



Alexander Luria

Russian Developmental Psychologist, Neuropsychologist, M.D.
1902-1977



Alexander Luria, a noted Russian Development Psychologist and Neuropsychologist, began his career in search of an objective, scientific approach to solving psychological problems versus the general subjective approach taken by most psychological theorists of the day. He was born in Kazan, Russia, a university town located east of Moscow and earned his degree in from Kazan University at the age of 19. His earliest work as a research psychologist focused on creating an objective, measurable approach to assess Freud's psychoanalytic theories and ideas regarding thought abnormalities and the impact of fatigue on mental processes. He quickly became disillusioned with psychoanalysis reflecting in later writings that it ignored the importance of the social experience on cognition. He shifted his early experimental psychological methods to understanding psychoanalytic concepts within the context of the work environment. His first project focused on the performance effects of toxic exposure in a foundry, using reaction time to measure fatigue and evaluating the role of speech on reaction time regulation. Luria became fascinated with this form of experimental psychology and began publishing a journal, *Problems of Psychophysiology, Reflexology and Hygiene of Labor*, to share research findings in this area. Luria's work on the journal earned him a position with the newly formed Institute of Psychology in Moscow in 1923. Shortly after joining the Institute, Luria advanced a unique psychoanalytic experimental design "using fluctuations of intensity of motor reactions as an objective measure of inner emotional conflicts." (Luria, *The Making of a Mind*, p. 18) He presented his findings to Yale in 1929 and his book "*The Nature of Human Conflicts*" was published in the U.S. in 1932, but never in Russia.

Alliance with Leontyev & Vygotsky

By 1923, Luria earned a position with the newly formed Institute of Psychology in Moscow, in recognition of his research regarding thought processes and reaction times in the work setting. It was then that Luria met A. Leontyev who had also recently secured a position at the Moscow Psychology Institute. His first encounter with Vygotsky was in 1924, when Vygotsky spoke at the Second Psycho-neurological Congress in Leningrad. Based on the insightfulness of Vygotsky's presentation, Luria helped arrange a position for Vygotsky at the Institute. Luria and Leontyev formed a quick alliance with Vygotsky upon his acceptance of the position demonstrated by Luria's recollection of the event in his autobiography: "Recognizing Vygotsky's uncommon abilities, Leontyev and I were delighted when it became possible to include Vygotsky in our working group, which we called 'Troika' (Russian vehicle driven by three horses)... "with Vygotsky as our acknowledged leader, we undertook a critical review of the history and current status of psychology in Russia and the rest of world with the ambitious aim to create a new, comprehensive and objective approach to understanding human psychology."

From 1928 to 1934, Luria and his two close colleagues focused on demonstrating the social origin and mediated structure of higher psychological processes, as portrayed in Luria's *Autobiography*, p. 56:

"The studies evolved from Vygotsky's belief that human beings' higher psychological functions come about through the intricate interaction of biological factors that are part of each individual's physical make-up... that evolved over thousands of years. At the time of (Vygotsky's) death, (Luria) and his colleagues had developed two complementary strategies for discovering the interplay between biological and social factors in the structure of higher psychological functions. The first strategy was to trace the development of such functions to the natural, biologically determined

functions that preceded them. The second strategy was to study the dissolution of higher psychological functions as the result of (trauma) to the (brain).”

The group believed that when uncovering key insights it was imperative to work, whenever possible, within the context of live settings, especially when studying forms of emotion. In reviewing the studies that had attempted to simulate emotions such as fear, disgust, and anger, the group consistently uncovered two shortcomings, as noted by Luria “...first, the emotion was in no way part of the subject’s real life situation but only an artificial incident unrelated to his ongoing purposes and motives. Second, acute states evoked in this way were quickly dissipated.” (Luria Autobiography, p. 34)

One of the first things the group noted when completing their research in real life settings was that:

“Strong emotions prevent a subject from forming stable, automatic motor and speech responses, although subjects of equivalent intelligence, operating under normal circumstances, (could) form such responses after only a few trials. It appeared as if subjects influenced by strong emotions adapted to each new situation in a unique way and did not settle into a stable reaction pattern. Not only did the subjects have unstable motor and speech responses when considered separately, but they seemed to be unable to create a single functional system that included both motor and speech components, often delaying the speech components of their reactions.” (Luria autobiography, p. 35)

Separately, Luria and Vygotsky demonstrated cognitive rehabilitation could be achieved in Parkinson patients by engaging different sensorimotor areas to regulate gait. “As they expected, this manipulation improved the ability of Parkinson’s patients to walk and therefore showed that transferring the neural regulation of a function to a different level in the brain could compensate for an impaired automatized process.” (Pathways to Prominence in Neuropsychology, p. 53)

Luria, Leontyev, and Vygotsky would work together until the political disillusionment of their natural ~ cultural approach, and Vygotsky’s death in 1934, would force a permanent end to the triad’s alliance. Luria and Leontyev, although remaining great friends following Vygotsky’s death, followed research paths related to their work with Vygotsky, but unique to their individual interests and strengths.

