

The Process of Mature Reading Made Manifest

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This article raises the problem of affective acceptance by teachers and student teachers of psycholinguistic formulations that appear to run counter to intuitive notions of the reading process. A series of psycholinguistic formulations that may be readily operationalized via a number of modified reading experiences is presented. Examples demonstrate the use by the reader of multiple sources of information and the tentative nature of the information processing. Intimations for the application of psycholinguistic formulations to the practical teaching of reading are suggested.

Cet article soulève le problème de l'acceptation affective, par les enseignants et par les étudiants-enseignants, de formulations psycholinguistiques qui semblent aller à l'encontre de notions intuitives en ce qui concerne le processus de lecture. On y présente une série de ces formulations qui peuvent facilement devenir opérationnelles au moyen d'un certain nombre d'expériences de lecture modifiées. De plus, des exemples démontrent l'utilisation par le lecteur de sources d'information multiples et la nature expérimentale du traitement d'information. On y fait enfin certaines suggestions par l'application de formulations psycholinguistiques à l'enseignement pratique de la lecture.

For the major part of this century research into reading instruction has been hampered by a lack of theory. Such research as was conducted was either descriptive or conformed to what has been termed racehorse research: which method promotes faster learning, produces better word attack skills, or elicits higher test scores?

This situation began to change in the mid 1960s and throughout the '70s, mainly through the writings of Kenneth Goodman (1963, 1969, 1970, 1973) and Frank Smith (1973, 1975, 1978). These two writers became prominent among a group of investigators who were interested in the psychology of language learning and usage.

One of the major accomplishments of Smith and Goodman was to make educators in the field of reading look at what had been, up until then, unexamined assumptions. When one looked at the proposed teaching-learning activities suggested by pre-theoretical writers, it became evident that reading was viewed as a stimulus-response activity wherein the reader paid close attention to certain aspects of the text which triggered off appropriate (or inappropriate) responses in his mind. To be sure, there were disagreements as to the nature of the stimuli. Some advocated the word, some the letters, and some letter clusters. But there

was little or no discussion of the underlying processes. A concomitant of these assumptions was that the reader took the pieces of stimuli (whatever they were) and built larger constructions out of them. Thus letters combine to make words, words form sentences, and sentences make meaningful utterances. Meaning was the end of the process. Instruction in reading followed the same pattern. Young children learning to read were provided with meaningless symbols or stories very low in meaningfulness and had their attention directed to whatever unit of perception the teacher deemed most useful (letter, letter cluster, or word). For example a story may read "Sam is at bat." The teacher might direct attention to words as individual items, to the similarity of spelling patterns between certain words, or break down each word into its constituent letters ($s = /suh/$), teach the sound associated with each, and blend them back into a word ($Suh + a + muh = Sam$). It was assumed that once the sound/symbol associations or names of the words had been identified, understanding would automatically result.

Coming to the question of reading from slightly different points of view, Goodman and Smith offered an alternative description of the reading process. One of their fundamental observations was that readers, young or old, beginners or skilled, are first and foremost concerned with trying to find out what the writing before them means. All else is but a means to this end. Certainly a reader will identify the name of a particular word, or break a complex word into morphological units, letter clusters or even letter/sound associations — but only if he or she needs to. The reader appears to proceed at the "highest" level possible (i.e., that which is most meaningful) and "drops down" to the "lower" levels when it appears necessary.

A second major observation of the psycholinguists is that the reader uses multiple sources of information: semantic, syntactic, morphological, and phonological. The reader appears to sample information from all these sources according to the "most meaningful" principle enunciated above.

