasing with regard to children's struggles with traumatic brain injury, brain tumors or epilepsy, Attention-Deficit Hyperactivity Disorder (ADHD), learning disabilities, intellectual and developmental disorders, and those on the Autism spectrum.

In this volume, eminent neuropsychology experts in research and practice present their important views and work on the theory and practice of brain-behavior functions,

building on the foundations set by the neuropsychology pioneers, Alexander Romanovich Luria from Russia and Ralph M. Reitan from the United States. These two pioneers, themselves students of Russian psychologist Lev Vygotsky and American physiological psychologist Ward Halstead, respectively, and now considered the forefathers of international developmental psychology, along with their disciples, have moved psychology beyond the focus on strict behaviorism to a more integrated understanding of "the role of brain processes in the explanation of the human mind" according to neuropsychologist Antonio Puente, former president of the American Psychological Association (p. xxvii).

The chapter authors can be considered the "new pioneers" of the field. Their work on the evaluation, treatment, and research of brain-behavior functions can be directly traced to the heritage of those noted neuropsychologists and the cross-fertilization of their work in qualitative and quantitative methodology.

As noted by the editors — the newly formed friends and colleagues from that meeting in Moscow — Drs. Nemeth and Glozman note in this volume, "A. R. Luria and R. M. Reitan have independently built outstanding pyramids of neuropsychological knowledge, to the point wherein they are considered by many to be the fathers of international developmental neuropsychology. The purpose of this volume has been to integrate Luria's qualitative and Reitan's quantitative approaches to the evaluation and treatment of neuropsychologically compromised children. Although separated by time and space, Luria and Reitan have offered solid foundations for the understanding of children's brain-behavior development" (p. 305).

As a colleague of Dr. Nemeth who has collaborated with her on many projects related to disaster relief including the cognitive impacts of such events on children and adults, I have been aware of the importance of her specialty and her work. As a clinical psychologist for half a century myself, I have learned much from this cooperation, and now from this volume, as will other readers.

A major lesson from this volume is that the socio-historical/qualitative approach provided by Luria combined with the quantitative ideas of Reitan contribute a powerful conceptualization of how this field of neuropsychology can influence many disparate research areas and disciplines of psychology. Relevant issues range from early learning and speech development, to executive functions, learning disabilities, social interactions, and medication management in varied clinical situations including environmental trauma and complex medical problems. All these areas have benefitted from the innovative thinking and insights of the two pioneers, elaborated by the "new" pioneers who are author chapters in this volume, carrying on the legacy of the two icons.

Certainly a "new pioneer," volume co-editor Dr. Nemeth is a visionary professional who has changed the face of neuropsychology in the United States by her innovative approaches to treatment of neurologically challenged children and adults. In a major leap forward for psychologists, she was instrumental in the campaign for psychologists to get prescription rights, which has been implemented legally in her home state of Louisiana. This is a significant accomplishment, in breaking down much resistance from the medical field, and in negotiating with legislators. She has further innovated a holistic approach

to neuropsychology, by integrating the field of emotions with that of environmental studies, in both her edited volumes (of which I am proud to say I am a co-editor), namely, *“Living in an Environmentally Traumatized World: Healing Ourselves and Our Planet”* and *“Ecopsychology: The Intersection of Psychology and Environmental Protection: Intervention and Policy”* (both from Praeger Press). She has further developed the concept that trauma is retriggered on anniversary dates of the event, and presented Anniversary Wellness Workshops which I have co-facilitated throughout her state on the anniversary dates of environmental traumas like Hurricanes Katrina and Matthew. A shining example of resilience herself, she has authored a book on the subject, *“Innovative Approaches to Individual and Community Resilience: From theory to practice.”*

I have been enormously blessed to be on this journey with her, developing these workshops and creating projects of innovative research and practice. As board members of the World Council of Psychotherapy (WCP), we have presented together about our trainings and workshops on disaster recovery at conferences around the world, from Moscow to Beijing, Paris and Buenos Aires.

The measure of a great professional is passing on her knowledge, which Dr. Nemeth does generously in training a new generation of neuropsychologists, many of whom have gone on to do exceptional work in the field, and some of whom are authors of chapters in this volume. Always forthright in speaking her mind, she has been vocal about extending rights to education for underprivileged students, during her tenures on the Council of Representatives of the American Psychological Association (APA).

Nemeth's accomplishments are extensive. Founder of the first neuropsychology center in Louisiana to treat neuropsychologically compromised children, the Neuropsychology Center of Louisiana, her expertise benefits a wide spectrum of patients with developmental and brain-behavior dysfunctions. Her boundless creativity has led to innovations, including the “Build-A-Brain series,” described in the chapter in this volume on *“Laying the Framework for Developing Executive Functions in Tweens with Learning Disabilities.”* Her leadership has been evident in the many positions in which she has served for her state's Psychological Association, the APA and the WCP, and particularly in her successful and courageous advocacy about obtaining prescription rights for psychologists to prescribe medication.

Nemeth has an extensive history with Reitan, having been trained and supervised by him for many years and being the first professional to use the Reitan REHABIT system, in 1980.

Nemeth's partnership with Glozman is essentially a match made in professional heaven. A disciple of the famed Russian neuropsychologist Luria, developmental psychology professor Dr. Glozman has claimed her own rightful position as the new generation of Russian psychologists. This is evident in her many professional papers and edited book reflecting comprehensive information on both Russian and Western developmental neuropsychology. With extensive expertise and credits in so many fields of neuropsychology — as a neuropsychologist, neurolinguist, research scientist, specialist in neuropsychological assessment and rehabilitation, and professor of neuropsychology, neurogeriatrics, developmental neuropsychology — Glozman is also the leading researcher at Moscow State University Psychology Department and uses Luria methods to evaluate and treat learning

disabled children at Luria's Research Center of Developmental Neuropsychology. Bridging Russia and America, she was also a visiting professor at the University of North Carolina in the USA. Spreading the ideas of her mentor, she organizes the International Luria Memorial Congress, serves as editor in chief of a new international journal, the *Lurian Journal*, and has evolved her mentor's theories to today, developing a new system of scoring Luria's neuropsychological assessment data for children and adults. As if that isn't enough, she has also founded a new branch of neuropsychology, the Neuropsychology of Communication, with published books in Russia, Great Britain and the US.

In an amusing but appropriate metaphor, the co-editors liken their mentors — Reitan and Luria — to the building of the great pyramids in Egypt and Central America.

The architect of the partnership can be considered to be clinical neuropsychologist Dr. Antonio Puente, who introduced Nemeth and Glozman. In his foreword to the book, Puente, professor psychology at the University of North Carolina in the USA, notes how the interface of Russian and American neuropsychology holds much promise, merging the hard science of the west illustrated by Reitan with the romantic cultural-historical science of the east espoused by Luria, to create a "unified and universal neuropsychology."

The American and Russian co-editors, who acknowledge the benefit from their respective mentors Reitan and Luria, elucidate the breadth and depth of the volume in their comprehensive introductory chapter on "*The Contributions of Luria & Reitan to Developmental Neuropsychology and to the Understanding of Neuropsychologically Compromised Children.*" The disciples outline the field of neuropsychology in Russia and America, diagnostic approaches and case examples and assessments of cognitive, affective and behavioral disorders.

In her chapter in this volume on "*Integrating Quantitative & Qualitative Measures with Neuropsychological Assessment and Intervention,*" Dr. Glozman emphasizes the importance of integrating the qualitative methods of Luria with the quantitative methods of Reitan, and of expanding this approach into the mainstream of healthcare practice. She supports her position by citing 1986 work of Horton and Puente, which asserted that neuropsychology can provide valuable understanding in the treatment of such chronic diseases as lupus, chronic obstructive lung disease (emphysema), cardiovascular disorders, and certain types of oncological disorders. She concludes that any medical complication or treatment having a direct or indirect impact on neural integrity should be considered within the scope of neuropsychology. Thus, the stage was set over 35 years ago, and currently expanded, to emphasize the usefulness of neuropsychology beyond neurosurgery and/or special education and into the mainstream of healthcare practice.

Glozman emphasizes the importance of a comprehensive assessment, to include the following: the individual's general characteristics, an assessment of motor activity, an evaluation of gnostic functions, an evaluation of verbal functions, an assessment of memory, and an evaluation of intellectual processes, including reasoning. Further, she maintains the importance of evaluating brain-behavior function well beyond the scope of a questionnaire.

The influence of the early, and new, pioneers in this volume, extends well beyond their respective countries of Russia and the United States. Their work in these chapters provide guidelines to innovative approaches in assessment and treatment which readers from any countries will find important and relevant.

In a chapter on *“Heritage of Reitan and Luria to 21st Century Developmental Neuropsychology,”* Portuguese psycholinguist Joaquim Quintino-Aires, PhD., echoes the support for the work of the early pioneers, emphasizing how studying their work gave him a better understanding of higher cortical functions, dynamic localization, and brain development. Luria and Reitan’s work extends to Portuguese psychology, notes Quintino-Aires, allowing Portuguese psychologists to move beyond the hospital setting into the school and rehabilitation settings. These revelations motivated Quintino-Aires to make the appreciative evaluation that, “The practice of neuropsychology is very beautiful work, not just very useful.” Quintino-Aires, winner of the Luria Award from Moscow State University and head of the Vigotsky Institute in Portugal, found Luria’s concepts of higher cortical functioning of the brain, bottom-up development and the Three Functional Blocks to be particularly helpful in understanding brain-behavior functions. Furthermore, he applied Luria’s concept of Syndromic Analysis to understand the symptoms of brain injury, including the loss of a function, localization of the injury, and development of a rehabilitation plan for that specific problem. Quintino-Aires credits Luria’s groundbreaking book, *Traumatic Aphasia — Its Syndromes, Psychology, and Treatment* (1947), as having enriched his understanding of the theory and practice of functional system reorganization.

In a chapter on *“Combining Qualitative and Quantitative Measures in the Evaluation of Executive Functions in ADHD,”* Russian child neuropsychologist Dr. Irina Shevchenko also supports the blended approach of Luria and Reitan recommended by chapter author Quintino-Aires and Glozman’s recommendation to go beyond questionnaire evaluation. A specialist in neuropsychological assessment and remediation, Shevchenko notes the prevalence of the neurobehavioral diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) in children being particularly high in the United States in 2007, but notes that these statistics could be misleading since they were made on the basis of questionnaires, rather than on full evaluations. While she includes several questionnaires in her examination of children with ADHD — given the influence of Reitan — like the Conners Scales and the Iowa Gambling Task that simulates real-life decision-making, she maintains that combining the approaches of Luria and Reitan allows for a better understanding of the structure of the disorder of ADHD and leads to a more effective approach for prevention and remediation.

To better understand the Reitan approach, Maryland neuropsychologist Dr. Arthur MacNeill Horton, Jr., past president of the National Academy of Neuropsychology and ardent follower of Reitan’s work, offers an in-depth analysis of the various aspects of the adult Halstead-Reitan Neuropsychological Test Batteries (HRNB), the older child battery (HRNB-OC), and the children’s battery (RINB), in his chapter on *“Ralph M. Reitan and the Clinical Interpretation of Neuropsychological Test Data.”* To obtain a comprehensive assessment of functioning, Horton uses Reitan and Wolfson’s General Neuropsychological

Deficits Scale (GNDS) with his own Alternative Impairment Index (AII). Norton, editor of the journal *Applied Neuropsychology-Child*, emphasizes the usefulness of a battery of tests in the GNDS. These include some measurements with intriguing descriptive titles, like the Trail Making Test, which requires visual tracking, simple and complex shifting, and sequencing ability, and the Finger Tapping Test, a measure of gross motor speed. So many other assessments outlined in the chapter captured my attention, like The Category Test that measures the person's ability to learn general abstract principles from sets of stimulus items; the Tactual Performance Test to assesses integration of tactile and kinesthetic feedback, psychomotor skills, and spatial memory; the Speech, Sounds, Perception Test, which requires the individual to attend to tape recorded stimulus words that are variations of an "ee" sound that require the ability to sustain attention, perceive speech sounds and real words; the Rhythm Test, which measures auditory memory, rhythm discrimination, and an attention ability; the Reitan-Indiana Aphasia Screening Test which assesses symbolic related language deficits such as reading, writing, naming, spelling, performing arithmetic, and repeating words and phrases; the Reitan-Klove Sensory-Perceptual Exam, a standardization of a behavioral neurological examination; the Reitan-Klove Lateral Dominance Exam, which assesses preference for use of hand, foot, and eye; and the Strength of Grip Examination, which assesses gross motor strength. The child's version, developed by Dr. Reitan at the Indiana University Medical School, has appropriate variations of these tests. Typically, an intelligence measure is included and various indicators, including the Level of performance, Patterns and relationships of performance, Pathognomonic signs, and a Comparison of the two sides of the body on motor and sensory perceptual measures. Impressively, Reitan use these indicators in order to do a blind analysis of the data with amazing accuracy.

A distinct priority in the analysis of brain-behavior dysfunction is the individual's ability to utilize good Executive Functions (EFs). This concept is explored in the chapter by Nemeth with one of her students and assistant, Kayla Mackenzie Chustz, on "*Executive Functions Defined*." Describing different definitions of EFs, the authors base their definition of EF skills on that proposed by American clinical psychologist Rebecca Branstetter, as "all of the cognitive skills needed to regulate your thinking, feeling, and behavior, often to reach a goal" as well as Luria's definition as "the ability to evaluate a problem, plan a response, carry out that plan, and assess the adequacy of the response within the context of the ongoing environment." The authors explore how these EFs re learned, drawing on the work of Russian psychologist Lev Vygotsky about psychological development in children, that EFs in young children are typically learned through play and that successful play requires self-regulation, which is a major component of EF. Regarding assessment of EFs, the authors give an extensive and very useful listing and review of both Russian and American style approaches. The latter includes measures and questionnaires such as the oft-used Brief Rating Inventory of Executive Function (BRIEF) and the McClosky Executive Functions Scale (MEFS) and the former uses a more cultural-historical approach. Beyond questionnaires, well-known EF measures noted include the Delis-Kaplan Executive Function System (D-KEFS), and the Wisconsin Card Sorting Test (WCST) and

Reitan's Halstead Category Test (HCT), considered as the gold standard, all with intriguing methods of measuring brain-behavior function.

In the subsequent and fascinating chapter on "*Understanding 'Hot and Cold' Executive Functions in Children and Adolescents*," co-authors Nemeth and Chustz elucidate that once EFs have been measured, processes can be taught to determine the efficacy of utilizing these functions. The process involves asking children to ask themselves the following five questions: (1) What is the problem? (2) How can I solve it? (3) Am I using an effective plan? (4) Was my plan successful? and (5) Did my feelings help or hinder my success? The authors point out that the fifth question in this process, which focuses on Emotional Intelligence, is frequently missing in analyses. Consistent with this, research emphasis is often focused on what is called "Cold" EFs, referring to analytic processes in cognition, according to the work of Chavez-Arana and colleagues published in 2018. Yet, an understanding of the affective component of EFs, which is referred to as the "Hot" EFs, is also necessary, for a thorough analysis. Leaving this aspect out can lead to faulty conclusions.

