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AUTHOR Alvermann, Donna E.; Van Arnam, Steve
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ABSTRACT

A study was conducted to determine whether high and low ability comprehenders would benefit from induced lookbacks over naturally occurring text. Subjects were 64 tenth grade students selected on the basis of how their self-perceived proficiency matched their actual reading achievement as measured on a standardized test. The subjects were randomly assigned to experimental (induced lookbacks) or control (spontaneous lookbacks) groups, and given a familiar or unfamiliar passage to read. The passages included two from grade-level social students selected on the studies texts and several from previous research efforts. Subjects were seen individually for 55 minutes by a teacher-examiner who read instructions aloud and recorded the subjects' nonverbal behavior. The open-ended test questions were scored by two independent judges with a .94 agreement rate. The results suggest that self-perceived low ability comprehenders may be differentially helped by an adjunct aid, such as the graphic organizer. Inducement of lookback behaviors resulted in superior performance for that group when compared to the group of low ability comprehenders that was left on its own. (CRH)

# Effects of Spontaneous and Induced Lookbacks on Self-Perceived High and Low Ability Comprehenders

Donna E. Alvermann
Reading Education Department
University of Georgia

Steve Van Arnam
Gloversville High School
Gloversville, New York

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Self-Perceived High and Low Ability Comprehenders

Many studies of individual differences among readers have been conducted since Buswell's (1920) early investigations of the eye-voice span in reading. Critical reviews of this extensive literature on good and poor readers exist in various formats, including a book edited by Waller and MacKinnon (1981), Reading Research Quarterly articles by Golinkoff (1975-76) and Samuels (1973-74), and recent technical reports issued by the Center for the Study of Reading (e.g., Kleiman, 1982). Noticeably absent in all of these reviews was any reference to what impact students' self-perceptions of their own reading ability may have had on their classroom performance. Instead, subjects were typically classified as proficient or less proficient readers on the basis of age and/or traditional reading ability measures.

Within the past three years, however, the results of at least two studies have pointed out the importance of looking at students' expectations for how well they will do on a particular task. Alvermann and Ratekin (1982), for instance, reported that, regardless of prior achievement in reading (as measured by standardized tests), seventh and eighth graders who perceived themselves as having high proficiency in dealing with essay and multiple-choice types of tasks recalled more of what they read than those who perceived themselves as having low proficiency in those tasks. Smead and Chase (1981) also reported an effect for student expectations. In that study, eighth graders' individual achievement expectations in math at the beginning of the year were found to relate to their subsequent achievement across both time (December/April) and outcome (standardized/criterion-referenced) measures. There is some evidence, then, to suggest that

researchers need to look at students' metacognitive awareness of their available knowledge, relative to a particular task, in addition to their scores on standardized tests of that knowledge.

Attempts by researchers to generate appropriate interventions that would assist students in improving their ability to learn from text have been the foci of several recent studies. Of particular interest to the present study are those investigations that have looked at induced and spontaneous text lookback behaviors among different types of readers. Alessi, Anderson, and Goetz (1979), for example, reported a facilitative effect for computer-manipulated lookbacks on college freshmen's comprehension of text. In their study, students in the lookback group who responded incorrectly to questions inserted in an artifically constructed 4,926-word text on physiological psychology were automatically branched back, via computer, to the appropriate segment of text where the correct answer could be found. Since their results were obtained under laboratory conditions and by using artificially constructed text with mature readers, however, three very important questions remained. One, would using naturally occurring text produce the same results? Two, assuming that readers can learn to monitor their own comprehension failures (Brown & Barclay, 1976; Brown, Campione, & Barclay, 1978), would it be feasible to expect that students could be trained to look back to the correct places on their own? Three, would their findings generalize to high-school good and poor comprehenders?

Although these questions were not addressed in the comprehension-monitoring and lookback studies conducted by Garner and her colleagues, (e.g., Garner, 1980; Garner & Kraus, 1981-82; Garner & Reis, 1981), their

findings, nevertheless, are of particular interest to the present study because they deal with the nature of individual differences and lookback behavior. Generally speaking, Garner's research has clearly shown that there are pronounced differences between junior high good and poor comprehenders in their ability to generate spontaneous lookbacks. Specifically, good comprehenders demonstrate consistently more monitoring and lookback behaviors than do poor comprehenders. Based on these findings, Garner and Kraus (1981-82, p. 12) concluded that "It...seems important to get on with the business of attempting to generate appropriate interventions to assist... upper-grade poor comprehenders in improving their monitoring facility." Similarly, Garner and Reis (1981, p. 581) concluded, "One way of helping novice text learners become more expert learners might involve instructing them (as fully-informed participants) in the use of a lookback strategy to resolve comprehension obstacles." Until the present study, however, these recommended interventions remained just recommendations.

