

REFERENCE LIST

Wolf, M. & Katzir-Cohen, T. (2001). Reading fluency and its intervention. *Scientific Studies of Reading*. (Special Issue on Fluency. Editors: E. Kameenui & D. Simmons). 5, p. 211-238.

Wolf, M. (2001). Seven dimensions in time. In M. Wolf (Ed.), *Dyslexia, fluency, and the brain*. York Press: Timonium, MD.

Wolf, M. & O'Brien, B. (2001). On issues of time, fluency, and intervention. In A. Fawcett and R. Nicolson (Eds.), *Dyslexia: Theory and Best Practice*, pp. 124-140. Whurr Publishers: London.

Wolf, M. (2001) The Double-Deficit Hypothesis, fluency, and a new intervention for children with dyslexia. *Dyslexia Contact*. British Dyslexia Association.

Wolf, M., Miller, L., & Donnelly, K. (2000). RAVE-O: A comprehensive fluency-based reading intervention program. *Journal of Learning Disabilities*, 33, p.375-386. (Special Issue on the Double-Deficit Hypothesis: Special Issue Editors: M. Wolf & P. Bowers).

Wolf, M. & Deeney, T. (2000) A new direction: Fluency, phonology, and speakers of African-American English. *Perspectives*. The International Dyslexia Association. 35-36.

Fluency Formula



About the Author

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Harvard University and has been awarded the Distinguished Professor of the Year Award from the Massachusetts Psychological Association, a Fulbright Research Fellow in Germany, and the Norman Geschwind Lecture Award from the International Dyslexia Association. With colleagues, Robin Morris and Maureen Lovett, she received the NICHD Shannon Award for Innovative Research and is conducting an NICHD three-city reading intervention project focusing on fluency (RAVE-O). Maryanne is the author of the Scholastic Red Fluency course for Grades K-2. She has published books such as *Dyslexia, Fluency, and the Brain*, and numerous articles in *Journal of Educational Psychology*, *Journal of Learning Disabilities*, and *Reading Research Quarterly*.



What is Fluency?

Fluency Development: As the Bird Learns to Fly

by Maryanne Wolf

At this very moment your attentional systems are engaged; your conceptual curiosity has been piqued by the simile of a bird's flight; and your visual system is swooping quickly across the page, forwarding its gleanings without a single conscious effort to the multiple cognitive and linguistic systems that await its work. There is more. The latter linguistic systems are rapidly transforming these subtly differentiated visual symbols into sounds and words capable of transforming our thoughts, our actions, indeed sometimes our lives. This is the teeming underlife of reading, and a great deal rests upon our ability to activate all of these processes accurately and fluently.

Despite the three-ring cognitive performances going on inside their heads,



adult readers rarely give reading's automaticity a moment's reflection unless confronted by its absence: for example, in a child first learning to read, where the greatest amount of thought and effort is given to every letter and word; or in the rare, tragic aftermath of a stroke or brain injury that renders a person *alexia* and able to read only in the most labor-intensive fashion. In both of these examples, what is missing is *fluency*—that quality of written language that allows us to read with rapidly-executed skill and with almost effortless comprehension.

There is a third example of fluency's absence that is something between the other two examples and equally note worthy. Many children with developmental reading disabilities never attain smooth, fluent reading, and as a result, become increasingly behind their peers in a despairing game of catch-up that won't end well. The cycle of school failure is an only too well-known phenomenon to most educators. A bright child arrives at school full of life and excitement; tries hard like everyone else to learn to read; told by the first teacher to try a little harder; told by the second teacher that she/he is “not working

to potential”; told by other children that she/he is “slow” or a “retard”; and told by society that everyone has to read well to get to college and to get a good job. By the time this child is in fourth grade there is no earthly resemblance to the child who entered school a few years before! Unless all children have their best shot at learning to read accurately, fluently, and with good comprehension, we will repeat this unnecessary cycle of personal failure and rejection and societal loss over and over again in school after school.

