Time and Tide: The Dynamic Nature of Oral Reading

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When it comes to understanding reading, few things are as misunderstood as the relationship between reading and time. Parents and teachers voice concerns about choppy, halting oral reading — and worry that this might be an indication of a reading problem. Accordingly, "fluent" oral reading is thought to be a positive indicator of a reader's skill. This "common-sense" view also has its share of proponents in some corners of the field of reading research. There are reading researchers who argue that fluent reading is defined as rapid and accurate (or "automatic") word identification. Furthermore, it is believed that automatic word recognition is a requisite of reading comprehension (Samuels, Schermer, & Reinking, 1992). Measurements of reading fluency are stock components of several widely used standardized assessments of reading ability. In the professional literature, book and journal space has been dedicated to discussions of reading fluency as a dimension of skilled reading (Rasinski, 1990b), as a topic for theoretical analysis (Carver, 1990; Stayter & Allington, 1991) and, in practical advice from researchers to teachers, as an end in itself (Zutell & Rasinski, l991a).

One could reasonably infer from the assumptions that underpin a model of reading-as-rapid-and-accurate-word-identification, that skilled fluent readers who comprehend a text would orally read a text at a fairly consistent rate. But does this model fairly depict what happens during reading? I have conducted a study of six readers of various ages to investigate the nature of oral reading rate as readers read and retell whole, authentic narrative texts. This research has led me to argue that this common-sense view of reading fluency is but a simplistic explanation that clouds understanding of a complex process. This study of reading rate is informed by a socio-psycholinguistic transactional view of reading. The following are some insights that resulted from this research.

Reading Is Dynamic

In presenting a different way of thinking about reading and time, I wish to position my remarks in the broader context of how readers use different texts. Applied linguists like Kenneth Goodman and Frank Smith have urged the field of reading to view the personal/psychological aspects of literacy processes from the widest scope possible. Instead of focusing on how individuals respond to elements of written language flashed on a screen by a tachistoscopic projector, for example, applied linguists have demonstrated that literacy activities are cultural and social practices as well as acts of individual use. As they explain how an *individual* processes written language, their observations address the functions and purposes that members of a society and culture bring to reading acts (Smith, 1985; K. Goodman, 1996).

Issues related to reading and time take on a much different cast when discussed from this perspective than they do in discussions about reading fluency as rapid word recognition. If comparison among readers is of interest, it seems reasonable that any two readers will read at different speeds. Speed is influenced by a reader's particular purposes. (I use the term speed here because it seems a better fit in a discussion about reading habits. The term I have been using, rate, is a statistical index used in measures of fluency.) Different readers have different life experiences to bring to the text, and they may bring different linguistic resources to a literacy event. In short, no two individuals will read the same text at the same speed, nor should they be expected to.

If a comparison is made between an individual's reading of one text and his or her reading of a different text, it is also reasonable to expect differences. For any two pieces of literature, the same reader on a given day may bring to the texts different intentions, purposes, mood, interests and background knowledge; a reading of *Popular Science* magazine in the waiting room of a dentist's office will be different from the reading of a novel at home or the reading of a professional journal at work (Rosenblatt, 1978).

This same reasoning can be applied to different readings of the same text. Take the example of a person who is interested in being her own contractor in building a custom home. She has gathered several books and articles from the library about varieties of plumbing materials. Suppose she has quickly read through some chapters and articles, paying just enough attention to detail to acquire information on price, material availability, degree of required expertise and specialized tools associated with each type of material in the construction of a water system, etc. Now, after this first quick reading, suppose this reader goes back to one or two articles that she has determined are particularly suited to the building circumstances she has in mind and reads them closely and more slowly to get the more detailed information she seeks. Of course, the opposite approach to this task can work just as well. In the real world, it is not reasonable to expect readers to read different texts at the same speed. Readers' shifting purposes require that they read the same text with different speeds at different