A variety of mathemagenic activities exist for helping students overcome obstacles to comprehension. Among those that have received most of the experimental attention are adjunct questioning and the use of advance organizers. Closely related to the concept of an advance organizer is the graphic organizer. The two types of organizers differ in that the latter is a visual depiction of how key concepts in a particular text are related. Lines, arrows, and spatial arrangement are used to show the connection between superordinately and subordinately stated information. The graphic organizer (or structured overview as it was then called) was originally developed by Barron (1969) and Earle (1970) as a means of teaching students to relate the "old" to the "new" in terms of vocabulary terms commonly

found in their content area texts. Since then several modifications have occurred in its structure and function. One of those changes was influenced by a recent interest in applying schema theory when designing classroom learning activities.

Briefly, Alvermann (1981) constructed graphic organizers that were thought to represent the text's "schema" for a particular piece of expository prose. This representation was only partially complete, however, in that certain key terms were purposefully omitted and replaced by uniformly drawn rectangles. Students were expected to use their content area textbooks to find the information that would correctly fill in (or "instantiate") the empty slots. In effect, this produced a cloze-type procedure not unlike the macrocloze activity developed by Gordon and Braun (1983) for helping students understand the structure of narrative text. In relation to the present study, the graphic organizer was thought to be an appropriate adjunct aid for inducing subjects to look back in their texts when they were presented with questions which they could not answer from memory. Specifically, the organizer was conceptualized as a "road map," of sorts, that would help students get to the appropriate missing information in the shortest time possible.

The importance of individual differences in educational research has been highlighted in recent years by the attention focused on the Aptitude x Treatment x Interaction paradigm (see Cronback & Snow, 1977). Researchers using this paradigm have assumed that the effectiveness of any instructional intervention would be modified by the learners' ability to handle the different psychological processes required by the task. Implicit in this assumption is Tobias' (1976) hypothesis that the higher an individual's

level of prior achievement, the lower the level of instructional support required. Conversely, as the level of prior achievement decreases, the level of instructional support would need to increase. Tobias used the term "achievement-treatment interaction" to describe the nature of this inverse relation. In the context of the present study, the achievement-treatment interaction hypothesis would predict an effect for graphic organizer-induced lookbacks among self-perceived low ability comprehenders. For the high ability comprehenders, on the other hand, no significant differences in lookback behavior due to graphic organizer instruction would be predicted.

In summary, although the findings from a number of studies have suggested that spontaneous lookbacks at relevant portions of previously read text are beneficial, especially among high ability comprehenders, less is known about the effects of lookbacks on low ability comprehenders. More importantly, it is not known whether good and poor comprehenders at the high school level will benefit from induced lookbacks over naturally occurring text, and if so, whether the benefits thus derived are equal for both the high and low ability comprehender. These unknowns, collectively, provided a purpose for conducting the present study.

## Data Source and Method

### Subjects and Design

An experimenter-designed questionnaire, "Self-Perceived Proficiency in Reading Social Studies Text," was administered to all 10th graders in a small city high school in upstate New York. Students' self-ratings of how they would perform on a typical social studies assignment were compared

to their reading scores as measured by the reading comprehension subtest of the standardized TAP test. Students who scored between the 99th and 83rd percentiles on the TAP were designated high ability comprehenders; those who scored between the 42nd and 18th percentiles, low ability comprehenders. From that pool of 119 subjects, 64 (32 high and 32 low comprehenders) were selected on the criteria that their self-perceived proficiency ratings matched their actual reading achievement. Next, blocking on self-perceived high and low ability comprehenders, subjects were randomly assigned to one of two treatment groups: the experimental (or induced lookbacks) and the control (or spontaneous lookbacks). Finally, within groups, subjects were randomly assigned to either a familiar or an unfamiliar passage condition. (Passages were defined as familiar or unfamiliar on the basis of earlier pilot tests.) The design was a 2 (reading ability) x 2 (treatment) x 2 (passage) factorial.*

Materials

Passages were taken from two social studies texts used at the subjects' grade level. Care was taken to ensure that portions selected had not been read earlier. The familiar passage was an historical essay on Louis XIV and contained 998 words; the unfamiliar passage was an historical essay on cultural diffusion and contained 1,007 words.

