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978-1-107-01388-9 - Overcoming Learning Disabilities: A Vygotskian-Lurian Neuropsychological Approach

Tatiana V. Akhutina and Natalia M. Pylaeva

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OVERCOMING LEARNING DISABILITIES

Based on the ideas of Russian psychologists Lev Vygotsky and Alexander Luria, this book explores methods of preventing or overcoming learning disabilities. Tatiana V. Akhutina and Natalia M. Pylaeva follow Vygotsky and Luria's sociocultural theory and their principles of a systemic structure and dynamic organization of higher mental functions, building on their theoretical foundation by focusing on the interactive scaffolding of the weak components of the child's functional systems, the transition from joint child–adult co-actions, and the emotional involvement of the child.

The authors discuss effective methods of remediation of attention, executive functions (working memory and cognitive control), and spatial and visual-verbal functions. *Overcoming Learning Disabilities* translates complex problems into easily understandable concepts that will be appreciated by school psychologists, special and general education teachers, and parents of children with learning disabilities.

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Overcoming Learning Disabilities

A VYGOTSKIAN-LURIAN NEUROPSYCHOLOGICAL
APPROACH

Tatiana V. Akhutina

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Moscow State University of Psychology and Education*

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PREFACE

Alexander Romanovich Luria was our teacher. We feel that it is our duty to share our understanding of Luria's ideas, as well as those of his friend and mentor, Lev Vygotsky, about whom Luria always spoke with great respect and love. We feel that it is also our personal obligation to give an account of how we put their ideas to work. Therefore, the purpose of this book is to introduce our methods of overcoming learning disabilities based on the Vygotsky-Luria neuropsychological approach.

The Vygotsky-Luria neuropsychological theory is systemic and dynamic and emphasizes the role of social interaction between a child and adult in the development of higher mental functions (HMFs). From this point of view, learning difficulties (the term used in Russia), or learning disabilities (the more widespread term internationally) in children are the result of the interplay of flawed neurobiological and social factors and their interactions during different stages of development in school-aged children that appear as a *partial disturbance or delay* in the development of their HMFs. Therefore learning disabilities (LDs) can be explained not only as an insufficient adaptation of children to their social requirements but also as an effect of the increasing social demands and standard teaching methods in contemporary education. Such a lack of mutual adaptation accounts for the disturbing tendency that has been reported in all industrial countries, namely, that the number of children with LDs is constantly growing.

When speaking about the mechanisms of LDs it is important to have in mind that negative social and neurobiological factors can interact and intensify each other. For example, neurobiological problems resulting from low birthweight might be compensated for if a child's development occurs in a favorable social situation; alternatively those problems may be significantly exacerbated if a child does not receive sufficient early parental or adult attention.

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Often child development in today's world is unbalanced: a social situation might enhance development of some functions at the expense of others, or the situation might be unfavorable for the successful development of certain functions. For example, adults might actively stimulate speech and verbal thinking and pay little attention to the development of movement dexterity, visual-motor coordination, drawing, and self-regulatory skills. It has been found that children who grow up in an urban environment as compared to those growing up in the country have worse scores in visual-spatial tasks (Polyakov, 2004), and one of the reasons for it is that they spend less time playing active games, games that require orientation in space like "hide-and-seek." In a different scenario, some children have been left alone at an early age, with very little interaction with adults such as reading and discussing books together. All of these circumstances, when combined with genetic predispositions, can cause pronounced unevenness in the development of HMFs that is impossible to offset in the highly demanding environment of modern learning institutions and that consequently leads to the development of LDs.

This book presents methods of preventing and overcoming learning disabilities. In the first introductory chapter (from the Russian edition) we discuss the context of our work; present an overview of contemporary research in neurobiology, neuropsychology, and economics dedicated to a child's mental development; and analyze the effectiveness of remedial programs. The second introductory chapter, added to the English edition, includes a discussion of the theoretical bases of Vygotskian and Luria's approach to neuropsychology and the understanding of LDs derived from it.