Independent Career Focus

Following Vygotsky’s premature death, Luria went on to have a very successful career that continued until his death in 1977. In his autobiography, Luria stated that work throughout his career continued to focus on elucidating the biological functions that play into the development of higher psychological functions and the restoration of higher psychological functions through the brain mechanisms that control them. In addition to continuing research on Vygotsky’s theories, Luria investigated changes in perception, problem solving, and memory, carried out the first large scale study of twins, and invented a psycho-diagnostic procedure that serves as the basis for today’s polygraph tests. In the late 1930’s, largely to remove himself from public view due to the Stalinist repression and purges, Luria entered medical school where he specialized in the study of [aphasia](#).

Functional Organization of the Brain

With the advent of WWII, Luria was assigned head of neurosurgical rehabilitation for those with brain injuries. Luria organized a hospital in Kissegatch, a little town on the border between the European and Asian regions of Russia. By 1944, over 3000 soldiers would be treated by Luria and his rehabilitation team. While in Kissegatch, he began investigating brain function and methods for the remediation of focal brain lesions. Through this work, he developed a systematic approach to understanding the brain and cognition. Luria further determined that complex behavioral processes are comprised of a number of brain structures, *each* playing highly specific roles and *all* contributing to a form of coordinated control. Luria called this concept of functional organization of the brain -- neuropsychology. In his 1948 publication *Restoration of function after Brain Injury*, Luria explained that a brain “function” can be defined as a:

“Complex adaptive activity (biological at some stages of development and social-historical at others) satisfying a particular demand and playing a particular role in the vital activity of the animal. A complex adaptive ‘function’ such as this will usually be executed by a group of structural units and...these will be integrated into a ‘functional system.’ The parts of this system may be scattered over a wide area of the body and united only in the execution of their common task (i.e. respiration, locomotion). Between these parts there is a pliable yet strong temporary connection, uniting them into one system and synchronizing their activity. This ‘functional system’ works as a complete entity, organizing the flow of excitation and coordinating the activity of the individual organs.” (Luria, *Restoration of the Brain*, 1963, p. 36)

In other words, Luria defined functions as “complex adaptive activities” necessary for the performance of a vitally important task. To demonstrate this idea, Luria explained that when breathing without complication, the action of the diaphragm is used. In situations where the diaphragm muscles have been paralyzed, the intercostal muscles in the chest make the chest expand and contract and, finally, when these muscles are also paralyzed the pharynx and larynx help to swallow air through the esophagus. Through this example, Luria demonstrated the action of breathing does not belong to any one set of tissues, but to a collective set of possibilities. Further, “brain function represents the output of complex systems of interacting brain areas. Each area contributes something unique to the performance of the function, and the level of involvement may vary depending upon the integrity of other areas within the system. In this respect, complex brain functions do not reside in discrete brain areas. Rather, all human behavioral acts take place with the participation of all parts and levels of the brain, each of which makes its own specific contribution to the work of the functional system as a whole. (Luria, Haigh, 1992, pp. 335-361)

The Brain & Functional Restoration

Through his work with brain-injured soldiers during WWII, Luria discovered that although damaged brain tissue could not be regenerated, general brain function often remained highly adaptable. His work in this area documented the recovery process of many of his patients (over 3000) who regained function after sustaining injury. Luria’s work with these soldiers helped him formulate his main principle of rehabilitation: “Disinhibition of temporary inhibited functions, bringing into use functional abilities of preserved symmetrical areas of the other hemisphere, and utilization of preserved areas of the impaired functional system.” (*Pathways to Prominence in Neuropsychology*, p. 56) More simply, function was occurring in one of two ways, either through “de-inhibition” or through reorganization. In cases where Luria could not find any apparent damage, function simply seemed to be inhibited or out of commission. Luria found that an inhibited function could be reversed and restored through a process of “de-inhibition.” When actual damage had been caused to neural pathways, Luria found that while function could not be restored through the damaged pathway, function could be restored through alternate neural pathways, by either engaging related pathways in *other functional centers* (*intra-functional reorganization*), or by engaging related (non-damaged) pathways in the *same functional center* (*inter-functional reorganization*) that was damaged during the injury.

Research Accomplishment & Publications

The amount of research Luria accomplished during this short time period had everything to do with the unique combination of his specialized knowledge, the large number of people sustaining traumatic brain injuries, and his assignment as head of the rehabilitation hospital during the war years. Such a broad based investigation of neuropsychological concepts and resulting revelations would have taken years to accomplish under any less rigorous circumstances. After the war, Luria went on to publish a number of books to share his discoveries in the new discipline of neuropsychology that he had established including:

- *Restoration of Function after Brain Damage*: published in Russia in 1943 and translated to English in 1963.
- *Traumatic Aphasia: Its Syndromes, Psychology and Treatment* was published in Russian in 1947 and translated and published into English in 1970. In this book Luria describes a special methodology for studying Aphasia and basic methods of rehabilitation of speech in patients with local brain injuries. It continues today to be recommended today as a source of information for linguists, neurologists, psychiatrists and psychologists interested in a scientific approach to the disturbances of language and speech and for a

better understanding of the structure of language.