We all know what hot and cold means in life. In neuropsychology, "cold" EFs refer to logical functions and "hot" EFs refer to emotional functions. Children with deficits in cold EFs may have difficulties concentrating on homework, make careless mistakes or misunderstand instructions while those with deficits in hot EFs can be disruptive, make risky decisions and have angry outbursts. In what makes perfect sense, integrating cognition and emotions is crucial for adaptive functioning.

In research, practice and learning settings, it is interesting to learn from the chapter that more focus is being placed on an important aspect of the EFs known as Executive Functioning Dysregulation. This dysregulation is defined by Chavez-Arana and colleagues as characterized by impairments in cognitive, behavioral, and emotional regulation.

The ongoing debate between IQ vs. EQ (emotional intelligence) — that gets ongoing attention — is addressed in the chapter. The authors maintain that as opposed to being opposites, IQ and EQ are inter-related, since it is well known that emotional states — like anxiety and/or depression — which are evident in EQ, can interfere with cognition, evident in measuring IQ. Making the argument here again for a comprehensive view, Nemeth and Chustz emphasize that "for successful problem solving, both the hot and cold aspects of executive functions must be integrated."

Such integration is especially important and necessary in learning settings. Regardless of age, individuals need to be able to integrate their thoughts and feelings in order to learn. This process starts in early age. In their chapter, co-authors Carla Anauate and Edna Maria Severinno Peters Kahhale, both Brazilian neuropsychologists, focus on early intervention, from the prenatal stage to the postnatal stage of children's development. In their contribution on "*Preparing Children to Learn Through Early Intervention*," ten spheres of development are identified: Passive and Active Postural Control, Visual, Manipulative, Locomotor, Hearing and Speech, Talk and Speech, Social Interaction, Personal Autonomy, and Cognition.

Several interesting studies are reported, including on attachment, that thoughts of a mother and music affect physiological reactions in a fetus, and lead to familiarity

connections of the baby to a mother's voice. Research is also noted that has become common beliefs, for example, that babies who undergo stress during pregnancy have less ability to withstand stress in adult life and that babies of anxious mother are more fearful.

The authors make several other important observations about the importance of attachment and brain development, verbal regulation of behavior within the school setting, and playful activities in learning, given that "to play is to learn." They conclude that, "the brain develops better within a stable environment of support and low levels of stress."

Expanding on the concept of stress from the previous chapter, chapter authors and Russian psychologists Dr. Natalia Karpova and Dr. Elena I. Nikolaeva, reaffirm the theme of the book that modern research is an extension of the work by Luria and Reitan. The authors, Karpova, professor at Moscow State Psychology-Pedagogical University, and Nikolaeva, professor at Herzen State Pedagogical University in St. Petersburg, Russia, note that stress can have a significant effect on the development of speech. In their chapter on "*The Role of Family in Speech Rehabilitation of Children with Learning Disabilities: Clinical Observations by Luria & Reitan*," they explore the causes and remediation of communication problems like stuttering, a speech problem with a complex psychological structure. Besides stress, they explain other factors that impact speech development, including genetics and family relations. To assess communication, the authors recommend family intervention and use of parts of the Luria battery. Four intervention stages are cited: diagnosis, invention, active family group intervention, and a two-week course of supportive family therapy.

The value of considering relationships (e. g. in parent-child interactions and through "communities") in the overall development of children with special educational needs (SEN) is highlighted in the chapter by Vitaly V. Rubtsov and Andrey V. Konokotin on "*Formation of Higher Mental Functions in Children with Special Educational Needs Via Social Interaction*." The chapter co-authors, Rubtsov, chair of the All-Russian Federation of Educational Psychologists and honorary professor of the University of Wisconsin, and Konokotin, his doctoral student at Moscow State University of Psychology and Education, cite the interconnectedness of communication and mutual understanding as crucial variables in helping SEN children develop higher mental functions (HMF). This point of view is consistent with those of Vygotsky, who maintained that social development and learning go hand in hand. The authors identify four types of learning communities: (1) precooperative, (2) pseudocooperative, (3) cooperative, and (4) metacooperative, and conclude that, in SEN children, social interactions with normally developing children (ND) are essential for the development of HMF.

Both SEN and ND children can have learning disabilities. In this regard, Louisiana clinical neuropsychologist Dr. Fernando Pastrana Jr., who trained under Nemeth, presents his interesting clinical work done with colleagues at Nemeth's Neuropsychology Center of Louisiana (NCLA), namely, co-authors educational diagnostician Patricia A. McElroy, statistical analyst Scott Johnson and clinical extern Kayla McKenzie Chustz. In their chapter on "*Laying the Framework for Developing Executive Functions in Tweens with Learning Disabilities*," Pastrana describes a unique "Build-A-Brain" program for tweens

(aged 10–14) consisting of small group interactions to facilitate the development of their Executive Functions (EFs). The 14-session summer program encourages children to create, communicate, and compete. Emphasis is placed on activities that facilitate their behavioral, emotional, social, and mathematical development. The Luria and Reitan models of intervention were combined for optimal success. The children, selected for their impaired mathematical skills, were seen twice a week, on Tuesdays for analysis and evaluation, and on Thursdays for intervention. Parent or parent figures participated in the Thursday sessions via a two-way mirror, so that they could transfer the observed techniques to their home setting. A computer program, MobyMax, was utilized in the home setting to improve mathematical skills. Both hot and cold EFs — as described in the chapter by Nemeth and Chustz — were taught in order to maximize children's problem-solving abilities. The children were followed over time, using a wide variety of measures that are as fascinating as the project, showing significant improvements in their problem solving, emotional, social, and mathematical skills. The entire process of the sessions is described, making a really fascinating read of the innovation. Activities like “Guess the Feeling” the “Tinker Toy Activity” and the “Seashore Rhythm Test” evoked my great interest, and agreement that these can be great fun for youth while being exceptionally useful to build their executive functioning. I wouldn't mind participating in such a workshop myself.

Clinical applications are essential to show that the theories actually have a positive impact. This is especially important after environmental trauma, when the executive functions (EFs) of children and adolescents are threatened and must be rebuilt. A major review of research in the field, by psychologist Robin Gay with Dr. Nemeth and myself, showed that trauma and grief after major disasters has a significant impact on children's cognitive processes, as well as on their general mental health. Over many decades of work “on the ground” in settings around the world, I have developed and implemented workshop interventions and trainings to help children cope. The implications, positive impact and applications of this approach on the neuropsychology of children is described in my chapter in this volume, on *“Rebuilding Executive Functions in Environmentally Traumatized Children & Adolescents.”* The activities in my model, carried out in a group setting, boost three major aspects of functioning shown by research to be essential for “building back better”: resilience, empowerment and community connection. Workshops of my toolbox of activities (in my “Global Kinds Connect Project”) designed around these solid psychological principles, have been shown to be effective according to assessments conducted before and after the workshops. The model has been applied in the “Anniversary Wellness Workshops” conducted by myself and Dr. Nemeth in Louisiana to help children — and adults — cope with reactions triggered on the anniversary dates of the natural disasters in that state. Further, the interventions were shown to be adaptable to diverse settings and cultures throughout the world, including after epidemics in Sierra Leone and the Congo, and also after natural disasters, including in Haiti, Japan, China, Sri Lanka, Iran and the USA. The activities revitalized EFs and also self-efficacy and socialization. The activities and techniques in my interventions are relevant to the Reitan's REHABIT system of expressive and receptive language for verbal skills, integration of abstract reasoning and logical analysis skills, and restructuring of visual-spatial, sequential,

and manipulatory skills. In the process, children's left, central, and right hemisphere processing skills, as identified by Reitan, are reintegrated in my model workshop that is fun for youth, but where the interactive activities are also grounded in solid neuropsychological and psychological principles. The multisensory activities, which I describe in detail, trigger neurocognitive process while restoring trust, ensuring safety, assuring attention, moving energy, and boosting self-confidence. Activities apply to varied learning styles, including for kinesthetic learners, visual learners, and auditory learners. Consistent with my advocacy at the United Nations where recommendations are usually made, I propose calls to action to all stakeholders about processes, programs, policies, training and research to promote and preserve children's neurocognitive function in the wake of environmental trauma.

The importance of a consideration of complex medical conditions in neuropsychologically challenged children is emphasized in the chapter by Louisiana neuropsychologist Dr. Tracy W. Olivier, who was fortunate to be another one of Nemeth's trainees and who also subsequently went on to success in the field. I remember well how Darlyne promoted Tracy's work, included her in presentations we made at professional conferences and also in the book she wrote on resilience. In Olivier's chapter on "*Neuropsychological Evaluation of Children with Complex Medical Concerns*," she emphasizes that interventions with these children must begin with comprehensive pediatric neuropsychological evaluations, taking into account their medical condition and treatment settings. For child patients from an early age until age 18, the neuropsychologist and medical specialist must work together to gather comprehensive information and determine the appropriate neuro-medical intervention. In her role as the head of Pediatric Neuropsychology at Our Lady of the Lake Children's Pediatric Development and Therapy Center in Baton Rouge, Louisiana, Olivier works tirelessly with medical professionals to ensure comprehensive assessments and appropriate interventions for neuropsychologically challenged children. The assessment includes the initial interview with the child and family members, a records review, comprehensive testing, a neuropsychological report, and a feedback/follow up reevaluation process. It is not uncommon for these children to have been diagnosed with other conditions, including pediatric cancer, acquired and traumatic brain injuries, and/or intellectual disabilities. At times, performance validity tests may be included. Olivier concludes that "interdisciplinary care is becoming the standard in most health care settings."

Medication or not? It's a question commonly and responsibly considered in all cases of treating dysfunction. It's a question addressed in the chapter "*When Medication may be Helpful*," by co-authors Dr. John Flatt, pediatric neurologist and chief medical officer of the Jason Foundation to prevent child suicide, and Nemeth. At times, they advise, neurobehavioral evaluations and interventions may not be enough and medications may be helpful. In all cases, though, psychological and physical symptoms must be assessed before medication management is chosen. A combination of thorough neuropsychological evaluations and assessment of symptoms and behavior yields the most useful indications for the appropriate course of treatment. Pediatric neurologists and prescribing pediatric neuropsychologists may be called upon to offer medication management for the following disorders that are all exceptionally important: attention deficit and hyper-

active disorders, sleep disorders, seizures and epilepsy disorders, headaches, tic disorders, obsessive-compulsive disorders, aggressive behaviors, drooling, and constipation. To reduce trial-and-error approach to deciding about medication management, pharmacogenomics assessments can be used, such as the Genomind Genecept Assay. In most cases, behavioral intervention is preferable to medication management. And, in all cases, the child's environment makes a difference, including predominantly the family situation, as Flatt and Nemeth note, "good parenting is the first step in this process... medication may help along the way, but it is not the answer. It is merely part of the process." A caring treating professional is also essential. Ultimately, in what I determine can be called the 5 A's, the authors conclude that all children require attachment, attention, acceptance, approval and acknowledgement, which the authors conclude adds up to what we would all agree matters for children's healthy development: love.

With all these rich perspectives presented, this volume presents the most up-to-date thinking about the field of neuropsychology for children, by world experts who are the second generation of those trailblazing neuropsychologists Luria and Reitan and the "new pioneers" building on the shoulders of their mentors, and even by some of the third generation, namely students building on the work of their teacher, co-author Nemeth herself. The contributions focus on the cross-fertilization of the ideas of the most respected founders of neuropsychology, Luria and Reitan, as well as the modern orientation of merging medicine and neuropsychology in the prevention and treatment of children's difficulties. These difficulties include learning disabilities, behavioral disturbances, emotional imbalance, school maladjustment, and parent-child difficulties faced by so many children worldwide in all cultures.

In their concluding chapter on "*Implications for the future*," the volume editors Nemeth and Glazman offer three recommendations for the future: assessment, intervention, and research. The goal is to help children around the world become more resilient, following the definition offered by Nemeth and Olivier, of a 3-part process: being firmly grounded in today and benefitting from yesterday in order to develop better tomorrows. The valuable groundwork in neuropsychology laid by the brilliant pioneers of the field, Luria and Reitan, has given rise to the present knowledge and perspectives reflected in this volume by the "new" generations of pioneers, advancing the field to promote more cognitively and emotionally healthy young people. The ultimate and inspiring message is that all children must be "accepted, protected and respected." Thus, this volume bodes well for children and their families, and for the future of our world.

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IN MEMORY OF A. R. LURIA

ПАМЯТИ А. Р. ЛУРИЯ

Luria in Kisegach. Part 2

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Лурия в Кисегаче. Часть 2

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Abstract. This is the second part of the article on the work and life of A. R. Luria in Kisegach, which presents the unique document *The Work Diary*. This notebook was used by him for daily records of patient studies. It is kept in the family archive of Luria. Comments on the *Diary* are written on the basis of his autobiographical book (Luria A. R., 1982; Cole, Levitin, & Luria, 2006); the memoirs of his daughter, Elena Luria, in her book about her father (Luria E. A., 1994); as well as the memoirs of his colleagues. This part of the article publishes entries in the *Diary* from March 15 to November 13, 1942. The introduction to the records tells about the scientist's colleagues who worked with him in the hospital. These are such well-known psychologists as B. V. Zeigarnik, A. V. Zaporozhets, S. Ya. Rubinstein, E. S. Bein, O. P. Kaufman. The article explains the reason for the myth that during the war A. V. Zaporozhets worked only in the hospital in Kaurovka under the supervision of A. N. Leontiev. In this regard, we are talking about the Kharkov School of Psychology, the areas of work of L. S. Vygotsky, A. R. Luria and A. N. Leontiev in the years 1932–1934. In general, the article shows the intensive practical and theoretical work of the scientists in Kisegach hospital.

Keywords: A. R. Luria; neuropsychology; aphasia; war trauma; restoration of brain functions; Kharkov School of Psychology; L. S. Vygotsky; A. N. Leontiev; B. V. Zeigarnik; A. V. Zaporozhets; S. Ya. Rubinstein; E. S. Bein; O. P. Kaufman

Аннотация. Это вторая часть статьи о работе и жизни А. Р. Лурия в Кисегаче, которая представляет уникальный документ «Дневник работы». Общая тетрадь с таким названием служила ученому для ежедневных записей о проведенных исследованиях больных. Она хранится в семейном архиве Лурия. Комментарии к «Дневнику» написаны по материалам его автобиографической книги (Luria A. R., 1982; англоязычное издание — Cole, Levitin, & Luria, 2006), по воспоминаниям о Кисегаче его дочери Елены Лурия в ее книге об отце (Luria E. A., 1994), а также по воспоминаниям коллег. В данной части статьи впервые публикуются записи в «Дневнике» с 15 марта по 13 ноября 1942 г. Во введении к записям рассказывается о сотрудниках ученого, работавших с ним в госпитале. Это такие известные психологи, как Б. В. Зейгарник, А. В. Запорожец, С. Я. Рубинштейн, Э. С. Бейн, О. П. Кауфман. В статье разъясняется причина возникновения мифа, что в годы войны А. В. Запорожец работал только в госпитале в пос. Кауровка под руководством А. Н. Леонтьева. В связи с этим речь идет о харьковской школе психологии, о направлениях работы Л. С. Выготского, А. Р. Лурия и А. Н. Леонтьева в 1932–1934 гг. В целом статья показывает интенсивную практическую и теоретическую работу ученых в госпитале Кисегача.