Part I considers general problems in the neuropsychological approach to learning and LDs. In the first chapter we focus on the new branch of neuropsychology – the neuropsychology of individual differences – that serves as a foundation for the practical application of neuropsychological knowledge in a school setting. The basic notion of the *uneven development of higher mental functions* is introduced here. Chapter 2 continues the discussion of these general methodological questions in school neuropsychology and presents the Vygotskian-Lurian approach to the diagnosis and remediation of LDs. The following chapter provides an overview of the main types of LDs. Chapter 4 deals with practical applications of our approach to remedial-developmental education. Whereas Chapters 2–4 are devoted to LD remediation, in the last chapter in this part we return to concerns common to all children. Chapter 5 focuses on the psychoeducational perspective of the prevention of deterioration in the physical health of students during the course of the educational process. We argue that taking into

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consideration the general neuropsychological characteristics of early school-aged children as well as the specific characteristics of individual students can facilitate the resolution of the problem; that is, it can optimize interaction between pupils and teachers and increase students' learning potential.

In Part II we present methods for the development and remediation of executive functions. We initially present data on the trials of our most well-known method of numerical sequences called the *School of Attention* (Akhutina, 1997; Akhutina & Pylajeva, 1995; Pylaeva & Akhutina, 1997/2008 R [Russian-language publications are designated by the letter R following the date]). We also discuss remedial adaptations of popular psychological tests (sorting of colored shapes, Link's cube, etc.), as well as methods and techniques based on more complicated number sequences (what we call the *School of Multiplication*; Pylaeva & Akhutina, 1999/2006 R). We describe both the process of remediation of programming and control functions and the technique of conducting the qualitative analysis of the "zone of proximal development" in the process of intervention. Using concrete examples we show how neuropsychologists deal with the following issues:

- How to determine the component of a functional system that needs to be remediated in a particular task to achieve maximum results
- How to provide help to the child
- How to withdraw this help gradually (cf. "scaffolding"; Bodrova & Leong, 2007; Chaiklin, 2003; Daniels, 2007)

Thus, the focus of Part II is on the core aspects of the developmental work conducted by a neuropsychologist, who provides an intervention aimed at the weak link in the development of HMFs and gradually decreases the intensity of the assistance depending on the child's progress.

Part III is dedicated to methods for the remediation of visual-verbal functions. Chapter 11 provides a general overview of the sequence of stages in the remediation work, and Chapter 12 describes specific methods used during one of the key stages.

Part IV focuses on methods of development and remediation of visual-spatial and quasi-spatial functions. Here we present specific methods and describe clinical trials. This part ends with an excerpt from our introductory math textbook, *Composition of Numbers*, and includes a case study of a boy with weaknesses in visual-spatial functions and visual-spatial dysgraphia.

The fifth and final part of the book presents three cases with severe developmental delays in HMFs in which interventions based on the Vygotsky-Luria theory were applied. Each child had multiple disabilities, but each one's neuropsychological profiles were considerably different: one child had

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significant delays in programming and control functions (Unit III according to Luria), the second child had delays in processing of sensory information (Unit II), and the third showed delays in the arousal system (Unit I).

In writing this book, our intent is to offer readers the choice of either reading the whole book chapter by chapter or selecting the parts of particular interest for them. As a result, readers might come across some repetition. Portions of the data presented in the book have already been published in a number of articles, although all of this material has been updated for this book. The rest of the data discussed have never been published.

We want to express our sincere gratitude to all our Russian and American colleagues and students who helped in preparing this publication, particularly Anastasia Agris, Tatiana Grabar, and Gary Shereshevsky. The manuscript was translated from Russian with the support of the Spencer Foundation (Chicago) within the framework of the program “Promoting Social Studies of Education in Russia.” We are grateful to the Spencer Foundation and to Daniil Alexandrov, director of the program, for their support. Special thanks goes to our translator, Julia Linkova – without her highly professional help, the English edition of this book would not have been possible. The authors also have the pleasant task of expressing their sincere thanks to the project manager of this edition, Brigitte Coulton, and copy editor, Gail Naron Chalew; their numerous questions helped to make the text more clear and readable for an English-speaking audience.