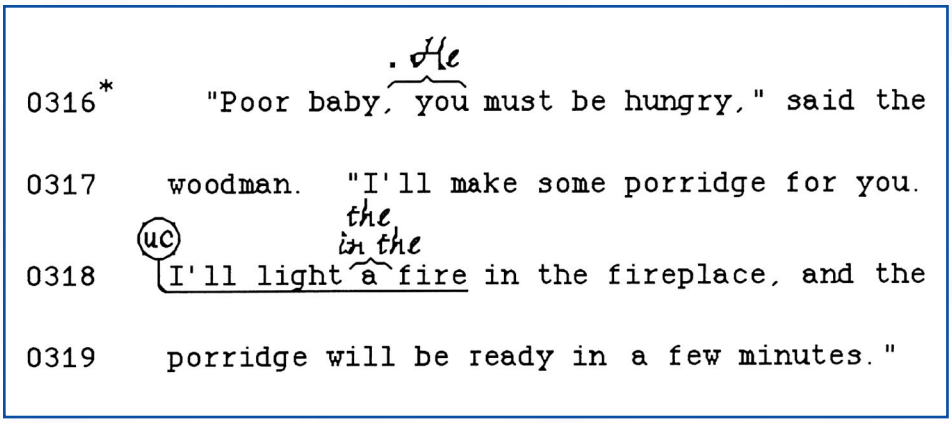


Figure 1. A miscue-marked typescript

times. Clearly, reading is dynamic: it is characterized by continuous change.

Such a phenomenon should be expected if reading is regarded as tentative information processing (Gollasch, 1982; K. Goodman, 1982b). But to obtain a more complete description of the relationship between reading and time requires that we shift our focus to formulating a scientific description of the tentative nature of reading.

Reading Flow

A miscue-marked typescript (see Figure 1) documents a reader's efforts at negotiating the meaning of a text by providing a record of the unexpected responses (miscues) a reader produces during an oral reading of a whole, authentic text. A marked typescript (like the excerpt in Figure 1) yields a wealth of information — not only about each reader, but also about the nature of the reading process itself. Each of a reader's miscues to a text tells us something of interest: the concern for meaning evident in the "double-backing" of simple regressions, self-corrections, or multiple attempts at producing a meaningful structure; the economy produced by omissions; the enrichment provided by meaningful insertions. Collectively as patterns, these miscues allow inferences about a reader's concern for constructing meaning as they engage in reading — what Goodman calls "comprehending" (K. Goodman, 1982a).

Patterns of miscues also allow us to infer insights about reading and time. Miscue analysis research has shown that when a text is familiar, mature readers proceed confidently, and produce few regressions or miscues that result in meaning loss (Y. Goodman et al., 1987). But when a text is unfamiliar or a reader does not yet have mature control over the reading process, one observes that the reader produces frequent regressions or proceeds more slowly when their predictions are not confirmed by the visual cues they expect to see. As readers negotiate a particular text, it is common to hear them speed up and slow down as they respond to the text that they perceive.

A common meaning for "flow" is "smoothness," but it can also mean "to follow a course," which is the sense I want to develop here. If we pair the miscue markings on a typescript with observations of a reader's speed, we get a sense of a reader's dynamic response to a text — of speeding up and slowing down across a text. This is reading flow. Just as evaluating the quality of patterns of miscues yields insights into a reader's concern for meaning construction, evaluating a reader's varying speed across a text gives us a means to interpret the efficiency with which readers employ the cognitive strategies of sampling, inferring, predicting and confirming. Flow relates to the dynamic quality of reading speed.

The above example (Figure 1) illustrates the concept of flow. Kelly is a proficient, mature reader. By carefully looking at a miscue-marked excerpt of her reading, we can imagine the reading speed "ebb and flow" of her response to the text. The excerpt is the 14th paragraph from "The Man Who Kept House" (1962).

Note that Kelly's miscues show a high degree of concern for meaning. In sentence 37 on line 0316 Kelly produces a complex miscue. Her structural reorganization of the text transposes the woodman's quote (which is directed to the baby) into a quote in which the woodman seems to be thinking aloud to himself about his predicament. "Poor baby. He must be hungry,' said the woodman." In sentence 39 on line 0318, Kelly produces another complex miscue. This time she produces what seems to be an incomplete prepositional phrase. Then she regresses to the beginning of the sentence, produces a determiner substitution in the form of a definite article (*the*, which performs the same grammatical function as the expected text item) and continues reading. A detailed transcription of Kelly's reading would be: "I'll light in the – I'll light the fire in the fireplace and the porridge will be ready in a few minutes." Her regression can be interpreted as a response to a prediction that was disconfirmed by the cues she sampled in the text. In her subsequent production of the second miscue, *the*, Kelly's reading suggests at least two interpretations:

