# The Dyslexia Debate

*The Dyslexia Debate* examines how we use the term "dyslexia" and questions its efficacy as a diagnosis. While many believe that a diagnosis of dyslexia will shed light on a reader's struggles and help identify the best form of intervention, Julian G. Elliott and Elena L. Grigorenko show that it adds little value. In fact, our problematic interpretation of the term could prove to be a major disservice to many children with difficulties learning to read. This book outlines in detail the diverse ways in which reading problems have been conceptualized and operationalized. Elliott and Grigorenko consider the latest research in cognitive science, genetics, and neuroscience, and the limitations of these fields in terms of professional action. They then provide a more helpful, scientifically rigorous way to describe the various types of reading difficulties and discuss empirically supported forms of intervention.

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# Preface

In every country and in every language, a significant proportion of children struggle to master the skill of reading. Whereas many children gradually overcome their initial difficulty and acquire functional literacy, there is a significant proportion of children who continue to encounter decoding difficulties throughout their childhood and whose problems, although not necessarily with decoding per se, persist into adulthood. As these individuals struggle to cope with the changing demands of school and wider life, the hardship and difficulties that typically result are often incapacitating, undermining, and distressing. Given such a scenario, it is understandable that there is often a strong desire on the part of these individuals, their families, and their teachers for some form of clinical diagnosis that can help explain the reasons underpinning these problems and that can indicate, and secure, effective forms of intervention.

It is hardly surprising, therefore, that the term most frequently used to describe this phenomenon – referred to here as developmental dyslexia – has such a strong resonance. For many, the term describes a biologically based condition that, importantly, can serve to remove any impression others may have that reading problems are a consequence of low intelligence or an impoverished environment. It is widely believed that once developmental dyslexia (hereafter, dyslexia) is diagnosed, appropriate specialized interventions can be set in place that have proven success in addressing this condition. Concomitantly, it is feared that a failure to diagnose this condition will result in erroneous understandings of the underlying problem and the continued operation of an inappropriate educational diet. The natural desire for such a label can also be heightened by the (often very true) belief that gaining this may be a necessary means to acquire additional resources of one kind or another.

For several decades, however, others have sought to challenge the scientific rigor and educational utility of this construct. Criticisms have focused on the misleading, yet widespread, belief that there is consensual understanding on the part of researchers and clinicians as to the nature and features of dyslexia, that the condition differs from other forms of reading disability, and that it is possible to describe its biological and cognitive origins in ways that can guide powerful educational and clinical practices. Such critics complain that, too often,

valuable resources are consumed by expensive and time-consuming diagnostic procedures when these are better utilized for providing early intervention to all children who struggle to learn to read.

In voicing such concerns, critics have sought recognition of the need for a more sophisticated analysis of the relevance and utility of the dyslexia construct itself. Somewhat paradoxically, however, the questions that have been posed as a result have often been oversimplified and fail to represent the principal concern. Thus, the key question – Is dyslexia a scientifically rigorous construct that has meaningful value for research and educational/clinical practice? – has too often been transmogrified into the unhelpful and misleading "Does dyslexia exist?" This gross misrepresentation of the core issue has often resulted in significant media interest and widely reported commentaries from public figures who, on one hand, have been dismissive of the needs of those who speak of the problems resulting from their dyslexia or, on the other hand, have proven eager to offer their personal biography to testify to the existence of the dyslexic condition. In the case of research scientists (psychologists, neuroscientists, geneticists) who work in highly specialized areas that examine the acquisition of typical and atypical reading skills, such debate has sometimes been perceived as introducing nonessential complexity that serves as an unwelcome distraction from detailed and sustained pursuit of particular scientific inquiries. However, failing to acknowledge the conceptual and definitional complexity of the core construct runs the risk of each discipline producing highly esoteric and recondite knowledge that operates primarily within a narrow disciplinary silo and whose practical applications are unclear.

This book represents a response to growing recognition that the key issues behind the debate about the construct of dyslexia (hereafter, the dyslexia debate) need to be highlighted and considered in detail. To achieve this, it takes each of the core disciplines in turn and considers what they tell us about the nature and underpinnings of typical and atypical reading. In so doing, they shed light on the question as to whether dyslexia should be conceived as a condition that is synonymous to, or different from, reading disability. In the light of this, the book then examines issues relating to assessment of and intervention for difficulties with the acquisition of reading skills. A key issue for intervention concerns whether there is value in examining underlying cognitive processes that are widely considered to be markers of dyslexia or, alternatively, whether it is preferable to focus primarily on core academic skills. Finally, in light of our examination of all of these issues, we reflect on the value of the dyslexia construct and recommend a way forward that is designed to reduce unnecessary complexity, ensure commonality of understanding, and concentrate resources on the provision of timely and appropriate intervention for all who struggle to learn to read.

Many of the specific disciplinary issues discussed in this book are complex and draw on rather specialized language and technical terminology. For this reason most readers will encounter work in one or more disciplines that, initially at least, is likely to prove challenging. This may be exacerbated, or perhaps aided, by our very deliberate decision to offer a comprehensive set of references that provides an encyclopedic overview of the available literature. However, while gaining a full and detailed grasp of all the issues is likely to require further independent reading, it is hoped that the contents of this book will enable the reader to grasp key issues in the dyslexia debate. Relevance and implications of the work across these disciplines for resolving the dyslexia debate will become clear to the reader.

