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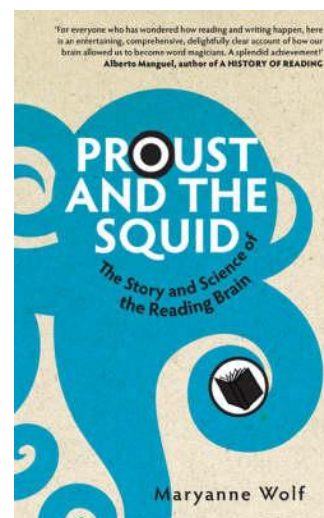
Wolf, Maryanne (2007). *Proust and the Squid: The Story and Science of the Reading Brain*. New York: HarperCollins.

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As doctoral students in a newly formed Department of Interdisciplinary Learning and Teaching, at The University of Texas—San Antonio, one of our first course assignments was to examine the approaches scholars use in the integrating of disciplines to answer complex research questions—unanswerable by a single field. An exceptional model of such interdisciplinary inquiry is Maryanne Wolf's *Proust and the Squid: The Story and Science of the Reading Brain*. This book combines the history of reading across cultures with the science of the reading brain. The book is unique in that the author represents the perspective of a cognitive



¹ Contributors to this review are the students of ILT 7003 *Exploration of Interdisciplinary Learning and Teaching*, a doctoral seminar at The University of Texas—San Antonio taught in the Fall, 2009 along with the instructor, Rosalind Horowitz, Professor, Interdisciplinary Learning and Teaching.

neuroscientist and expert on reading with the perspective of a concerned mother. In an effort to grasp the complexities of her son's dyslexia, Maryanne Wolf explores the history of the written word across civilizations and its parallels in the development of reading abilities in children.

Proust and the Squid is a remarkable example of scholarly insight and integration of knowledge targeted for the general public, primarily educators and parents, in a trade book, but it also provides invaluable information for researchers and doctoral students who require background information in order to pursue new interdisciplinary questions. In conjunction with colleagues at the Center for Reading, Language, and Development at Tufts University, in Boston, Wolf has extensively worked for over seven-years to present in everyday language what it means to read or not to read.

Wolf considers individuals from diverse linguistic backgrounds, while articulating the point, contrary to what many people believe, that learning to read is, in fact, *not* natural. Formation of the necessary pathways to do so can be both beautiful and also problematic.

Maryanne Wolf pushes her reader to challenge commonly held notions about how reading emerges in childhood.

This volume is fascinating for how it is rooted in knowledge from a number of fields—neuroscience, perceptual and cognitive psychology, clinical psychology, linguistics, literature and the history of civilizations of the world, rarely juxtaposed and integrated in one source.

The first part of the book provides a most readable discussion for the layperson of the technicalities of how the brain learns to read. In chapter one, Wolf's research into the physiology of the "reading brain" and its ramifications for past, present, and future society allows for a rare glimpse into the interdisciplinary work conducted behind closed doors of academia-- so vital to advancement of knowledge yet limited by academic departmental structures. Utilizing several poignant examples, Wolf illustrates the scientifically-proven physiological differences between literate cultures and how these cultures have evolved through various incarnations of written language—in German and Spanish, Hebrew, Chinese, and Japanese. Concomitantly, Wolf

Maryanne Wolf teaches child development at Tufts University, where she holds the John DeBiaggio Chair of Citizenship and Public Service and is the director of the Center for Reading and Language Research. Wolf gives a book talk on C-Span: <http://tinyurl.com/4ohgr35>



traces the history and evolution of the brain in an effort to understand what role reading will play for students in the future.

