

Don't take students' word for what they do while reading

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The metacognitive reading strategies college students said they utilized were investigated. No significant differences were observed between groups of students identified as high and low comprehenders on the strategies they believed they applied during reading. However, the examination of student performance during reading indicated that the students did not consistently apply the metacognitive strategies they professed to use or that they were not proficient in applying them.

Metacognition has been proposed as an integral component of reading. Several metacognitive skills involved in reading have been identified: (1) clarifying the purposes of the reading, (2) identifying the important aspects of the text, (3) focusing attention on the main aspects of text rather than trivia, (4) monitoring activities to determine if comprehension is taking place, (5) engaging in self-questioning to determine if goals are being met, and (6) taking corrective action when comprehension failures are detected (Baker & Brown, in press-a, in press-b; Brown, 1980, Brown & Smiley, 1977; Brown, Smiley, Day, Townsend, & Lawton, 1977; Smiley, Oakley, Worthen, Campione, & Brown, 1977).

Given the importance of metacognitive skills in reading, a question arises as to the use and correct implementation of these skills during reading. Readers' self-reports of metacognitive strategies may not necessarily imply that readers will in fact employ them or employ them in efficacious ways. The current study, then, was designed to be an initial investigation of the types of metacognitive skills employed by relatively proficient readers and the extent to which some of these skills are employed in an effective way.

METHOD

Subjects

Subjects were 76 undergraduate volunteers who participated in order to fulfill class research requirements. Based upon the results of a standardized reading comprehension test, the upper and lower quartiles returned for further analysis.

Materials and Procedure

All subjects were administered the Nelson-Denny Reading Comprehension Test. Students who scored in the upper quartile were assigned to the high-comprehension group, and those scoring in the lower quartile were assigned to the low-comprehension group. These subjects were then asked to read an 11-paragraph passage on solar evolution (Glover, Plake, Roberts, Zimmer, & Palmere, 1981). Subjects were instructed to read each paragraph and to identify the main idea(s) via underlining. Subjects were further informed that they would be required to complete a free recall test upon completion of the above tasks. The sub-

jects were also informed that this was not a timed task and that they were free to utilize any techniques or strategies they wished to assist in the understanding and remembering of this information.

All subjects in the original pool completed a metacognition form immediately after the administration of the Nelson-Denny, in which they were asked to specify the techniques they utilized to assist in the recall of the information. The upper and lower quartiles completed an additional metacognitive form following the reading task.

RESULTS

The Nelson-Denny tests were scored according to standard directions, and the results were employed to assign subjects to groups. Reader's essays were scored for the number of main ideas identified. The passage had previously been analyzed (e.g., Glover et al., 1981) for main ideas, and the 29 main ideas were employed as the criterion against which subject performance was evaluated. The essays were scored by two raters against the criterion, with an interrater reliability of $r = .98$. The average of their ratings was then employed in the data analysis. An analysis of variance employing groups as the independent variable and main ideas underlined in the essay as the dependent variable was then performed. The high-comprehension group identified a significantly greater number of main ideas than the low-comprehension group did [$F(1,27) = 7.36, p < .01$] (see Table 1).

The free recalls were scored for the number of idea units (Meyer, 1975) recalled by subjects. An analysis of variance employing groups as the independent variable and idea units recalled as the dependent variable

Table 1
Means and Standard Deviation for Dependent Measures

Group	N	Dependent Measures			
		Main Ideas		Free Recall	
		Mean	SD	Mean	SD
High Comprehenders	16	18.69	5.47	12.31	4.39
Low Comprehenders	13	13.46	4.73	7.85	5.06

revealed that the high-comprehension group recalled significantly more idea units from the passage than did the low-comprehension group [$F(1,27) = 6.47, p < .02$] (see Table 1).

The results of the metacognitive instrument were then analyzed. A chi square showed no significant differences between the high- and low-comprehension groups on the techniques they professed to employ to understand written text (see Tables 2 and 3). There were also no significant differences between the groups on reported usage of memory strategies (see Table 4).

