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A.R. Luria and the History of Russian Neuropsychology

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This paper analyzes Russian contributions to neuropsychology from the eighteenth up to the twenty-first century. Various approaches to the problem of the organization and localization of mental functions in the Pre-Lurian and Luria's periods are discussed. Comparisons with European and North American contributions and with contributions from subsequent Russian literature (post-Lurian period) are presented to demonstrate their interconnections in shaping the course of Russian neuropsychology and the main tendencies in its development.

Keywords Russian neuropsychology, localization of functions, mechanisms of mental functions, A.R. Luria, cultural-historical approach

Pre-Lurian Period

The history of Russian neuropsychology dates back to the eighteenth century. Like other European countries, neuropsychology in Russia was developed by neurologists and psychiatrists. Memory problems as well as speech and language disturbances after brain damage were of their first concerns.

Long before the historical contribution by P. Broca in 1861, considered by most neuropsychologists to be the starting point in the study of aphasia, L. Bolotov described a case of an organic language disorder in 1789. Bolotov considered this defect to be the consequence of memory loss and he gave an interesting description of its improvement (Bolotov, 1789). Another case history of probable aphasia was presented by N. Filippov in 1838. He gave a detailed follow-up of a patient with an "extraordinary muteness" (Filipov, 1838).

In 1867, V.M. Tarnovsky published a large paper (more than 70 pages), describing different forms of aphasia and proposing an original model of speech production in a way to differentiate aphasia from dementia or an ability to coordinate the movements of certain muscular groups, which take part in word pronunciation. It should be pointed out that Tarnovsky used the term "aphasia," proposed by A. Trousseau in 1864. In previous papers these language disorders were called "alalia" following J. Lordat (1843), or "aphemia" following P. Broca. A critical review of the studies on aphasia in Tarnovsky's paper show his knowledge of the contributions of his European contemporaries, as well as his original approach to the phenomenon of loss of speech. Namely, in contrast to the localizationist theories of the day, Tarnovsky proposed to differentiate the localization of *function* and localization of the *defect*. ". . . One should not conclude, as many do, that, for instance, autopsy evidence of a local destruction in the left frontal convolution in an aphasic patient

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means this lesion to be the only cause of aphasia and that consequently the ability to speak is localized in this region" (Tarnovsky, 1867, p. 247). It is similar to the ideas expressed by Hughlings Jackson in 1884 and by A.R. Luria (1947). The same conclusion was proposed by G. Idelson (1896–1897) who wrote: "Speech can not be localized. A localization is permissible merely for speech disorders" (p. 77). Idelson was one of the first to point out some components in the origin of aphasia, which are not related to brain damage but with a patient's functional state.

This period of Russian aphasiology—like the one in Europe—had ardent proponents of the localization approachand those who opposed. Among the former was A. Kojevnikov, the founder and the president of the Moscow Association of Neurologists and Psychiatrists. His book *Aphasia and the Central Organ of Speech* (1874) contains many arguments to prove that "the ability to speak definitely depends on a special region of the brain, which appropriately can be named the central organ of speech" (Kojevnikov, 1874, p. 2). He considered the regions adjacent to the left Sylvian fissure to be this central organ. "A diversity in aphasic symptoms could be well explained by a complex apparatus functioning during the act of speech and by the fact that different components of this complex mechanism are disturbed in each case" (pp. 22– 23).

B.E. Larionov (1898) also developed a localization theory. He defined a "musical center" within the "center of speech." Complex types of aphasia indicate, in his opinion, "a very limited localization of specific centers, isolated injury of which, in very restricted regions of the brain, appears relatively seldom" (Larionov, 1898, p. 705).

A very significant contribution by Kojevnikov was the description of a so-called "*sensory aphasia*" due to an injury in the left temporal region. He wrote that patients with this type of aphasia reveal disturbed verbal comprehension and a rather large vocabulary, but the words are used in an inappropriate manner; consequently the patient's speech becomes incoherent, with an unclear set of words. This description was published by Kojevnikov on May 20, 1874, in the Moscow Medical Bulletin (Kojevnikov, 1874). The contribution of C. Wernicke was also published in 1874, but sometime after June, as the description of the sensory aphasia case included autopsy evidence for the patient who died on June 23, 1874. So, Kojevnikov's case disproves the general opinion that Carl Wernicke was the first to describe sensory aphasia, often named "Wernicke's aphasia" (however, none of them was the first to describe patients with language comprehension problems, not yet called sensory aphasia). In the same paper, Kojevnikov gave one of the first descriptions of visual agnosia. He proposed to explain transitory aphasia by molecular impairments, invisible at autopsy. Considering modern aphasiology and the present controversy over verbal and nonverbal communication disorders, it is interesting to mention Kojevnikov's observation that "in aphasia, speech disorders often go together with disorders of gesture, that is an inability to express in signs their own ideas—an ability, well developed in mutes" (Kojevnikov, 1874, p. 24).

