A Brief History of Russian Aphasiology

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This paper analyzes early Russian contributions to the study of aphasia, dated between 1789 and 1941. Different approaches to the problem of the organization and localization of verbal functions as well as to the understanding of mechanisms of aphasia and principles of aphasia rehabilitation are discussed. Comparisons with European and North American contributions and with contributions from later Russian writing (e.g., Luria's period) are presented to demonstrate their interconnections in shaping the course of Russian aphasiology.

KEY WORDS: aphasiology; neuropsychology; localization of functions, mechanisms of aphasia; speech rehabilitation.

INTRODUCTION

The study of aphasia—speech and language disturbances after brain damage—is one of the oldest concerns of neurology and psychology. This topic is now even more compelling given the increase in the number of strokes and brain injuries that produce cognitive deficits including disorders of speech and communication. A continuing interest in the problems of aphasia is due to the fact that its study helps one to understand the cerebral organization of mental functions and the relationship of language to other cognitive functions (intelligence, memory, perception, etc.), the structure of speech, different levels of speech/language organization and their interaction in verbal behavior, and methods for rehabilitation of verbal communication.

The development of aphasiology has been mainly traced in neuropsychology to the names of Jacques Lordat (1773–1870), Paul Broca (1824–
1880), Henry Bastian (1837–1915), Carl Wernicke (1848–1905), J. Hughlings Jackson (1835–1911), Ludwig Lichtheim (1845–1928), Adolf Kussmaul (1822–1902), Joseph Déjerine (1849–1917), Arnold Pick (1851–1929), Pierre Marie (1853–1940), Henry Head (1861–1940), and other European neurologists. The contribution of Russian neurologists and psychologists of the 19th century to the study of aphasia is almost unknown. Older authors are very seldom mentioned in Russian neuropsychological literature (Luria, 1947; Tonkonogy, 1954; Beyn, 1964; Tsvetkova, 1972; Tsvetkova and Glozman, 1989) and never in Western literature, even in handbooks on aphasia or historical reviews (Marie, 1906; Benton, 1964; Geschwind, 1966; Hécaen and Dubois, 1969; Critchley, 1970; Goodglass and Kaplan, 1972; Lecours and Lhermitte, 1979; Seron, 1979; McNeil Horton and Puente, 1986).

Nevertheless, Russian aphasiology has its own history, dating back to the 18th century. Long before the historic contribution of 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 in the Economical Magazine. Bolotov considered this defect to be consequent to a loss of memory and he gave an interesting description of deficit regression. Also using a case history, N. Filippov presented in 1838 a detailed follow-up of a patient with an “extraordinary muteness.”

LOCALIZATION—ANTILOCALIZATION APPROACHES

Broca’s contribution excited a great interest and discussion among Russian aphasiologists. In 1867, V. M. Tarnovsky published in the medical journal of St. Petersburg a large paper (more than 70 pages), describing different forms of aphasia. It should be pointed out that V. Tarnovsky used the term “aphasia,” accepted in Europe only in 1877 after the contribution of A. Trousseau (1801–1867). In previous contributions these language disorders were called “alalia” following J. Lordat, or “aphemia” following P. Broca. A critical review of the studies of aphasia in the paper of Tarnovsky represented his knowledge of the contributions of his European contemporaries, as well as his original approach to the phenomenon of loss of speech. 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 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). The same conclusion was proposed by G. Idelson (1896), who wrote, “Speech cannot be localized. A localization is permissible merely
for speech disorders” (p. 77). Idelson was one of the first to point out some components in aphasia etiology that 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 adherents including proponents of the localization approach and those who were opponents of it. Among the former was Alexey Kojevnikov (1836–1902), the founder and the president of the Moscow Association of Neurologists and Psychiatrists. His book, *Aphasia and the Central Organ of Speech* contains many arguments designed to prove that “the ability to speak depends reliably on a specific region of the brain, which in justice can be named the central organ of speech” (Kojevnikov, 1874, p. 2). He considered the regions adjacent to the Sylvian fissure to be this central organ. B. E. Larionov developed further a localization theory. He defined a “musical center” inside the “center of speech.” Complex forms 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). Case histories of aphasia described by I. Godnev (1881) and V. Mentov (1902) are also permeated with the localizationist approach.