Wolf emphasizes the plasticity of the brain, which reconfigures itself for different types of reading albeit from clay tablets, to hieroglyphs, alphabets and now in the digital formats. Her key point is that “we were never born to read.” Rather, as computer scientists call it, our brain has an “open architecture” that allows for flexibility and reconfiguring. She deftly utilizes the relationship between the prose of timeless literary classics and the biological mechanisms that human beings have developed to allow, or in the case of dyslexia, disallow the consumption of the written word. She highlights dyslexics who were creators, Thomas Edison, Alexander Graham Bell, Charles Schwab and Leonardo da Vinci, asking us to consider whether the dyslexic brain was linked to their creativity.

Wolf tells us at the onset, page 6, that she uses the French novelist Marcel Proust, as a metaphor and the largely unappreciated squid, used in neurological research, as an analogy. They represent two very different aspects of reading. For Proust, reading was an opportunity to delve into very different kinds of imaginary worlds, “capable of transforming readers’ intellectual lives” and the squid, shy and cunning, was used in the 1950’s “to understand how neurons fire and transmit to each other” as the brain cleverly adapts and transforms itself when things go amiss.

Chapter two creates an historic and developmental timeline of the first writing systems, thought to be 77,000 years old, designed for reading—in administration and accounting. Wolf’s interdisciplinary approach in explaining the brain’s adaptations, while learning to read and write, provides the reader with a view of the complexity and the “unnaturalness” of reading. Historically, writing and reading systems from cultures isolated from one another paralleled systems of syntax and phonemes in different forms. In this chapter, and again in chapter six, neuroscientists illustrate the human brain as a system of association and coordination to accomplish reading. These associations in the brain differ from logographic reading to phonological reading and from early reading to automatic and fluent reading. In the end, she argues different forms of writing, from cuneiform

(lines) to hieroglyphs (drawings) changed how we read and think.

Chapter three asks a fundamental question: “What makes an alphabet?” Professor Wolf explores three important claims to determine if a given alphabet builds a different brain. Claim one expatiates on the experimentation of cognitive scientist Charles Perfetti of The University of Pittsburgh. The images provide evidence of the evolution of script and how this evolution ties into the development of the reading brain. Claim two asserts how an alphabet forges new ideas in the brain. According to Vygotsky, “...the act of putting spoken words and unspoken thoughts into written words releases and, in the process, changes the thoughts themselves” (p. 65). The third claim explains how the alphabet transforms learning to read through enhanced awareness of speech. This chapter also includes Socrates’ objections to the written word. His concern was about the inflexibility of the written word, memory destruction with written word use, and the loss of control over language.

In Part II of this volume, how the brain learns to read over time is addressed. Chapter four opens with the age-old story of a young child sitting on the lap of a beloved adult listening to bedtime stories of fairies, giants, and dragons. It is upon this premise that she skillfully enlightens the reader of the developmental origins of what Kornei Chukovsky calls “linguistic genius.” Wolf goes further to weave a tale of two readers. The first is a tale of a child that vicariously experiences new worlds and adventures by hearing and seeing the written word. Wolf believes that these experiences are foundational to building schemata and making integral cognitive connections. Readers of this chapter will no doubt see glimpses of their former selves as linguistic geniuses and may find that they become new advocates of the tradition of bedtime stories. The second tale is much more ominous, for it exposes the dark consequences that fall upon the child who has not been read to on a regular basis during their reading brain’s formative years.

Maryanne Wolf shares the story of her personal literacy development in chapter five. She explains how her love of reading provided her not only with countless hours of vicarious adventures, but also with a supreme sense of

wholeness. This touching story is presented in sharp contrast to an otherwise confident childhood friend who was rendered utterly helpless by his struggle to achieve the same success. This personal introduction is followed by a detailed explanation of the first three stages of reading development: emerging pre-reader, novice, and decoding reader. The foundation of literacy acquisition relies on the synchronization of cognitive, social, and linguistic experiences.