> 1) That she possesses an understanding of the architecture of peasant dwellings – or at least the pragmatics of food preparation. A woodman's house probably only has one fixture dedicated for cooking fires; hence the assignment of a definite article in place of an indefinite one.
>
> 2) That she possesses an understanding of the pragmatics of intentionality; that the fire the woodman intends to light will indeed be the same one on which he will cook the porridge to feed the hungry baby; or

Either way, Kelly's miscues in this sequence show that she's making sense at some deep level. So, after initially moving forward at the beginning of line 0318, Kelly stopped because she perceived a problem that required her to reconcile the wording and syntax that she had assigned with the wording and

syntax that she was expecting. She then doubled back to the beginning of the sentence and produced a meaningful and acceptable structure before moving forward again. Backing up takes time. If one could gauge her reading speed as she progressed across this section of the text, a recording of the successive positions of the gauge's needle would look something like "fast, stop, slow, fast." That's reading flow. Clearly, the concept of flow works together with miscue analysis to enhance an understanding of the reading process.

Water flowing in a river is a helpful metaphor for understanding reading flow. Imagine measuring the speed at which water travels on the surface at any point along a particular segment of a river's path. Now, imagine the range of physical circumstances in the riverbed that contributes to variations in the water's traveling speed along the river's course – changes in depth, submerged boulders, bottlenecks and the like. If you were to follow the progress of a floating leaf as it travels down the river, you would notice that as the banks of the river widen, the speed of the leaf decreases – almost stopping, perhaps. Conversely, you would notice that the speed of the leaf rapidly increases as the distance between the river's banks narrows and the it shoots through a narrow canyon. The leaf's speed would decrease rapidly as it approaches a bottleneck of the type that a logjam might create, and then it would increase rapidly over the stretch where the water flow finds an outlet. In fact, one can think of any variety of physical characteristics in a riverbed, one after another, that would be metaphorically illustrative of what happens as readers "navigate" a text.