Ключевые слова: А. Р. Лурия; нейропсихология; афазия; военная травма; восстановление мозговых функций; харьковская школа психологии; Л. С. Выготский; А. Н. Леонтьев; Б. В. Зейгарник; А. В. Запорожец; С. Я. Рубинштейн; Э. С. Бейн; О. П. Кауфман

The second part of the *The Work Diary* by A. R. Luria includes his records from March 15 till November 13, 1942. The following entries date back to 1943. The size of the records is smaller: the records for the first two months are almost as much as for the rest of 1942. There are no records from April 25 till June 20, and from July 27 till August 22. Luria departs for Moscow for 2 months and for Kazan almost for a month. There are also no entries from March 27 until April 15, from June 24 till July 1, and then again an interruption until July 14.

Tamara Osipovna Ginevskaya, the wife of Alexander Vladimirovich Zaporozhets, explains one of the reasons for the short absences of A. R. Luria. At the request of Elena Luria she wrote memoirs about Luria:

This was a remarkable person — Luria! The complete absence of swagger, selfishness, he displayed readiness for self-sacrifice for the sake of business... For weeks, he was lying on the floor of the printing house in Chelyabinsk where his works were printed. There, he ruled, edited manuscripts, rode in a cart, sometimes arriving home for a day or two, no more. Weary and hungry. A bit of food and sleep — that was all his rest. While he was sleeping, Lana cleaned his suit, wondering how it hadn't fallen apart at all. It was all covered with hay, grass and dirt, just like Alexander Luria himself (Luria E. A., 1994, p. 101).¹

¹ Lana — Lana Pimenova Lipchina, A. R. Luria's wife.

What works did T. O. Ginevskaya mean? In the list of Luria's works of 1942, there were two articles published in issues 1–2 and 4 of *Neuropathology and Psychiatry* but they were not published in Chelyabinsk. In the list of works of A. V. Zaporozhets, there was a brochure on *The Methodology of Restorative Occupational Therapy for Injuries of Upper Limbs* by A. V. Zaporozhets and S. Ya. Rubinstein with the subtitle *The Administration of Hospitals in the Chelyabinsk Region, 1942*. A. R. Luria was likely to edit various methodological letters, conference proceedings and collections of the works of the hospital staff in the Chelyabinsk region.² There are similar materials from different regions on the Internet (see *Figure 1*). One might think that the exchange of experience was an important task for the staff of evacuation hospitals which Luria tried to perform. Of course, he was collecting materials for future publications. For these materials the *Diary* data was not enough.

If we compare the records about patient Karabanov (March 20–26) with his description in *Traumatic Aphasia* (Luria A. R., 1947, pp. 79–80 / 1970, pp. 180–181), we could see much more data in the book. This suggested that in addition to the diary, Luria kept other special records about certain patients. Some patients were described only in those special records. For instance, there were no records about patient Zas in the diary, the character and co-author of the book *The Man with a Shattered World* (Luria, 1971/1972), although Luria worked a lot with him.

In the diary, as in *Traumatic Aphasia*, Luria often mentions his colleagues who work with him in Kisegach. All of them deserve a special story.

Bluma Vulfovna Zeigarnik (1901–1988) was born in Lithuania. There she graduated from a female gymnasium and, preparing to enter the university, passed the exams for the broader curriculum of male gymnasiums. In 1919, she married Albert Ya. Zeigarnik.



Figure 1. Publications of evacuation hospitals

² More than 80 evacuation hospitals worked in the Chelyabinsk region in 1942–1943 — according to archive74.ru evakogospitali_cho.pdf

They went together to Germany to study. In 1922, Bluma entered the faculty of philosophy at the University of Berlin. There she was carried away by lectures of Kurt Levin. Under his supervision, she wrote a thesis *Memorizing Completed and Uncompleted Actions*. The article on this theme (Zeigarnik B., 1927) made B. Zeigarnik the world-famous author of *The Zeigarnik Effect* (see Figure 2).

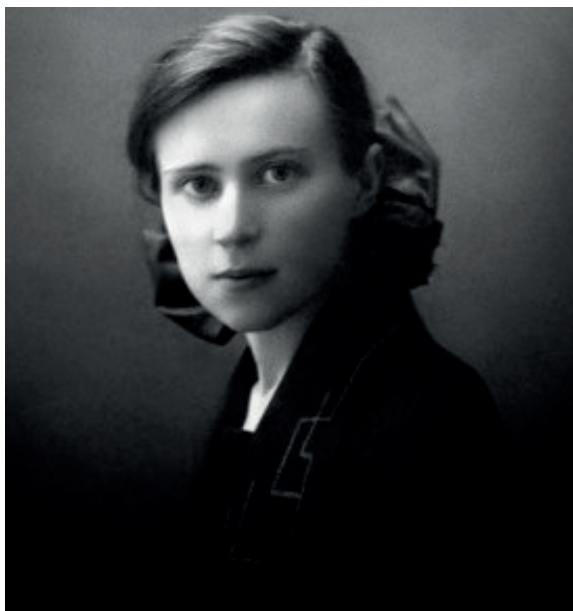


Figure 2. Bluma Zeigarnik. 1922

After graduating from the University (1925) and defending her thesis (1927), she worked at the University of Berlin as a freelance employee, and her husband — at the Soviet trade office in Germany. In May, 1931, they moved to Moscow. B. Zeigarnik met L. S. Vygotsky³ through her fellow student at the University of Berlin, Gita Birenbaum,⁴ and made reports in the research group of Vygotsky on June 10 and 17 (Akhtutina, 2012). In his letter of June 12–16 to A. R. Luria, L. Vygotsky wrote about the first report by B. Zeigarnik: “Well-done. Gracefully. Cleverly. A little from ladies’ needlework. Quite in Lewin’s style.” Vygotsky worried about B. Zeigarnik’s employment and noticed: “She wants where we are. The right idea: Birenbaum, she, Kazmina + we altogether are power” (Vygotsky, 2004, p. 27). In the same 1931, Bluma Zeigarnik began working as a research

³ B. Zeigarnik met A. R. Luria earlier, in 1929. On his way to America to the IX International Psychological Congress, Luria stopped in Berlin and met with Levin and his students (Luria E. A., 1994, p. 44).

⁴ Gita Vasilievna Birenbaum (1903–1952) was a psychologist and a member of Vygotsky’s circle. In 1923–1925 and 1927–1930, she studied at the University of Berlin. Under the supervision of K. Levin, she wrote a well-known thesis about forgetting intentions (Birenbaum, 1930). On arriving in Moscow, she worked in the Institute of Higher Nervous Activity at the Communist Academy (later, The All-Union Institute of Experimental Medicine, AIEM). Then she worked in psychiatric clinics in Moscow (named after Solovyov), Ulyanovsk and Ryazan.

fellow at the Institute of Higher Nervous Activity where G. V. Birenbaum was already working. Since 1932, it became a department of the All-Union Institute of Experimental Medicine (AIEM). In the “Donskaya” clinic of AIEM Zeygarnik and Birenbaum under the direction of L. S. Vygotsky conduct pathopsychological and neuropsychological work (see Birenbaum & Zeygarnik, 1935; Nikolaeva & Polyakov, 2016; Zavershneva & Van der Veer, 2017, chapters 19 and 25; Zeygarnik, 1934; Zeygarnik & Birenbaum, 1935).

In summer 1940, Bluma’s husband was arrested on a charge of espionage. He was sentenced to ten years without the right of correspondence, which usually meant shooting. B. Zeigarnik stayed with two children one of whom was less than a year old and the other was six years old. After the arrest of her husband, she went often to Lubyanka⁵ to find out anything about his fate. There financial difficulties emerged. Alexander Romanovich Luria supported Bluma Zeigarnik both emotionally and financially. When the war began, he facilitated the appointment of B. V. (a Jewess, a wife of an enemy of the state, suspiciously fluent in German!) to the branch of the clinic of nervous diseases of the AIEM in Kisegach.

Elena Luria told about Kisegach that there was not enough food in winter 1941, and their family cooked soup of dried potatoes. It was even harder for B. Zeigarnik with two children. She was supported; first of all, by A. R. Luria and S. Ya. Rubinstein. Compare the photos of 1922 and 1942 (*Figure 2 and 3*) — they transmit the idea how harsh Bluma’s life was better than words. But she encountered not only blows of fate but was blessed with its gifts as well! One may read this in her grandson’s story, Andrey Zeigarnik (Zeigarnik A. V., 2001). The collaboration of Zeigarnik and Luria in Kisegach is also described by E. D. Homskaya (2001).

The working experience in the hospital was depicted in several articles by B. Zeigarnik during the war and post-war time (for instance, Zeigarnik B. V., 1943a, 1943b, 1947).



Figure 3. Bluma Zeigarnik (sitting to the right) and Esther Bein (sitting to the left) in Kisegach in 1942. The third person is unknown (Olga Kaufman?)

⁵ Lubyanka is a common name for the NKVD/KGB/FSB building on the Lubyanskaya square.

Both authors of these comments to *The Work Diary* were acquainted with B. V. Zeigarnik. She was a small, slim old woman (she never lectured from the pulpit because she would not be seen from there). Her lectures were perfect, she told much about Kurt Lewin and shared her love for her two teachers — Kurt Lewin and Lev Vygotsky. Students and staff reciprocated her, affectionately calling her “Blumochka.”⁶ One of the authors, Tatyana Vasilyevna Akhutina, has carefully preserved the book of Zeigarnik *Pathopsychology* dated 1976 that was presented by Bluma Zeigarnik and signed by her (see Figure 4).

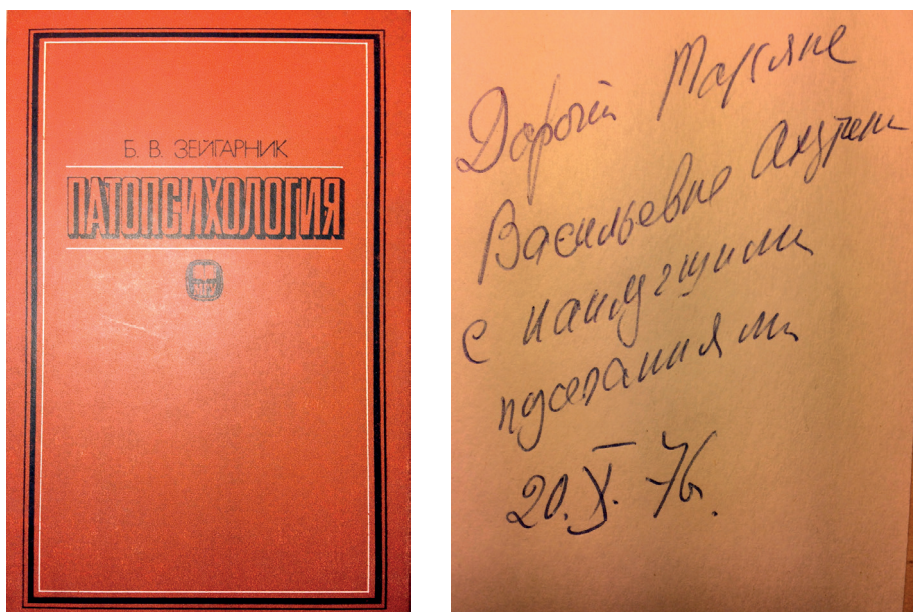


Figure 4. B. V. Zeigarnik's inscription on her book “Pathopsychology” (Abnormal Psychology) — “To Dear Tatyana Vasilyevna Akhutina with best wishes” 20.X.76

Alexander Vladimirovich Zaporozhets (1905–1981), his wife and co-worker Tamara Osipovna (Iosifovna) Ginevskaya (1905–1992) were psychologists of Vygotsky circle. A. V. Zaporozhets was one of the famous “five”⁷ students, the closest students of Vygotsky.

There is a myth about the work of Zaporozhets during the war which is widespread on the Internet and repeated in Wikipedia: “In 1941–1943, he worked at the experimental hospital for movements rehabilitation at the Institute of psychology (the Sverdlovsk region)” (“Zaporozhets Alexander Vladimirovich,” 2020). It needs clarification: first, the hospital was not experimental; secondly, not for the rehabilitation of movements; thirdly, not one but two. The first hospital was at the AIEM (the Chelyabinsk region) and the second — at the Institute of Psychology (the Sverdlovsk region). Where did this long-lasting myth come from?

⁶ Blumochka is a diminutive form of the name Bluma.

⁷ “The Five” was a group of students of the 2nd MSU: Lidia Bozhovich (1908–1981), Rosa Levina (1908–1989), Natalia Morozova (1906–1989), Lia Slavina (1906–1986) and Alexander Zaporozhets (1905–1981).

Zaporozhets was born in Kiev. In his early youth, he was an artist and played in the Les Kurbas theatre. Since 1925, he studied at the 2nd Moscow State University (MSU) where he made friends with four classmate girls. Luria recalled the emergence of “the five”:

At that time, I occupied the position of the head of the Psychology Laboratory at the Institute (*Academy* — T. A., N. P.) of the Communist Education named after N. K. Krupskaya. In order to attract University students to scientific work, I organized a student psychological circle, in which we discussed L. S. Vygotsky’s ideas (Luria A. R., 1982, p. 33).⁸

A. V. Zaporozhets recalled that in the experiments fulfilled by “the five” under A. R. Luria’s supervision, children at different ages (from pre-schoolers to adolescents) had to memorize a number of words with the help of a pictogram, that is, a graphic image of the memorized material. The analysis of age-related differences showed the transition from external to internal mediation of the memorization process (Zaporozhets, 1982, p. 14–15). Describing those experiments, Luria noted: “This colossal work has remained unpublished but it has given birth to much more important fruit — five first-class psychologists...” (Luria A. R., 2003, p. 272). In 1930, A. Zaporozhets graduated from the University, and at the end of 1931, he moved to Kharkov.

Tamara Ginevskaya described the moving and life in Kharkov:

The debate still flared up, and finally, Lev Semenovich was “killed,” and his scientific school was defeated. Having found neither emotional nor material support a small group of Moscow scientists (Luria, Leontiev, Bozhovich and Zaporozhets) went, as it was said then, “on a long business trip.” They moved to Kharkov — the capital of the Ukraine at that time — to a new psychoneurological clinic established by Professor Rokhlin at the psychiatric hospital. It was Vygotsky who negotiated the work in Kharkov...

We settled in a large apartment that Professor Rokhlin had rented for the Moscow community. For some time, we lived in it really all together: we, Luria, Bozhovich and Leontiev but soon, only Luria and us stayed there (there were two rooms)... (cited from the book by Luria E. A., 1994, p. 69; see also Ginevskaya, 2005) (see *Figure 5*).⁹

It is known that according to the contract, Luria and Leontiev had to be in Kharkov for 20 days each month, and the rest of the time they could live in Moscow. There, in May, 1933, Luria accidentally met Lana Pimenovna Lipchina after a three-year break. She be-

⁸ Luria worked both at the Academy of Communist Education and at the 2nd MSU. Their buildings were opposite each other.

⁹ In his letters to Luria, Vygotsky wrote about the negotiations with Rokhlin about moving to Kharkiv (Vygotsky, 2004). In the fall of 1931, Vygotsky was approved as the head of the department of genetic psychology in the State Institute of personnel training of People’s Commissariat of Healthcare of the Ukraine (Vygodskaya & Lifanova, 1996, p. 129; Yasnitsky, 2008, p. 93). L. Vygotsky planned moving to Kharkov but the state of his health and responsibility for a large family (two daughters, the nephew, his wife, mother and sisters) were the reasons (perhaps, not the only ones) why Vygotsky could not do this.



