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Editorial

Luria's neuropsychology in the 21st century: contributions, advancements, and challenges

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This special section of the present issue of *Psychology & Neuroscience* is dedicated to the contemporary heritage of Soviet neuropsychologist Alexander Romanovich Luria (1902-1977). This special issue emerged within the context of the annual meeting of the Brazilian Institute of Neuropsychology and Behavior (IBNeC (Instituto Brasileiro de Neuropsicologia e Comportamento), during which a series of conferences were dedicated to celebrating Alexander Luria's 110th year of birth. To commemorate the academic life and scientific achievements of this distinguished neuropsychologist, IBNeC asked for original contributions from researchers worldwide, with the common motivation and goal to discuss the contemporary application of the principles that were first proposed by Luria. Prof. Yulia Solovieva was invited to help IBNeC formulate the special issue the reach out to potential contributors, with the goal of covering a wide range of content that constitutes Luria's Soviet neuropsychology. We acknowledge Prof. Solovieva's meticulous and proficient work and thank her immensely for her dedication.

Lurian propositions regarding the principle of the extracortical organization of mental functions found a way around the impasse generated by the dispute between localization arguments and antilocalization arguments, which were grounded in polemics concerning the relationship between brain and behavior. Luria proposed an alternative theoretical framework to resolve this debate, launching a scientific concept that was simultaneously consistent with neurophysiological tradition and the humanist perspective for comprehending and understanding clinical conditions (Hazin, Leitao, Garcia, Lemos, & Gomes, 2010). He also contributed to solving the dilemma about choosing between nomothetic and idiographic approaches in psychology by proposing a unique way of looking at neuropsychological phenomena and methodologies to evaluate them. This perspective posits that neuropsychological evaluation requires the consideration of a continuum between quantitative information based on scores from psychometric tests and qualitative information based on observing and analyzing the structure of each task, the types of errors that are produced, and the anticipation of conditions that minimize or overcome the identified deficits (Eilam, 2003; Glozman, 1999). These points were analyzed and clinically illustrated in the paper by Yulia Solovieva and Luis Quintanar Rojas, which addresses the syndromic analysis of attention-deficit/hyperactivity disorder (ADHD) in preschoolers.

Luria, together with other contributors to Soviet historical and cultural psychology (especially Vygotsky and Leontiev), proposed a central theory that states that human development is a complex process that must be framed within social, cultural, and historical contexts. The relationship between neuropsychological development and culture plays a crucial role because the totality of an individual's ideas, skills, and habits significantly modulates the development of cognitive skills. Development requires adaptive flexibility that is responsible for modulating functions and connections when facing diverse contextual changes.

This theoretical framework necessitates consideration of the role of neural plasticity, conceived as a multidimensional process that underlies memory and learning processes and operates at various cognitive levels at every step of ontogenesis. Neural plasticity plays a central role in maturational processes by which neurodevelopment is achieved and different potentials of change are expressed. Distinct brain areas develop during distinct phases of development, thus configuring

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critical periods for the emergence of certain cognitive skills. These windows of opportunity are marked by the overproduction of synapses in specific areas of the brain's cortex. The paper by Yuri V. Mikadze, "The principles of plasticity in Lurian neuropsychology," discusses the ways in which the issue of plasticity was formulated in Luria's theory of the systemic dynamic localization of higher mental functions, also illustrating the dynamics that underlie neurodevelopment.

The ability to understand brain organization and a child's cognitive functioning under normal and pathological conditions requires knowledge of the neurodevelopmental phase where the child is. The consequences of a brain lesion are determined by the brain's developmental phase during which the lesion occurs. Clinical manifestations of brain lesions are more variable in children than in adults. This principle is well illustrated by a set of papers that address the clinical condition of ADHD. The paper by Janna Glozman and Irina A. Shevchenko on executive functions in children who are diagnosed with ADHD stresses the executive aspects of this syndrome and the importance given by Luria to these abilities. The paper by Regina I. Machinskaya, Olga A. Semenova, Ksenya A. Absatova, and Galina A. Sugrobova, "Neurophysiological factors associated with cognitive deficits in children with ADHD symptoms: EEG and neuropsychological analysis," sheds light on neuropsychologically assessed cognitive deficits in children with symptoms of ADHD and children with typical development and the visual analysis of such deficits by resting-state electroencephalography.

The theoretical contributions made by Luria to the organization and function of the brain, together with evaluation and recovery models based on the theoretical model of functional systems and the extracortical organization of superior cognitive mental functions, offer important insights into intervention programs. Such programs place importance on cultural auxiliary resources—so-called "cultural prostheses"—that allow an individual to construct alternate cognitive functions and bypass developmental deficits (Hazin et al., 2010). These theoretical landmarks are explored in three papers that delve into the dialogue between neuropsychology and education: "The influence of Luria's work on the use of visual modeling in preschool education" (Veraksa and Veraksa), "Mathematics acquisition in Mexico: Research on teaching, acquisition difficulties, and correction" (Yulia Solovieva and colleagues), and "A Lurian systemic-dynamic approach to teaching illiterate adults a new language with literacy (Bella Kotik-Friedgut, Michal Schleifer, Pnina Golan-Cook, and Keith Goldstein). The first paper mentioned above discusses visual models, once considered by Luria as important tools for psychological development within the context of socio-historical-cultural psychology. The second paper investigates and discusses methods of assessing, correcting, and teaching mathematics at the preschool and school levels in Mexico. The third paper emphasizes the acquisition of a second idiom by Ethiopian individuals within the context of migratory movements from Africa to Israel.

IBNeC, together with *Psychology & Neuroscience*, has succeeded in reaching the goals established by the project that generated this special section. The articles herein explore the central principles that contemporary neuropsychology inherited from Luria, and a neuropsychological model that integrate biological, socio-affective, and cultural variables is discussed to demonstrate how this complex process helps us understand the ways in which people can build different qualitative forms of being and functioning within our world. Illnesses, deficits, and dysfunctions must be seen as sources of both weakness and creative power that impose challenges on those who seek to understand different forms of existence.

We sincerely thank IBNeC, Prof. Yulia Solovieva, and all of our collaborators who contributed to this publication. We proudly commemorate Luria's systemic neuropsychology and celebrate the ensemble of work that he left to contemporary psychology.

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