The Causes and Consequences of Differences in Reading Fluency

The concept of reading fluency plays an important role in current cognitive theories of the reading process. It is critically intertwined with reading comprehension. In this article, we outline how contemporary reading theorists conceptualize reading fluency. We discuss why it is a good overall indicator of the efficiency of the reading process. Finally, we suggest ways teachers and parents might foster the development of reading fluency.

What is Reading Fluency?

Cognitive psychologists who study reading conceive of reading fluency as the ability to recognize words rapidly and accurately (see LaBerge & Samuels, 1974; Perfetti, 1985; Rayner & Pollatsek, 1989; Stanovich, 1980, 1986). Much research in the psychology of reading indicates that fluent word recognition may be almost a necessary condition for good comprehension and enjoyable reading experiences.

The ability to recognize words rapidly and accurately is emphasized in current reading theory because it is the key to good reading comprehension. It is not difficult to see why. Humans have only so much cognitive capacity to devote to a particular task (Kahneman, 1973).

In cognitive psychology, this is known as the assumption of limited processing capacity, or limited cognitive resources. Since higher level processing of text is very capacity demanding (Freedman & Calfee, 1984), it is important to be able to allocate all of one's capacity to this level of processing.

Before readers can process at a higher level, however, they must be able to get the words off of the page. That is, the visual stimulation (i.e., the print) must undergo a transformation in order for the words to make contact with their stored memory codes and meanings. This is the brain process we call word recognition.

Although, in general, word recognition is not necessarily highly capacity demanding (unlike certain aspects of comprehension), for unpracticed readers it is. However, word recognition can become automatized (LaBerge & Samuels, 1974); that is, its efficiency can be increased to the point where it takes very little cognitive capacity. When processes of word recognition take little capacity (are fluent), most of the reader’s cognitive capacity can be focused on comprehending the text, criticizing it, elaborating on it, and reflecting on it—in short, doing all the things we know good readers do.

Conversely, what happens when word recognition is not fluent? Inefficient word recognition processes demand excessive cognitive capacity, leaving less capacity for comprehension. Inadequate capacity for comprehension robs reading of its inherent enjoyment because so

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few resources are left for processing meaning, reflecting, becoming absorbed in a narrative, understanding the humor, and using one’s imagination.

Thus, nonfluent word recognition results in unrewarding reading experiences that lead to less involvement in reading-related activities. This, of course, starts a cycle of interacting negative consequences (Stanovich, 1986). Nonfluent reading leads to less reading. Lack of exposure and practice then leads to a continued failure to develop automatic word recognition. As a result, practice continues to be avoided or is merely tolerated without real cognitive involvement, and the downward spiral continues. Importantly, since reading unlocks knowledge, develops vocabulary, and facilitates other cognitive skills (see Stanovich, 1986), these other skills and processes are developmentally delayed. The child who is slow to develop fluency is thus twice disadvantaged.

How do we know when the word recognition of a particular reader is fluent? Although, as argued above, fluency indicates that automaticity has been developed, it is not practical to assess automaticity (low capacity usage) directly. Researchers have developed various complicated methods for assessing automaticity (Britton, Glynn, Meyer, & Penland, 1982; Horn & Manis, 1987), but they are not practical for teachers or other practitioners. Fortunately, a much simpler indicator will suffice for teachers. When accurate word recognition takes place rapidly, the child has the requisite fluency. Of course, fluency is dependent on the material being read, and we are taking this caveat for granted here.

Teachers have traditionally been concerned with word recognition accuracy, and this focus on accuracy is also reflected in standardized assessment instruments. However, word recognition can be accurate but not automatic. Speed is one of the best indicators of automaticity (low resource use). In short, accurate word recognition is not enough for full fluency. Accurate word recognition must be completed rapidly for full fluency to be indicated.

What About “Word Calling”?

Is fluent reading always good? The discussion above suggests so, but what about the phenomenon often referred to as “word calling,” where words are pronounced fluently but are not understood. Isn’t this a bad thing? Here we have encountered one of the perennial “red herrings” in discussions of reading, so it is worth some discussion.