In preparing this book, we have sought advice from very many scholars. We wish to thank all of them for their help and guidance. In so doing, we would like to express our particular gratitude to Dorothy Bishop, Jack Fletcher, Robert Fulbright, Fumiko Hoeft, Brahm Norwich, Keith Stanovich, Lee Swanson, Mei Tan, and Frank Vellutino. We also thank Magge Gagliardi for her assistance with the illustrations and colleagues at Cambridge University Press for their support, faith, and patience. Of course, all errors and misunderstanding are our own.

# Foreword

*by Frank Vellutino, University at Albany, New York*

In any area of scientific inquiry, a comprehensive text discussing recent advances in both theory and research is always a welcome addition to the existing literature. Of course, such a text must also provide historical perspective in order for the reader to fully appreciate the importance and relative impacts of new findings in the field, in terms of whether or not such findings provide support for the theories that generated them and whether or not they can or have been replicated. Finally, such a text must provide a critical and relatively unbiased analysis of the theories discussed in the text and research findings related to those theories. Elliott and Grigorenko's book, *The Dyslexia Debate*, in my opinion, satisfies all three criteria. It is the latest in a series of texts focusing on issues surrounding the origin of difficulties in acquiring early literacy skills that were published during the 19th, 20th, and 21st centuries.

Chapter 1 of the book focuses on the multitude of definitions and descriptions of dyslexia as a term used in reference to developmental reading difficulties. The reader who is unfamiliar with the relevant literature will be immediately struck by the utter lack of consensus regarding whether dyslexia is little more than a descriptive and somewhat misleading label for early reading difficulties or a neuropsychological construct with well-established construct validity. After providing a brief account of early work done in the study of developmental reading difficulties, the chapter focuses on current definitional issues and thoroughly discusses the controversy surrounding a number of definitions of dyslexia, including (1) discrepancy-based definitions such as the traditional IQ-achievement discrepancy and the discrepancy between reading and listening comprehension; (2) definitions based on response to intervention; and (3) definitions based on causal explanations such as visual deficits and language-based deficits. It becomes painfully clear by the end of Chapter 1 that questions and issues associated with the definition of dyslexia and synonymous terms such as reading disability and specific reading disability will be with us for some time.

Chapter 2 discusses hypothesized explanations of early reading difficulties, implicating cognitive deficits as causes of such difficulties: phonological deficits, visual and auditory deficits, rapid naming deficits, working memory deficits, and a variety of others that have been proposed over the years. After

reviewing the vast literature concerned with the cognitive deficits discussed in this chapter, it is concluded that no single causal hypothesis can explain early and protracted reading difficulties and that the origin of such difficulties must surely be multifaceted, although it is acknowledged that the largest amount of variance on measures of reading ability can be explained either by phonological deficits alone or by phonological deficits combined with other deficits.

Chapter 3 contains two broad sections. The first provides detailed descriptions of the structural and functional aspects of the brain in relation to normal and abnormal reading ability and discusses results from studies using post mortem, neuroimaging, and other functional procedures to illustrate brain-reading relationships that have been documented. The discussion is divided into four different categories: (1) studies of brain activation patterns in typical adult readers; (2) studies of brain activation patterns in typically developing pre-readers; (3) studies of brain activation patterns in atypical as compared with typical readers; and (4) studies of brain activation patterns in atypical readers before and after remedial intervention. Results provide reasonably strong support for reliable brain-reading relationships in the populations evaluated. However, the authors correctly point out that the theoretical significance and practical implications of such findings are unclear and are likely to remain so for some time to come, given that research in this area of inquiry is in its infancy.

The second section of the chapter provides a historic tracing of work done addressing the question of whether "reading disability" has a genetic basis. It is asserted, at the outset, that despite initial challenges to the view that reading disability "is a condition whose pathogenesis involves hereditary factors," there is increasing evidence that "the malfunctioning of the brain system that supports reading may be caused by multiple deficiencies in corresponding genetic machinery." The discussion distinguishes between two types of studies assessing genetic links to reading and reading disability: heritability and relative risk studies where siblings and other family members are evaluated for susceptibility to reading disability using performance measures such as reading and reading-related tasks (e.g., phonological tasks); and "molecular studies" where genetic material (DNA) is obtained in addition to such performance measures. The discussion makes it clear that although considerable progress has been made establishing a genetic link to individual differences in reading ability, this work is yet in the initial stages of validation, and the facts, as we know them, do not yet have meaningful practical application.

