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Critical Review of Language at the Speed of Sight: How We Read, Why So Many Can't, and What Can Be Done About It By Mark Seidenberg

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Abstract

This comprehensive book review on Mark Seidenberg's *Language at the Speed of Sight: How We Read, Why So Many Can't, and What Can Be Done About It* advances the conversation around the "reading wars" in scholar and educator stances on effective methods to teaching reading through explicit phonics-based instruction versus a whole-language approach that emphasizes the child's discovery of meaning through experiences in a literacy-rich environment. Seidenberg's support of science-based or "brain-based" teaching of reading is critically examined, as it relates to theoretical and practical knowledge in reading pedagogy. This review aims to provide scientific insight into reading development and pedagogy, to address reading achievement disparities in the US.

Keywords: language, reading development, dyslexia, phonics-based instruction, science-based reading

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Language at the Speed of Sight: How We Read, Why So Many Can't, and What Can Be Done About It
By Mark Seidenberg

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Mark Seidenberg's latest book, *Language at the Speed of Sight: How We Read, Why So Many Can't, and What Can Be Done About It* (Basic Books, 2018, 384 pp.), introduces a paradox between the achievements of reading science and America's chronic literacy underachievement, leading to a fundamental question: If educators know so much about reading, why are literacy levels in the United States so low? Seidenberg is a cognitive neuroscientist whose research in development of language, reading, and Dyslexia is the basis from which he considers the extent to which the science of reading impacts literacy education. Seidenberg's framework appeals to those who perceive literacy as the foundation to academic success and Democratic citizenship. Throughout the text, the disconnect between educational practice and the science of reading gives the reader insight into the dynamic nature of cross-cultural distinctions and the challenge of conversion. While children from culturally and linguistically diverse backgrounds are growing exponentially in U.S. schools, so is the need for relevant, effective literacy strategies to support reading growth.

Language at the Speed of Sight offers a rationale consistent with scholars who advocate for social justice and equitable opportunities in education. Many scholars would not contend with the disparities among student achievement and the need for effective pedagogy to which Seidenberg offers a somewhat ground-breaking approach to address these challenges in an apparently revolutionary way. His approach is to provide teachers with a basic understanding of brain research and the mechanics, or phonics, of reading. He alleges educators need to acquire a scientific literacy basis because success in reading depends on linking print to speech. Skilled reading is associated to children's spoken language, grammar, and vocabulary as demonstrated through

neuroimaging research on brain organization and brain development. In actuality, brain-bases of learning language and reading is a back-to-basics approach; reading is a cognitive skill that develops through cognitive science:

> Rather than focusing on a conjectural future in which reading is unimportant or engaging in practices that either justify or perpetuate reading gaps or turn the decline of reading into a self-fulfilling prophesy, reading educators should be held to a commitment to teach children to read. (p. 293)

The effects of reading education are explored in each chapter, which Seidenberg bases on the profound disconnection between science of reading and educational practice. While difficult to bridge, he deems it necessary to use reading methods consistently with knowledge about human cognition and development. Inconsistency puts children at risk for reading failure which can be especially discriminatory towards children in poverty and discouraging to children who need to be highly engaged in reading, and children who have reading disabilities. In particular, overcoming disengagement is key to unlocking students' potential and empowering critical consciousness to sustain democratic dialogue. The text is broken into three parts to highlight (a) the nature of visible language in reading, writing, and speech, (b) the science of how we become readers and difficulties that arise in developing language skills, and (c) educational challenges that marginalize certain communities, along with prospective changes for our future readers. After bringing readers' attention to the serious nature of this educational crisis, Seidenberg identifies the source of the problem in reading practices, which is the disconnect between what science informs us about reading and how reading instruction is implemented. He then highlights the broader issue of poverty:

> The system is failing students for whom the environment, of which education is a major part, exerts a greater influence. Rather than focusing narrowly on the undeniably large role of poverty in poor achievement, we might also focus on the undeniably large role that education could play in improving outcomes. (p. 246)

Seidenberg's primary claim in Part One is that methods routinely used to teach children reading are inconsistent with underlying knowledge about human cognitive development, which makes learning to read an unnecessary challenge. The three-cueing system of using phonological-orthographic, semantic, and syntactic sources to decode words is the basis of many instructional approaches, despite pedagogical knowledge not consistently aligning with how skilled readers actually decode. There remains a large gap between state of research knowledge about reading development and the state of understanding in professional and pubic domains (Castle, Rastle, & Nation, 2018).Dating back to the 16th century (Hart, 156/1969), standard practice in teaching children to read involved explicit linkage between letters and sounds. Seidenberg clarifies that phonics instruction in early childhood determines how early literacy skills develop in