Despite the frequency with which the term word calling occurs in reading publications, it is rare to find an author who spells out exactly what the term means. The implicit assumptions behind the term’s use appear to be as follows: (a) Word calling occurs when the words in the text are efficiently decoded into their spoken forms without comprehension of the passage taking place; (b) word calling is a bad thing, because it indicates that the reader does not understand the true purpose of reading—extracting meaning from the text; (c) children engage in word calling because they have learned inappropriate reading strategies; and (d) the strategic difficulty is one of overreliance on phonics strategies (see, for example, Goodman, 1968, p. 20; Smith, 1982, p. 145).

These assumptions have gained popularity despite the lack of evidence that word calling occurs with an appreciable number of poor readers. There is no research evidence indicating that decoding a word into a phonological form often takes place without meaning extraction, even with poor readers. To the contrary, a substantial body of evidence indicates that even for young children, word decoding automatically leads to meaning activation when the meaning of the word is adequately established in memory (Ehri, 1977; Goodman, Hauth, Guttenberg, & Rao, 1985; Guttenberg & Hauth, 1978, 1980; Kraut & Smothergill, 1980).

The latter requirement is crucial. Reports of word calling rarely indicate whether the words that are “called” are even in the child’s listening vocabulary. If the child would not understand the meaning of the word or passage when spoken, then overuse of decoding strategies can hardly be blamed if the child does not understand the written words. Thus, a minimal requirement for establishing word calling is the demonstration that the written material being called is within the listening comprehension abilities of the child (see Gough & Tunmer, 1986).

It is also necessary to demonstrate that the word calling is not a simple consequence of poor decoding. Although reasonable efficient decoding would appear to be an integral part of any meaningful definition of word calling,
decoding skills are rarely carefully assessed before a child is labeled a word caller. As we noted previously, one does not obtain a clear picture of a child's decoding abilities unless speed and automaticity criteria are also employed (e.g., LaBerge & Samuels, 1974; Perfetti, 1985). It is quite possible for accurate decoding to be so slow and capacity-demanding that it strains available cognitive resources and causes comprehension breakdowns. Such accurate but capacity-demanding decoding with little comprehension should not be considered word calling as defined above. To the contrary, it is a qualitatively different type of phenomenon. Comprehension fails not because of overreliance on decoding, but because decoding skill is not developed enough.

Thus, when the term word caller is clearly specified and logically analyzed, it is found not to contradict our previous conclusion: Fluent word recognition is one mechanism that serves to support efficient, enjoyable reading, which is characterized by a focus on the meaning of the passage, use of cognitive capacity for high-level processes of text elaboration, critical reading, and comprehension monitoring. There is no evidence indicating that one can be "too fluent." Fast, accurate word recognition is virtually always a good thing.

Where Does Fluency Come From?

Having established the importance of word recognition fluency and having dispensed with a mistaken criticism of the idea that fluency is critical to good reading, we now turn to the question of how fluency develops. What accounts for individual differences in reading fluency?

Of course, there are naturally occurring differences among individuals. That is, even among individuals who have been exposed to equal amounts of print, some differences occur in how effective that exposure has been in developing fluency. But despite these naturally occurring differences, a more important factor is the amount of exposure to print. In short, practice is what develops fluency.

Through practice, children develop knowledge of correct spellings of words (often referred to as complete orthographic representations) and spelling-sound correspondences. These form the basis of the capacity-free recognition—the automaticity—that is a characteristic of fluent reading. Exposure to print facilitates the formation of orthographic codes that enable recognition on a direct, visual basis. Induction of spelling-sound correspondences through practice or explicit instruction facilitates the recognition, via spelling-sound recoding (i.e., phonological coding), of a letter string into an acoustic form already stored in memory.

But differences in the amount of reading practice children get are enormous, and they are exacerbated by certain societal and school practices that serve to create rich-get-richer and poor-get-poorer situations (see Stanovich, 1986). Biemiller (1977-1978) has documented how extremely large differences in reading practice begin to emerge as early as the middle of the first-grade year (see also Allington, 1984). In October, the children in the three most able groups in his sample read a mean of 12.2 words per child per reading session, the children in the three average ability groups read 11.9 words per child per reading session, and the children in the two least able groups were not reading. By January, the mean of words read per child per session for the most able groups was 51.9, for the average ability groups, 25.8, and for the least able groups, 11.5. In April the respective means were 81.4, 72.3, and 31.6. Thus, soon after experiencing greater difficulty in breaking the spelling-to-sound code, poorer readers are reading much less text than their peers.