A third major tenet of the psycholinguistic school is the idea of expectation. Rather than waiting for the text to tell him what to do, the reader comes to the reading situation with a variety of expectations. For example, a reader would be very surprised if he or she opened a Harlequin romance and found it discussing quadratic equations or the structure of the universe. Equally, he or she would be disconcerted by a telephone directory that began, "Once upon a time." The idea of expectation, or prediction, runs throughout the psycholinguistic formulations regarding reading. The reader begins with general expectations and refines them as more information is acquired. The reader bases his predictions on his knowledge of the world and his knowledge of spoken and written language. Expectations range from knowing what kind of language one is likely to meet in a supermarket, through anticipating the completion of

the sentence "John patted the dog's ———," to knowing how to complete the unfinished word in, "Father went to the garage to collect his auto ———."

An associated construct of expectation is the idea that reading is a more heavily cognitive task than a perceptual one. Reading involves not so much looking carefully at what is on the page as reconstructing the author's intent from the visual information sampled from the page. Indeed, there appears to be a trade-off between attention to visual stimuli and attention to meaning. The greater the reduction in attention to letters, spelling patterns, and words, the greater attention can be given to the meaning. The difficulty in noting typographical errors in one's own writing is proof of the truth of the visual/meaning trade-off. As a writer rereads his own words he "knows" what should be there and thus tends to "see" what ought to be there rather than that which is actually set down.

Smith claims that readers identify letter, words, and meaning by sampling featural information (Smith, 1978). Features are abstract geometric properties found in letters and across words and meanings. Smith claims that the reader's ability to detect the presence or absence of these features is intuitive and unconscious. He also argues that it is possible to identify a subset of features sufficient to identify meaning without identifying constituent words; and to identify a subset of features sufficient to identify a particular word without identifying constituent letters. Put more colloquially, we can, Smith claims, identify meanings without identifying words and we can identify words without identifying the letters. Smith's assertion is counter-intuitive and his supporting argument complex.

The process of conveying psycholinguistic formulations to teachers has been an interesting experience. We found that the resistance to the acceptance of the psycholinguistic point of view was a difficulty not so much in intellectual apprehension as in affective reception. Once the students understood what the psycholinguists were saying they simply did not believe them. They certainly did not feel that such descriptions accurately described their own reading behavior. For example, when presented briefly with the sentence, "The emmenagogue was successful," they would claim that they knew how to pronounce the word "emmenagogue" because they had sounded it out when the time constraints placed on them made such a procedure highly unlikely. It appears that (a) the adult's reading behavior is so well integrated that he becomes totally unconscious of the process, and (b) he comes to believe that the teaching strategies are psychologically valid descriptions of the reader's internal processes. However, these two points are conjectures on our part and have not been subjected to any scientific test. Even so, on the basis of them we developed a series of modified reading experiences designed to raise the over-learned internalized reading strategies of the mature adult reader to a conscious level.

In one of the first of these modified reading experiences we have taken a passage from Anthony Burgess' *The Clockwork Orange* (1963). Through the use of this material we have been able to develop a fairly firm understanding of the following principles:

1.1 *The reader establishes meaning in order to identify words.* If the student is confronted with this statement in its present bald, abstract form the typical response is one of total mystification or scornful rejection. Common sense suggests that a reader first identifies individual words and then forms these words into sentences.

1.2 *The reader does not process difficult material in a strictly linear fashion.* This statement flies in the face of many teaching techniques. Some teachers are at pains to develop habitual left-to-right, top-to-bottom eye movements. Consequently, many practising teachers will tend to reject this observation.

1.3 *Establishing sound/symbol associations is of little value in reading for meaning.* The effect of this statement in some teachers is akin to claiming that the very foundations of one's educational beliefs are being threatened. The decision to adopt a phonics approach frequently seems to carry with it an emotional commitment that is very resistant to change.

1.4 *Language evokes meaning via a web of relationships. A reader can tolerate some gaps in the web and still identify the overall meaning of the passage but this tolerance is not infinite.* This claim runs counter to the widely accepted idea that meaning resides in the words and often leads teachers to present and analyze words in isolation.

1.5 *Meanings of unfamiliar words are global and tentative and are refined through repeated encounters in different contexts.* This statement tends to run counter to the demand for perfection or near perfection in both oral reading and comprehension of written material.