I begin this forward on “Fluency's Development” with unsettling examples of fluency's absence because I want to bring home two related points and their clear implication: first, fluency is more complex and essential than most people ever realize. Second, the stakes are very high if children do not become fluent readers. Fluency, therefore, should be part and parcel of how we teach reading and how we teach teachers of reading. In other words we should be as *explicit* in how we help a child learn to read fluently, as we are in teaching a child to decode a word accurately. The rest of this forward will be organized around these two



points, beginning at the beginning—with the complex nature of what fluency is.

Understanding Fluency

Until recently most people did not think very much about fluency at all. Years ago reading expert Richard Allington (1983) went so far as to say that fluency was “the most neglected” skill in reading. There is decidedly more attention given to the topic now, but

The GOAL of Fluency

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there is still a great deal to learn about what contributes to our brain’s ability to integrate all the processes involved in reading in rapid, almost automatic fashion. Think for one minute at a deeper level about the opening paragraph’s description of what our brain

does when we read: first, the attentional systems have to “engage”, and the frontal lobe’s executive systems have to line up the process-players for the particular task ahead. Second, the visual system has to activate no fewer than six major “way stations” before the letters are identified as recognized visual patterns (representations). Third, the visual representations have to be connected to a great many component systems—the appropriate sound-based matches i.e., phonological representations), the meanings (i.e., semantic representations), and also how the word’s roots (i.e., morphological knowledge) and sentence context (i.e., syntactic knowledge) affect the interpretation of meanings. Only after all these cognitive and linguistic processes are accessed and their representations are retrieved (i.e., the retrieval system) can either be a phonological plan for articulating the words smoothly (i.e., the articulatory system) with appropriate speech melody (i.e., prosody). And all of this has to happen in lightning fashion, or the end result is not fluent! If you could see how many areas in the brain are activated when we are asked to



Fluency and Comprehension: The Link

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read—and, how quickly—you would appreciate anew the extraordinary achievement reading represents both in the brain’s evolution and in a single child’s development.

But the point I wish to make here is more subtle than an appreciation for reading’s complexity. Until now the reading research world largely looked at fluency as the **outcome** of this entire set of processes. Indeed reading researchers Marianne Meyer and Rebecca Felton in an excellent review of this research described the consensual view of reading fluency as “the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanisms of reading such as decoding” (Meyer & Felton, 1999, p. 284). What is missing from this otherwise satisfactory definition is any mention concerning where this ability comes from:

that is, how it develops, and what is necessary for it to develop. My colleagues and I suggest a differently organized, *developmental* and *component-based* view of fluency that goes below the surface of the consensual view of reading fluency. Along with Virginia Berninger (2001) and Ed Kame’enui (2001) and their two research groups on the West coast, we seek to reconceptualize reading fluency as a developmental process, with many components contributing to it.

Like most changes in perspective, this reconceptualization demands a figure-ground shift from older views, with all the implications for pedagogy that such a shift implies. My colleague Tami Katzir (2001) and I have put forth a new, still evolving definition of fluency that has both developmental and multiple contributing processes at the core of it:



In its beginnings, reading fluency is the product of the initial development of accuracy and the subsequent development of automaticity in underlying sublexical processes, lexical processes, and their integration in single word reading and connected text. These include perceptual, phonological, orthographic, and morphological processes at the letter-, letter-pattern, and word-level, as well as semantic and syntactic processes at the word-level and connected text-level. After it is fully developed, reading fluency refers to a level of accuracy and rate where decoding is relatively effortless; where oral reading is smooth and accurate with correct prosody; and where attention can be allocated to comprehension.

