aps ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

Psychological Science in the Public Interest
2016, Vol. 17(1) 1–3

DOI: 10.1177/1529100615623268
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Speed Reading: You Can't Always Get What You Want, but Can You Sometimes Get What You Need?

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Compared to listening to a speaker, reading seems more effortful. Why? An obvious difference is that the structure of visual language forces the reader to acquire information in a parasitic manner, looking at patterns of straight and squiggly lines, making eye movements to recognize words, and mapping these onto more "natural" auditory language abilities. But are there ways of bypassing (or minimizing) the extra demands of processing visual language? Many would lead us to believe that the answer is yes. Consider the potential benefits of reading 5 times more quickly than you currently read, with no loss in comprehension. For the past five decades (beginning with Evelyn Wood's speed-reading programs), there have been training programs that claim to dramatically increase the speed of reading, taking advantage of the massive power of the human brain to leave readers unencumbered by the laborious additional demands of converting print to the system used for spoken language.

The target article in this issue has brought together a dream team of researchers who have studied reading and rapid processing of visual information to evaluate the potential efficacy of speed-reading programs. Rayner, Schotter, Masson, Potter, and Treiman argue that if one wants to evaluate such programs, it is critical to first understand the processes that are involved in reading. Thus, the authors provide an in-depth review of the extensive literature on reading, from basic aspects of writing systems to higher-level comprehension. They also review the available empirical evidence evaluating the efficacy of speed-reading programs. The review is an outstanding resource for anyone who is interested in reading and speed reading. Rayner et al argue from this literature that speed-reading training programs are unlikely to pay off as advertised because of well-established empirical facts about reading. For example, one approach espoused by speed-reading advocates is to fixate on only a few words within each line of text, thereby decreasing the number of time-consuming fixations that most words receive during normal reading. The notion here is that readers can pick up considerable information in the periphery while fixating a particular word or phrase. Rayner et al. point out that visual information quickly degrades in quality as it extends beyond the fovea and parafovea. Thus, by decreasing fixations, a reader will process fewer words, thereby decreasing comprehension.

Another more recent approach is to take advantage of smart devices that use apps to present text one word after another at fixation. This strategy eliminates altogether the "wasted time" devoted to eye movements. There is a rich body of work on presenting text sequentially in this manner (called rapid serial visual presentation), and there is indeed evidence that participants can pick up some information at extraordinarily fast presentation rates. The appeal of this approach is captivating (it can be easily experienced via a simple online demonstration advocating one such training program: http://spritzinc.com/). However, Rayner et al. argue that this procedure also has limitations because there is evidence of a breakdown in the quality of comprehension at fast presentation rates (see Potter, Kroll, & Harris, 1980). Although the procedure is intuitively appealing, it is likely that people using it are poor at evaluating how much information they are actually processing.

The quality of comprehension and our ability to know how much we are comprehending (metacomprehension) is a critical issue in evaluating the appeal of speed-reading programs. As an example of our modest metacognitive abilities, consider the following passage that circulated widely on the Internet: "Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoetnt tihng is taht the frist and lsat ltteer be at the rghit pclae." This demo went viral, suggesting that one can rely heavily on context in reading and avoid detailed processing of letter information. However, the perceived ease of reading

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such text comes at a cost when examining the actual eye movements of the readers. Rayner, White, Johnson, and Liversedge (2006) showed that there is a decrement of about 12% in simple reading speed when the letters of words are scrambled in this way (comprehension was not examined in this study). Clearly, the internal letters in words do matter in reading, even though subjectively we perceive remarkable ease in reading such sentences. There is also accumulating evidence that individuals often engage in "just good enough" heuristics in comprehension, which most often are successful but can also lead to problems when syntactic markers lead to alternative interpretations. This occurs in "garden path" sentences or sometimes even in headlines ("Complaints about NBA Referees Growing Ugly"—see Ferreira, Ferraro, & Bailey, 2002).

Many of the arguments laid out in Rayner et al.'s article turn on the quality of comprehension. As Rayner et al. emphasize, comprehension is not an all-or-none phenomenon. Rather, various degrees of comprehension can be tapped by different comprehension tests. Once one acknowledges that there are degrees of comprehension, then it is easy to understand the trade-off between comprehension and reading speed. Rayner et al. argue that speed-reading programs maintaining that there is no cost in comprehension when reading speed is greatly increased have often used more cursory measures of comprehension that may not be sensitive to its subtle aspects.

An additional issue to consider is the goal of the reader. For example, there may be times when detailed comprehension is not the reader's goal and more cursory, gist-based information is sufficient. Rayner et al. acknowledge that if one is interested in acquiring more gist-based information from the text, there may be some advantage to training programs that increase skimming speed. Presidents Kennedy and Carter were advocates of speed-reading programs that likely make gist-based analyses sufficient for some text material in a familiar content domain. However, if one is interested in the rich situations that skilled authors construct for the reader or the details of complex arguments in an unfamiliar subject, then there are limitations not only on the rate at which words are extracted from the text but also on higher-level language-processing capacities. These higher-level processes involve working memory, syntactic analyses, and referential and semantic processes. Indeed, Rayner et al. note that there is a similar limit to how quickly information can be presented when one speeds up the presentation of speech. So, the limiting factor for full comprehension may not be the additional constraints of converting visual print into words but, rather, the higher-order demands of language comprehension, such as working memory.

Rayner et al. note that relatively little empirical work exists examining expert speed readers with detailed comprehension tests both immediately after reading and after a delay. Both immediate and delayed comprehension tests would be particularly useful because it is possible that memory after a delay even for normal reading may be more gist based (see Reyna & Kiernan, 1994), and gist-based processing may be accomplished via speed reading. The pertinent question may be whether a difference in gist-based retention would exist at longer delays (e.g., weeks or months) after speed reading versus standard reading. We cannot know, because the relevant research has not been done.

The training procedure for speed reading is unique because its goal is not transfer to other cognitive tasks but merely training of the skill itself, reading. This contrasts with other training programs, such as Lumosity and working memory training programs, wherein the goal is transfer to more general fluid cognitive performance. Not surprisingly, it is much easier to produce benefits of training on a specific task than to demonstrate transfer to novel tasks that rely on the same construct (e.g., see Shipstead, Redick, & Engle, 2010, for a review). In this light, it would be interesting to test individuals who have developed exceptional speed-reading skills. For example, world speed-reading champion Anne Jones reportedly has been clocked at 4,251 words per minute (http://www.mentalworldrecords.com/worldspeedreadingcouncil/)—the normal reading rate is about 250 to 300 words per minute. Such mind-training competitions have become quite popular and have produced remarkable and well-verified feats in training specific skills (e.g., Simon Reinhard memorized a deck of cards in 21.9 seconds, and Kevin Hayes solved eight Rubik's cubes in a single breath underwater; Carey, 2014; Held, 2015). Not surprisingly, a common characteristic across mind-training competitions is the intense practice demanded to reach these extraordinary levels of performance. Carefully examining the performance of individuals who have become very efficient in speed-reading programs in both immediate and delayed comprehension tests may provide important insights into the limits on the speed of transferring print to meaning.

The Rayner et al. article is an excellent and timely review of what we currently know about reading, speed reading, and comprehension. There is probably no quick fix for circumventing the temporal demands of reading without a cost to some aspect of comprehension. However, one can envisage, through practice, developing a skill of "titrating" reading speed (e.g., possibly via skimming) to the level of comprehension desired by the reader. A careful analysis of such skill development would be an important complement to the current literature.

Declaration of Conflicting Interests

The author declared no conflicts of interest with respect to the authorship or the publication of this article.

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