Both Kojevnikov and N. Rodossky assumed that aphasia was neither an intellectual impairment nor a loss of memory, but a disturbance of voluntary activity, of an inability "to control well the organ of speech" (Rodossky, 1872, p. 142). A significant contribution of Rodossky was the study of disturbances in the evolution of voluntary and involuntary, oral and written speech. He was one of the first to reveal and to describe a relation between deficits of sound articulation and disorders of comprehension in reading, as well as between inner speech and writing disorders. He also pointed out the emotional reactions of aphasics to their impairments. So, Rodossky's contribution could be reliably considered as one of the first attempts to approach the study of aphasia in a systematic way.

It should be stressed that Russian neurologists of nineteenth century tried to reveal the mechanisms of different forms of aphasia by an analysis of the psychological and physiological structures of speech. M.M. Manassein (1883), for example, compared aphasic symptoms with the ontogenetic development of speech. He also argued for the compensatory role of the right cerebral hemisphere, revealed for instance in mirror writing.

Besides the studies of aphasia, agnosia, and apraxia in nineteenth century, a very important contribution to the neuropsychology of memory was made in Russia. In 1890 S. Korsakoff described in detail severe memory disturbances in alcoholic patients, included now in all neuropsychology handbooks under the name "Alcoholic Korsakoff's syndrome." Later, in 1907, V.M. Behterev demonstrated these disorders to be related to lesions of the medial temporal regions of the brain, namely of hippocampal complex. Similar case observations were presented by Scoville and Milner in 1957. So the contributions of Russian researchers, made more than 100 years ago, indicate that they paid attention to many of the fundamental problems of neuropsychology that remain significant to this date (Glozman, 1996).

At the beginning of the twentieth century, many Russian aphasiologists performed experimental studies of verbal functions, in particular the measurement of stimulus duration, speed, and quality (Astvatsaturov, 1908; Fedorin, 1913). Using these methods, I.N. Fedorin made a revision of the psychoanalytic interpretation of the slip of the tongue phenomenon done by S. Freud and proved its relationship to the inertia of nervous processes. G. Boino-Rodzievitch (1902) attempted to apply the psychophysiological approach to the problem of function recovery and to explain a modification of the clinical pattern noticed during aphasics' recovery by a gradual activation of the sensory centers.

M.I. Astvatsaturov, in his PhD dissertation dealing with an analysis of normal and aphasic language, made one of the first *linguo-statistical studies* of aphasia. He concluded that "amnesia for nouns is revealed after motor center disturbances, while amnesia for verbs is due to Wernicke area lesions" (Astvatsaturov, 1908, p. 224).

M.B. Krol — a family doctor of V.I. Lenin—observed 55 cases of aphasia and 30 cases of apraxia, compared them with Western studies and stressed the difference between anarthria and aphasia, the first being attributed to damages of cortico-bulbar connections from both hemispheres. The author analyzed word-finding difficulties in aphasia and considered *amnestic aphasia* to be distinct from the other forms of aphasia, which could be attributed to a lesion of the left parietal region of the brain. Krol also made a very sophisticated analysis of the mechanisms of sensory aphasia. He concluded that "sensory aphasia was neither an intellectual disturbance nor a sensory defect *sensu stricto*. It should be considered as a disorder of the secondary identification of the gnostic function, therefore, the right name for it is agnosic aphasia" (Krol, 1912, p. 25). This idea was experimentally confirmed in 1976 by N.G. Kalita. Krol was also one of the first to indicate an interdependence and interrelationship between gnosis, praxis, and speech and to show a close interrelation between speech disorders and other mental impairments.

This idea was further developed in a book by M.S. Lebedinsky, who showed a dual mechanism for this interrelationship: "It is due to a likeness of different pathophysiological mechanisms of the brain on one hand, and on the other hand it is a result of the common evolution of human conscious activities, with praxis, gnosis, and speech being closely interwoven" (Lebedinsky, 1941, p. 229). The interrelationship can also be revealed between speech and memory, gnosis and attention and other functions.

Very important for the consecutive development of neuropsychology was Lebedinsky's idea on simultaneous integration and differentiation of each brain area that is independent and at the same time included in various functional systems. The functioning of the brain area is partly determined by the appropriate functional system. The same

principle of integration and differentiation characterizes the interhemispheric interaction as well. Lebedinsky also described the syndromes of disturbances of the nondominant hemisphere, like anosognosia, dysautomatization of activity, and so on. The interhemispheric interaction in each mental function permits its restitution after local brain damage. Lebedinsky also stressed the necessity to take into account the individual differences in mental functioning. This appeal was "heard" 50 years later (Homskaya et al., 1997).