Implications of Fluency Research for the Pedagogy of Reading

Such a definition makes several shifts, each of which has direct implications for the teaching of reading. First, fluency is seen as a lengthy developmental process, which encompasses all the early phases of reading

acquisition, and also all the levels of reading from sublexical letter fluency to word-level to connected text level fluency. **This means that we need to have a dual emphasis on both accuracy and fluency at each stage of our teaching from the identification of letters to reading connected-text stories.** At the present moment, the major emphasis (where it happens at all) is in the use of repeated reading, which is directed solely at the level of connected text.

Second, this reconceptualized definition of fluency is based on contributions from the linguistic systems that contribute to reading accuracy: phonological, orthographic, morphological, syntactic, and semantic. This means that we need as teachers to emphasize the importance of the full range of underlying linguistic systems. For example, knowing that the simple word “bat” has many meanings (semantic knowledge) and can be used in various ways in a sentence as a noun or verb (syntactic knowledge) can quite literally speed up the identification of the word, as well as its comprehension, during reading. At a still deeper level, think for yourself what you experience when you are asked to read



the following words: *planum temporale*. Now if you just finished a course in neuroscience or brain anatomy, you would read that pair of words as a single term, because you know they refer to one particular region in the brain. But if you have never seen those words, you will slightly pause, potentially stumble, and read each of them much more slowly than usual. So it is with the child who doesn't know the meaning of a word on the page. Vocabulary knowledge is a contributing factor to more accurate, more fluent word identification.

Third, the goal of fluency has little to do with speed, but a lot to do with the time it provides for comprehension, the ultimate goal. It would be very easy to misunderstand work on fluency as simply learning to read faster. Comprehension is the hoped-for end, not rapid reading. To achieve that goal, we need to build increased automaticity both in the letter and word-level identification processes and also in the retrieval of information from contributing linguistic systems. In this way the child can better allocate time to the continuum of comprehension skills from

comprehension-monitoring to inferential abilities. For example, the more time saved by fluent decoding, the more time a child can monitor the text for meaning, and infer the correct interpretation of the text. Teachers need to be very explicit with children so that young students don't lose sight of their ultimate goal in reading: fluent comprehension.

To summarize, there is a new conceptualization of reading fluency that is beginning to emerge from reading research, and it has very significant implications for how we view the teaching of reading. Previous work emphasized the use of repeated reading techniques to increase fluency, and this remains an important technique after reading is already acquired. The view of fluency espoused here is, however, decidedly developmental and places repeated reading as one means among many that can be used from the start of acquisition—from the level of letters and letter patterns—all the way to connected text. This new view also places special importance on knowledge from multiple linguistic systems.



The Fluency Formula™ Program

The *Fluency Formula* program has been influenced by these broader, developmental concepts found in the changing view of fluency discussed here. In my work as a consultant to educators at Scholastic, my goal is to provide them with research principles that can help shape their offerings to children. I want to point out some of the key features in Fluency Formula that are especially well-suited to the teaching of fluency skills from my viewpoint. First, there are activities directed to each level of reading. For example, there are phonics speed drills that address letter and sight-words levels; there are phrase-cue text passages, and connected text “one minute fluency readers” that can be timed and used for repeated reading with partners. In our own experimental work (Wolf, Miller, & Donnelly, 2000) we have found these latter types of minute stories to be a rich resource for building fluency and comprehension. An especially important dimension of these stories is the personal timing and charting of each child’s “words correctly read per

minute” from week to week. The inclusion of a fluency norm chart encourages the teacher to assess and observe the progress of every child with relative ease. It is a wonderfully motivating, simple tool, which when used with the comprehension questions, can be a powerful influence for child and teacher.

Another key feature of singular importance is the inclusion of work in vocabulary in this program. As stressed throughout this foreword, fluency is not simply an outcome of reading, but the developing consequence of many years of work in various linguistic systems, particularly vocabulary development.

I want to end this forward with a return to its beginning, with the title’s allusion to the flight of birds, an image I owe both to Frank Woods for finding it and to William James for writing it. James wrote that...

So it is with children who learn to read fluently and well: they begin to take flight into whole new worlds as effortlessly as young birds take to the sky.