Other materials included a practice passage, "Camp Wildwood," which had been used previously by Garner and Reis (1981), a 10-item open ended question test over the practice passage, and two 10-item open ended question tests over material covered in the experimental passages. Each of the 10-item open ended question tests contained 4 lookback questions and

6 non-lookback questions. (Pilot tests had confirmed that all designated lookback questions did indeed require lookback behaviors.)

Procedure

Subjects were seen individually in conference rooms off the main room of the school library by one of two social studies teachers who had been trained earlier by the experimenter in the use of graphic organizer instruction. The procedure for experimental subjects, meeting one at a time for approximately 55 minutes with the teacher-examiner (T-E), included:

1) After putting the subject at ease, the T-E read the following directions prior to asking the subject to read the practice passage:

> "In front of you is a passage that has been divided into 3 parts. Each part is on a separate page. After you finish reading each part, I'll ask you some questions. You may look back at any part of the passage to answer them. In fact, you should look back for answers. To help you look back, I want you to use this study aid. (Display graphic organizer segment that corresponds to first segment of the passage.) Think of the graphic organizer as a "road map" to the passage. It will guide you quickly to the spot in the text where you can find the answer to my question. (Demonstrate how graphic organizer is to be used.) Do you understand what you are to do? Good, then you may begin."

As the subject read, the T-E took notes on nonverbal behaviors. All questions were asked orally by the T-E who then coded the question sheet as to whether the subject actually did look back to previous pages for answers to designated lookback questions. (See Garner and Reis, 1981 for fuller description of procedure.) Also, the T-E recorded the student's answers to all questions.

2) After informing students of their scores on the practice passage, the T-E introduced one of the two experimental passages. The procedure for Step 1 was repeated, including the direction-giving.

3) Following the subject's completion of the experimental passage and accompanying questions, the T-E interviewed him/her using a brief post-session debriefing questionnaire.

4) Beginning and ending times for reading and answering questions on both the practice and experimental passages were recorded by the T-E.

The procedure for the control subjects was the same with the exception that no graphic organizer was provided and the following set of directions was substituted:

> "In front of you is a passage that has been divided into 3 parts. Each part is on a separate page. After you finish reading each part, I'll ask you some questions. You may look back at any part of the passage to answer them. Do you understand what you are to do? Good, then you may begin."

Scoring

The open ended question tests for each of the 2 experimental passages were scored by two independent judges who achieved an overall agreement rate of .94. Differences were discussed and the remaining test scores appropriately adjusted. The resulting data were then analyzed in two parts. In the first part, the percent of total questions correct--i.e., both look-back and non-lookback--were analyzed. In the second part, only the 4 designated lookback questions were analyzed. (For the experimentals, one added criterion was that they must have used the graphic organizer to answer the lookback questions.) Finally, answers to the post-session questionnaire were analyzed for instances of verbal report data which indicated that students actually used graphic organizers to look back in their texts.

## Results

Preliminary data analyses using the Maximum R-Square Improvement program of SAS revealed that time spent in reading and answering the questions accounted for 30 percent of the variance when the total number correct was the dependent variable of interest and 52 percent when just the lookback questions correct was the dependent variable of interest. These same preliminary analyses indicated no differences on either dependent variable due to passage type ($F = 0.16$, $p > .60$). As a result of these findings, the main analyses consisted of ANCOVA's with time as the covariate. Also, the data were collapsed across passages in all further analyses.

Table 1 contains summary statistics (expressed in percents) for the total number of questions correct and the number of lookback-only questions correct. Mean scores of the experimental and control groups have been adjusted for differences due to time. Separate 2 (treatment) x 2 (reading ability) analyses of covariance, with time as the covariate, were performed.

The analysis of covariance with total correct as the dependent variable revealed not unexpectedly a main effect for reading ability, $F_{(1,59)} = 47.57$, $p < .001$ but none for treatment, $F_{(1,59)} = 3.13$, $p < .08$. However, there was an effect for the interaction between treatment and reading ability, $F_{(1,59)} = 6.13$, $p < .02$. A similar pattern resulted from the analysis of covariance with lookback-only correct as the dependent variable. Again, there was a main effect for reading ability, $F_{(1,59)} = 41.36$, $p < .001$ but not for treatment, $F < 1$. However, the interaction as before was significant, $F_{(1,59)} = 4.12$, $p < .05$. As indicated in Figure 1, tests of simple main effects ($p < .05$) for total correct revealed that the low ability comprehenders who were in the group exposed to the graphic

organizer treatment outperformed the low ability comprehenders who were in the control group. Likewise, as indicated in Figure 2, tests of simple main effects ($p < .05$) for lookback-only correct revealed that the experimentals again outperformed the controls.