Figure 5. Alexey Leontiev, Lydia Bozhovich and Alexander Zaporozhets (the leaders of the Kharkov group — the early 30s)

came his wife in July. This event triggered his decision to leave for Moscow. In 1934, Luria and Leontiev returned to Moscow, the former — in March, and the latter — in October (Yasnitsky, 2008, p. 94).

A brief introduction into scientific developments in Kharkov. In 1932, L. S. Vygotsky delivered a report *On the Plan of Works on Genetic and Clinical Psychology*. Luria's transcript of the report is preserved in his archive. Vygotsky set the task of "studying higher psychological functions from a systemic point of view," and to solve this problem, Vygotsky suggested two ways: the analysis of "disintegration and genesis" (quoted from the article Akhutina, 2012, p. 9). At the same time, he concretised the principles of the analysis of disintegration, in essence, formulating the principles of the future neuropsychology (Ibid.). The object of the analysis was to be speech/language and non-verbal functions. Vygotsky focused on speech which was important to carry out another strategic plan — the study of the dynamic semantic structure (or structure of senses) of consciousness. Implementing the plan for clinical psychology, Vygotsky and Luria entered the medical faculty of the Kharkov Psychoneurological Institute, combining full-time and distance learning. Luria worked intensively in the clinic in Kharkov, while Vygotsky examined and analysed patients in Moscow.

A. N. Leontiev put forward a different program. He accuses Vygotsky of "word-centrism" and contrasts this with the study of action and activity. Here is how he assessed the situation in Kharkov, dictating his autobiography to his son in 1976: "The confrontation of two lines towards the future. My line is a return to the original theses and their development in a new direction. The study of the action (= an object-related action)... Vygotsky's line is affective tendencies, emotions, feelings" (Leontiev, A. A., Leontiev, D. A.,

& Sokolova, 2005, pp. 375–376). A bit earlier on that day, Leontiev spoke of Vygotsky: “The closure of all psychology to meaning. Crept out — aphasia, schizophrenia, theses on localization (neuropsychology), etc.”¹⁰ (Ibid., p. 374). And he continued after: “The Kharkovites grouped around me, not A. Luria, since Bozhovich and Zaporozhets preferred working with me, and Galperin (local) was also reached out to me... A. Luria did not fit in the society in Kharkov” (Ibid., p. 375), see *Figure 5*.

In Kharkov, Zaporozhets became the closest assistant and friend of A. N. Leontiev. At the same time, according to V. P. Zinchenko:

Undoubtedly, A. V. Zaporozhets was also a leader but an inconspicuous and non-garish leader. He was a moral leader... Consciously or unconsciously, he kept a low profile. For example, only from A. N. Leontiev’s notes to his text about the hypothesis of the genesis of the psyche and its experimental verification, I learned that the both things were made up together with A. V. Zaporozhets (Zinchenko, 2011, p. 367).¹¹

In addition, in the preface to this book it is written that it was Zaporozhets who compiled the notes to it. It was the end of the 50s when Alexander Zaporozhets was already a distinguished scientist and the head of the laboratory but it was natural for him to offer that help. V. P. Zinchenko (2011) remarked “an infinite kindness” in A. V. Zaporozhets. K. M. Gurevich recalled about Alexander Zaporozhets: “You know, this is an exceptional person, absolutely exceptional... Always ready to do everything that is necessary to you, at the same time, he always [made it clear that] he was interested in that” (Leontiev A. A. et al., 2005, p. 255).¹²

We should note that the list of the themes by Zaporozhets in Kharkov included not only A. N. Leontiev’s topics. On the one hand, these were *The Study of the Meaning of the Function of the Practical Activity of the Child* (co-authored with P. I. Zinchenko) and *Preverbal Forms of Thinking*. And on the other hand, these were *The Development of Reasoning in the Child* (co-authored with G. D. Lukov), *The Semic Analysis of Children’s*

¹⁰ “Crept out” — this was said about the last work of Vygotsky, his neuropsychological testament, the theses of the report *Psychology and Localization of Mental Functions* (Kharkov, 1934)! A bright representative of the Kharkov group, L. I. Bozhovich, expressed another opinion about this direction of Vygotsky’s work. Her main problem was the development of personality (for her biography, find Gutkina, 2008). In her last article, she wrote that the study of the problems of underdevelopment and disintegration had allowed Vygotsky to approach the concept of *Psychological Systems*. She claimed: “...in essence, L. S. Vygotsky has overcome the crisis in psychology through studying the genesis and structure of higher mental functions and creating a method for studying them” (Bozhovich, 1988, p. 108).

¹¹ Zinchenko spoke about the book by A. N. Leontiev *Problems of the Development of the Mind* (1959/1965), for which the author was awarded with the Lenin prize in 1963. In a footnote (1959/1965, p. 50), A. Leontiev wrote: “...the hypothesis about the genesis and nature of sensitivity was developed by the author jointly with A. V. Zaporozhets (1936).”

¹² Kindness also distinguished L. S. Vygotsky. To the question of G. L. Vygodskaya about her father, what personality trait would you single out, A. R. Luria answered: “His mind. Genius,” D. B. Elkonin — “Kindness. Breadth. Scientific generosity,” A. V. Zaporozhets — “Nobility. High morality. Delicacy,” N. G. Morozova — “A characteristic feature of Lev Semenovich was his desire to help” (Vygodskaya & Lifanova, 1996, p. 160).

Speech, and *The Semic Analysis of Language Meanings Acquired at School* (co-authored with V.I. Asnin) (see Galperin, 1934; Yasnitsky, 2008). The term *semic analysis* was used by A.R. Luria in the 1930s but it was introduced into active use by Vygotsky. On December 5, 1932, Vygotsky gathered his students for an “internal conference” and made the famous report on *The Problem of Consciousness*. In its conclusion, he said: “The semic analysis is the only adequate method for the study of the systemic and semantic structure of consciousness” (Vygotsky, 1997, p. 137 / 1982, p. 166). We learned from *L. S. Vygotsky’s Notebooks* that on the eve of the main report, Vygotsky invited Luria, Leontiev and “the five” to *The Symposium — On the Prospect of Our Research* (Zavershneva & Van der Veer, 2017). Vygotsky’s records preserved the plan of his report including the rationale of “the necessity for a new stage of the research” and his notes during the discussion, i.e., the schemes of the response to each participant. Thus, Vygotsky cared about their further joint work. The report on December 5 lasted seven hours with a two-hour break; the discussion took another day, December 9.

A.N. Leontiev in his oral autobiography said: “The apogee of discord — 1932 (after the report), the beginning of 1933” (Leontiev A. A. et al., 2005, p. 376).

In summer 1934, Vygotsky died. And this event changed the evaluation of the similarity and discord. The differences in the positions of L. S. Vygotsky and A.N. Leontiev which seemed “terribly” fundamental, turned out to be not that serious within the time perspective. Vygotsky understood this before, he tried to gather all his students at AIEM’s when this opportunity occurred in January 1934. This was also understood by Leontiev, who in 1977, speaking about Vygotsky, admitted: “The alternative of 1930–1931 was not an alternative but a necessary line of the movement of the psychological research. Not Either-Or, but necessarily And-And” (Ibid., 2005, p. 48). It was claimed in 1977, but the simplified cliché “The Kharkov school is Leontiev, and Zaporozhets is Leontiev’s alter ego” is still reflected in literature. So, the myth about one hospital grew out of a more general myth about the Kharkov period of life of A. V. Zaporozhets. Let’s consider his work in hospitals.

Neurosurgical evacuation hospital No. 3120 in Kisegach began working in August 1941. It provided facilities for a clinic of nervous diseases of the AIEM, director N. I. Grashchenkov. A. R. Luria, A. V. Zaporozhets, S. Ya. Rubinstein took part in its establishment, in particular, in the organisation of labour workshops. Later, S. G. Gellerstein,¹³ B. V. Mitlina and others joined the work on occupational therapy (Zeigarnik & Rubinstein, 1982). The first important results in the rehabilitation of movements and working ability were described in the brochure of A. V. Zaporozhets and S. Ya. Rubinstein *The Method of Restorative Occupational Therapy for Injuries of Upper Limbs* (1942, p. 28).

From Luria’s *The Work Diary*, it was clear that on March 18, 1942, he had a conversation with Zaporozhets. They discussed “the concept of the rehabilitation role of compensation.” After these words, Luria put two exclamatory marks.

¹³ S. G. Gellerstein (1896–1967) — Dr. in Biology, Professor, one of the founders of the Soviet Psychology and Psychophysiology of Work.

Let us move on to the hospital in Kaurovka where A. V. Zaporozhets worked with A. N. Leontiev. In the chronicle of Moscow State University dated 1942 and published in the newspaper of the Moscow University in May 2004, one might read: “September 6. A Rehabilitation clinic at the Research Institute of Psychology of the Moscow State University was established in hospital 4003. The clinic aimed at developing therapeutic-pedagogical methods of the correction of motor and sensory defects as a result of military injuries... Professor A. N. Leontiev was appointed as Director” (Chronicle of 1942, 2004).¹⁴

Zaporozhets revealed his attitude to the moving to Kaurovka in his letter to A. N. Leontiev dated 6.11.1942:

These days I work very productively (contrary to reason). I have finished a brochure on the rehabilitation training and thought up some interesting things about the principles of the rehabilitation and about the structure of voluntary action. I will tell you when we meet... Has anything been undertaken about Danya (D. B. Elkonin)? I really want to be together. I hope it will be soon (see Sokolova, 1995, p. 8).

It is not known when Zaporozhets and Ginevskaya moved to Kaurovka. It was not earlier than October 1942 (see the letter above) and not later than February 13, 1943 according to the record in A. N. Leontiev's diary with the mention of Ginevskaya and Zaporozhets (Leontiev A. A. et al., 2005, p. 362). Zaporozhets returned to Moscow in the autumn of 1943 where he was invited by A. N. Leontiev to work at the Institute of Psychology at the Moscow State University. A. N. Leontiev left Kaurovka in the summer of 1943 (Leontiev A. A. et al., 2005, p. 48).

The book by A. N. Leontiev and A. V. Zaporozhets *The Rehabilitation of Movement: The Study of the Hand Function Rehabilitation After Injury* was prepared in a short time and published in 1945 with a circulation of ten thousand copies (Luria's *Traumatic Aphasia* edition of four thousand copies). A. V. Zaporozhets wrote six chapters of this book (chapters 4–9) out of ten. The footnote on page seven read: “A. R. Luria was the initiator to organize this work [the development of the theoretical basis of rehabilitative functional methods]. He was the first in the Soviet Union to raise psychological issues of the rehabilitation of functions after injury” (1945/1960). Chapter 5 described the dynamics of movement rehabilitation in patients “in two rehabilitation hospitals”: in 60 patients from Kaurovka and 25 patients from Kisegach (1945/1960, pp. 108–109). The list of references included an article by Zaporozhets and Rubinstein about occupational therapy (1942). Later, the same authors wrote the article *Psychophysiological Issues of the Organization of Restorative Occupational Therapy* (1947).

¹⁴ The hospital number was incorrect in the chronicle. The right number EG 4003 was found in the documents of P. Ya. Galperin and published by M. A. Stepanova (2017). Galperin worked there from February to October 1943.

Tamara Ginevskaya accompanied her husband in Kharkov, Kisegach, and Kaurovka. We know that she was a laboratory assistant in Kharkov and senior laboratory assistant in Kaurovka. After the war, she worked in the laboratories of Leontiev and Zaporozhets. A. N. Leontiev in his oral autobiography recalled that the collection of works of the Kharkov School, scattered after the decree on Pedology in 1936, had included "Ginevskaya's investigations on the distinction of the genetic and semantic centres of the drawing which explicated and documented the presence of the analysis of activity (action, goal)" (Leontiev A. A. et al., 2005, p. 377). In 1941, a similar article was published in Ukrainian in the Scientific notes of the Chernivtsi Pedagogical Institute. In Kaurovka, T. Ginevskaya and P. Ya. Galperin studied the dependence of the range of movements upon the psychological nature of the task. The authors showed that the change of the task might cause "a drastic and unexpected increase in the efficiency of the movement... due to the change in the psychological structure of the task" (Galperin & Ginevskaya, 1947, p. 79). Together with A. N. Leontiev, she explored the sensitivity of an injured hand, and then continued this theme in the genetic aspect. Tamara Ginevskaya's memories about Zaporozhets and his colleagues are very important for the history of psychology (2005).

Susanna Yakovlevna Rubinstein (1911–1988) was a well-known psychologist, one of the founders of the Russian pathopsychology (abnormal psychology). S. Ya. Rubinstein was born in Odessa; her mother taught mathematics in the male gymnasium; it was rare in those times. The father's profession was unknown, and biographers wrote that he had been a respected man in Odessa who performed functions similar to those of a magistrate (justice of the peace) (Zvereva, 2012). Right after leaving the school, sixteen-year-old Susanna left for Moscow and entered the pedagogical faculty of the 2nd MSU. After graduating from the University, S. Ya. Rubinstein engaged in research and development of the psychological basis for professional selection and vocational guidance. In 1938, he entered the graduate school at the All-Union Institute of Experimental Medicine, in which A. R. Luria became her scientific supervisor. At that time, B. V. Zeigarnik worked in the Institute clinic; she became a close friend and instructor of S. Rubinstein for a lifetime. Owing to Luria and Zeigarnik, the young graduate student deepened her understanding of Vygotsky's ideas¹⁵ that became a basis for her further scientific path.

In summer 1940, Bluma Zeigarnik's husband was arrested on a charge of espionage. Describing the difficult time after the arrest of A. Ya. Zeigarnik, grandson of A. Ya. and B. V. Zeygarnik, Andrey, wrote:

I would like to mention here Alexander Luria, who at that time and many years later in every possible way supported and helped Bluma Zeigarnik, as well as her closest friend Susanna Rubinstein. Her support, no matter how arrogant it may sound, is today perceived as a feat.

¹⁵ S. Ya. Rubinstein recalled in 1988: "I happened to listen to his lectures (Vygotsky) as a student and to be present at the discussions (analyses) of children. Charm and erudition combined in his speech with the simplicity and accessibility of presentation" (Vygodskaya & Lifanova, 1996, p. 251).

This courageous person was not only afraid to accompany Bluma to Lubyanka, but also offered to go there instead. Very few were ready to take such a risk (Zeigarnik A. V., 2001, p. 186).

Then many were afraid even to say hello to relatives of “enemies of the people” (see *Figure 6*).