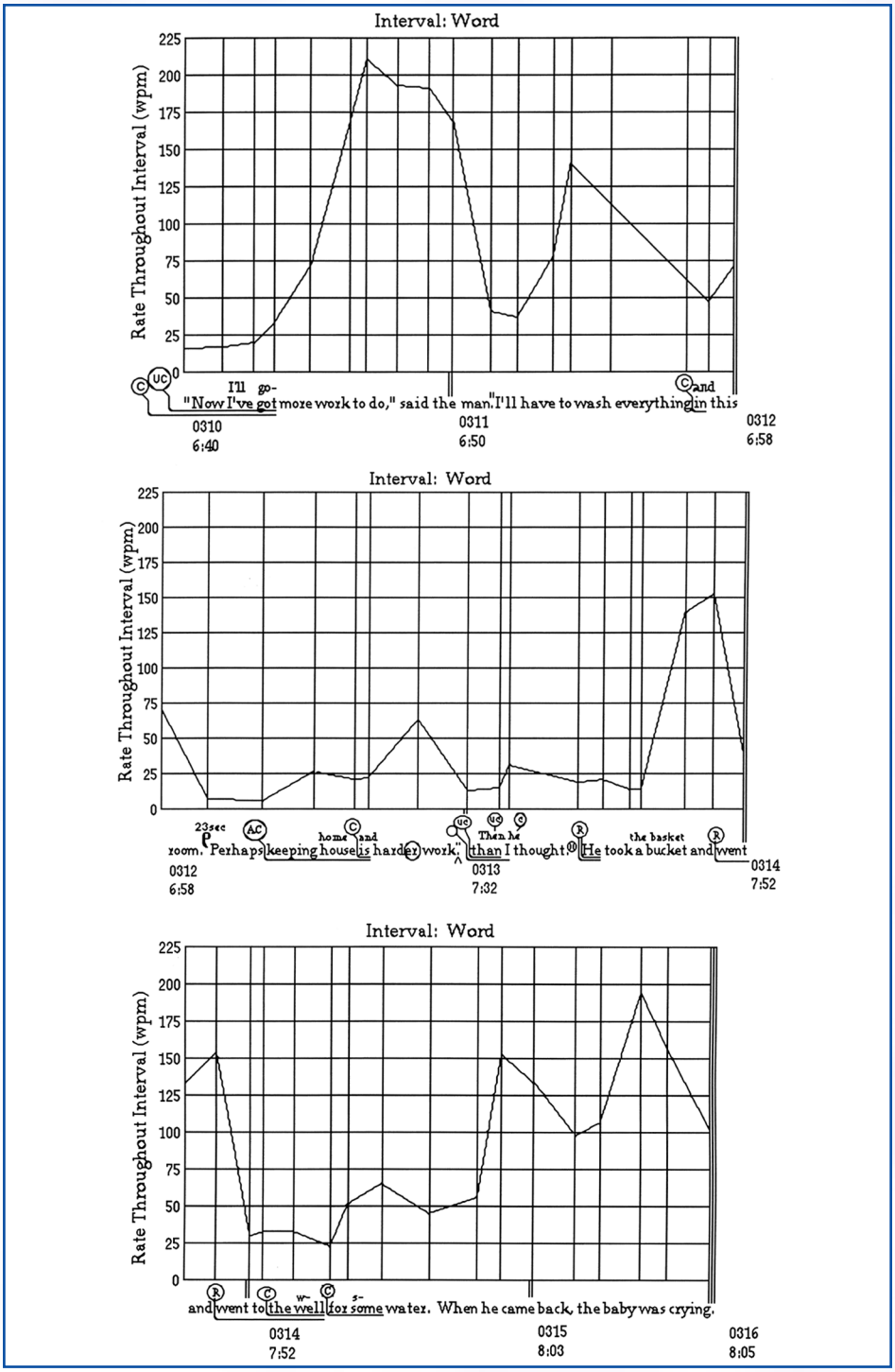
Underlying Views of the Reading Process

For much of the reading research community, "fluent reading" is characterized as word identification that is rapid and accurate. The alternate view offered here describes reading as a process of meaning construction — the reader constructs personal meaning by transacting with written text.

Traditional beliefs about reading fluency hold that fluent readers proceed through a text at a stable rate, and that slow, labored and inaccurate oral reading does not proceed at a rate that is required to maintain sufficient comprehension of a text. Furthermore, according to this view, one simple index of reading fluency can be determined by calculating a reader's reading rate over an entire text (expressed as words per minute: total words in the text divided by the time taken to read aloud).

However, as has been shown in the analysis of this typical reader, the use of a single numerical index such as words per minute per text is not merely inadequate at capturing the dynamic element of reading rate that has been described here, but it also obscures the underlying

Figure 2. Word Interval Rate and Reading Strategy Use: Non-Proficient Reading



character of the reading process. Reading rate is not a characteristic, which is simple and static; on the contrary, it is the outward sign of one dimension of a dynamic and complex process. And instead of simply using "reading rate" as synonymous for a static measure of words read per minute, it is more helpful to think of reading rate as the variable rate of processing text as measured by record of oral output.

The use of rate to analyze an oral reading of an authentic text adds an unexplored dimension to miscue analysis. When simultaneously displayed with a miscue-marked typescript, a rate interval analysis provides an understanding of how the contour of a reader's pattern of rate is an indication of the effective and efficient employment of reading strategies[1] (Figure 2).