The first paper specifically devoted to aphasia rehabilitation was written in 1938 by N.V. Vasilenko. He analyzed the conditions favoring the reeducation of aphasics, including etiology, localization, the nature of a lesion, general cerebral condition, and premorbid personality features. His conclusion, which was confirmed later, was "Traumatic aphasics recover best" (Vasilenko, 1938, p. 23). Another assumption of his is also consistent with modern psychological theories of rehabilitation: "In most cases of aphasic disturbances the lost function is not restituted but substituted by a new one resembling the normal speech only in its final effect" (Vasilenko, 1938). Furthermore, Vasilenko proposed valuable methodological recommendations: to use alternative paths, to use residual compensatory mechanisms, to use the patient's activity and initiative, and so on. These approaches were further developed in the contributions of A.R. Luria (1947, 1948).

So, one can see that at the end of the nineteenth and the beginning of the twentieth century the neuropsychological problems (including aphasia, agnosia, apraxia, of interhemispheric interaction, and others) were at the center of attention of many Russian neurologists and psychologists. It is sufficient to note that one of three topics in the program of the First Congress of the Russian Association of Neurologists and Psychiatrists in 1911 was "On the clinical pattern and local diagnosis of mental impairments due to organic lesions of the brain (aphasia, agnosia, apraxia)."

The contributions of early Russian aphasiologists have demonstrated a major approach to the field. These writers did not limit themselves to descriptions of symptoms but attempted to find the underlying psychophysiological mechanisms and they made use of the current physiological, psychological, and linguistic theories of the day to interpret the observed phenomena. In addition, Russian neurosychological studies contributed to the further development of psychology. As far back as 1898, A.E. Tscherbak noted that "modern experimental psychology is mostly related to the study of nervous diseases" (p. 809). Most of the psychological theories of L.S. Vygotsky also came from the neuropathological studies.

Therefore, one can conclude that the well-known contributions of A.R. Luria (1902–1977) and his disciples fell on fertile ground. Russian neurologists and psychiatrists of the end of nineteenth and the beginning of the twentieth centuries established a solid base for "Luria's period" in the history of the neuropsychology.

Lurian period

In 1922 Luria wrote his first large (more than 200 pages) book *Principles of a Real Psychology*. The book was not published and the manuscript remained in Luria's archives until 2003. It is really fantastic that a 20-year-old psychologist, recently graduated from the university, formulated the main principles of a psychological study in this book:

- To deal with the concrete personality, the living human being, as a biological, social, and psychological unity.
- To study individual regularities, uniquely determined sequences, that is to combine a description of individual, unique processes with the study of lawful, regular processes.

- To study an individual human mind as a whole and the particular mental phenomena as functions, elements of this whole, developing in this concrete human personality, with the possibility of change through the transformation of social conditions.
- To study individual values of the examined psychological phenomena for the life of the actual personality.

Luria developed and followed these principles all over his life; they were adopted by his students and disciples and they formed the methodological basis of Russian/Soviet neuropsychology.

In the same book Luria indicated the sources of these principles: the science of human behavior and the needs that drive it; the reflexology of Behterev; and the psychoanalysis of Freud. Luria shared the main psychoanalytic ideas: holistic and dynamic approach to personality, biological, and social determination of personality development, interrelations between external and internal, and interrelations between conscious and unconscious.

Luria organized the Psychoanalysis Study Group. A message about it was sent to Sigmund Freud and soon Luria received the answer to this letter from Freud, written in Gothic German script (still in Luria's files), in which Freud gave an authorization to translate his work (Fig.1).

During the 1920s, Luria and L.S. Vygotsky started their first experiments on patients with brain damage. Vygotsky used two kinds of tests for "brain mapping" that were created in Russia. One was based on reflexology, and the other was a test battery similar to the one later created by Wechsler. Both were not satisfactory for Luria's and Vygotsky's goals: They could not explain the mechanisms of cognitive deficienciesthat resulted from neurological defects.

They formulated the general principles of a new approach to the analysis of psychological processes organization (that differ them from neuropsychologists of the pre-Lurian period). First of all, they tried to specify the relationship between the elementary and higher forms of psychological activities and their cerebral organization in healthy adults. Then Luria and Vygotsky determined possible changes in psychological processes that might appear in different forms of brain damage, and those that might be expected in early abnormal ontogenetic development.

Vygotsky and Luria developed the idea that cognitive processes descend from complex interaction and interdependence of biological factors (individual mind) that are part of physical nature, and cultural factors, that appeared in the evolution of the human being. This social-historical approach in neuropsychology looks for origins of human conscience and mental activity neither inside the brain nor in the mechanisms of nervous processes but in human social life.

Besides, both Vygotsky and Luria agreed that Pavlovian reflexes might serve as the material basis of the mind, but they did not determine the structure of complex behavior or the properties of higher mental processes such as remembering, voluntary attention, problem solving, speech, and others. "The structure of the organism presupposes not an accidental mosaic, but a complex organization of separate systems. This organization is expressed paramountly in a functional correlation of these systems, . . . they unite as very definite parts into an integrated functional structure" (Luria, 1932, pp. 6–7). It means that a higher mental function is a functional systemconsisting of many components, each of which is based on the work of a special area of the brain and performs its special role in the system.