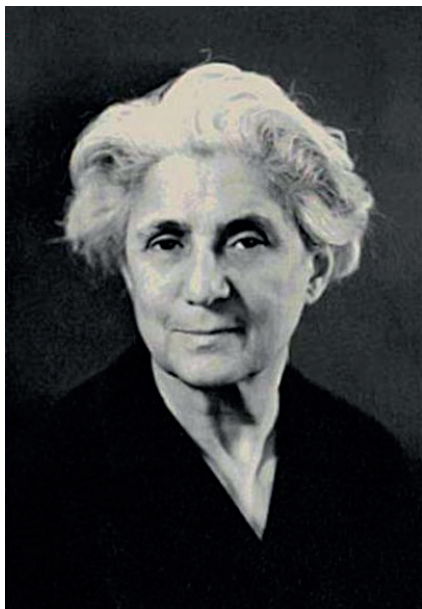


Figure 6. Susanna Yakovlevna Rubinstein (the 60s)

In 1941, when the Great Patriotic War began, A. R. Luria invited S. Ya. Rubinstein (and B. V. Zeigarnik) to go to Kisegach. There she took part in the establishment of labour workshops and gave training classes to patients. We presented the memoirs of B. V. Zeigarnik and S. Ya. Rubinstein about this time in the preface to the first part of our publication. Together with A. V. Zaporozhets Susanna Rubinstein developed methodological recommendations for the rehabilitation of movements in patients with brain lesions. The brochure about it was published in 1942 in Chelyabinsk. The professional experience of the war years was summarised by Susanna Rubinstein in her PhD thesis *The Rehabilitation of Working Ability in Patients with Military Brain Injury* (1945) and in some articles. For instance, in 1947, an article by Zaporozhets and Rubinstein *Psychophysiological Issues of the Organisation of Restorative Occupational Therapy* was published in the Scientific Notes of the MSU (Zaporozhets & Rubinstein, 1947; see also Rubinstein, 1949).

The myth about the work of A. V. Zaporozhets only in Kaurovka touched also S. Ya. Rubinstein. Some wrote about her, that she also worked there. However, A. N. Leontiev listed all those who participated in the work under his guidance: Associate Professor A. V. Zaporozhets, Associate Professor P. Ya. Galperin, Senior Research Fellows of the Research Institute of Psychology A. G. Komm and Ya. Z. Neverovich, Senior Laboratory Assistant T. O. Ginevskaya, Associate Professor of the Sverdlovsk Pedagogical

Institute V. S. Merlin, and the Hospital Employees Z. M. Zolina and Dr. E. D. Polykovsky (Leontiev & Zaporozhets, 1945, p. 7–8).

After the war S. Ya. Rubinstein worked in the Laboratory of Pathopsychology at the Research Institute of Forensic Psychiatry named after Serbsky. In 1956, she participated in the establishment of one of the first psychological laboratories in the aerospace psychology under the guidance of K. K. Platonov. Since 1962, under the guidance of B. V. Zeigarnik, she worked in the Laboratory of Psychopathology of the Moscow Research Institute of Psychiatry of the Ministry of Healthcare of the RSFSR. In 1971, she defended her doctoral thesis on the problem of auditory hallucinations. In the seventies, she delivered lectures at the Lenin Moscow State Pedagogical Institute and Moscow State University. The methodological guide *Experimental Methods of Pathopsychology* (1970) of S. Ya. Rubinstein is still very popular among colleagues and students.

Esther Solomonovna Bein (1906¹⁶–1981) was a neuropsychologist, Dr. in Biology (in the field of Psychology), professor, a student and a friend of L. S. Vygotsky and A. R. Luria.

It is known from the Internet that in 1940 she finished research on constancy of the size perception in adults and children with impaired and normal hearing. The subjects had to determine the size of the object at different distances from the subject. Being detected that children with hearing impairment (as well as those who hear) had a constant perception of the size of objects that is clearly pronounced at the early school age.

During the war, E. S. Bein together with A. R. Luria participated in the development of the neuropsychology methods. She studied speech impairment in brain pathology; as a result, she worked out widely known methods of speech rehabilitation. The results were summarized in her doctoral thesis in biology (1949) on the problems of the psychological analysis of sensory aphasia and the ways to overcome it. For more than 40 years, she worked at the Research Institute of Neurology of the USSR Academy of Medical Sciences, was one of the founders of the rehabilitation department, led a group of neuropsychologists and speech therapists. During the last years, E. S. Bein was also a consultant in the Research Institute of Defectology of the USSR Academy of Pedagogical Sciences.

What is important to add to this information?

1. Among E. S. Bein's fellow defectologists, there were R. N. Vygodskaya, R. E. Levina, N. G. Morozova, Zh. I. Schiff,¹⁷ i. e. L. S. Vygotsky's widow and three of his close students. They invited E. Bein to take part in the preparation of a volume on defectology for the collected works of Vygotsky. She engaged both in compiling the volume and in writing the afterword and notes (see Vygotsky, 1993/1983).

¹⁶ E. S. Bein's birth year is often given incorrectly in the Internet.

¹⁷ Zh. I. Schiff (1904–1978) worked as a teacher for seven years after graduating from the Leningrad Pedagogical Institute named after A. I. Herzen (1926). In 1930–1932, she studied at the graduate school of the same Institute, carried out investigations under the supervision of L. S. Vygotsky and defended her PhD thesis on *The Development of Scientific Concepts in Schoolchildren* (1934). In 1935, she published a book with the same title with the Preface by L. S. Vygotsky. In 1936, due to the eradication of pedology, she was deprived of her PhD (re-awarded in 1946). All the subsequent scientific activity of Zh. I. Schiff was connected with the Research Institute of Defectology of the Academy of Pedagogical Sciences.

2. As to the work in Kisegach, Luria's *Traumatic Aphasia* (1947/1970) showed that E. S. Bein was an active assistant of A. R. Luria in the development of the methods of the diagnosis and correction of aphasia. It was her who Luria referred to most often (11 times), mainly to the study of sensory aphasia and the development of the methods to overcome it. In *The Diary* in the record of 20.1.1942, Luria fixed the work with a patient with a severe temporal lobe syndrome and wrote after: "planning Bein's theme." One might think that there was no coincidence that the discussion of the scientific theme of Bein (the theme in the hospital and the thesis) happened after the examination of the patient with sensory aphasia. In 1947, she defended her thesis on *The Psychological Analysis of Sensory Aphasia* (referred to in her works and in Luria's books). Probably, later (in 1949 or 1950), she was awarded a doctorate taking into consideration the collection of her works.
3. For many years, E. S. Bein gave clinical workshops at the Lenin Moscow State Pedagogical Institute, introducing the rehabilitation of speech in patients with aphasia to future speech therapists. One of the authors of the present publication, T. V. Akhutina, attended those workshops. What do I remember? E. Bein gave us classes in the Institute of Neurology. On the wall of her study, there was a large portrait of L. S. Vygotsky; as I learned later, that was the original lifetime portrait. E. Bein herself was a middle-aged, plump woman, no longer very healthy and no longer very beautiful (but see her portrait in *Figure 7*). She gave lectures on aphasia in-depth and clearly. I still remember her words which I transmit to my students:

This is not so difficult to conduct efficient classes with patients with aphasia (all of us, students, pricked up our ears, we did not obviously expect this!). One needs to choose tasks which a patient manages to perform, without any mistakes, but will make an every effort.



Figure 7. Esther Solomonovna Bein (the 50s)

I always remember this advice given in 1962, when I tell students about the approach to rehabilitation put forward by Barbara Wilson — errorless learning (for instance, Wilson, Baddeley, Evans, & Shiel, 1994).

When I began dealing with aphasia after my graduation, I got acquainted and made close friends with E. S. Bein's student, a speech therapist, Marianna Konstantinovna Shokhor-Trotskaya.¹⁸ Once I told her about my mother, Elena Nikolaevna Gruzintseva. My mother was a defectologist and graduated from the 2nd Moscow State University; she attended L. S. Vygotsky's lectures there, later she met with him, when working at the Institute of Defectology. She appreciated Vygotsky greatly, kept his books and the shorthand of his report, even though it was dangerous. A photograph of defectology professors with students is kept at our house — with L. S. Vygotsky and my mother in it.¹⁹ After this conversation, Marianna Shokhor-Trotskaya told me that for many years she had accompanied E. Bein (at her request) to Rita Noyevna Vygodskaya's house on the paydays where Vygotsky's widow had lived with two daughters. Being aware of the fact that her family experienced financial difficulties, E. Bein gave a part of her salary to Rita Vygodskaya. Once, on the way to the Vygodskys, E. Bein said: "If I had been in Moscow in 1934, Lev Vygotsky would not have died." M. Shokhor-Trotskaya did not ask any questions, E. Bein seemed to have said this phrase to herself.

At the end of life diseased Shokhor-Trotskaya made a great present to our Laboratory of Neuropsychology at Moscow State University. She presented us with L. S. Vygotsky's portrait that she had been keeping after E. S. Bein's death. Janna Markovna Glozman brought the portrait to the laboratory and it has been with us since then.

Olga Petrovna Kaufman was a psychologist and a co-worker of A. R. Luria in his laboratory at the AIEM. Together with A. R. Luria and E. S. Bein, she developed methods of the rehabilitation of speech and writing in Kisegach. There is a lack of data about O. P. Kaufman's publications even on the Internet. We managed to find only three links: two of them were in the post-war year of 1947. Due to another link we learned that at least until 1952 O. Kaufman worked at the Research Institute of Neurology of the USSR Academy of Medical Sciences in the Department of Psychophysiology and Pathology of the Brain Activity.

In *Traumatic Aphasia* A. R. Luria referred to her investigations nine times and noted that her two articles were being published or prepared for the publication. O. P. Kaufman studied motor aphasia (efferent and afferent) — in particular, speech comprehension in such patients. In 1947 and 1949, the article *Restoration of the Speech Process in Motor Aphasia* and the article about optical agraphy were published (Kaufman, 1947, 1949). The third article meant by Luria — *Rehabilitation Training in Case of Semantic Aphasia* — was not found on the Internet. In 1952, the first study guide on the rehabilitation of speech in aphasia was developed in the Research Institute of Neurology of the USSR Academy

¹⁸ M. K. Shokhor-Trotskaya (≈1931–2002) was a well-known speech therapist, E. S. Bein's student and the author of numerous works on the rehabilitation of speech in aphasia.

¹⁹ That photo is reproduced of the book *Lev Semyonovich Vygotsky* (Vygodskaya & Lifanova, 1996, p. 119).

of Medical Sciences. It was the album *The Rehabilitation of Speech Processes in Traumatic Aphasia* compiled by E. S. Bein and O. P. Kaufman, and edited by Prof. A. R. Luria (Bein & Kaufman, 1952). We learned this from M. K. Shokhor-Trotskaya's book *The Strategy and Tactics of Speech Rehabilitation* (2001) which reproduced this "perfectly illustrated album" on pages 167–173.

We are finishing the story of the psychologists who happened to be A. R. Luria's colleagues in Kisegach. A. N. Leontiev said about his peers: "You know, I get lucky with people. Take those who surround me — they are exceptional people" (the memoirs of K. M. Gurevich cited by Leontiev A. A. et al., 2005, p. 255). One might say the same about A. R. Luria's group in Kisegach. And this is no coincidence — after all, many of the friends were in common (see Figure 8, 9).

The Russian text of the *Diary* is presented in the Appendix.

In the text below, comments from the right pages appear immediately after the records to which they relate. There are many abbreviations in the text; all of the abbreviations are expanded in this publication. In obvious cases they are not specifically marked, but in the most difficult places the disclosure is given in [square] brackets. Illegible words are marked with <angle> brackets, and inserted words are in {curly} brackets. All of the author's underlines are preserved; a single underline is conveyed respectively, double underscores are passed in bold with underscores.



Figure 8. A. N. Leontiev, R. E. Levina, L. I. Bozhovich, L. S. Slavina, A. R. Luria (sitting), A. V. Zaporozhets, N. G. Morozova, D. B. Elkonin. Here we see A. R. Luria and A. N. Leontiev, "the five" and D. B. Elkonin against the background of the teacher's portrait



Figure 9. A. N. Leontiev, A. R. Luria (sitting in the center), N. G. Morozova and R. E. Levina (to the left and right of them), T. O. Ginevskaya, L. S. Slavina, L. I. Bozhovich and D. B. Elkonin (standing). Please, note that in the previous photo, Zaporozhets put his hand on Leontiev's shoulder, and in this one — Bozhovich put her hand on Luria's shoulder, i. e. both "elders" are highlighted

The Work Diary

15.III.

Experiment with Zakharov.

1) A pure parietal aphasia²⁰ — the impairment of *Zusammensehen*.²¹

²⁰ A. R. Luria considered semantic aphasia to be parietal aphasia. The second volume of the planned three-volume book entitled *The Study of Aphasia in the Light of the Brain Pathology* was called *Parietal (Semantic) Aphasia*. The first volume of *Temporal (Sensory) Aphasia* was finished in 1940, and based on that, in 1942, a doctoral dissertation on medicine was defended. In 1940, the second, incomplete and unpublished volume consisted of 219 typewritten pages. It included three different literature reviews — from neurology to linguistics — and showed the role of the simultaneous spatial synthesis (*Zusammensehen*) and a holistic strategy of perception in the understanding of complex logical and grammatical constructions (Luria A. R., 1940; see also Akhutina & Agris, 2018).

²¹ *Zusammensehen* (Ger.) — a compound word: *zusammen* (together) + *sehen* (see). It means simultaneous vision.

- 2) The mechanism of grasping the meaning of a phrase: the patient cannot grasp the implicit sense hidden behind the external phasic²² aspect of the phrase; therefore, he:
- either tries to recognize the meaning “in the face,” bringing <parts> of the phrase closer to one another and recognizing something familiar in the phrase; understanding by means of **recognition**,
 - or gives a grammatical analysis of the phrase, and due to the preservation of the rules, he gradually gets to the meaning and comes to its evaluation **by conclusion** (but then he has always got a feeling of uncertainty because there is no grasp).

*On the right side: **NB!** Parietal aphasia.*

- 1) No grasp, zusammen sehen!
- 2) Hence the attempt to master the concept, semantic structure goes in two ways
| either by the **reduction till the recognition** (and then the patient acquires a full clarity of
| the evaluation)
| or by the **increase till the conclusion** (and then the patient experiences a feeling of | uncer-
tainty of his evaluation as there is no inner scheme!)

18.III.

Experiment with Usatov.

- 1) A severe limitation of the field of perception: the patient saw only one object, and the field of vision was regulated not by the spatial principle but by the object field.
- 2) Memory: the lack of memorization after 150–200 repetitions (with reduced energy activation!).

On the right side:

- 1): (further experiments with interacting and neighbouring objects are necessary).
- 2): (further experiments with a mediated memorization are necessary).

A talk with A. V. Zaporozhets²³

The idea of the rehabilitation role of the compensation!!

19.III.

Wrote a report about the clinic...

20.III.

- 1) Experiment with Karabanov. To the issue of frontal aphasia.
- a) the inability to make an inner field (the experiment with memory — no <3–4 letters illegible>) of memorization;

²² The opposition of the phasic (external) and inner speech was proposed by L. S. Vygotsky in his *Thinking and Speech*.

²³ A. V. Zaporozhets (1905–1981) was a known Russian psychologist. He was a student of L. S. Vygotsky and A. R. Luria, a member of the Kharkov group of A. N. Leontiev (see above in the introduction to the second part).

b) the experiment with <directed?> associations²⁴ — <3 letters illegible>. = naming the same words several times;

c) the experiment with a series (...+3) — repeats the chains audibly!

d) a series of measuring experiments!

2) {O. P.} Kaufman's observations of Svetlov: The operation ({cerebral} edema) destroys the temporary connections that have been developed by training and leaves a severely impaired functions unchanged!