- *Human Brain and Psychological Processes*, consists of 10 articles written by Luria between 1938 and 1963, that reflect the Luria's concepts of human brain functions and the continuing development of clinical neuropsychology in Russia. The collection of articles was published in English in 1966.
- *Higher Cortical Functions in Man*: Published in Russia in 1962, translated and re-published in English five times between 1966 and 1980. In the introduction H. Teuber of Cambridge University shared that "this sort of approach to sensorimotor coordination requires a new way of looking at the major brain syndromes in man." (1965 preface, xii). K. Pribram of Stanford University shared that Luria has shown "reflex organization is everywhere conceived and shown to be a two way street whose traffic pattern is built of feedback between the central nervous system and peripheral sensory and motor structures. His, is a strong and sophisticated statement that does not flinch at complexities. This strength of statement is derived not from preconceived prejudice but flows from observation and experience. We are indeed fortunate to have available in English such a readable translation of an important contribution to neuropsychological knowledge by one of the outstanding Soviet scientists of our time." (1965, preface, xv)

Luria & the Masgutova Method

The reactions observed and noted by Luria's real life study environments and the impact of strong emotions on performance were scientifically validated by Canon and Seyle through their work revealing the homeostatic regulatory action of the Autonomic Nervous system in response to stress. Collectively, their work revealed that the autonomic nervous system acts as the body's first line of defense. In non-stress situations it automatically regulates reflex actions to ensure the long-term security of the body by shifting into a state of *rest* and *digest*. Under negative stress, it automatically shifts reflex actions into a defensive preservation mode. This mode is commonly known as *Fight* and *Flight*. While in this state, actions are more reactive, emotions less stable, and if pushed to the extreme, learning can be restricted. Dr. Masgutova, building on the findings of Vygotsky, Luria, Canon, and Seyle, determined that when the autonomic nervous system cannot manage by itself, it engages a second line of defense, primary motor reflex patterns, to ensure immediate and ongoing survival. Once engaged, these neurosensorimotor reflex patterns often remain in a non-integrated state until restorative techniques are used to facilitate the integration process. When these reflex patterns remain present, an individual's emotions are often poorly regulated, reaction patterns are less stable, behavioral interactions less efficient and effective, and generalized learning more difficult to achieve. Through the integration process the Masgutova Method helps to return the body to the normal homeostatic stress management of the autonomic nervous system.

The Masgutova Method brings to life Luria's concepts of de-inhibition and reorganization (inter- and intra-functional) through the restorative techniques Dr. Masgutova has created to activate:

- Existing neural pathways when simply inhibited, to facilitate the integration process through de-inhibition;
- Alternative neural pathways when primary pathways are damaged either through inter-functional pathways (within damaged functional area), or intra-functional pathways (through alternative but related functional areas) to facilitate the neurosensorimotor integration process.

Each primary motor reflex pattern plays a role in our maturation and future development. If a primary motor pattern does not emerge, does not integrate, or resurfaces at a point when it should only be playing a subordinate role, our body is sending up a red flag. While many continue to believe that primary motor reflex patterns disappear, Luria's work demonstrates that this is not true. If they truly disappear, then maturational patterns would not resurface as they do during brain damage. Dr. Masgutova has, in fact, demonstrated through the use of her MNRI® Method, that primary motor reflex patterns:

- Generally, integrate to act as subordinate components of more complex automatic reflexes and advanced learning, resurfacing in the face of trauma or chronic ongoing or intermittent stress, signaling a need for intervention.
- May emerge, but not integrate, signaling the existence of an underlying challenge (not always apparent) and the need for intervention to facilitate the maturation and integration process.

- May not emerge at all, due to underlying challenges (again, not always apparent) requiring intervention to facilitate activation, maturation, and integration.

Credits and Further Reading:

Adelman, The Neurosciences: Paths of discovery, Birkhauser Boston, 1991, Includes Monograph Luria, A.R., Haigh, B., Neuropsychology: Its sources, principles, and prospects

Homskey, E, "Alexander Romanovich Luria: A Scientific Biography," Kluwer Academic, 2001

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Luria, A. R., "Restoration of Function After Brain Injury," Pergamon Press, 1963

Luria, A. R., "The Working Brain," Basic Books (ISBN 0-465-09298-X), 1973

Luria, A.R., "The Cognitive Development: Its Cultural and Social Foundations," Harvard University Press, 1976

Luria, A. , Cole, M., Levitin, "The Autobiography of Alexander Luria: A Dialogue with The Making of Mind," 1979, Lawrence Erlbaum Associated, 2006

Stringer Cooley, & Christensen, Pathways to Prominence in Neuropsychology, Psychology Press, 2002