skilled readers. In other words, decoding practices that support the three-cueing system (known as the Searchlight model in the UK) have a positive impact on the trajectory of reading development, documented in the large and diverse body of work on the cognitive processes that support skilled adult readers (Castles, Rastle, & Nation, 2018). A traditional method of modeling word recognition and pronunciation in terms of various processing mechanisms is different from Seidenberg's theoretical approach. Computational modeling that involves different types of information within phonology, semantics, and orthography in which all words and non-words are processed in the same way. The gradual process of how orthographic patterns trigger activation in neural connections creates the word processing used in reading. This phonemic awareness process is accelerated by explicit instruction of basic skills in a balanced literacy approach, an effective whole-language approach to teaching reading as it emphasizes the child's discovery of meaning through experiences in a literacy-rich environment, according to Seidenberg and Goodman (1967). Seidenberg's sequential model embeds a procedure of processing sequences of words and tracking the sentence and text-level statistics to provide insight in how children learn vocabulary, grammar, and how sentences are comprehended and produced. This section asserts that to create a powerful balanced literacy approach, explicit instruction in phonics and vocabulary must be more efficient because what teachers think children learn about sight words, phonics, or vocabulary differs from how students' brains actually respond to it. He is optimistic that future research will reach determinations about which specific instructional practices have the highest impact on advanced reading literacies and how to closer align children's learning processes with how they are assessed.

As the demographic makeup of American society shifts to a more linguistically and culturally diverse population, the void felt by students who grapple with rigorous academic content must be filled. *Language at the Speed of Sight* seeks to address this void by reorienting education with the science of reading, providing an understanding of this complex ability at levels that intuition alone cannot sufficiently penetrate. While Seidenberg focuses this book on the underachievement of literacy based on current downfalls of reading methods, such as inconsistent performance results in various types of comprehension assessments, he does not note the plateauing of reading proficiency in US schools across grades 4 through 12 (National Assessment of Educational Progress, 2017). Yet various reviews note a strong scientific consensus on the importance of phonics instruction in initial stages of reading development (Rowe, 2005).

Castle and colleagues (2018) provide evidence for the claim that systematic phonics in reading instruction improves development in reading, as seen in a report by National Reading Panel (NRP, 2000) . Alphabetic knowledge and fluency can be improved through phonics intervention (Volpe, Burns, DuBois, & Zaslofsky, 2011), and the positive effects from improvements in alphabetic fluency may influence reading proficiency by gradually facilitating increasingly more sophisticated processes, such as decoding and word

recognition (Saez, Nese, Alonzo, & Tindal, 2016). Many readers have difficulty decoding, which is using phonological codes to recognize words; thus, they have to rely on context to guess words which reduces their comprehension skills. Acquiring strong reading skills increases ability to decode words rapidly and become less dependent on decoding from context. As foundational reading skills develop, comprehension skills improve.

The first part of the book examines the visibility of language, and the evolution of reading from the historical writing of Mesopotamian Cuneiform to more formalized writing systems that represent phonology and semantics. He shares in-depth knowledge, seemingly in order to gain credibility in the eyes of his readers of his recommendations. Reading is inherently phonemic knowledge, according to Seidenberg, and learning how to represent this knowledge in spoken words. This ability is performed by a critical, looping mechanism in brain development that aligns print and speech to make reading feasible. Seidenberg's expertise on decoding is the focus throughout this section in order to emphasize the complex nature of a reader's ingrained capacity of spoken language in visible form.

Seidenberg's objective is to provide a framework for understanding the brain bases of reading to help the development of neurologically-linked practices that help children read. Throughout Part Two of the book, he indicates that prereaders' knowledge of letter names is one of the strongest predictors of subsequent literacy progress, which expands vocabulary knowledge. These skills generate language learning in both production and comprehension, which pave the way to acquire new words rapidly. A question for Seidenberg is: If schools are teaching alphabetic knowledge yet many students insufficiently acquire basic reading skills, how can reading practices adapt to meet early readers' needs?

Seidenberg identifies the role of teachers and parents in a child's reading acquisition in that adult-child interaction promotes linguistic development. He emphasizes how reading to children is as important as introducing them to print, which builds new neural circuits linking visual code to existing systems of print. A computational model, Seidenberg explains, is a triangular model in teaching literacy and linguistic skill development. It includes semantics (the word perceived), orthography (creating links from print to prior knowledge from speech), and phonology (comprehending and producing speech). This triad supports reading acquisition of language that includes decoding skills, rapid word identification, and integrating words using prior vocabulary when activated.

Throughout part three of *The Educational Challenges*, Seidenberg warns of environmental factors influencing language impairments. Perhaps the biggest force to reckon with is low socio-economic status, which has a devastating effect on young readers. Perceptions of the quality of U.S. public education lies in standardized test data that show small but significant increases in reading comprehension associated with national improvements observed in phonics knowledge; though it is not conclusive that this association reflects a causal relationship (Walker,

Sainsbury, Worth, Bamforth, & Betts, 2015). Standardized assessment scores are tied to teacher accountability, as based on quantitative measures of student performance according to the National Reading Panel (Elleman, 2017). Assessment scores are not a singular measure of teacher accountability or reading proficiency, as student demographics must also be considered. In the chapter, "How Well Does America Read?" Seidenberg highlights data from standardized test scores with racial and economic demographics, emphasizing achievement gaps.