EXERCISE ONE

Exercise Number 1—Read the following passage:

"What's it going to be then, eh?"

There was me, that is Alex, and my three droogs, that is Pete, Georgie, and Dim, Dim being really dim, and we sat in the Korova Milkbar making up our rassoodocks what to do with the evening, a flip dark chill winter bastard though dry. The Korova Milkbar was a milk-plus mesto, and you may, O my brothers, have forgotten what these mestoes were like, things changing so skorry these days and everybody very quick to forget, newspapers not being read much neither. Well, what they sold there was milk plus something else. They had no licence for selling liquor, but there was no law yet against prodding some of the new veshches which they used to put into the old moloko, so you culd peet it with vellocet or synthemesc or drenchrom or one or two other veshches which would give you a nice horror-show fifteen minutes admiring Bog And All His Holy Angels and Saints in your left shoe with lights bursting all over your mozg. Or you could peet milk with knives in it, as we used to say, and this would sharpen you up and

make you ready for a bit of dirty twenty-to-one, and that was what we were peeing this evening I'm starting off the story with.*

After reading the passage the participants are required to identify certain of the unfamiliar words and also the source of the information used in the identification process.

1.1 *The reader establishes meaning in order to identify words.*

There are numerous opportunities to demonstrate that the unfamiliar terms are identified not by inspection of the word itself but by the reader's appreciation of the contextual information as it relates to his or her knowledge of the world. For example, "droogs" is invariably interpreted as "friends" (although mates or buddies would be equally acceptable) through the expression "my three ——" and the three names following. The reader's knowledge of syntax (it has to be a plural noun) and of the world (a group of four males, evident by their names, would be likely to refer to each other as friends) are sufficient to make an accurate identification. It is interesting to note that participants never suggest colleagues, associates, or partners. Presumably, they are (unconsciously) responding to the informal style evident in the opening sentences.

1.2 *The reader does not process difficult material in a strictly linear fashion.* One very simple way in which we have brought participants to appreciate that they do not follow a strictly linear processing pattern is to ask them to try and recall what they did when they met the first unfamiliar term. Invariably the response we get is, "I skipped it and read on." The point can be underlined through the use of specific examples. It is revealing for participants when they realize that much of the information required for the identification of "droogs" occurs after the occurrence of the word. Several of the participants report that they glanced back at "droogs" after having encountered the three names.

1.3 *Establishing sound/symbol associations is of little value in reading for meaning.* The validity of this statement can be shown with several examples, but the term "veshches" is particularly productive.

The way we have proceeded is to invite observations from participants to make intra-text associations with the word. The responses we obtain are usually something like those that follow:

(a) The word is used in association with liquor so it might be some kind of stimulant

(b) You put it into moloko (milk?). Are they "spiking" the milk?

(c) It produces a horrowshow (a bad trip?). Is it like LSD?

(d) The examples, synthemesc, drencom, and vellocet, sound like drugs. Is it a drug?

The reader should note the use of multiple sources of information and the tentative nature of the conclusions. However, the most powerful

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effect is the sense of closure effected when all four sources of information have been tabulated. There is invariably a consensus that “veshches” means drugs. At this point it is observed that at no time has the word been spoken aloud (the instructor is at pains not to do so and its questionable pronunciation makes the participants reluctant to do so). This sense of closure is stressed. The participant will readily agree that the task feels finished once meaning has been established and yet the process has not included the oral pronunciation of the word.

1.4 *Language evokes meaning via a web of relationships. A reader can tolerate some gaps in the web and still identify the overall meaning of the passage but this tolerance is not infinite.* A count of the number of unfamiliar terms compared with the number of running words in the passage reveals that the ratio of familiar to unfamiliar words is about 10:1. The instructor does not permit the closeness of this ratio to the instructional reading level (as defined in informal reading inventories) to go unremarked. The limitations of the reader’s tolerance are demonstrated by a passage that uses Burgess’ vocabulary but which was composed by the senior author: “I cheested up my litso and rookers a bit. On with my platties with plenty of cutter and ittied off keeping my glazzies alert for millicents and ptitsas.”