Further exacerbating the situation is the fact that poor readers often find themselves trying to read materials that are too difficult for them (Allington, 1977, 1984; Bristow, 1985; Gambrell, Wilson, & Gantt, 1981). The combination of lack of practice, deficient decoding skills, and difficult materials results in unrewarding early reading experiences that lead to less involvement in reading-related activities.

Differences in the volume of reading outside the classroom are also linked to reading fluency, and these differences are likely to become increasingly large as schooling progresses. Anderson, Wilson, and Fielding (1988) attempted to study these out-of-school differences in print exposure by having fifth-grade children fill out a daily activity diary for several months. The investigators were able to estimate how many minutes per day individuals were engaged in reading and other activities while
not in school. They found that the child at the 50th percentile in amount of book reading at home was reading approximately 4.6 minutes per day, over six times as much as the child at the 20th percentile (less than 1 minute daily). The child at the 80th percentile in amount of home book reading time (14.2 minutes) was reading over 20 times as much as the child at the 20th percentile.

Anderson et al. (1988) estimated the children's reading rates and used these, in conjunction with the amount of reading in minutes per day, to extrapolate a figure for the number of words the children at various percentiles were reading. Their findings revealed the enormous differences in word exposure that occur from children's differential proclivities toward reading. For example, in their sample the child at the 90th percentile in print exposure read almost 2.5 million words per year outside of school, over 46 times more words than the child at the 10th percentile, who is exposed to just 51,000 words outside of school during a year. Or, to put it another way, the entire year's out-of-school exposure for the child at the 10th percentile amounts to just eight days reading for the child at the 90th percentile.

These differences continue into adulthood (Stanovich & West, 1989) and have potent effects not only on reading fluency but on other skills, knowledge bases, and processing mechanisms that reading itself develops (Stanovich, 1986). For example, a good deal of vocabulary growth appears to take place via the induction of meanings from written and oral contexts. However, the lexical richness of print, as opposed to oral speech (Hayes, 1988; Hayes & Ahrens, 1988), guarantees that the extremely large differences in exposure to written text uncovered by Anderson et al. (1988) will have effects on the subsequent vocabulary development of the children (Nagy & Anderson, 1984; Stanovich, 1986).

How Is Fluency Fostered?

If children are to become fluent readers, they need to read a lot. Our job as educators is to see to it that children want to read—that they seek new knowledge via the written word and derive satisfaction and joy from it throughout the reading process. The truth is, not too many do (Anderson et al., 1988).

Reading Begins at Home

The number of hours preschoolers spend reading to their parents’ laps before they enter school varies tremendously, from zero hours to 1,700 or more (Adams, 1990). For many years, educators have known that children whose preschool reading is closer to the 1,700-hour mark have an educational advantage over those at the spectrum’s other end. Those nearer the 1,700 mark are more likely to read before they are given formal instruction. This obviously increases their practice, which leads to fluency. Those who are read to, but are not early readers, are more likely to learn to read with ease when formal instruction does begin (Teale & Sulzby, 1986). Durkin’s (1966) study of children who know how to read before entering first grade indicated that access to print, being read to, valuing education, and early writing were more important factors than IQ.

Cullinan (1989) reminds us that “children need adults who share their literary heritage and lead them into literacy. Story has great power in human lives. We know that it is a primary act of mind; it is the way we organize our minds and understand our world” (p. 50). Moreover, real stories help create an interest in books that leads to more reordering and greater exposure to reading materials.

Nursery rhymes and poems, often sung or recited from memory, connect today’s children with their literary heritage. Rhyme and alliteration play an important part in learning to read (Bradley & Bryant, 1985). The pattern, word, and phrase repetition and the rhythm of poems and nursery rhymes lend themselves to multiple readings and eventual automatic recognition of the words in the text. Knowing end rhymes helps children figure out new words, and alliteration strengthens phonemic awareness. Because children respond to the rhythm and rhyme of poetry, and because rhyme and alliteration play an important role in learning to read, poetry books are an important source for parents to read to and with their children.

