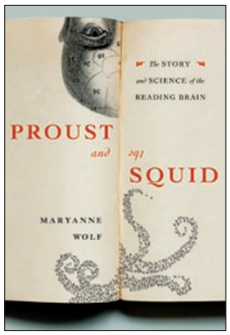
Meandering through dyslexia



Proust and the Squid: The Story and Science of the Reading Brain

by Maryanne Wolf

Harper Collins, 2007
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Reviewed by Richard Wise

While reading this review, you are likely to scan 150–200 words per minute. This speed does not depend on word length: *furniture* is read as quickly as *fur*, with a single eye fixation. As a child, you learned reading-specific visual attention, so that while recognizing a word, you look ahead with lower-acuity parafoveal vision to determine the eye movement required to center high-acuity foveal vision on the next word. Separate hierarchical neural systems automatically map a recognized word onto your memories of the sound form, irrespective of irregularity (so *yacht* is *yot* and not *yatched*), and onto the motor plan for its reproduction by handwriting. Most relevant to the task, visual word shape activates meaning.

Neuropsychologists have described adults with acquired impairments in one or more of these automatic 'streams' of processing evoked by reading. Thus, for example, focal brain damage can leave a patient unable to recognize words while still able to recognize letters, resulting in compensation by the painfully slow strategy of reading letter by letter. Perhaps the most intriguing patients are those who read a word as a close associate in meaning; *canary* may be read as *budgerigar*. Most disabled are those patients with a form of dementia that destroys acquired knowledge; as semantic knowledge is amodal, they lose understanding of spoken as well as read words, pictures and eventually objects.

Surprisingly, much of what I have briefly summarized gets no mention in Maryanne Wolf's book, which claims to tell us about the reading brain. Instead, the book is mainly about developmental dyslexia. This focus on the author's research experience alone is a pity, because studies of acquired reading disorders have been more informative about brain organization than studies of dyslexic children. Instead, she chose to digress into other areas, including the history of writing. This was too much tangential detail for me. Much better just to have stuck to the differences in modern orthographies that explain, in part, variations in the prevalence of symptomatic dyslexia across cultures.

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What is most intriguing about dyslexia research is the feuding. Research factions struggle with the absence of absolutes and consistencies, which provokes heated debates. Wolf is, of course, only too aware of these problems and perhaps wisely relegates the revelation that there is not even a universally agreed definition of dyslexia to the notes section. Nevertheless, she gives a curiously bloodless account of the scientific tensions and the grumbles of dissenters. The problem is that that the hard data are rather dull. Some constellations of behavioral impairments are much more common than others. Genetic data tell us the condition is heritable, but this does not inform us about mechanisms and management.

To compensate, much is made of brain imaging. Unfortunately, brain imaging, anatomical and functional, can be an unreliable source of biological truths. Many, including me, would say that it has added little to our understanding of the dyslexic brain. Perhaps I had better add the qualifier 'as yet'; others would prefer 'and will never'. Even the studies on normal reading brains are ultimately unsatisfactory. As the Western alphabetic script is so different from Chinese orthography, it is hardly surprising that reading activation patterns look different across languages, but that is detail for the specialists. Nevertheless, Wolf has taken advantage of a popular prejudice: that a publication is more plausible, and of greater scientific validity, if it includes a brain image (preferably color-coded). Playing to this prejudice, the book includes multiple drawings of the brain with reading-associated 'splotches', although the publishers have lessened their impact by omitting color. I spend my life creating these images in relation to language processing, and it is perhaps my place to find much to criticize in many of these functional imaging studies. Wolf seems to find little to fault.

However, what I find hardest to like about this book are the attempts to add human interest. Many pages are devoted to the impressions and emotions evoked by creative writing. Enter Proust and, by implication, thousands of other writers of good novels. Better they had been left out of the story, as their prose style is so much more evocative than the author's. Wolf's hyphenated qualifiers ("breath-defying" and "thought-provoking") and solecisms ("relatively unique") are less compelling. In any case, dyslexic children do not lack imagination, memory or emotion, but simply have an impaired ability to access these mental states through the printed word. Even for skilled readers, the film of the book is often preferable; *Jaws* the movie gets my vote over the novel, no matter how mechanical the movements of the fish.

The writer is better at conveying the distress felt by dyslexic children, especially when their educational handicap is misunderstood. It is also reassuring to hear that dyslexia is not necessarily a bar to great achievements; I, too, am impressed by the dyslexic Jackie Stewart's ability to generate optimal Bayesian solutions when cornering at twice the speed I have ever driven a car on the straight.

Finally, what about the poor old squid? In reality, he gets little mention. He is there to tell us that reading depends on neurons, but axons or synapses to systems is a leap that no one has yet made. And I cannot agree, as is claimed, that a dyslexic child is a little bit like a squid that can only swim slowly. A great title, but the contents of the book do not live up to it.