Consequently, a "neuropsychological assessment must not be limited to a simple statement that one or another form of mental activity is affected. The assessment must be a qualitative (structural) analysis of the symptom under study, specifying the observed defect and the factors causing it" (Luria, 1969, p. 306).

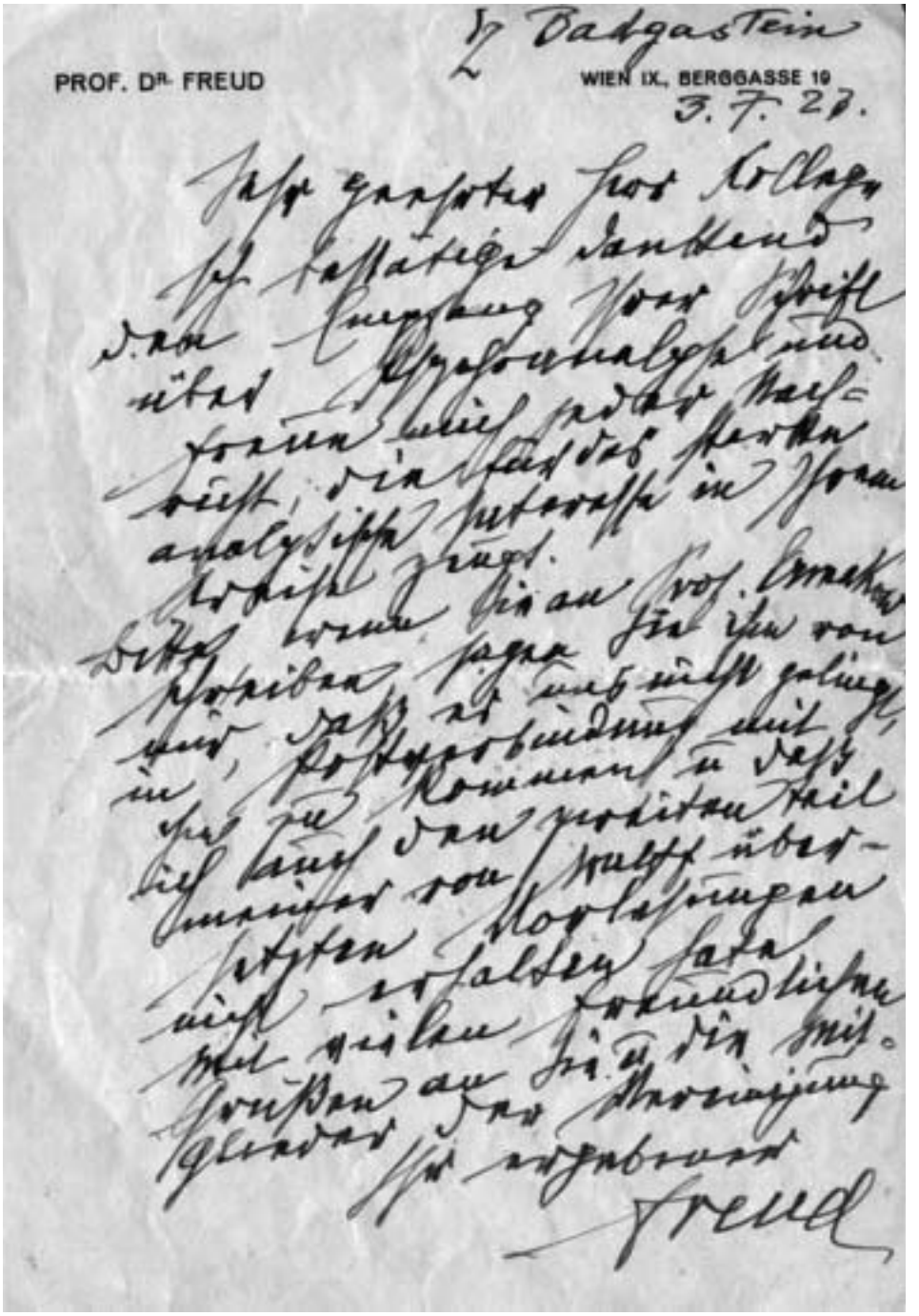

Figure 1. The letter by S. Freud to A.R. Luria.

One of the basic concepts in Lurian terminology is the "Neuropsychological Factor"— a structural-functional unit that is characterized by a definite principle of psychophysiological activity and functioning (*modus operandi*). A factor reflects, on the

Figure 2. A.R. Luria, assessing a patient.

one hand, a definite kind of functioning of the working brain, provided by neural networks of a certain brain area; on the other hand, a factor has a psychological meaning, and it is an important constituent of a psychological functional system. The disturbance of the factor leads to the appearance of a definite syndrome — a systematic constellation of symptoms. A syndrome (factor) analysis is an analysis of observed symptoms with the goal of finding a common base (factor), which explains their origin. It supposes a stepwise procedure that includes the comparison of all observed symptoms, a qualitative estimation of symptoms, a discovery of their common base, i.e., detecting a primary deficit, its systemic consequences and compensatory reorganization.