In the passage above the ratio of familiar to unfamiliar words is almost three to one and beyond the capacity of the participants. The parallel between this reading experience and the experience of the child reading at the frustration level is brought out. The relative uselessness of sounding out may also be developed. Participants can demonstrate reasonably accurate oral reading but the meaning remains opaque.

1.5 *Meanings of unfamiliar words are global and tentative and are refined through repeated encounters in different contexts.* To develop a full appreciation of the truth of this statement the participant needs to read a much larger portion of Burgess’ book, but an indication of the process may be shown via the term “peet.”

The first time this word is encountered, it is accompanied by such a heavy load of unfamiliar words that the participant gets little more than that is a verb: “you could peet it with vellocet on synthemesc or dren-crom.”

The second encounter is much more revealing: “you could peet milk with knives in it.”

Its status as a verb is confirmed but the reader’s knowledge of the world tells him or her that what one does with milk is to drink it. The meaning of the phrase “with knives in it” usually remains uncertain at this point.

The final encounter, “that was what we were peeting,” reinforces the word as a verb. The word “that” refers back to milk, thus tending to reinforce the idea that the meaning is drink.

A second set of generalizations that can be given some experiential referents includes the following statements:

2.1 *The richest sources of featural information appear to be the upper half of the letters, the ascenders and descenders, consonants, and the beginnings and endings of words.*

2.2 *Skilled readers make use of whatever visual information is available in order to identify meaning.*

2.3 *Skilled readers do not require all the visual information available.*

2.4 *Writing contains more visual information than skilled readers require (i.e., writing is redundant).*

2.5 *Meaning can be identified without first identifying constituent letters and (in some cases) words.*

2.6 *Unfamiliar language requires the reader to use more visual information.*

EXERCISE TWO

The mutilated sentences in Figure 1 are “flashed” one at a time via an overhead projector. The participants are then permitted an extended period of time for examination.

- (a) Mary had a little lamb.
- (b) His perscnience was amazing.
- (c) My old man s d f o w t e b a d.
- (d) I f c a d y o r p e c c a l t e c u e s t o m . t s a l u s.
- (e) M B n n l s v r t h o a n.
- (f) Th p n c p a l s s d i . p r m p t r y r d r.
- (g) Wei y c e v . i n Q u e k . ?
- (h) H h a e s t a b a c c o t c a t e g f c w c .
- (i) H u n d r e d D o n u t e s t a n a w a l l.

FIGURE 1

Mutilated Sentences

2.1 *The richest sources of featural information appears to be the upper half of the letters, the ascenders and descenders, consonants, and the beginnings and endings of words.* The ease with which participants can read sentence (a) suggests that there is sufficient information in the upper half of the letters for the material to be read. The certainty with which it is erroneously reported as, “Mary had a little lamb,” demonstrates the heavy reliance on context and the extent to which readers will ignore visual information.

Sentence (e) demonstrates the relative importance of ascenders and descenders (all, of course, consonants) over vowels in the reading process.

Sentence (g) shows that the first half of the word is quite sufficient for the reader to read simple material, while sentence (c) indicates that loss of information from the centre of words does not seriously disturb the reading of easy sentences.

2.2 *Skilled readers make use of whatever visual information is available in order to identify meaning.* The readers' continuing ability to read sentences (a), (c), (e), and (g), despite shifts in the location of the mutilations, supports the notion that the skilled reader can use limited visual information from a variety of sources.

2.3 *Skilled readers do not require all the visual information available.* This observation is nothing more than a corollary of 2.2. In normal text, all visual information is available at all times. The successful reading of mutilated sentences suggests that the reader does not need all the information provided.

2.4 *Writing contains more visual information than skilled readers require (i.e., writing is redundant).* Statement 2.4 is really a restatement of 2.3, except this time the comment is made regarding the nature of written language rather than the requirements of the reader.