On the right side:

Parietal lobe: the effect of edema on the destruction of temporary connections.

21.III.

Experiment with Karabanov:²⁵ Motor skills

a) inability for narrative motor skills (Apraxie der Handlungsfolge);²⁶

b) the impairment of kinetic melodies

22.III.

Experiment with Karabanov. W²⁷ of rhythms (the inability for an immediate perception of the rhythms with the following fragmentation). W: easily performs all the trials for the activity if all the W components are within the field.

23.III.

Experiment with Karabanov: the analysis of memory (based on the external mediation: mediated memorization, recognition, etc.).

24.III.

Experiment with Karabanov: the analysis of intellectual processes: the inability to grasp the inner meaning of mental structures.

25.III.

Experiment with Karabanov: The pictogram and a letter to the wife: the mediation helps.

26.III.

Experiment with Karabanov. Memorizing 2 lines of a poem with the interference in learning. The patient is not able for the dynamic generalization of a higher order (i. e., having memorized C,

²⁴ Possibly, Luria is referring to directed associations, i. e. Semantic Fluency Test.

²⁵ Pat. Kar. was described in *Traumatic Aphasia* on pages 79–80 of Russian edition and pages 180–181 of English edition (Luria A. R., 1947/1970).

²⁶ Apraxie der Handlungsfolge (Ger.) — the apraxia of the action sequence.

²⁷ W — *Wahrnehmung* [?] (Ger.) — perception.

he loses E; having memorized E, he loses C, i.e. he does not produce any structure CE [a curly bracket above CE].

No records from 26.III till 16.IV.

16.IV.

- 1) Vostrikov — Injury to the left frontotemporal area. Premotor syndrome → premotor speech impairments, functional layers on premotor disorders.
- 2) Belonogov — concussion syndrome, asthenia, fatigue.
Counting disability by type of link omission.
- 3) Melnichenko — the 7th (Brodmann) area syndrome²⁸ (the deficit of the differentiation of contralateral movements, with intact kinetic melodies and strength).
- 4) Evstakhiev — premotor impairment, with symptoms of a healthy (ipsilateral) hand.

20.IV.

Experiment with Polyakov: The right premotor area syndrome (1. Impulsivity with the deficit of <splitting> self-consciousness and 2. motor skills: the inability for perceiving and repeating rhythms).

On the right side: NB!

22.IV.

- 1) The basic idea: the premorbid level has {a value} in that sense that after injury, the ability to keep former traces and to form new connections suffers in different ways. Thus, in a person with a low premorbid condition, the injury may cause the “disturbance” of those principles which are intact in another individual. This is not because of the severity of the injury but due to the fact that in patients (A), that function runs in the order of the formation of new connections and in the order of the reproduction of previous ones in patients (B).
- 2) A number of patients with negative symptoms: soft tissue injury may cause a transient contusion of this system... but a very rapid and full restitution (cf. Gabdullin, Agabekov, etc. — the rehabilitation of the left temporal region).
- 3) The injury can lead not only to the loss but also the weakening of the function — by type of Sehschwäche (cf. patient Kalabekov) or Hörschwäche²⁹ (cf. patients Gabdullin, Kopalo, etc.).

24.IV.

Experiment with Dgantuev — universal aspontaneity (without any frontal semiology).

25.IV.

The impairment of sense comprehension in frontal patients!

On the right side: SENSE AND MEANING (frontal and posterior lesions)

²⁸ Upper sections of the parietal lobe.

²⁹ *Sehschwäche, Hörschwäche* (Ger.) — poor vision, poor hearing.

A trip to Moscow

20.VI.42.

Experiment with Moiseev; a conversation with {O. P.} Kaufman.

The interzonal interaction. Each zone has its specific function but simultaneously — contributes its component to the organization of work of other zones; in parietal lesions, the temporal region begins functioning in a different way (through the insula?); this is expressed in the inability to grasp the simultaneous schemes of acoustic processes — and particularly — the inability to grasp the sound structure of the word, the inability to acquire a complex structure of the rhythm (cf. || || || +; || || || — this rhythm — does not go at all!).

Hence — parietal syndrome: the impairment of simultaneous schematization in optics (the spatial arrangement), in grammar, in counting; — the same in acoustics!!

On the right side: NB {on one line with The interzonal interaction}

22.VI.42.

1) Observation patient Snekov: in parietal lesions, any task hidden behind the question is understood (the patient knows what he needs to answer) but the structure of the question is not grasped.

On the right side: NB: Sense and meaning.

In frontal lesions, concussions and general dementias — a patient does not grasp the sense of the question, i. e. the assigned task remains unclear — and he has the tendency not to answer the question but to repeat the question approaching echolalia!

On the right side: Cf. patient Davydov!

- 2) Patient Petrov ({E.} Bein) — a pure temporal syndrome! Trained to acquire sounds through the letter.
- 3) Patients Barsuk and especially Mitskevich — residual, stable impairment of active frontal systems. Frontal Abstimmung³⁰ of speech function — expressed in the deautomatization of speech, its asponaneity and the impairment of the THOUGHT→SPEECH system with a sufficient intactness of the W→SPEECH system; hence the intactness of naming the objects and an acute amnesia in the spontaneous speech.

On the right side: Frontal aphasia!

Cf. Mitskevich! cf. Shingarev! cf. Karabanov! cf. Sychev!

- 4) Zozulya — the 37th area syndrome (occipital-temporal syndrome) — the impairment of the recollection of words, no parietal impairments.

³⁰ *Abstimmung* (Ger.) — adjustment.

On the right side: Occipital-temporal syndrome?

- 5) Kasheev — The T3 syndrome:³¹ the impairment of acoustic and speech memory, with an intact phoneme differentiation.

On the right side: The T3 syndrome

23.VI.

- 1) Buyskikh — a case with negative aphasic symptoms in the latent left-hander. The hypothesis of a LATENT ambivalence of the hemispheres and a recessive heredity of the hemispheric dominance: the patient with heredity (his genealogy is in *Figure 10*). {This patient is described in *Traumatic Aphasia*, case 2 (Luria A. R., 1947, p. 37–38 / 1970, p. 63–64)}

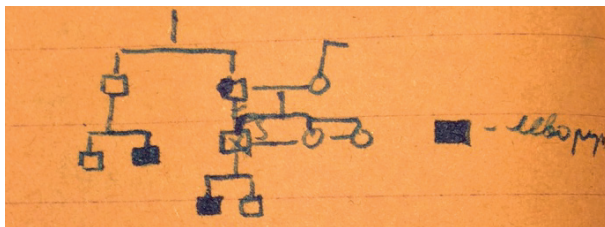


Figure 10. Genealogy of patient Buysk.

- 2) Premotor syndrome: Vostrikov! Diuzhev!
- 3) Davydov: a severe impairment of the left hemisphere! Primitiveness of the psyche — against the background of a relative intactness of the sound aspect of speech.
- 4) Experiment with Nikanorov:
- the stages of phonemic difficulties in writing (delays — transposition of sounds — substitutions).
 - Assertion: in local concussions (without any damage to the integrity of the brain) — not the disintegration syndrome but the SYNDROME OF LOCAL ASTHENIZATION!
— different dynamics of the structure;
— a different course;
— a different prognosis.

On the right side: Cf. Sultanov! Cf. Blinnikov!

Theme: CLINICAL SYNDROMES of traumatic aphasia
(forms of destruction — the form of asthenias)

1.VII

- 1) Experiment with premotor syndrome $\Pi/\Pi/\wedge$ ³²
- I. A group of premotor patients produce clear and persistent symptoms

³¹ T3 syndrome — syndrome of damage to the lower temporal gyrus.

³² $\Pi/\Pi/\wedge$ — The Graphomotor Sequences Test.

- II. A group of marginal premotor patients — unstable and easily treatable symptoms
 - III. A group of premotor, frontotemporal patients — may not produce symptoms
 - IV. A group of the right premotor patients —??
- 2) Kosrochenko — the disintegration of the structure of complex actions in frontal abscess.

14.VII

Experiment with Kosrochenko.

- 1) Frontal lesions — the disturbance of motivation, field factors and clichés instead of motives
Memory — instead of recollections → associations, “floating up”;
W. {perception} — within impressions!
Understanding — only of an external situation but not the motives.
- 2) Rehabilitation — (compensation); ways (a) through dividing a complex instruction into parts, (b) through changing the context!!

On the right side:

- 1) The illustration to the Frontal chapter (the traumatic material).
 - 2) With Bl. V. {Zeigarnik} — meaning / sense!! structure mental <processes> in frontal lesions!
- For 2) NB. To the theory of the compensation (overcoming) of frontal lesions!

23.VII.

- 1) An experiment with Kuybar. Pseudo-semantic syndrome in the left temporal lobe lesion.
 The impairment of the understanding of grammatical structures — but with the possibility of the compensation! (due to the inability to retain the series).
 The impairment of oral counting — written counting is intact.
- 2) Experiment with Volkov: T3 syndrome
 The intactness of the W. {perception} of phonemes, the intactness of the understanding of words (no alienation), the intactness of the sound analysis — the disturbed series!!

On the right side:

The pseudo-semantic (temporal) impairment.

T3!!

24.VII.

- 1) Experiment with Smirnov (injury to the frontal-premotor area).
 - a) Shrapnel **leucotomy**!³³ The separation of the whole frontal system!! Hence the disturbance of sense — with the intact meaning.
 - b) Against the background of the general asponaneity — mild impairments of premotor speech.
- NB: the reverse development of speech was delayed!!

³³ Leucotomy (lobotomy) — the dissection of the white matter of the brain.

On the right side: Military expert Egas Moniz!!³⁴

25.VII.

Experiment with Brozgalov: The T2 syndrome (intermediate between T1 and T3!!)³⁵

On the right side: T2

26.VII.

New aphasic patients (the general examination).

NB: patient Shkoliar (the right frontal lesion in the left-hander with negative symptoms: a latent right-handed person!!).

On the right side: NB: Fig. 11. A genotypic causation of the dominance (a latent recessive right-hander!!)

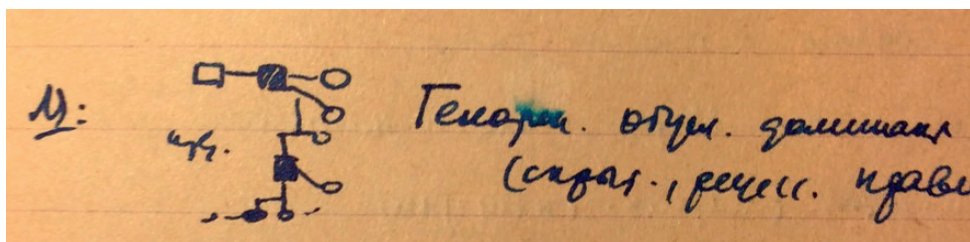


Figure 11. Pat. Shk.

27.VII.

Prosvetov — a severe premotor symptom complex.

A new sensitized trial (finger sequencing).

A departure for Kazan

22.VIII

Experiment with Ivanov.

Awkwardness — parietal (extra-spatial)

— thalamic (postural)

— premotor (dynamic)

³⁴ Egas Moniz was a Portuguese neurologist and the developer of cerebral angiography. He was regarded as one of the founders of modern psychosurgery, having developed the surgical procedure of leucotomy — known better today as lobotomy. Owing to that fact, he became the first Portuguese national to receive a Nobel Prize in 1949 (shared with Walter Rudolf Hess).

³⁵ Syndromes T1, T2 and T3 are syndromes of lesions of the superior, middle and inferior temporal gyri.

25.VIII

Kulagin ({with O. P.} Kaufman). 1) Optical agraphia! 2) the cerebral sinus syndrome

26.VIII.

1) Kertbat — a reverse development of syndrome T2–3 brings reveals the lesion of successive processes, the impairment of acoustic mnesia and the disturbance of word stress.³⁶

2) Odinets — T3 (fully rehabilitated).

On the right side: Dynamic reversals of the injuries to T3

27.VIII

1) Kharin — mild symptoms of the frontal lobe.

Pimenov — a negative case: injury to the soft tissues of the frontal lobe without any symptoms.

2) Kulichkov — motor agrammatism with telegraphic style.

3) Barsenev — (Perelman's³⁷ patient). A neurodynamic genesis of stuttering in concussion patients. (The conflict of increased inertia of excitation — with a tendency to active speech.)

On the right side:

NB

Neuro-dynamic dysphasia!
in a concussion patient
{with mixed dominance}

28.VIII

1) Guriakov. The delineation of aphasia from the frontal disturbances (frontotemporal aphasia).

2) Furman, Antonov. Frontal and premotor impairments.

31.VIII

1) Bursiagin. Temporal aphasia. A disturbed repetition and naming of words.

2) Kondratenko. Frontal aphasia (the spontaneous speech impairment).

2.IX.

Katkov –injury to the left frontotemporal area with the following rapidly-passed aphasia (left-handedness in the family, see *Figure 12*). {See *Traumatic Aphasia*, case 6 (Luria A. R., 1947, p. 39–40 / 1970, p. 67)}

³⁶ Word stress is a relative emphasis or accent given to a certain syllable in the word.

³⁷ L. B. Perelman is a staff member of the hospital, a neuropathologist and the author of the book *Reactive Post-Concussion Deaf-Muteness, its Identification and Treatment* (1943).

On the right side:

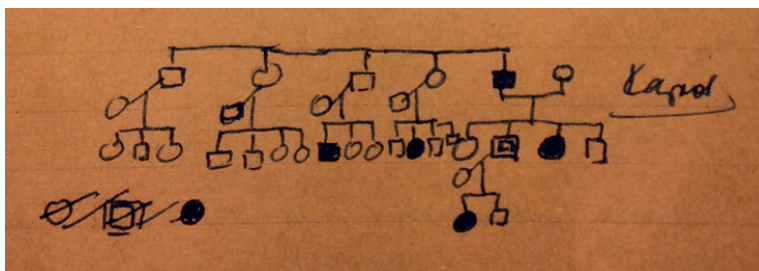


Figure 12. Genealogy of patient Katk.

16.IX.

Experiment with Karabanov (Bassin).³⁸ The inability (illegible) the genuine melody design.

17.IX

1) Experiment with Karabanov — the impairment of fluency in W. (perception) and thinking (a disturbed internal field).

2) Observations over Makr (illegible). The disturbance of voluntary processes.

The essence of hysteria: Usually, involuntary processes become voluntary but the voluntary flow of processes is disrupted.

The levels of voluntariness and levels of disintegration.

18.IX

Experiments with aphasia.

Motor-aphasic thought impairment (with O. P. Kaufman).

19.IX

1) Kondratenko. Rhythms. Automation impairment (premotor syndrome).

2) Prosvetov. Rhythms. Frontal syndrome. The tension of the motor set in delayed actions.

3) Surovtsev, Sarovets. Rhythms. Disturbed rhythms of the afferent type.

3.X. 42.

Prokhorov		Sense and meaning
Moiseev		in frontal lesions

³⁸ F. V. Bassin (1905–1992) was a staff member of the hospital, a psychologist. He was a member of L. S. Vygotsky's circle and became a well-known psychologist and neurophysiologist, an expert in the psychology of the unconscious. He was one of the initiators and organizers of the Tbilisi Symposium on the unconscious.