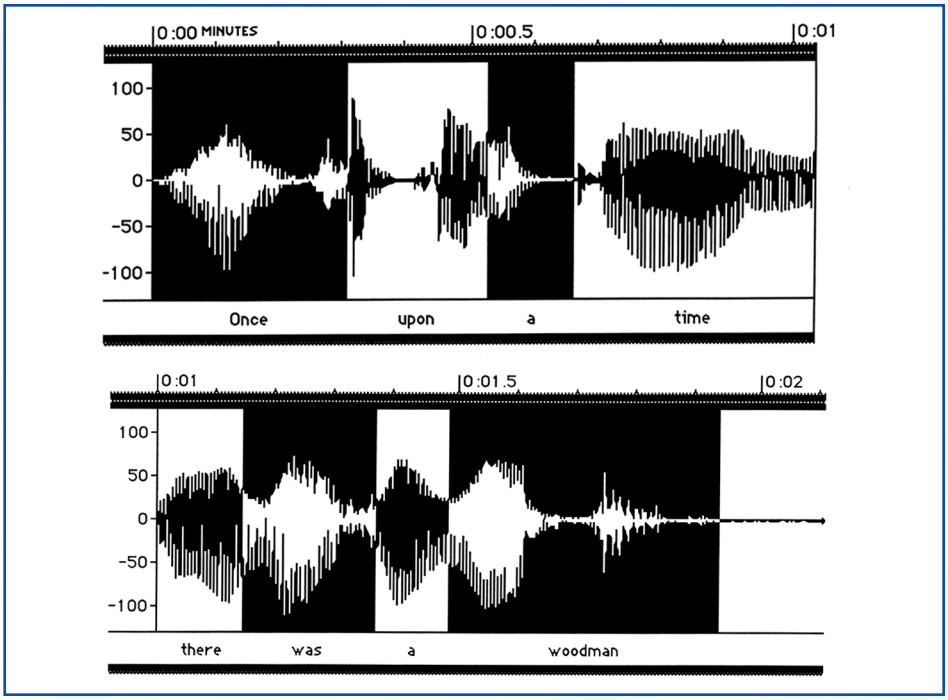


Figure 3. Digital Voice Waveform

A Procedure for Illustrating Reading Flow

Patterns of reading flow can be determined by partitioning an authentic text into sections (units of analysis) and then measuring the duration of an oral reading of each selected section and dividing the duration by the number of words in the section. Possible linguistic units of analysis include the paragraph, sentence, clause, or word level.

The measurement of reading rate requires that one locate the boundaries between sections with a high degree of precision. However, perceiving boundaries between words in normal speech is quite challenging. The difficulty comes from the fact that individual phonemes are produced in a continuous sound stream. This phenomenon makes the boundaries that separate individual phonemes difficult to perceive because it sounds to the listener as if individual phonemes are run together. An example is the phrase "Once upon a time," which, in a continuous stream, sounds something like "Wunsupannahtime."

To help solve this dilemma, I employed computer software that captures sound, digitizes the sample and produces a graphic waveform.[2] Once captured and displayed on a computer screen, any portion of the waveform can be played (and replayed several times if necessary). Once the phonemic boundaries of a word have been determined, one can use the computer software's "ruler" to determine the time elapsed between the boundaries. This is done by excising and measuring a particular sample in much the same way that one would cut a segment of string from a spool, stretch it next to a ruler and measure its length. By determining the time elapsed between the boundaries, one can obtain a measurement of duration of a given segment of a sound stream with a precision of up to one one-hundredth of a second (.01 sec.).

Figure 3 illustrates this procedure. Figure 3 is a waveform representing a digital sampling of my voice reading the phrase "Once upon a time there was a woodman" at a brisk rate of 220 words per minute. The waveform segments that represent individual words have been highlighted in alternating black and white for the purpose of illustrating word boundaries and digital representations of phonemes in the digitized sound stream. As such, this procedure can be used to help determine the boundaries that separate sentences and words.

How and Why Reading Flows

Reading flows in the same sense that a river flows. Measures of rate vary depending on the site of the measurement within the text, textual factors such as wording and syntax, and the reader's response to the text at a given moment in time. In addition, flow is omnipresent: the varied pattern of reading rate distribution across a text is observable in oral reading regardless of whether the linguistic structure selected for analysis is the entire text or any of its paragraphs, sentences, clauses or words.

Reading flow has a fractal nature. For example, a paragraph interval with a low (or high) reading rate does not necessarily contain sentence intervals all of which have low (or high) reading rates. And a sentence interval that has a low (or high) reading rate does not necessarily contain word intervals all of which have a low (or high) reading rate. Figure 4 both demonstrates the omnipresence of flow in language structures and provides a picture of the "branching" quality of reading flow. Notice that for any interval, variability in rate exists within that same language structure category and in adjoining categories. In addition, this fractal quality is characteristic of language structure categories not represented in this figure, such as the entire text, or groups of text, clause, syllable or grapheme/phoneme.