## Conclusion

The results suggest that self-perceived low ability comprehenders may be differentially helped by an adjunct aid such as the graphic organizer. Inducement of lookback behaviors resulted in superior performance for that group when compared to the group of low ability comprehenders which was left on its own (spontaneous lookback group). This finding, plus the fact that no treatment differences were found for the self-perceived high ability comprehenders, support Tobias' achievement-treatment interaction hypothesis.

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Table 1. Summary Statistics for Total Correct and Lookback-Only Correct by Treatment Group and Reading Ability

| Reading Ability | Graphic Organizer (Induced) Total | Graphic Organizer (Induced) Lookback-Only | No Graphic Organizer (Spontaneous) Total | No Graphic Organizer (Spontaneous) Lookback-Only |
|---|---|---|---|---|
| High Ability Comprehenders | | | | |
| M | 76.92[a] | 61.13[b] | 79.30 | 71.26 |
| (SD) | (3.79) | (6.48) | (3.71) | (6.34) |
| Low Ability Comprehenders | | | | |
| M | 60.20 | 31.71 | 44.82 | 16.66 |
| (SD) | (3.64) | (6.21) | (3.90) | (6.66) |

[a]Percent correct out of a possible 10.

[b]Percent correct out of a possible 4.

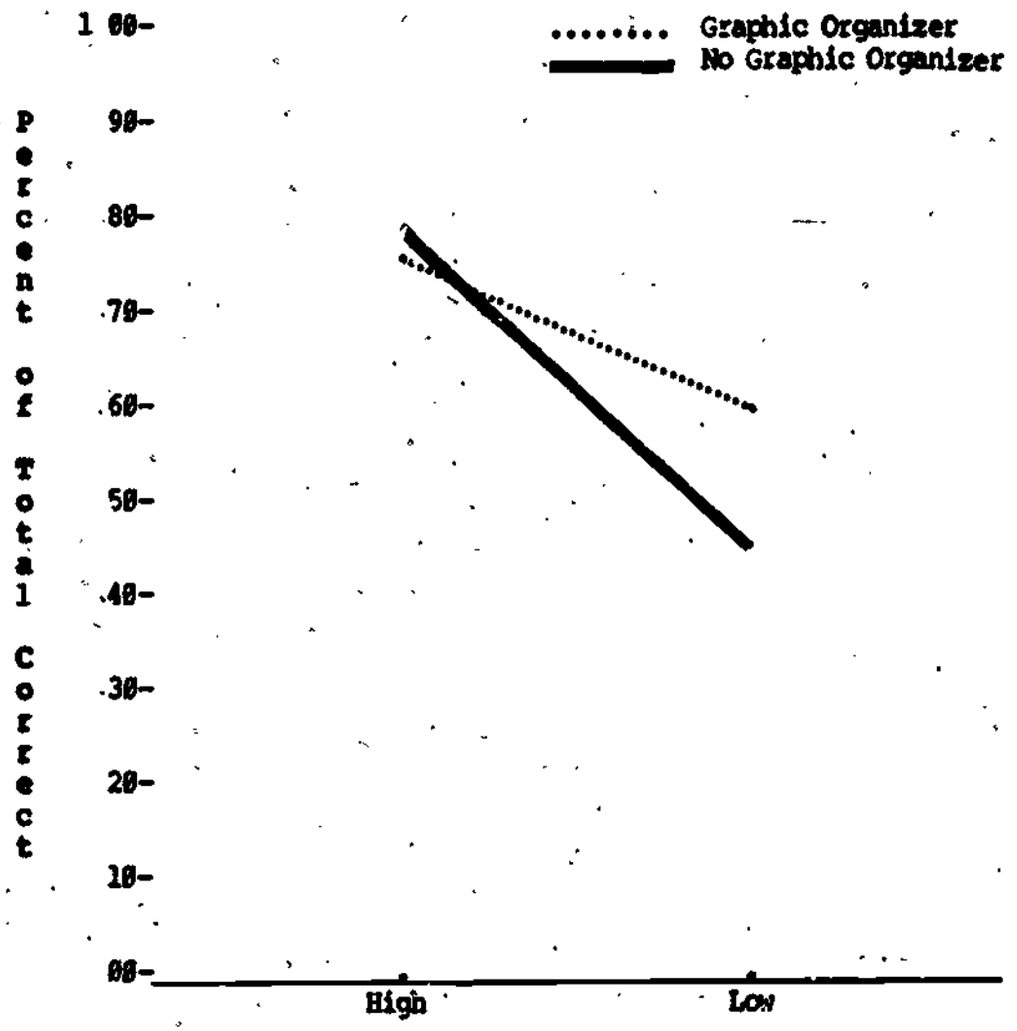


Fig. 1. Interaction between Treatment and Reading Ability for Total Correct

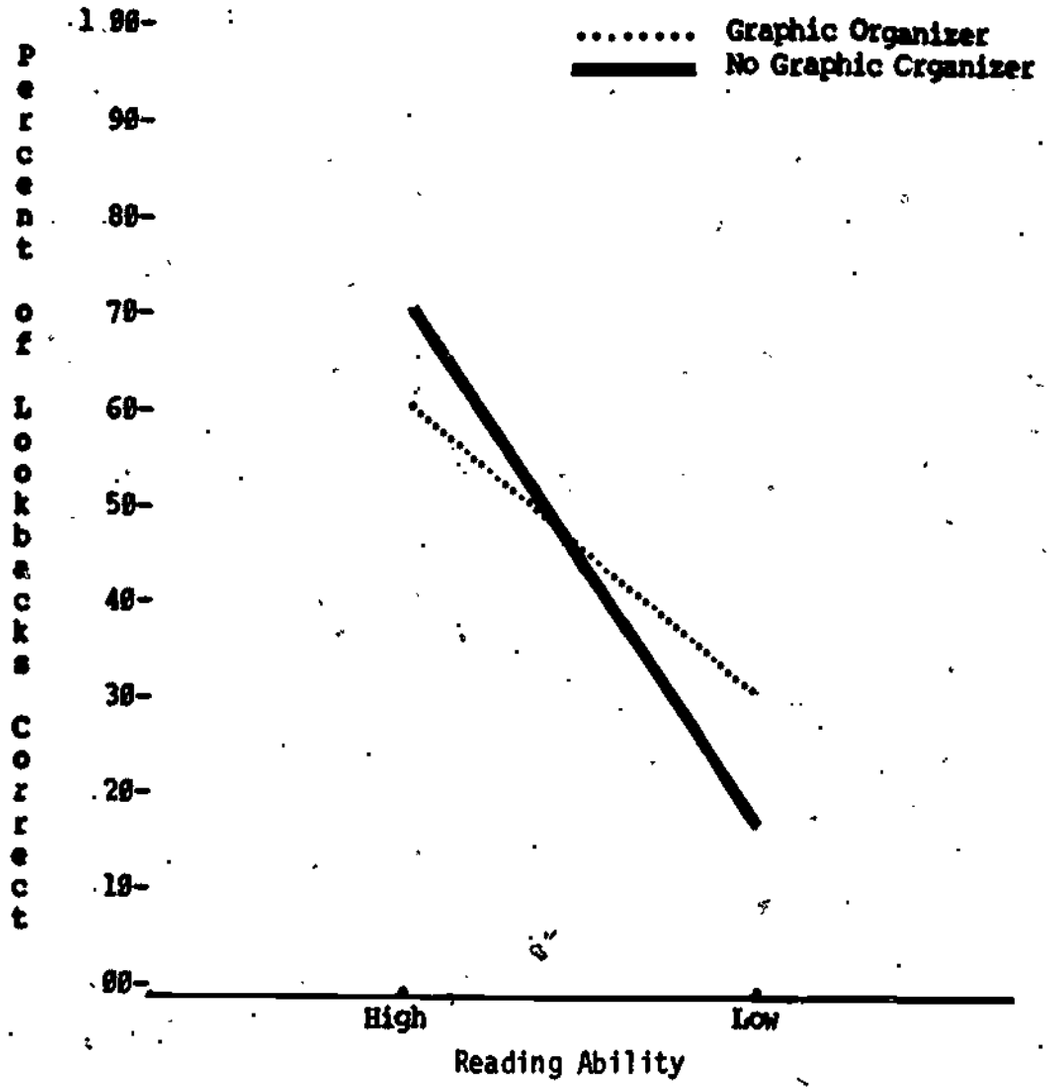


Fig. 2. Interaction between Treatment and Reading Ability for Lookback-Only Correct