3.X.42.

- 1) Experiment with Sehschwäche³⁹ in the occipital injury (Zakharchenko): it is “removed” by glasses, i. e. “an unclear vision” presbyopia⁴⁰ ceases to be compensated.
- 2) Experiment with Prokhorov: a frontal patient: understanding the sense — counting (division) — rhythms.
- 3) Experiment with Kubyshkin: a compensated impairment of functions in the impaired frontal lobe in the ambidextrous person (*Figure 13*, at the top). NB: ambidextria! (*on the right side*).

9.X.42. Nadezhdin: a left-hander with the injury to the right premotor zone and the corresponding dominant hemi-syndrome (*Figure 13*, at the bottom) (*on the right side*).

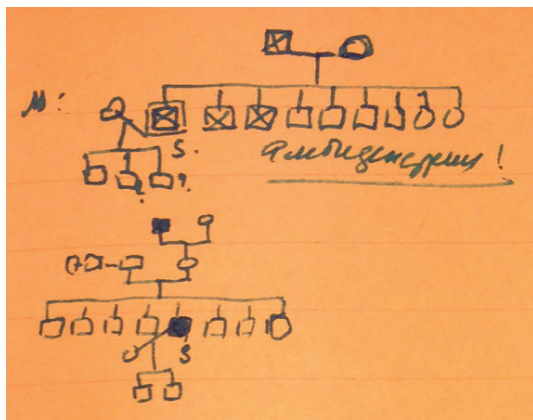


Figure 13. Genealogy of patients Kub. (at the top) and Nad. (at the bottom)

10–16.X.42.

With O. P. Kaufman. The development of issues on motor aphasia.

- 1) The classification of motor aphasias (phasic — denervated — dynamic)
- 2) Different ratios of speech/thought in them.

17.X.42.

1) Komarov. A severe motor aphasia without any semantic disorders in the patient with the injury to the left hemisphere — with a hidden gene of left-handedness gives very minor semantic and <motor> disorders and severe impairments of motor speech (*Figure 14*).

³⁹ *Sehschwäche* (Ger.) — poor vision.

⁴⁰ Presbyopia (*aged sight*) is a refractive error of the eye in which a person cannot focus on the fine print or small objects at the close distance.

On the right side:

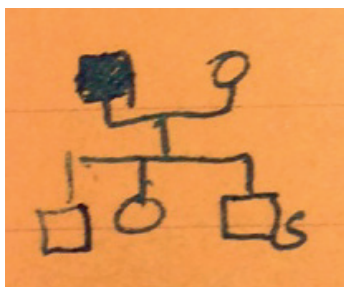


Figure 14. Genealogy of patient Kom.

2) The analysis of motor aphasias: Classification by

	phasic	denervated	dynamic
“length” and “depth”	speech	speech	speech
	writing	–	–
	sylog. exp. ⁴¹	–	–

22.X.

Saborov: agrammatism. A disturbed scheme of the phrase.

23.X.

Gazdiuk: Subcortical concussion syndrome (pseudo-parkinsonism; with a frontal-subcortical defect).

24.X.

1) Baranishin — frontal syndrome (b). 2) Saborov — the impairment of the flow of intellectual processes in frontal aphasia.

28.X.

Saborov — the inability to retain the **sequence**.

30.X.

1) Saborov — Compensation in series sequences

= | — with reflection.

| = — easy!!

{The series is surrounded by a triangle showing the decreasing structure of the series. Perhaps, it was a trial for constructing a serial sequence with sticks}.

⁴¹ Sylog. exp. — seemingly, Luria implied tests for understanding syllogisms. He used them to study thinking in frontal impairments or semantic aphasia.

2) The right frontal lobe — Leidev, Peschanov — Rhythms: the evaluation of " as "' {i. e. the evaluation of the rhythm "by 2" as "by 3"} — there is an impairment of the sensory denervation (2 times are loud — one time is quiet).

On the right side: NB!! The disturbance of rhythms assessment = the phenomenon of the impairment of **sensory denervation!!**

3.XI.

More cases of a latent left-handedness! (Katkov!)

5.XI.

1) Saborov — an experiment with memorizing a poem — the disintegration of the structure of the poetic rhythm.

2) Togadev: slight remnants of premotor aphasia ("house-table-cat" {It is Luria's test for verbal memory})

On the right side: NB

8.XI.

1) Saborov — the frontal disintegration of perception

2) Saveliev — a disturbance of <illegible> actions

9.XI.

1) Khristov — temporal aphasia.

A new sensitized method for studying the alienation of words (excluding the active speech).

2) Simonov — motor aphasia with the general impairment of the dynamic background.

10–11.XI.

Experiments with rhythms.

1) The mediation by the space (optical memory) and speech.

12.XI.

Experiments with rhythms: the mediation by speech images "mAmmy — banAna" in temporal patients gives no results (Bursiagin, Khristov) {this refers to the use of stress in words: in the word "mAmmy" stress is on the first syllable, in the word "banAna" — on the second syllable}.

13.XI.

1) Saveliev | the impairment of simple rhythms and their mediation

2) Shegalov | "dAddy — informAtion" {in the word "daddy" ['dædɪ], the stress is on the first syllable, in the word "information" [ɪnfə'meɪʃn] — on the third syllable}.

(The end of the records in the year of 1942)

To be continued...

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Appendix Приложение

Это приложение мы решили дать, поскольку текст «Дневника работы» представляет собой личные записи. Перевод такого текста на иностранный язык не исключает возможность субъективной интерпретации написанного. Чтобы избежать этого риска и позволить читателям самим ознакомиться с первоисточником, в приложении мы публикуем записи на языке оригинала. В тексте «Дневника» содержатся сокращения. Их объяснение дано в квадратных скобках. Неразборчивые слова заключены в угловые скобки, а вставленные слова — в фигурные скобки. Нумерация рисунков приводится в соответствии с английским вариантом.

Дневник работы

15.III.

Опыт с Захаровым.

- 1) Чистая теменная афазия¹ — нарушение *Zusammensehen*² [симультанного видения].
- 2) Механизм схватывания смысла фразы: больной не может схватить скрытый за внешней фазической³ стороной фразы смысл; поэтому он
 - или старается узнать смысл в лицо, сближая <части> фразы друг с другом, узнавая знакомое в фразе; понимание методом узнавания,
 - или дает грамматический анализ фразы и так как у него сохранены правила — он постепенно добирается до смысла и приходит к его оценке методом умозаключения (но тогда у него все время остается чувство неясности, ибо нет схватывания).

¹ Теменной афазией А. Р. Лурия называл семантическую афазию. Второй том из задуманного трехтомника под названием «Учение об афазии в свете мозговой патологии» назывался «Теменная (семантическая) афазия». Первый том «Височная (сенсорная) афазия» был закончен в 1940 г., и в 1942 г. на его основе была защищена докторская диссертация по медицине. Второй, незаконченный и неизданный том в 1940 г. включал 219 машинописных страниц. Он содержал три разных обзора литературы — от неврологии до лингвистики — и показывал, какова роль симультанного пространственного синтеза (*Zusammensehen*) и целостной стратегии восприятия в обеспечении понимания сложных логико-грамматических конструкций (Luria A. R., 1940; см. также: Akhutina & Agris, 2018).

² *Zusammensehen* (нем.) — сложное слово, состоящее из двух частей: *Zusammen* (вместе) и *sehen* (видеть).

³ Противопоставление фазической (внешней) и внутренней речи было предложено Л. С. Выготским в «Мышлении и речи».

На правой стороне: **НВ!** Теменная афазия.

1) Нет схватывания, zusammen sehen!

2) отсюда попытка овладеть понятием, смысловой структурой идет двумя путями | или снижением до узнавания (и тогда больной приобретает полную | ясность оценки) | или поднятием до умозаключения (и тогда у больного остается ощущение | неясности своей оценки, так как внутренней схемы нет!).

18.III.

Опыт с Усатовым.

1) Грубое ограничение поля восприятия: больной видел лишь один предмет, и поле зрения регулируется не пространственным, а предметным принципом.

2) Память: отсутствие запоминания после 150–200 повторений (при энергетической сниженности!).

На правой стороне:

Напротив 1): (нужны дальнейшие эксперименты на взаимодействующие и сопутствующие объекты).

Напротив 2): (нужны дальнейшие эксперименты с опосредованным запоминанием).

Беседа с А. В. Запорожцем⁴

Идея восстанавливающей роли компенсации!!

19.III.

Писал отчет о клинике.

20.III.

1) Опыт с Карабановым⁵. К лобной афазии.

а) невозможность создать внутреннее поле (опыт с памятью — нет <3–4 буквы нрзб>) запоминания;

б) опыт с огр<аниченными?> ассоциациями⁶ — <3 буквы нрзб>. = перечисление по несколько раз тех же слов;

с) опыт с числовым рядом (... +3) — повторяет вслух звенья!

д) серия измерительных опытов!

2) Наблюдения {О. П.} Кауфман над Светловым: Операция (отек) разрушает временные связи, возникшие в результате обучения, и оставляет без изменения грубо нарушенное!

На правой стороне: Темя: влияние отека на разрушение временных связей.

⁴ А. В. Запорожец (1905–1981) — известный российский психолог (подробнее см. во введении к этой части).

⁵ Больной Кар. описан в «Травматической афазии» (Luria A. R., 1947, p. 79–80 / 1970, 180–181).

⁶ Возможно, Лурия имеет в виду направленные ассоциации.

21. III.

Опыт с Карабановым: Моторика

- а) невозможность повествовательной моторики (*Apraxie der Handlungsfolge*)⁷;
- б) нарушение возможности кинетических мелодий

22. III.

Опыт с Карабановым. W⁸ ритмов (невозможность сразу воспринять ритмы с расчленением на фрагменты). W: легко делает все пробы на активность, если все компоненты W есть в поле.

23. III.

Опыт с Карабановым: анализ памяти (опора на внешнее опосредование: опосредованное запоминание, узнавание и т. д.).

24. III.

Опыт с Карабановым: анализ интеллектуальных процессов: невозможность схватить внутренний смысл интеллектуальных структур.

25. III.

Опыт с Карабановым: Пиктограмма и письмо жене: опосредование помогает.

26. III.

Опыт с Карабановым. Заучивание 2 строчек стихотворения с интерференцией заучивания. У больного не получается динамическое обобщение высшего порядка (т. е. он, заучив С, теряет Е, заучив Е, теряет С, т. е. не вырабатывает структуры СЕ [сверху фигурная скобка]).

С 26. III по 16. IV нет записей.

16. IV.

- 1) Востриков — Ранение левой лобно-височной области. Премоторный синдром → премоторные нарушения речи, функциональные напластования на премоторные нарушения.
- 2) Белоногов — коммоционный синдром, астения, истощаемость. Нарушения счета по типу упуска звеньев.
- 3) Мельниченко — синдром 7-го поля⁹ (дефект дифференциации контрлатеральных движений при сохранении кинетических мелодий и силы).
- 4) Евстахийев — премоторное нарушение с симптомами здоровой (ипсилатеральной) руки.

⁷ *Apraxie der Handlungsfolge* (нем.) — апраксия последовательности действий. Описана К. Kleist.

⁸ W – *Wahrnehmung* [?] (нем.) — восприятие.

⁹ Верхние отделы теменной доли.

20.IV.

Опыт с Поляковым: Синдром правой премоторной области (1. Импульсивность с недостатком <расщепления> самосознания и 2. моторика: невозможность восприятия и повторения ритмов).

На правой стороне: NB!

22.IV.

- 1) Основная мысль: преморбидный уровень имеет {значение} в том смысле, что способность сохранять прежние следы и образовывать новые связи после ранения страдает по-разному; таким образом, у человека с низким преморбидом ранение может вызвать «нарушение» тех принципов, которые у другого сохраняются, не из-за тяжести ранения, а из-за того, что у больных (А) эта функция идет в порядке воспитания новых связей, а у больного (Б) — в порядке воспроизведения прежних.
- 2) Ряд больных с отрицательными симптомами: ранение мягких тканей может вызвать скоропреходящую контузию данной системы... но очень быструю и полную реституцию (ср. Габдуллин, Агабеков и др. — реабилитация левой височной области).
- 3) Ранение может повести не только к выпадению, но и к ослаблению функции — типа Sehschwäche (ср. больной Калабеков) или Hörschwäche¹⁰ (ср. больные Габдуллин, Копало и др.).

24.IV.

Опыт с Дгантуевым — Универсальная аспонтанность (без лобной семиотики).

25.IV.

Нарушение смысла у лобных больных!

На правой стороне: СМЫСЛ И ЗНАЧЕНИЕ (лобные и задние поражения)

Поездка в Москву

20.VI.42.

Опыт с Моисеевым; беседа с {О. П.} Кауфман.

Межзональное взаимодействие. Каждая зона имеет свою специфическую функцию, но одновременно — вносит свой компонент в организацию работы других зон; так при теменных поражениях иначе (через островок?) начинает работать височная область; это выражается в невозможности схватить симультанные схемы акустических процессов — и конкретно — невозможности схватывать звуковое строение слова, невозможности усваивать сложную структуру ритма (ср. || || || +; || | || | — не идет совсем!).

¹⁰ *Sehschwäche, Hörschwäche* (нем.) — слабость зрения, слабость слуха.

Отсюда — теменной синдром: нарушение симультанной схематизации в оптике (пространственное расположение), в грамматике, в счете; — то же и в акустике!!

На правой стороне: NB {напротив слов Межзональное взаимодействие}

22.VI.42.

- 1) Наблюдение больной Снеков: При теменных поражениях всякая задача, скрытая за вопросом, понимается (больной знает, что ему нужно ответить), но не схватывается структура вопроса.

На правой стороне: NB: Смысл и значение.

При лобных поражениях, коммоциях и общих деменциях — больной не схватывает смысл вопроса, т. е. задача, которую ему ставят, остается непонятной — и он обнаруживает тенденцию не отвечать на вопрос, а повторять вопрос, приближаясь к эхолалии!

На правой стороне: Ср. больной Давыдов!

- 2) Больной Петров ({Э. С.} Бейн) — Чистый височный синдром! Обучен усвоению звуков через букву.
- 3) Больные Барсук и особенно Мицкевич — резидуальное, устойчивое нарушение активных лобных систем. Лобная Abstimmung¹¹ речевой функции — выражается в дезавтоматизации речи, ее аспонтанности, нарушении системы МЫСЛЬ→РЕЧЬ при достаточной сохранности системы W→РЕЧЬ; отсюда сохранность в назывании предметов и резкая амнезия в спонтанной речи.

На правой стороне: Лобная афазия!

Ср. Мицкевич! ср. Шингарев! ср. Карабанов! ср. Сычев!

- 4) Зозуля — синдром 37 поля (затылочно-височный синдром) — нарушение воспоминания слов без теменных расстройств.

На правой стороне: Затылочно-височный синдром?

- 5) Кашеев — Синдром ТЗ¹²: нарушение акустико-речевой памяти при сохранности различения фонем.

На правой стороне: Синдром ТЗ {напротив слов: 5) Кашеев}

23.VI.

- 1) Буйских — отрицательный случай афазии у латентного левши. Гипотеза ЛАТЕНТНОЙ амбивалентности полушарий и рецессивного наследования доминантности полушария: больной с наследственностью (родословная Буйск., см. *рис. 10*).