After detecting which components of mental activity are disturbed, the neuropsychologist determines the preserved ones. Luria (1948) created the theory of neuropsychological rehabilitation: to use the preserved components ("patient's strengths), to supplement them with external aids, and to reconstruct the activity on the basis of a new functional system.

When World War II broke out in 1941, Luria put this theory into practice. He directed a rehabilitation hospital where several thousand patients with brain injuries were treated. It is astonishing "how much he was able to draw from those patients and how much he gave them back! [. . .] In doing so, he brought into play both his empathy and his theoretical insights into cortical functioning — particularly in tracing frontal lobe functions dedicated

to managing the interplay of intentions, memory, action, and selective intake of information" (Bruner, 2004, p. XI).

So, the Lurian period is an establishment of the theoretical framework in neuropsychology. Therefore, the value of Luria's contributions in neuropsychology can be considered to extend far beyond his own research publications. He contributed to the development of new approaches by subsequent generations.

Post-Lurian period

In this section I will try to give a global description of the historical development of Russian neuropsychology. It should be mentioned first that most of the studies by Russian neuropsychologists described below started at the time when Luria was active and often with his participation. The development of Russian neuropsychology by students who have been trained directly by Luria or indirectly by others who were influenced by his ideas, before and after his death in 1977, coincides with the universal tendency to replace the static neuropsychology, relating the individual's behavior to fixed cerebral lesions, by the dynamic neuropsychology, analyzing the dynamics of brain-behavior interaction (Tupper & Cicerone, 1990, Glozman, 1999a, 2000). The following model represents the development in neuropsychology through three overlapping and coexisting phases (Fig.3).

In the *first phase*, the emphasis for neuropsychologists was on the brain in its relations to different behaviors. The neuropsychology of this period was considered by Luria, as well as by occidental neuropsychologists, to be a "field of practical medicine" (Luria, 1973, p. 17). The main and invaluable attainment of this phase is a revision by Luria of concepts of localizationism and antilocalizationism and the creation of the theory of dynamic and systematic cerebral organization of mental processes. It resulted in the functional analysis of different brain systems and description of frontal, parietal, temporal, and other syndromes. The recent development of this approach follows two main lines: (1) a study of functions of the right hemisphere and interhemispheric interactions for different types of memory, perception, and reasoning for compensating capabilities and others (Simernitskaya, 1978; Korsakova & Mikadze, 1982; Vasserman & Lassan, 1989; Krotkova, 1998; Homskaya & Batova, 1998; Meerson & Dobrovolskaya, 1998; Moskovich, 2004) and (2) research in subcortical brain pathology, especially cognitive disturbances in patients with Parkinson's disease — a specific combination of "natural" brain alterations appearing with age, necessitating a change in strategies, voluntary selection, and use of new forms of mediating mental activity and specific impairments caused by the disease (Korsakova & Moskovichyute, 1985; Korsakova, 1998; Glozman, Levin, & Tupper, 2004).

In the *second phase* of neuropsychology development, the structure of mental activity has been the focus of attention and afterwards its localization in the brain. It gave birth to different syndromes of mental disturbances: local, resulting in the neuropsychology of memory (Luria, 1976a; Korsakova & Mikadze, 1982), neurolinguistics (Luria,1976b, Akhutina, 1981; Akhutina & Glozman, 1995) and so on, diffuse syndromes after cerebrovascular pathology (Moskovich, 2004), syndromes of underdevelopment or atypical development, heterogeneity in the maturation of brain structures and connections, resulting in learning disabilities (Mikadze & Korsakova, 1994; Akhutina, 1998, 2004; Polyakov, 2004), and finally mental dysfunctions in normal subjects in specific functional states or with some individual particularities or accentuations in cognitive performances. The latter line gave birth to the neuropsychology of individual differences, i.e., an application of neuropsychological concepts and methods to the assessment of healthy subjects (Homskaya et al., 1997).