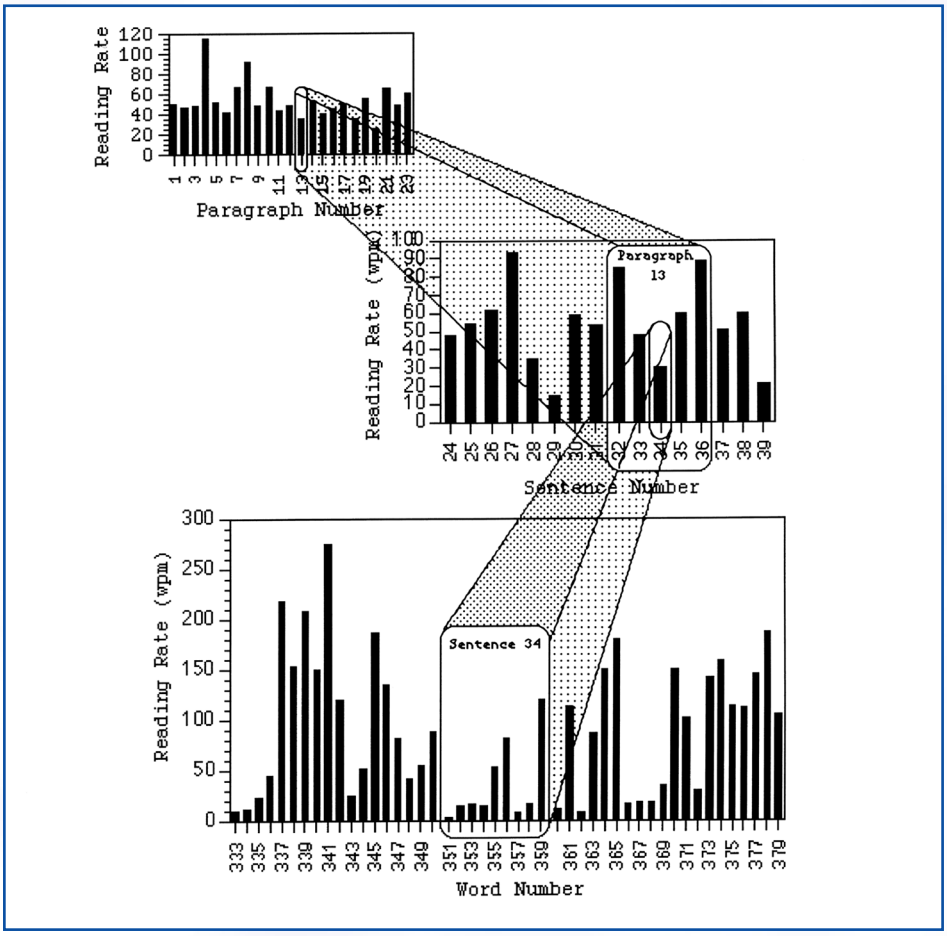


Figure 4. Reading Flow and Branching

Proficient and Non-Proficient Reading

Patterns of reading flow are observable for proficient as well as non-proficient readers,[3] and these patterns show a striking similarity. When the reading rates for individual sentences in a text are juxtaposed, a "stepped" contour is evident (Figure 5). Notice that when the patterns of variability are compared between a proficient reading (Kelly) and a non-proficient reading (Betsy), there is a greater variability of reading rate for the proficient reading.

This "stepped" contour evident in Figure 5 is typical of all six readers for which data is available. Also notice that there appears to be a greater variability of reading rate in Kelly's more proficient reading — a finding that is typical of all of the readers I have analyzed. This last observation is important because it probes the nature of reading when a reader possesses mature control over the execution of reading strategies. A theory of reading-as-automatic-word-identification lends itself to the suggestion that a reader who is highly skilled at word recognition would present a "flatter" contour.[4] However, the data shows that proficient readings display *greater* rate variability. Measures of central tendency such as mean rate and standard deviation can be used to describe the observed rate variability in statistical terms (Table 1).

It is important to differentiate the term "reader" from "reading." All readers can be efficient readers of some texts. Likewise, very mature readers may struggle over texts with high concept load and complex syntax.