¹¹ Abstimmung (нем.) — настройка.

¹² Синдром ТЗ — синдром поражения нижней височной извилины.

{Пациент описан в книге «Травматическая афазия», случай 2 (Luria A. R., 1947, р. 37–38 / 1970, р. 63–64)}.

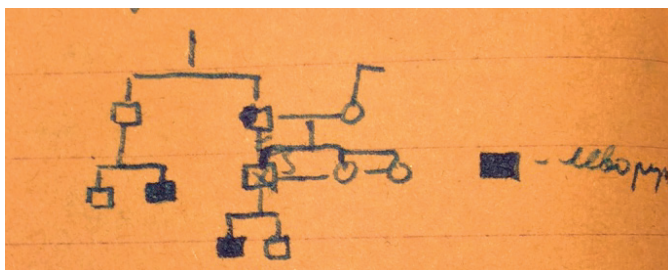


Рис. 10. Родословная больного Буйск.

2) Премоторный синдром: Востриков! Дюжев!

3) Давыдов: грубое нарушение левого полушария! Примитивность психики — на фоне относительной сохранности звуковой стороны речи.

4) Опыт с Никаноровым:

а) ступени фонематических затруднений в письме (задержки — перестановки звуков — замены).

б) Положение: При местных контузиях (без повреждения целостности мозга) — не синдром распада, а СИНДРОМ МЕСТНОЙ АСТЕНИЗАЦИИ!

— другая динамика структуры,

— другое течение,

— другой прогноз.

На правой стороне: Ср. Султанов! Ср. Блитников!

Тема: КЛИНИКА травматической афазии
(формы разрушения – форма астений)

1.VII

1) Опыт с премоторным синдромом ПАП¹³

I. Группа премоторных больных дает четкие и стойкие симптомы

II. Группа около-премоторных больных — нестойкие легко преодолеваемые симптомы

III. Группа премоторных, лобно-височных больных — может не давать симптомов

IV. Группа правых премоторных больных —??

2) Косроченко — распад строения сложных действий при лобном абсцессе.

14.VII

Опыт с Косроченко.

1) Лобные поражения — нарушение мотивации, вместо мотивов — полевые факторы, штампы.

Память — вместо воспоминаний → ассоциации, всплывание;

¹³ ПАП — графомоторная проба.

W. {восприятие} — в пределах впечатлений!

Понимание — только внешней ситуации, но не мотивов.

- 2) Восстановление — (компенсация); пути (а) через расчленение сложной инструкции на части, (б) через изменение контекста!!

На правой стороне:

{К 1)} 1) Иллюстрация к Лобной главе (травматический материал).

2) С Бл. В. {Зейгарник} — значение/смысл!! Структура психических <процессов> при лобных поражениях!

{К 2)} NB. К теории компенсации (преодоления) лобных поражений!

23.VII.

1) Опыт с Куйбар. Псевдосемантический синдром при поражении левой височной доли.

Нарушение понимания грамматических структур — но с возможностью компенсации! (из-за невозможности удержания серии).

Нарушение устного счета — при сохранности письменного счета.

2) Опыт с Волковым: синдром ТЗ

Сохранность W. {восприятия} фонем, сохранность понимания слов (нет отчуждения), сохранность звукового анализа — при нарушении серийных рядов!!

На правой стороне: Псевдосемантическое (височное) расстройство.

ТЗ!!

24.VII.

1) Опыт с Смирновым (ранение лобно-премоторной области).

а) Осколочная лейкотомия!¹⁴ Отделение всей лобной системы!! Отсюда — нарушение смысла — при сохранении значения.

б) На фоне общей аспонтанности — легкие нарушения премоторной речи.

NB: было задержано обратное развитие речи!!

На правой стороне: Эксперт военный Egas Monitz!!¹⁵

25.VII.

Опыт с Брозгальовым: Синдром Т2 (промежуточный между Т1 и ТЗ!!)¹⁶

На правой стороне: Т2

¹⁴ Лейкотомия (лоботомия) — рассечение белого вещества головного мозга.

¹⁵ Egas Monitz (Эгаш Мониш) — португальский невролог, один из основателей современной психирургии, разработал церебральную ангиографию, предложил хирургическую процедуру лейкотомии (современный термин лоботомия). Награжден в 1949 г. Нобелевской премией.

¹⁶ Синдромы Т1, Т2 и ТЗ — синдромы поражения верхней, средней и нижней височных извилин.

26.VII.

Новые афазики (общий просмотр).

NB: больной Школяр (правое лобное поражение у левши с отрицательной симптоматикой: латентный правша!!).

На правой стороне:

NB: Рис. 11. Генотипическая обусловленность доминантности (скрытый рецессивный правша!!).

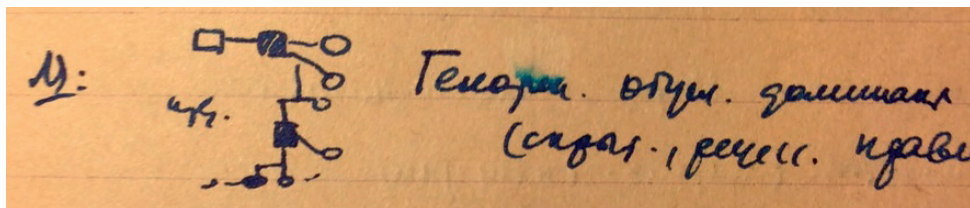


Рис. 11. Пациент Шк.

27.VII.

Просветов — грубый премоторный симптомокомплекс.

Новая сенсibilизированная проба (пересчет пальцев).

Отъезд в Казань

22.VIII

Опыт с больным Ивановым.

Неуклюжесть — теменная (экстра-пространственная)

— таламическая (постуральная)

— премоторная (динамическая)

25.VIII

Кулагин ({с О. П.} Кауфман). 1) Оптическая аграфия! 2) синдром синуса

26.VIII

1) Кертбат — обратное развитие синдрома Т2–3 дает выявление поражения сукцессивных процессов, нарушения акустического мнестиза и нарушения ударности.

2) Одинец — Т3 (полностью восстановлен).

На правой стороне: Динамические откаты ранений Т3

27.VIII

1) Харин — легкие симптомы лобной доли.

Пименов — отрицательный случай: ранение мягких тканей лобной доли без симптомов.

- 2) Куличков — моторный аграмматизм с телеграфным стилем.
- 3) Берсенева — (больной Перельмана)¹⁷. **Нейро-динамический** генез заикания у коммоционных больных. (Конфликт повышенной инерции возбуждения — с тенденцией к активной речи.)

На правой стороне:

NB

Нейро-динамические дисфазии!
у коммоционного больного
МИКСТА
{со смешанной доминантностью}

28.VIII

- 1) Гуряков. Отграничение афазии спереди (передне-височная афазия).
- 2) Фурман, Антонов. Лобные и премоторные расстройства.

31.VIII

- 1) Бурсягин. Височная афазия. Нарушение повторения и названия слов.
- 2) Кондратенко. Лобная афазия (нарушение спонтанной речи).

2.IX.

Катков — ранение левой лобно-височной области с быстро прошедшей афазией (левше-ство в роду, см. рис. 12) {см. «Травматическая афазия», случай 6 (Luria A. R., 1947, p. 39–40 / 1970, p. 67)}.

На правой стороне:

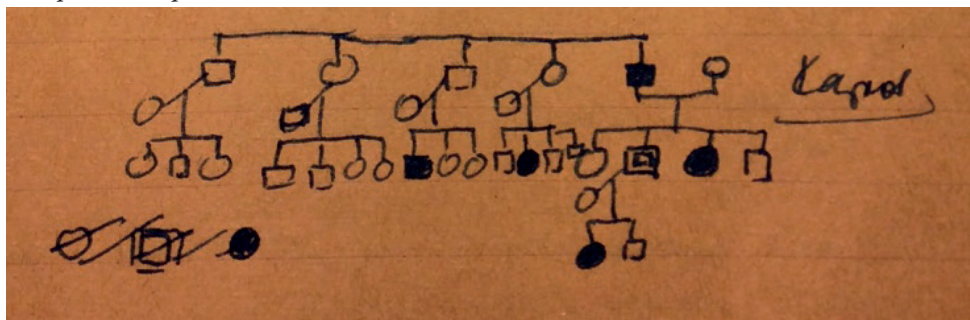


Рис. 12. Родословная пациента Катк.

¹⁷ Л. Б. Перельман — сотрудник госпиталя, невропатолог. Автор книги «Реактивная постконтузионная глухонмота, ее распознавание и лечение» (1943).

16.IX.

Опыт с Карабановым (Бассин)¹⁸. Невозможность <нрзб> подлинную конструкцию мелодии.

17.IX

- 1) Опыт с Карабановым — нарушение плавности в W. (восприятии) и мышлении (нарушение внутреннего поля).
- 2) Наблюдения над Макр <нрзб>. Нарушение произвольных процессов. Сущность истерии: Обычно непроизвольные процессы становятся произвольными, а произвольное протекание процессов нарушается. Уровни произвольности и уровни распада.

18.IX

Опыты с афазией.

Моторно-афазическое нарушение мышления (с О. П. Кауфман).

19.IX

- 1) Кондратенко. Ритмы. Нарушение автоматизации (премоторный синдром).
- 2) Просветов. Ритмы. Лобный синдром. Напряжение моторной установки в отсроченных действиях.
- 3) Суровцев, Саровец. Ритмы. Нарушение ритмов афферентного типа.

3.X.42.

Прохоров		Смысл и значение
Моисеев		при лобных поражениях

3.X.42.

- 1) Опыт с Sehswäche¹⁹ при затылочном ранении (Захарченко): она «снимается» очками, т. е. «неясное зрение» пресбиопика²⁰ перестает компенсироваться.
- 2) Опыт с Прохоровым: лобный больной: понимание смысла — счет (деление) — ритмы.
- 3) Опыт с Кубышкиным: компенсированное нарушение функций при поражении лобной доли у амбидекстра (см. *рис. 13*, вверху).

На правой стороне: NB: амбидекстрия!

¹⁸ Ф. В. Бассин (1905–1992) — сотрудник госпиталя, психолог. Известный психолог и нейрофизиолог, специалист по психологии бессознательного, доктор медицинских наук. Входил в круг Л. С. Выготского. Один из инициаторов и организаторов Тбилисского симпозиума по проблеме бессознательного.

¹⁹ *Sehswäche* (нем.) — слабость зрения.

²⁰ Пресбиопия («старческое зрение») — аномалия рефракции глаза, при которой человек не может рассмотреть мелкий шрифт или маленькие предметы на близком расстоянии.

9.X.42. Надеждин: Левша с ранением правой премоторной зоны и соответствующим доминирующим гемисиндромом (рис. 13, внизу) (на правой стороне).

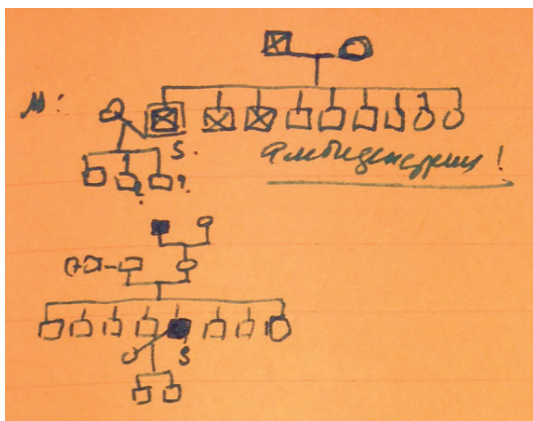


Рис. 13. Родословные больных Куб. (вверху) и Над. (внизу)

10-16.X.42.

С О. П. Кауфман. Разработка вопросов моторной афазии.

- 1) Классификация моторных афазий (фазическая — денерваторная — динамическая)
- 2) Разные соотношения речи/мысли при них.

17.X.42.

1) Комаров. Грубая моторная афазия без семантических расстройств у больного с ранением левого полушария — при скрытом гене левшества дает очень незначительные семантические и <двигательные> расстройства — при грубых расстройствах моторной речи (рис. 14).

На правой стороне:

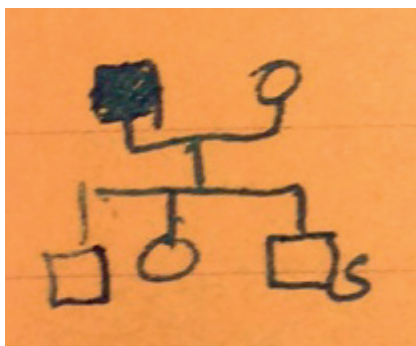


Рис. 14. Родословная Ком.

2) Разбор моторных афазий: Классификация по

	фазическая	денерваторная	динамическая
длине	речь	речь	речь
и	письмо	—	—
толщине	силлогич. эксп. ²¹	—	—

22.X.

Саборов: аграмматизм [зачеркнуто]. Нарушение схемы фразы.

23.X.

Газдюк: Подкорково-коммоционный синдром (псевдо-паркинсонизм; с лобно-подкорковым дефектом).

24.X.

1) Баранишин — синдром лобный (б).

2) Саборов — нарушение течения интеллектуальных процессов при лобной афазии.

28.X.

Саборов — невозможность удержания РЯДА.

30.X.

1) Саборов — Компенсация в серийных рядах

= | — с осмыслением

| = — легко!!

{Серия обведена треугольником, показывающим убывающую структуру серии. Возможно, это была проба выкладывания из палочек серии.}

2) Правый лоб — Лейдест, Песчанов — Ритмы: оценка " как " [т. е. оценка ритма «по 2» как «по 3»] — есть нарушение сенсорной денервации (2 раза — один слабо).

На правой стороне: NB!! Нарушение оценки ритмов = явление нарушения **сенсорной денервации!!**

3.XI.

Еще случаи латентной леворукости! (Катков!)

5.XI.

1) Саборов — опыт с заучиванием стихотворения — распад структуры стихотворного ритма.

²¹ Силлогич. эксп. — по-видимому, имеются в виду тесты на понимание силлогизмов. Лурия использовал их для исследования мышления при лобных нарушениях или семантической афазии.

2) Тогдаев: тонкие остатки премоторной афазии («дом-стол-кот» {проба Лурия на слухо-речевую память})

На правой стороне: NB

8.XI.

- 1) Саборов — лобный распад восприятия
- 2) Савельев — нарушение <нрзб> действий

9.XI.

- 1) Христов — височная афазия.

Новый сенсibilизированный метод исследования отчуждения слов (с исключением активной речи).

- 2) Симонов — моторная афазия с общим нарушением динамического фона.

10–11.XI.

Опыты с ритмами.

- 1) Опосредствование пространством (оптическая память) и речью.

12.XI.

Опыты с ритмами: опосредствование речевым образом «па-па» — «до-ро-га» у височных больных не дает никаких результатов (Бурсягин, Христов) [имеется в виду использование ударения в словах: в слове «па-па» ударение на первом слоге, в слове «до-ро-га» — на втором слоге].

13.XI.

- 1) Савельев | нарушение простых ритмов и
- 2) Шегалов | их опосредствование «пАпа» — «бородА» {в слове «па-па» ударение на первом слоге, в слове «бо-ро-да» — на третьем слоге}.

(Конец записей 1942 г.)

Окончание следует...

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