**MECHANISMS OF APHASIA**

An important characteristic of early Russian contributions to the field of aphasiology at the end of the 19th century was to go beyond description of the problem of localization of the speech disorders and to attempt to explain the mechanisms involved. These attempts included one of the earliest contributions by V. Tarnovsky (1867) to reveal the mechanisms of different forms of aphasia through an analysis of the psychological and physiological structures of speech. It resulted in a rather original approach to a modern aphasiological model of speech production, in spite of its unusual terminology:

1. “An idea of specific arousal” (corresponding to the conceptual stage in modern models of speech production) is preserved in aphasia while disturbed, for instance, in dementia.
2. An expression of this idea by symbols-words, or in other words, a shaping of the inner speech, responsible for verbal memory. A disturbance of this element produces a loss of verbal memory in aphasia.
3. A desire to transform the inner speech into an articulated utterance—that is, a voluntary motor intention. A disturbance of this element provokes a language disorder, named by Tarnovsky “an
abulistic aphasia”—"a loss of the will to speak." So, we have every reason to believe that dynamic aphasia was marked out by Russian neurologist V. Tarnovsky, half a century before K. Kleist.

4. The prospect to transfer this desire to cerebral centers, coordinating the movements of certain muscular groups, which take part in word pronunciation. A disturbance of this element provokes a dissociation between speech and writing in aphasia.

5. An intactness of the centers coordinating muscle movements in conversation. An inhibition or low arousal of these centers becomes a physiological mechanism producing a kind of aphasia, described by the author as a disorder of sound articulation.

6. The preservation of each separate muscle necessary for word articulation. A disturbance of this element (a loss of several sounds) leads to nonaphasic speech disorders.

So, the mechanisms of aphasia are attributed to a disturbance of points 2–5 in Tarnovsky's model.

Another attempt to describe the mechanisms of aphasia was put forth by N. S. Rodossky (1872). He speculated about a task to “explain aphasia through precise physiological foundations” (p. 114). It should be noted that Rodossky was guided more by psychological than physiological theories. He considered that aphasia was neither an intellectual impairment, nor a loss of memory, but a disturbance of voluntary activity, or an inability “to control well the organ of speech” (p. 142). An aphasic patient, according to Rodossky, did not forget words or lose an ability to speak, as he can sometimes say sentences in an involuntary manner: “his impulsations of will do not achieve the center of speech” through a pathological process in the cerebral hemispheres (p. 140). A significant contribution of Rodossky was to study disturbances in the evolution of voluntary and involuntary, oral and written speech. He was one of the first in the world to reveal and to describe a relation between deficits in 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 systematically approach the study of aphasia.

Rodossky's ideas were mainly shared by A. Kojevnikov, whose book was published in 1874 as 4 issues of the Moscow medical newspaper and then as a book. Kojevnikov put to himself a question: “What is the nature and the main cause of aphasia?” First, he agrees with Rodossky, who felt that aphasic patients have preserved intellectual capacities. M. I. Astvat-saturov (1908) and M. B. Krol (1912) expressed the same ideas. Besides, Kojevnikov wrote, an explanation of aphasia by the loss of memory for
words (as stated, for instance, by G. Idelson, 1897) is beneath criticism: if aphasia represented a loss of memory for words, the patient should be able to repeat a prompted word. Instead, not only are aphasics mostly unable to find a word, they cannot repeat the word, which they hear and understand. "A diversity in aphasic symptoms could be reliably explained by a complexity of the apparatus functioning during the act of speech and by the fact that different components of this complex mechanism are disturbed in each case" (Kojevnikov, 1874, pp. 22–23).

A very significant contribution by A. Kojevnikov was a 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 rather large vocabulary, but the words are used in an inappropriate manner; consequently the patients' speech becomes incoherent, with an unclear set of words. This description was published by Kojevnikov on May 20, 1874, in the medical newspaper Moscowsky vrachebny vestnik. 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." In the same book, A. Kojevnikov gave one of the first descriptions of visual agnosia. He also 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 gestural disorders, that is an inability to express in signs their own ideas—an ability, well developed in mutes" (p. 24).

Hence, the contribution of A. Kojevnikov, made more than 100 years ago, paid attention to many of the fundamental problems of aphasiology that remain significant to this date. The same could be said about some of his contemporaries. 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.