The presence of wider range and greater variability for the proficient reading runs counter to what one might expect if reading was best described as a process of rapid and accurate word identification. If that was the case, it would be reasonable to expect that less, not more variability would accompany greater skill in identifying words, thereby resulting in higher mean sentence rates. But that doesn't happen. Instead, variability increases as readings become more proficient. The question is, why? To use the language of topography: *Why are the peaks higher and the valleys lower, and why are they both set at a higher average elevation?*

The pattern of the data suggests that more proficient readings are characterized by greater "flexibility" in the employment of reading strategies. In other words, what makes a reader proficient is not just that she or he is faster and produces fewer regressions and pauses, but that she or he is also more flexible. Readers who display mature control over use of the reading process when transacting with a particular text are able to efficiently and flexibly control their use of the cognitive reading strate-

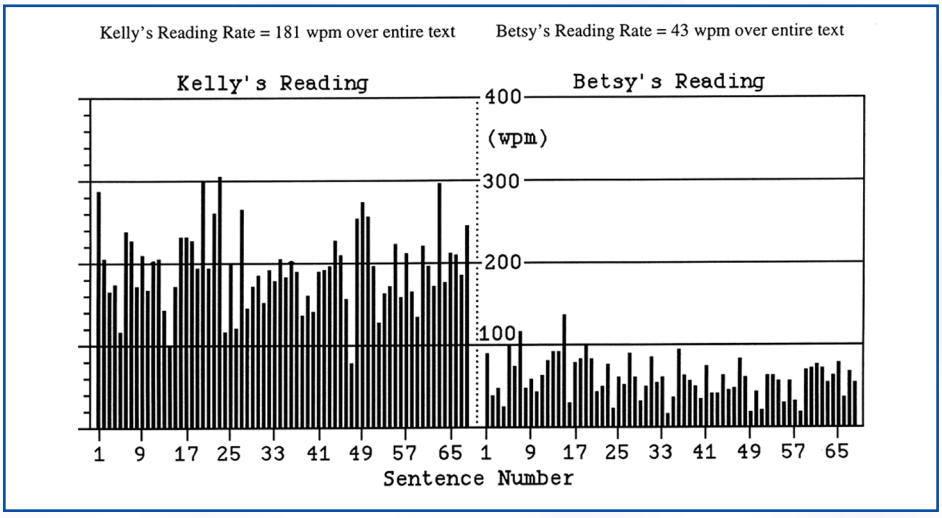


Figure 5. Comparison of Rates for Efficient and Effective Readings for Successive Sentences Across Entire Text of "The Man Who Kept House"

	Proficient reading	Non-proficient reading
	(Kelly)	(Betsy)
Range R	228.2	121.1
Mean Sentence Rate $\bar{X}_S$	192.2	58.2
Standard Deviation σ	47.2	24.3

Table 1. Comparison of Summary Statistics for Reading of "The Man Who Kept House"

gies of sampling, predicting, inferring and confirming. When readers produce proficient readings, they display greater facility by speeding up when they *can* and by slowing down when they *need to*. Their control over process and text enables them to do whatever they deem necessary to identify and solve "problems" as they construct meaning. This is why the sentence rate distributions for the more proficient readings have a "wider spread."

A socio-psycholinguistic transactional view of reading, such as the one that underpins this article, has much to offer in terms of helping to provide insights about the reading process that might otherwise go unnoticed. The dynamic nature of reading rate and the similarities between proficient and non-proficient readings are among several such insights.

Endnotes

1. A reading of a text is *effective* when the reader is successful at constructing a personal meaning. The term *efficient* means reading while using the fewest number of print cues.

2. *SoundEdit 16*. San Francisco: MacroMedia.

3. The term "proficient" means that a reader is both *effective* and *efficient* when reading a particular text.

4. A "contour" refers to the curve of the line mapped by the tops of each of the columns.

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Alan Flurkey's teaching experience spans from elementary schools to special education programs to higher education. He applies his knowledge of the reading process in all of his courses, tailoring the information according to the educational setting. His extensive teaching experience at the elementary school level and in special education programs has proven to be invaluable as he prepares tomorrow's reading teachers at Hofstra University.

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Professor Flurkey has consulted with numerous school districts and has conducted workshops on reading at numerous educational organizations in Arizona and Texas. He recently conducted a very successful workshop at the Diane Lindner-Goldberg Child Care Institute (CCI), located in the Saltzman Community Services Center. The CCI workshop, "Celebrating Young Children's Reading and Writing," was the first in a series designed to assist early childhood teachers to understand the importance of print awareness in children ages 2-5 years old.

Professor Flurkey has authored several journal articles and book chapters and is co-editor of *Many Cultures, Many Voices: Proceedings of the Whole Language Umbrella Conference*. He also co-edited an issue of the journal *Primary Voices* on miscue analysis for classroom teachers.

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