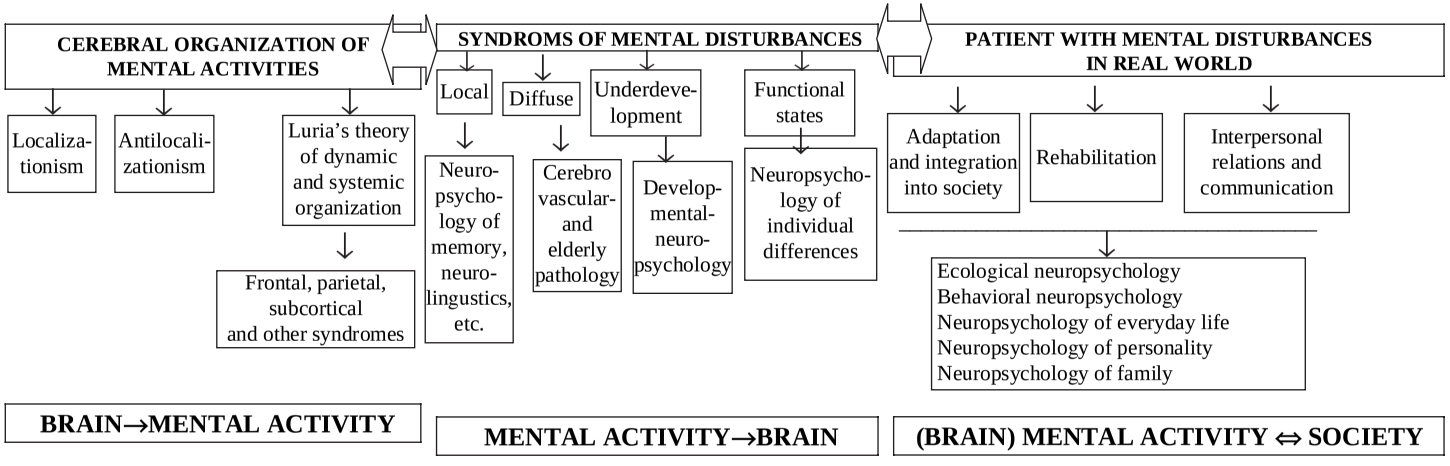

Figure 3. Model of development in neuropsychology.

The third phase of development in neuropsychology focuses on the interrelationship between a patient and his or her environment and integrates neuropsychological and real life data. The main task of the neuropsychological assessment is not so much diagnostic but prognostic and corrective suggestions. Neuropsychological assessment should rather emphasize the subject's strengths, which are important in his/her correction (rehabilitation) program and predict his/her ultimate integration into society. This principle was first realized in aphasiology as the so-called "socio-psychological aspect of rehabilitation" (Tsvetkova et al., 1979; Tsvetkova, 1985) and, subsequently, in studies of interrelations between communication disorders and personality in different nosological groups (Glozman, 2002) and in developmental neuropsychology.

As stated above, Luria's approach presupposes a qualitative analysis of the symptom under study, based upon an understanding of the factors and underlying complex psychological activities. The quantitative evaluation of disturbances is of primary value for determining the dynamics of change in cognitive functioning during neuropsychological follow-up and for measuring the outcome of rehabilitative or remedial procedures. The scoring systems worked out by Luria disciples include (besides normative reference of the Lurian qualitative analysis of the origin of the symptoms) conditions of corrections of mistakes and possibilities to organize successful completion of the test with or without external assistance (Glozman, 1999b).

Conclusion

A psychophysiological orientation for Russian neuropsychology, in contrast to the predominantly neurological orientation in Western contributions, favored the continued development of this field in Russia and assured its predominance in several areas of study: the first descriptions of sensory aphasia and visual agnosia, the first linguo-statistic analysis of aphasia, strong foundations for the systematic approach to investigations of brain damages, and so on. Unfortunately, the rich history of Russian neuropsychology was rather inaccessible to Western neuropsychologists and could not influence them until the Lurian period, when many contributions were translated into English and other languages. Luria's works are still studied and cited frequently all over the world. This paper aimed to show how Russian neurologists and psychiatrists at the end of nineteenth and the beginning of the twentieth centuries prepared the theoretical and methodological contributions of Luria and their contemporary development.

Three main trends can be seen in the development of Russian neuropsychology after Luria:

1. Extensive expansion of research and practice, that is, embracing numerous new domains and nosological patient groups;
2. Combination of qualitative and quantitative approaches;
3. A social and personality-based orientation.

All the aforesaid show that Luria's creative and comprehensive approach stimulates the further development of neuropsychology in Russia and throughout the world.

References

Akhutina TV (1981): Lexical organization upon aphasiological data. In: AA Zalevskaya, ed., *Psycholinguistic Studies of Vocabulary and Phonetics* (pp. 3–12). Kalinin, Kalinin Univ. Press, In Russian.

Akhutina TV (1998): Neuropsychology of individual differences in children as a basis for the application of neuropsychological methods at school. In Homskaya ED & Akhutina TV, eds., *First*

International Luria Memorial Conference Proceedings (pp. 201–208). Moscow, Russian Psychological Association Press, In Russian.

Akhutina TV (2004): Writing: Assessment and remediation. In: Ahutina TV, Glozman JM, Moskovich LI, Robbins D, eds., *A.R. Luria and Contemporary Psychology: Festschrift Celebrating the Centennial of the Birth of Luria* (pp. 125–145). New York, Nova Science.

Akhutina, TV, Glozman J.M. (1995): The neurolinguistic study of semantics. *Aphasiology 9* (2):143–152.

Astvatsaturov MI (1908): *Clinical and Experimental Psychological Studies of Verbal Functions. Ph.D. Dissertation*. Saint Petersburg Medical Academy. In Russian.

Behterev VM (1907): Fundamentals on brain functions. *Trudy Kliniki dushevnyh I nervnyh bolezney (Proceedings of the hospital of mental and nervous diseases), VI*, St. Petersburg. In Russian.