Chapter six, once again, delves into the structure of the brain as it relates to its reorganization and facilitates the unnatural act of reading. The focus in this portion of the text is on moving towards fluency and how the brain develops more efficient pathways with reading practice. The gains in efficiency allow the fluent reader's brain time to integrate analogical context and affective knowledge. The brain of the literate and illiterate are using entirely different areas and activate dramatically different amounts of contextual imagery. This continual development of the reading brain may explain why one can constantly find new meaning or relevance to a favorite work, re-read later in life.

Part III of the volume explores why the brain cannot learn to read. Some children "would rather clean the mold in a bathtub than read". This quote marks the beginning of chapter seven. It accurately expresses the laborious job reading can be for many children. It is in this chapter that Wolf provides novel insight about the dyslexic brain's activity as it functions during reading. With neuroscience and research data, this chapter sheds new light on a century-old mystery.

Wolf pulls together the pieces of many research studies, including that of Professor Frank Vellutino, the University of Albany, SUNY, which highlighted the oral language limitations experienced by dyslexic children. Wolf propels what we know about dyslexia into a new realm of possibility as we steadily move closer to solving this complex puzzle. Providing some intimate pieces from her son's journey with dyslexia, Wolf delivers a comprehensive explanation of research and future possibilities for exploring dyslexia and the reading brain. Chapter seven concludes with rich and practical information for classroom teachers, although the humble

Wolf contends that there remains much to be explained about the mysteries of dyslexia.

It is in chapter eight that Wolf expands on an earlier list of successful artists, scientists, inventors and actors with dyslexia. The question remains whether this talent and creativity come from the fact that the brain of a person with dyslexia is forced to compensate through use of the right hemisphere or if these individuals are born with dominance in that hemisphere. Wolf provides a historical overview of research in this field, including the work of Samuel Orton over 80 years ago to the use of cytoarchitectonic methods (at the cellular level). There have also been powerful twin studies and studies in different languages, each of which helps us gain a better understanding of the science behind the study of reading disabilities. Maryanne Wolf explains that, "...if future studies pinpoint the different phenotypes and their structural and behavioral characteristics, deficits and strengths, we could supply many of the puzzle pieces still missing from the history of dyslexia" (p. 207).

This chapter concludes with a message to parents and educators to recognize and honor the talents of those students with reading disabilities. The interdisciplinary approach to understanding dyslexia can help educators to differentiate their lessons and to reach those with "differently organized brains."

In the last chapter of this book, Wolf explains how the reading revolution was neuronally and culturally based. Reading spread culture throughout the lands of the world. By learning the various characters and symbols from different regions during trade or commerce, people were exposed and forced by necessity to learn and explore other people and cultures. This communication increased the use of writing, which Wolf explains freed the brain to form new thoughts and develop cognitively.

The conclusion of the book leaves us thinking about the enormous possibilities that will be available in the future. Technology, data collection, and computational tools will improve in ways we can barely envision today as will the capacity of our brains to calculate at a rate of 10 to the 40th power times faster than they do today.

As we pursue new ways of combining knowledge and interdisciplinary inquiry, we hope to formulate research questions in reading and learning that are pressing, but have not been examined—and with the zeal and thoroughness as demonstrated in our model, *Proust and the Squid*. In addition, the present doctoral cohort is comprised of former and current educators, some administrators and parents, as well. We believe researchers, educators, and parents will find this book a fascinating, readable, engaging resource for understanding the brain, dyslexia and reading difficulties, the history of human development, and the future of reading.

About the Reviewers

The contributors to this review are Shannon Blady, Angeli Willson, Tracey Kumar, George Jackson, Lori Prior, Lucretia M. Fraga, Leo Wittnebel, Kalpana Mukunda Iyengar, Ralph Gdovin, Debra Root, Andrew Schuetze, Shelbee Nguyen, and Rosalind Horowitz, who is editor of *Talking Texts: How Speech and Writing Interact in School Learning* (2007). Horowitz is a Spencer Fellow of the National Academy of Education and Chair of the AERA, SIG 168, Doctoral Education Across the Disciplines, Outstanding Paper Award.



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