The poverty hypothesis Seidenberg presents insinuates that wealthy public school children are thriving and poor children are struggling not because schools are failing, but because they come to school with all the documented handicaps that poverty imposes: hunger, developmental delays, illness, homelessness, emotional and mental illnesses. The number of books in the home categorize a measures of SES, demonstrating a large proportion of US test takers in poverty.

Asserting that teacher preparation programs must bridge the two cultures of science and education, Seidenberg offers language development as one explanation: the link between reading and speech is the prerequisite of early reading success. Considering adults in a child's home as a resource for positive early literacy experiences, the accountability for teaching phonics at home varies based on effects of socioeconomic differences, especially when the primary language at home differs from primary school language.

Seidenberg's concerns of the lack of commitment to brain-base reading in educational practices infer science as a yielding source of effective teaching methods. I believe he is insisting on an educational shift: a theoretical rebalancing of both science and sociocultural theories in the philosophy of education that entails effective reading practices from an interdisciplinary lens. While he details the various challenges children face in developing strong reading skills, I think educators would promote continual research and development of instructional strategies that produce skilled readers, especially with an interdisciplinary approach, despite the difficulties. While I believe his idea of a balanced literacy approach is important in the teaching of reading, Seidenberg provides little practice-based methods of applying these theories. He alludes to a balanced literacy approach which incorporates phonics instruction in text-based literacy activities to acquire the ability to read words accurately, rapidly, and automatically. Seidenberg recommends restructuring how we train future practitioners to center on a science-based reading approach. However, he fails to address the funds of knowledge that both teachers and students of diverse cultural and linguistic backgrounds contribute and how to create context-based literacy opportunities that include students' backgrounds. There are many layers to his claim that adult speech influences children's language acquisition more so than any other language experience and is a relevant area of research, specifically in home-based language experiences. Other determinants to literacy and language acquisition need to be examined. Such measures include parental

education level, immigration or generational status, digital literacy (ie. number of digital books, tablets, computers, video games), and early home literacy experiences.

Seidenberg uses this text as a call to action for educators to support inevitably occurring changes in methods to teaching reading. He proclaims current times require more attention to the importance of teaching reading in a cognitive-based approach. Teaching decoding with phonological codes through a triad computational model of phonology, spelling, meaning is effective if it is in relevant context to the reader. Seidenberg gives little attention to the role of children's funds of knowledge and prior knowledge in reading comprehension. A balanced literacy approach should include relevant comprehension strategies as well as phonics instruction in acquisition of basic reading skills. Seidenberg contends neuroimaging and brain data can identify etiologies and allow for more focused, effective instruction. Though he alludes to the significance of making-meaning of text in relevant context, the connection to science-based reading practices is not clear. While this theoretical knowledge informs phonics and vocabulary instruction in what children should learn, he does not provide practitioners with how to teach basic reading skills.

In order to prepare readers capable of navigating multimodal literacies in transforming digital contexts, children must have foundational reading skills to develop various literacy skills as critical readers. While Seidenberg provides a bird's eye view of the purpose in reading education, I offer a worm's eye view that teachers need to synthesize a personal educational philosophy in which their definition of literacy includes multiple specific forms that technology now affords: "Literacy is the ability to identify, understand, interpret, create, compute, and communicate using visual, audible, and digital materials across disciplines and in any context" (p. 278).

In one respect, readers could conclude that this book offers a feasible foundation to improve literacy achievement. Educators who recognize the problems in the reading achievement gap may view this book as a podium to stand behind to advocate for change. However, what would support Seidenberg's claim more would be accounting for the evident scientific research on how reading and language develops in the brain that current reading instructional practices are based upon. Rather, he claims brain-based reading research is not a foundation to teaching reading. As an advocate for teachers, he reinforces that theories to teach reading are not widely used because teachers lack commitment, sincerity, integrity, motivation, or intelligence, but because teachers are inadequately advised and trained without relevant science. More research is necessary to address the challenges poor readers face, as educational researchers build upon existing theoretical frameworks to explore effective reading practices. This book is a resource for university researchers seeking to improve teacher preparation programs, for policy makers and educators alike. The primary notion is that science-based reading instruction is a way to reduce the academic achievement gap in reading education. A holistic literacy framework influences teaching practices and

policies that may reduce academic achievement gaps and improve reading achievement. Such an outcome aligns with his petition:

> *Because most of what goes on in reading is subconscious: we are aware of the result of having read something—that we understood it, that we found it funny, that it conveyed a fact, idea, or feeling—not the mental and neural operations that produced that outcome. That is why there is a science of reading: to understand this complex skill at levels that intuition cannot easily penetrate. (p. 304)*

As a cornerstone for change, this text offers an in-depth understanding of the foundation of reading. After all, reading is still fundamental.

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