Boino-Rodzievitch GG (1902): On the theory of aphasia. *Vrachebnaya gazeta (Medical Newspaper) 3*: 48–50. In Russian.

Bolotov LT (1789): Something specific on memory. *Economitcesky Magazin (Economical Magazine), part 39, n. 62*: 149. In Russian.

Broca P (1861): Perte de la parole. Ramolissement chronique et destruction partielle du lobe antérieur gauche du cerveau. *Bulletin de la Société d'Anthropologie 2*: 398–408.

Bruner J (2004): Preface. In: Ahutina TV, Glozman JM, Moskovich LI, Robbins D, eds., *A.R. Luria and Contemporary Psychology: Festschrift Celebrating the Centennial of the Birth of Luria* (11–13). New York, Nova Science.

Fedorin IN (1913): *Voenno-Meditsynsky Jurnal (Military Medical Journal*, pp.219–245), *4–5*. In Russian.

Filippov NS (1838): *Voenno-Meditsynsky Jurnal (Military Medical Journal*, p. 5) *1*. In Russian.

Glozman JM (1996): A brief history of Russian aphasiology. *Neuropsychology Review 1*: 1–10.

Glozman JM (1999a): Russian Neuropsychology after Luria. *Neuropsychology Review 1*: 33–44.

Glozman JM (1999b): Quantitative and qualitative integration of Lurian procedures. *Neuropsychology Review 9*(1): 23–32.

Glozman JM (2000): Neuropsychology in the former USSR. In: Craighead W & Nemeroff Ch, eds., *The Corsini Encyclopedia of Psychology and Behavioral Science, V*. 4 (pp. 1730–1733) New York, John Wiley & Sons.

Glozman, JM (2002): *Communication and the Health of the Personality*. Moscow, Academia. In Russian.

Glozman JM, Levin OS, Tupper D (2004): Executive behavior after cortical and subcortical brain damage. In: Ahutina TV, Glozman JM, Moskovich LI, Robbins D., eds., *A.R. Luria and Contemporary Psychology: Festschrift Celebrating the Centennial of his Birth* (pp. 65–77). New York, Nova Science.

Homskaya ED & Batova NYa (1998): *Brain and Emotions*. Moscow, Russian Pedagogical Agency Press. In Russian.

Homskaya ED, Efimova IV, Budyka EV, Enikolopova EV (1997): *Neuropsychology of Individual Differences*. Moscow, Russian Pedagogical Agency Press. In Russian.

Idelson G (1896–1897): Actual state of the study of aphasia. *Nevrologichesky Vestnik (Neurological Bulletin), v. IV, n. 2–4, v. V, n. 1–3*. In Russian.

Jackson H (1884): *Evolution and Dissolution of the Nervous System*. Croonian lecture.

Kalita NG (1976): *On Nature and Mechanisms of Naming Troubles in Acoustico-Mnestic Aphasia*. Ph.D. Dissertation. Moscow. In Russian.

Kojevnikov AYa (1874): Aphasia and the central organ of speech. *Moscovsky Vrachebny Vestnik (Moscow Medical Bulletin)* May 6–June 17: 18–58. In Russian.

Korsakoff SS (1890): *Boleznennye Rasstroystva Pamyati i ih Diagnostika (Pathological Memory Disorders and their Assessment)*. Moscow. In Russian.

Korsakova NK (1998): Neuropsychogerontology: Development of A.R. Luria's school of ideas. In: Homskaya ED & Akhutina TV, eds., *First International Luria Memorial Conference* Pproceedings (pp. 249–254). Moscow, Russian Psychological Association Press. In Russian.

Korsakova NK & Mikadze YuV (1982): Neuropsychological studies of memory: Results and perspectives. In Homskaya ED, Tsvetkova LS, & BV Zeigarnik, eds., *A.R. Luria and Modern* Psychology (pp. 101–110). Moscow, Moscow University Press. In Russian.

Korsakova NK & Moskovichyute LI (1985): *Subcortical Structures and Mental Processes*. Moscow, Moscow Univ. Press. In Russian.

Krol MB (1912): *K klinike I Topicheskoy Diagnostike Afazicheskih I Aprakticheskih Rasstroystv (On the Clinical Pattern and Topical Diagnosis of Aphasic and Apractic Disorders)*. Moscow, Moscow University Press. In Russian.

Krotkova OA (1998): Interhemispheric interaction and rehabilitation processes after local brain damages. In: E.D. Homskaya & T.V. Akhutina (Eds.). *First international Luria memorial conference proceedings* (pp. 126–131). Moscow: Russian Psychological Association Press, In Russian.

Larionov BE (1898): *Obozreniye Psychiatrii, Nevrologii i Experimentalnoy Psychologii (Reviews in Psychiatry, Neurology and Experimental Psychology.)* Moscow. In Russian.

Lebedinsky MS (1941): *Afazii, Apraxia, Agnozii (Aphasias, Apraxias, Agnosias)*. Kharkov, Meditsina. In Russian.