Other possibilities for parents include participation books, ABC and counting books, concept books, picture books, folklore, easy to read books, predictable books, and big books. Three key sources for listings, which explicate each genre and/or provide examples, are Emerging Literacy: Young Children Learn to Read and
Write (Strickland & Morrow, 1989); Collected Perspectives (Moir, Cain, & Prosak-Beres, 1990); and Adventuring with Books: A Booklist for Pre-K - Grade 6 (Jett-Simpson & Committee on the Elementary School Booklist, 1989).

As noted, one aspect of early reading experience is book reading interactions between parents and children. A few years ago, McCormick and Mason (1986) evaluated the impact of “little books” on children of working class families. The McCormick and Mason little books were inexpensive booklets with a predictable small phrase and related picture on each page. Working with 52 children from four Head Start classrooms, McCormick introduced the story in each lesson by showing the children the title page and asking them to predict the possible content. They were then asked to relate the possible content of the story to their own knowledge. Next, McCormick modeled reading the story, showing the print and pictures to the children as she read aloud. Finally, the children recited it with her, first as a group and then individually. Each week, the story introduced for that week was mailed to the child at home.

McCormick and Mason demonstrated that story reading activity does affect early reading skill development. They noted that “this technique, which supports children so that they can master whole stories at their level of competence . . . enables them to learn to read simple books accurately and to transfer the approach to texts that they have not seen before and that contain different words” (p. 22). Results of a follow-up study (which used the same children as they entered kindergarten) demonstrated:

Children who receive stories at home do learn to read them. Benefits also extend to the amount of home support they receive for literacy, the use of a written language register to try to read, and their knowledge about letters, letter-sounds, and printed words. It appears that children become actively involved, presumably for the first time, with reading in a way that enables them to be successful and to share with their parents. (p. 25)

Any portrait of a young child becoming literate at home must naturally include their attempts to construct meaning through writing (Clay, 1975). Writing is another way to encourage and maximize children’s interaction with print. Moreover, opportunities to write permit children to experiment with their own tacit hypotheses about the way written systems work. Writing itself leads to more reading and thus greater opportunities to develop fluency.

Early Reading in School

In the forward to an important new book on learning to read, Erickson (1990) reminds us that illiterate mothers have produced marvelously literate children. Erickson’s point is that we should not act as if print-rich home environments are a necessary condition for learning to read and write. Clearly this is not the case. Schooling can (and does) make a tremendous difference.

Cohen’s (1968) second-grade study of the importance of modeling fluent reading is a case in point. Cohen initiated a year long read-aloud project in New York City, with 10 experimental classrooms and 10 controls. In the experimental classes, the teachers read aloud for at least 20 minutes followed by the children doing something significant with the stories (e.g., dramatizations, painting a memorable scene). At the end of the year, the experimental group was significantly ahead of the control group on reading comprehension and reading vocabulary. The study was replicated by Cullinan, Jaggar, and Strickland (1974) in kindergarten through grade 3, with similar results.

Teachers who love to read ignite this spirit in their students (Nathan & Temple, 1990). Teachers who read themselves, read aloud to children, and encourage children to read are cornerstones of healthy, literate environments that promote reading fluency. Add to these the habits of writing, talking, and listening purposefully across the curriculum, and we begin to capture the essence of our best classrooms.

The need for a low risk environment has led many teachers we know to organize their classrooms with their children, rather than filling every nook and cranny before students arrive in September (Feitelson, 1988). Low-risk environments encourage children to “try out” reading without fear of failure or frustration. Labels (e.g., names, weather charts, locker numbers, reading centers, plants) are written in front of the children and placed appropriately. Schickedanz (1986) describes how environmental print can be used to organize the classroom environment.

Early learning-to-read experiences are multifaceted and are often based upon familiar texts (Johnson & Louis, 1987). It is not uncommon, at
first, for many teachers to rely heavily on songs and poems the children know well. Using charts made from familiar chants, patterned story books, nursery rhymes, and poems, teachers guide children into sentence, phrase, and word recognition, slowly transferring the decoding process from the teacher’s domain to that of the child.

Repeated reading of the same texts brings satisfaction, too, while at the same time strengthening the recognition of those non-content words that cause such problems (e.g., when, that, whose, then, once). In addition to using songs that are in book form (e.g., Over in the Meadow, Galdone, 1986) and poems (e.g., The Owl and the Pussycat, Lear, 1987) for repeated reading, predictable pattern books, where repetition is built in (e.g., Duck, Lloyd, 1988), are good. The book, Joyful Noise: Poems for Two Voices (Fleischman, 1988), turns repeated reading into a highly meaningful act. In order to read the poems properly (two voices are required), the children must practice their reading.