2.5 *Meaning can be identified without first identifying constituent letters and (in some cases) words.* It is obvious that individual letters need not be identified since in many cases successful reading is achieved despite the complete obliteration of some letters. The minimal disturbance created by the absence of complete words is not demonstrated in this series but can be shown by presenting a semi-obliterated word in isolation and then in context. In the former condition identification is impossible, tentative or ambiguous, whereas in the latter uncertainty is zero.

2.6 *Unfamiliar language requires that the reader use more visual information.* The greater difficulty in reading sentences (b), (d), (f), and (h) relative to (a), (c), (e), and (g) indicates the need for more visual information where the vocabulary is less familiar and the syntax is more complex. Participants find sentence (i) very difficult to read but at least one or two people in every audience encountered thus far have identified it quite accurately. Their ability to do so is used to demonstrate that reading is possible with a minimum of visual information.

EXERCISE THREE

A third exercise demonstrates that the participants' intuitive knowledge of spelling patterns applied to the surrounding letters makes the identification of some letters to the point of complete certainty unnecessary.

The participants are presented with the symbol

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and are asked to suggest what letter it will be. They are assured they are

looking at the top of a letter. Suggestions range over a, c, e, g, and s. They are then shown the symbols:

at

Revised hypotheses for the original letter include, a, e, and s. The letter c is rarely suggested and g is usually rejected. Participants are sometimes surprised to find that they already "knew" that gt is a highly improbable sequence in English spelling.

The participants are then exposed to the complete sentence:

Meet me at the meeting meter

This sentence is read easily and accurately and the original configuration at is identified as "at" with complete certainty. The participants are then asked to compare the configuration identified as "at" with the last two letters in "meet" and the second and third letters in "meter." The fact that they are identical comes as a surprise to most and the point can be made that any given configuration is allocated to a particular category as a function of the reader.

Limitations

We do not claim to be able to convey all the principles in all their depth and intricacies developed in the growing body of psycholinguistic literature with a few modified reading experiences, but we do feel that the preceding examples, together with further exercises not reported here, can provide the first-hand experience which makes the more abstract formulations of the psycholinguists more comprehensible and more acceptable to teachers and student teachers.

Application

Invariably with teachers and students the question is raised, "This is all very well, but how do I go about teaching children to read?" Space does not permit our full response to this question, but in short what we help teachers to do is examine existing instructional materials and methodologies from a psycholinguistic point of view. Questions are raised such as, "Is the reader centrally and primarily concerned with meaning?" "Is the reader provided with the multiple sources of information required for identifying meaning?" "Is the language encountered akin to the natural language patterns the child brings to school?" On the basis of answers to these and other related questions any given piece of material or any methodology is evaluated as to the extent that it conforms to what is presently known about language, language acquisition, reading, and learning to read.

REFERENCES

Burgess, A. *A clockwork orange*. London: Heinemann; New York: Norton, 1963.

- Goodman, K. S. Analysis of oral reading miscues: Applied psycholinguistics. *Reading Research Quarterly*, 1969, 5(1), 9-30.
- Goodman, K. S. A communicative theory of the reading curriculum. *Elementary English*, 1963, 40, 290-298.
- Goodman, K. S. Psycholinguistic universals in reading. In F. Smith (Ed.), *Psycholinguistics and reading*. New York: Holt, Rinehart and Winston, 1973.
- Goodman, K. S. Reading: A psycholinguistic guessing game. In H. Singer & R. B. Ruddell (Eds.), *Theoretical models and processes of reading*. Newark, Del.: International Reading Association, 1970.
- Smith, F. *Comprehension and learning: A conceptual framework for teachers*. New York: Holt, Rinehart and Winston, 1975.
- Smith, F. (Ed.). *Psycholinguistics and reading*. New York: Holt, Rinehart and Winston, 1973.
- Smith, F. *Understanding reading: A psycholinguistic analysis of reading* (2nd ed.). New York: Holt, Rinehart and Winston, 1978.
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