**EXPERIMENTAL STUDIES**

At the beginning of the twentieth century many Russian aphasiologists performed experimental studies of verbal functions, namely measurement of stimulus duration, speed, and quality (Astvatsaturov, 1908; Fedorin, 1913). Using these methods, I. N. Fedorin (1913) made a revision of the
psychoanalytic interpretation of the slip of the tongue phenomenon done by S. Freud and proved its relationship to the mobility or inertia of nervous processes. M. I. Astvatsaturov (1877–1936), in his Ph.D. dissertation dealing with an analysis of normal and aphasic language, made one of the first linguino-statistical studies of aphasia. He concluded that “an amnesia for nouns is revealed after motor center disturbances, while an amnesia for verbs is due to Wernicke zone lesions” (Astvatsaturov, 1908, p. 224).

M. B. Krol (1879–1939)—a family doctor of V. I. Lenin—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 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 agnostic aphasia” (Krol, 1912, p. 25). M. 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. “A loss of the word itself interferes with the higher mental functioning” (Krol, 1912).

This idea was further developed in the book of M. S. Lebedinsky (1894–1980), 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 main value of S. N. Davidenkov’s contributions (1915, 1917) consists, in current opinion, of his being an opponent of the traditional division of aphasics into expressive and impressive (receptive) types. He was one of the first to show speech comprehension disorders in motor aphasia, which helps to differentiate aphasia from dysarthria and stuttering.

**APHASIA REHABILITATION**

The study of aphasia rehabilitation was not noted as frequently in the early history of Russian aphasiology as much as descriptions and psychophysiological interpretations of different kinds of aphasia. Nevertheless, at the beginning of this century G. G. Boino-Rodzevitch (1902) attempted to apply the psychophysiological approach to the problem of rehabilitation and to explain a modification of the clinical pattern noticed during aphasics’ rehabilitation through a gradual activation of the sensory centers. Later,
M. S. Lebedinsky discovered another mechanism of rehabilitation: a restitution of disordered mental activities by development of new physiological structures of the brain. With this he argued for the positive effect of training and education.

It should be pointed out that, in contrast to the pessimistic notion of the impossibility of restoring speech, which was prevalent in Western aphasiology, Russian contributors were generally more optimistic. Thus, M. B. Krol wrote that "aphasic impairments, namely agnosic aphasia can be restituted to a great extent" (Krol, 1912, p. 26). In S. N. Davidenkov's contribution (1915), the typical stages of regression of motor aphasia are described.

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, such as etiology, localization, the nature of a lesion, general cerebral state, and premorbid features of the personality. His conclusion, confirmed later, was "Traumatic aphasics are best rehabilitated" (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). N. Vasilenko also proposed valuable methodological recommendations: to use alternative paths, residual compensatory mechanisms, the patient's activity, and initiative, and so on. These approaches were further developed in the contributions of A. R. Luria (1947, 1948), E. S. Beyn (1964), V. M. Kogan (1962), L. S. Tsvetkova (1972), and others.

CONCLUSIONS

One can see that at the end of the 19th and the beginning of the 20th centuries the problems of aphasia were at the center of attention for many Russian neurologists and psychologists. It is sufficient to note that one of three topics in the program of the 1st 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)" (Juravel, 1981). The level of development of the early Russian aphasiological studies is revealed both in the greater number of contributions and in their "geography": these problems were examined not only in Moscow (A. Kojevikov, M. Krol) and St. Petersburg (M. Astvatsaturov) but also in Kharkov (S. Davidenkov, M. Lebedinsky), in Kasan (I. Godnev), in Tartu (G. Idelson), in Tambov (F. Bartelink), in Erevan (G. Kucharyants), and in other Russian cities.
The contributions of early Russian aphasiologists have demonstrated a major approach to the field. These writers were not limited 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. A psychophysiological orientation for Russian aphasiology, 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 linguino-statistic analysis of aphasia, strong foundations for the systemic approach to investigations of aphasia, and so on. In addition, Russian aphasiological studies contributed to the further development of psychology. As far back as 1898 A. E. Tscherbak wrote, "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 pathology studies.

Therefore, one can conclude that the well-known contributions of A. R. Luria (1902-1977) and his disciples fell on fertile ground. Russian aphasiologists of the end of 19th and the beginning of the 20th centuries established a solid base for "Luria's period" in the history of the neuropsychology of language.

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REFERENCES