Lordat J (1843): Analyse de la parole pour servir à la théorie de divers cas d'alalie et de paralalie (de mutisme et d'imperfection de parler) que les neurologistes ont mal connus. *Journal de la Société Pratique de Montpellier* 7: 333–417.

Luria AR (1932): *The Nature of Human Conflicts*. New York, Liveright.

Luria AR (1947): *Traumatic Aphasia*. Moscow, Medical Academy Press. In Russian. English translation (1970) The Hague, Mouton.

Luria AR (1948): *Restoration of Brain Functions After War Trauma*. Moscow, Medical Academy Press. In Russian. English translation (1964) Oxford, Pergamon Press.

Luria, AR (1969): *Higher Cortical Functions in Man* (2nd edition). In Russian. Moscow, Moscow University Press. (English translation, Basic Books, 1980).

Luria AR (1973): *The Working Brain. An Introduction to Neuropsychology*. London, Penguin Books.

Luria, AR (1976a): *The Neuropsychology of Memory*. Washington, Winston.

Luria, AR (1976b): *Basic Problems of Neurolinguistics*. The Hague, Mouton.

Luria AR (2003): The principles of real psychology. In: Glozman JM, Leontiev DA, Radkobskaya AG, eds., *A.R. Luria. Psychological Tribute* (pp. 295–384). Moscow, Smysl. In Russian.

Manassein MM (1883): *Voenno-Meditsynsky Jurnal (Military Medical Journal), May, part CXLVI*, pp.17–96; *June, part CXLVII*, pp. 1–175. In Russian.

Meerson YaA & Dobrovolskaya NV (1998): Disorders in perception of absolute and relative objects localization in spatial depth (depth agnosia) after focal damage of the right or left cerebral hemisphere. In Homskaya ED & Akhutina TV, eds., *First International Luria Memorial Conference Proceedings*. Moscow, Russian Psychological Association Press. In Russian.

Mikadze YuV & Korsakova NK (1994): *Neuropsychological Diagnosis and Correction of Primary School Children*. Moscow, Inteltex. In Russian.

Moskovich LI (2004): Cerebral hemisphere asymmetry on the cortical and subcortical levels. In: Akhutina TV, Glozman JM, Moskovich LI, Robbins D, eds., *A.R. Luria and Contemporary Psychology: Festschrift Celebrating the Centennial of the Birth of Luria* (pp. 11–13). New York, Nova Science.

Polyakov VM (2004): Neuropsychological screening of child population. In: Akhutina TV, Glozman JM, Moskovich LI, Robbins D. eds., *A.R. Luria and Contemporar y Psychology: Festschrift Celebrating the Centennial of the Birth of Luria* (pp. 93–105). New York, Nova Science.

Rodossky NS (1872): On the study of aphasia. *Voenno-Meditsynsky Jurnal (Military Medical Journal), part 113* (pp. 112–174). In Russian.

Scoville WB & Milner B (1957): Loss of recent memory after bilateral hippocampal lesions. *Journal of Neurology, Neurosurgery and Psychiatry 20*: 11–21.

Simernitskaya EG (1978): *Hemispheric Dominance*. Moscow, Moscow Univ. Press. In Russian.

Tarnovsky VM (1867): Some forms of the syphilitic aphasia. *Voenno-Meditsynsky Jurnal (Military Medical Journal), part 100, n. 12*: 225–296. In Russian.

Trousseau A (1864): De l'Aphasie, maladie décrite récemment sous le nom impropre d'aphémie. *Gazette des Hôpitaux 37*.

Tscherbak, AE (1898): On the value of anatomy and pathology of nervous system for physiological psychology. *Obozreniye Psychiatrii, Nevrologii i Experimentalnoy Psychologii (Reviews in Psychiatry, Neurology and Experimental Psychology*, n. 10 (pp. 809–810). In Russian.

Tsvetkova, LS (1985): *Neuropsychological Rehabilitation of Patients*. Moscow, Moscow Univ. Press. In Russian.

Tsvetkova, LS, Glozman, JM, Kalita, NG, Maximenko, MYu, & Tsyganok, AA (1979): *Socio- Psychological Aspect of Aphasics Rehabilitation*. Moscow, Moscow Univ. Press. In Russian.

Tupper DE & Cicerone KD (1990): Introduction to the neuropsychology of everyday life. In: Tupper D & Cicerone K, eds., *The Neuropsychology of Everyday Life: Assessment and Basic Competences* (pp. 3–18). Boston, Kluwer Academic Publishers.

Vasilenko NV (1938): On restitution after aphasic impairments. *Sovetskaya Psychonevrologia (Soviet Psychoneurology) 6*: 15–24. In Russian.

Vasserman, LI & Lassan, LP (1989): Effect of lateralization of subcortical stereotaxic destruction on post surgery dynamics of mental functions in subjects with epilepsy. In: *Clinical Aspects of the Problem of Brain Functional Asymmetry*. Minsk, Belarus. In Russian.

Wernicke C (1874): *Der Aphasische Symptomenkomplex*. Breslau.