Chapter 4 focuses on issues surrounding assessment of the causes of early reading difficulties as well as on instructional approaches to preventing and remediating such difficulties. The chapter is organized around four related questions: (1) What is the most effective (i.e., evidence-based) means of teaching reading from an early age? (2) How can we best identify young children

at risk of word-reading difficulties and use this information to prevent later problems? (3) What can be done to help those who are resistant to initial intervention? (4) Is there anything special about specialist dyslexia teaching that is particularly effective for a subgroup of poor readers? These questions are thoroughly addressed, and it is generally concluded that structured, comprehensive, and individualized reading instruction is the only defensible approach to correcting early and protracted reading difficulties as compared with alternative approaches that have questionable validity and no empirical support (e.g., visual and auditory training activities, visual-motor activities, tinted lenses, etc.), in addition to reading intervention. Special emphasis is made on the importance of adopting a preventive approach to early reading difficulties that seeks to identify children at risk of reading difficulties as early as possible, in order to provide them with the intervention necessary to remove impediments to reading skills acquisition.

Chapter 5 is the concluding one, and after summarizing issues and problems associated with the lack of consensus regarding the definition, cause(s), and remediation of dyslexia and following the discussion of the tension between the "science and politics" of dyslexia as a neuropsychological construct, the authors assert that the term has engendered unnecessary confusion in the field and has long since passed its usefulness for scientific and practical purposes. As a consequence, they strongly recommend that "dyslexia" be discarded as a term used to refer to early and long-term reading difficulties and that the term "reading disability" be used in reference to such difficulties in its stead.

In my opinion, this is an excellent text that should be read by researchers and practitioners on both sides of the dyslexia debate. The topics are important and will no doubt be of interest to both sets of professionals. They are discussed thoughtfully and even-handedly and with an appropriate amount of detail. Moreover, the text is clearly written, although a few sections in the neurobiological and genetics chapter will present many readers with some degree of challenge, especially those who are not familiar with the technology and procedures used by researchers in these two areas of inquiry. Yet, scholars on each side of the dyslexia debate are likely to have disparate views regarding the central question addressed in this text, which, of course, is the construct validity of dyslexia as a term used to refer to developmental reading difficulties. Those who question the construct validity of dyslexia will find much to like in this text and are likely to applaud the authors' suggestion that the term be discarded as a label for reading difficulties having a biological and genetic origin. Those who do not question the construct validity of dyslexia will find much to quarrel with in this text and will no doubt eschew the authors' suggestion that it be discarded as a label for developmental reading difficulties. My own biases are aligned with those of the authors. I have long argued that the term should be abandoned in scientific and practical applications because I have found that

in scientific applications, the number of definitions of dyslexia can be roughly equated with the number of theories of dyslexia and in practical applications the number of definitions of dyslexia can be roughly equated with the number of commercially available interventions designed to remediate reading difficulties said to be caused by dyslexia.

For example, multisensory-type reading interventions, as initially designed by Samuel Orton and Anna Gillingham, were said to circumvent and compensate for optical reversibility ("seeing letters backwards") and other visual perceptual problems that were hypothesized by Orton (1937) to be caused by a developmental lag in hemispheric dominance. When it became clear from research evaluating Orton's theory that optical reversibility was not a psychologically real phenomenon, and when evidence began to accumulate suggesting that most reading difficulties are likely caused by language-based deficits (e.g., phonological deficits) rather than visual perceptual deficits, the raison d'être for Orton-Gillingham-type multisensory interventions eventually became the need to circumvent and compensate for language-based deficits that were said to cause early reading difficulties rather than optical reversibility and other visual perceptual deficits. Similarly, a study conducted by Tallal (1980) produced results suggesting that developmental reading difficulties are caused by a disorder in auditory temporal order perception that impairs speech perception, thereby defining dyslexia as a nonverbal auditory processing disorder rather than a visual or language-based disorder. These findings were never replicated. Yet, despite the paucity of support for Tallal's theory, a computer software program (Fast ForWord) was subsequently developed and promoted as an intervention that remediates temporal order perception deficits as the root cause of difficulties in acquiring literacy skills. At present, however, there is little more than testimonial support for the efficacy of this program in remediating early literacy difficulties.

The literature is replete with similar instances wherein the definition of dyslexia changes in accordance with different practical and/or scientific biases. Therefore, I strongly support the authors' suggestion that the term be discarded in both the scientific and practitioner communities. However, I am not sure their suggestion that the term "reading disability" be substituted for "dyslexia" will eliminate the type of confusion caused by the latter term. After all, "reading disability" and related terms such as "specific reading disability," "disabled readers," "reading disorder," "learning disability," and "specific learning disability," have all been closely associated with the term "dyslexia" and are probably loaded with as much excess meaning as dyslexia. Therefore, I would like to see all such terms jettisoned from the relevant literature as well as from the lexicons of researchers and practitioners and more neutral terms such as "reading difficulties," "learning difficulties," "atypical reader(s)," and "struggling readers" used instead. But, as opined by the authors, I rather doubt that this

will happen anytime soon, given the entrenched nature of the more traditional terms.

In sum, Elliott and Grigorenko's text makes an important contribution to the literature concerned with the acquisition of skill in reading and impediments to the acquisition of skill in reading. The questions it addresses and the issues it discusses are clearly and incisively articulated, and the review of work done in the field is comprehensive and informative. It should be read by all those interested in the causes and correlates of early reading difficulties, especially scholars conducting research in this area of inquiry and practitioners working with struggling readers.