Children enjoy writing personal versions of patterned stories, poems, and songs, many of which are found in literature based basal books as well as trade books. At first, many young readers like to copy what other authors have written, but most move from copying to writing their own, independent versions rather quickly (Shockley & Allen, 1990). Such activities help to reinforce the recognition of words and phrases, thus increasing fluency.

As in writing independently, children enjoy being able to choose what to read. From the kindergarten years through college, more and more teachers are building choice into their classroom (e.g., Atwell, 1987; Routman, 1988). With opportunities to choose one’s own reading material, interest is more likely to be satisfied and the amount of reading students do is likely to increase. The first grader’s tenth dinosaur adventure, the fourth grader’s tenth mystery, the teenager’s tenth romance, and the adult’s tenth book on fitness, satisfy and at the same time work toward fluency.

Promoting Fluency Beyond Initial Stages

Many studies indicate that students use structural knowledge to guide their expectations, understanding, recall, and production of both narrative and expository text (e.g., Bereiter & Scardamalia, 1982; Fitzgerald & Teasley, 1986; Slater, Graves, Scott, & Redd-Boyd, 1988). We know, too, that students can be taught to identify text structure at all age levels (Berkowitz, 1986; Slater et al., 1988; Taylor & Beach, 1984), and that such training improves reading comprehension (Armbruster, Anderson, & Ostertag, 1987). Knowledge of text structure makes texts more affordable and easier to read. As reading is made easier, fluency improves.

Guided instruction techniques—group discussions, guided reading/writing, focused lessons, mini-lessons, assigned independent work—provide teachers with the opportunity to choose, in a timely fashion, what might serve their students best. Coming from the perspective of integrated reading and writing, a popular and useful teaching strategy for exposition is the know, want to know, learn strategy (KWL), formulated by Ogle (1989). Ogle uses a strategy sheet where the students brainstorm what they already know (activating prior knowledge), determine what they want to find out (reading for purposes that are of personal interest), categorize their prior knowledge and questions by topic (anticipating an organizational framework), and report what they have learned or still need to find out (providing points of departure for further reading). The most exciting aspect of using KWL is the lively class discussions that arise. Children’s prior knowledge is often in conflict—they don’t all want to know the same things—and what they learn is differentiated. This provides diagnostic information for the teacher.

Because readers’ theatre and/or full-stage dramatization both require students to reread or memorize and then recite text, both are natural entrees into strengthening reading fluency as well as comprehension. All one need do is listen to a child grapple with attempting to say the right words, stress the right syllables, or achieve the right intonation for an audience of peers in order to understand the power of drama in the classroom. Text that may have been read meaninglessly comes alive with the added requirement of hooking an audience. Two of the finest books on the subject are Playmaking (Klar, 1991) and Making Theater (Kohl, 1988).

When teachers guide children’s storybook reading to deepen comprehension and


appreciation, they often do so by studying an author or tapping into a theme or genre (Stewig, 1990). Thematic explorations of books make reading more predictable as familiar patterns are made explicit. In addition, research has shown that when students and teachers examine the elements or characteristics of a genre, students apply what they have learned in writing their own stories in that mode (Hoskisson & Tompkins, 1987). We recommend Children's Literature in the Reading Program (Cullinan, 1987) as a rich strategy source for promoting reading and writing fluency, as well a lifelong love of books.

Conclusion

A consideration of the role of fluency in the reading process provides an opportunity for approachment among the many fictions within the reading community (Stanovich, 1990). Whole language advocates have been correct in emphasizing the importance of immersing children in print. However, reading perspectives that emphasize the importance of developing efficient word recognition abilities within an immersion orientation also are offering important insights. Children must acquire the automatic word and phrase processing that enables fluent reading and permits the reader to allocate cognitive capacity to comprehension. Clearly the goals of differing perspectives converge. In fact, as our examples above demonstrate, wise practitioners have long sampled the better aspects of the different theoretical perspectives on reading (and writing) in order to create the lifelong habits of literacy.

References