A final analysis examined differences in the number of idea units recalled between high and low comprehenders who actually took notes during the reading and subjects from both groups who did not take notes. While only three of the high comprehenders reported that they typically took notes during reading, eight of these subjects actually did employ the note-taking strategy during the experiment. All of the subjects in the low-comprehension group who stated that they used the note-taking strategy ($n = 7$) actually did employ this method. A post hoc fixed-effects two-factor analysis of variance that compared the number of idea units recalled by students in each group who utilized the note-taking strategy vs. those who did not employ this technique showed significant results favoring the students who employed the note-taking strategy [$F(1,25) = 14.13, p < .001$] (see Table 4).

Table 2
Reported Use of Comprehension Techniques

	High	Low
Quick Read	0	3
Slow Read	13	12
Skim First	5	6
Skip Unfamiliar	2	6
General Learning	3	6
Imagination	9	4
Topic Summary	12	12

Table 3
Reported Use of Memory Strategies

	High	Low
Reread	13	12
Underline	8	11
Note Outline	3	7
Own Words	5	2
Mental Picture	2	2
Repeat Aloud	5	5

Table 4
Means, Ns, and Standard Deviations

	Took Notes			Did Not Take Notes		
	N	Mean	SD	N	Mean	SD
High	8	15.0	4.57	8	9.63	2.0
Low	7	10.43	5.03	6	4.83	3.31

DISCUSSION

The results of the study can be summarized as follows. First, students who were identified as high-comprehension readers were able to identify significantly more main ideas from a written passage than were students identified as low comprehenders, indicating that high-comprehension readers were able to distinguish the pertinent textual features and information in the paragraphs. Second, subjects from the high-comprehension group could recall more of the material from a written text than could students from the low group, indicating that these students had processed the information at a level that facilitated the recall of the information. Third, there was no significant difference between the two groups on the reported usage of comprehension techniques and memory strategies. Apparently, these college-aged subjects were aware of the cognitive processes involved in the reading-recall task and were equally competent in identifying the techniques and strategies needed to understand and recall information from a printed text. Fourth, spontaneous note takers from both groups recalled significantly more information than students who did not elect to utilize the note-taking strategy, verifying previous research (Brown & Smiley, 1978) in which note taking was found to be a helpful strategy for recall of information among spontaneous note takers. Fifth, readers did not necessarily employ the techniques and strategies they professed to use, indicating a need for verifying what readers say they do in metacognitive research.

It was expected, from previous research, that the high-comprehension group would be more competent in identifying the main ideas of the passage. Previous evidence suggests that the ability to extract the main ideas from written prose is a particularly difficult task for poor readers (Smiley et al., 1977). It was expected that the self-reports from the two different groups would vary significantly on the comprehension techniques and recall strategies that the students professed to utilize on a reading comprehension/recall task. It was further expected that the high-comprehension readers would report the utilization of note taking and transposing the information to the readers' own words, as this is commonly acknowledged to be a sophisticated strategy utilized by competent readers. Conversely, it was expected that the low-comprehension readers would profess to employ rereading and underlining techniques more consistently than the high-comprehension readers, as these are generally categorized as lower level strategies.

A variety of methods of studying metacognition have been attempted, and, common to research in the cognitive areas, each of these methods has problems. The most common methods of studying the metacognition processes a reader uses include: (1) asking readers how they would perform a hypothetical reading task, (2) reports of what readers are doing during an actual reading task, and (3) assessing the reader's techniques and strategies by some performance measure. The present study suggests that, although one might discover a reader's awareness of what the reader thinks he is doing or should be doing during the reading process, some type of verification system must be employed to discover the techniques and strategies that actually are employed and the degree of success of this application.

Baker and Brown (in press-a) reviewed a number of techniques by which researchers have attempted to monitor cognitive processes. These included self-reports and interviews, oral reading, "think-alouds" during a task, videotape observations, several technological methods including eye movement research and interactive computer programs, and a variety of text disruptions and cloze techniques. The use of these techniques has made it easier to obtain and interpret processing information, especially on specific skills, but these techniques do not necessarily adequately assess complex comprehension processes. Researchers can combine the process approach with a product that can be analyzed. The product could include underlined protocols, descriptions of sketches of mental pictures, and written or taped summaries in the reader's own words. Brown (1980) suggests that research should not completely be verbal

reports, but that these should be supplemented with additional probes or external checks. The current research supports the need for a checking system on metacognitive processing and monitoring behaviors.

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