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Nonliteral comprehension

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Abstract

There is a general concern about the reading and thinking abilities of today's youth. Of special concern are students' abilities to make inferences about what they read. Recent data show that students' basic reading skills have generally improved or have remained stable during the 1970s, but the inferential comprehension of 13- and 17-year-olds has dropped. This study focuses on nonliteral comprehension. Specifically, this study describes how researchers have defined nonliteral comprehension and ways the nonliteral comprehension of children might be improved.

NONLITERAL COMPREHENSION

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CHAPTER I

INTRODUCTION

There is a general concern about the reading and thinking abilities of today's youth. Of special concern are students' abilities to make inferences about what they read. Recent data show that students' basic reading skills have generally improved or have remained stable during the 1970s, but the inferential comprehension of 13- and 17-year-olds has dropped.

This study focuses on nonliteral comprehension. Specifically, this study describes how researchers have defined nonliteral comprehension and ways the nonliteral comprehension of children might be improved.

Statement of the Problem

The purpose of this study is to find (a) How have researchers defined nonliteral comprehension? and (b) According to the research literature, how do various treatments affect students' nonliteral comprehension?

Importance of the Problem

Many researchers use differing terms for nonliteral comprehension, and they define these terms in several ways. These differences become a problem when trying to synthesize the available information.

The improvement of nonliteral comprehension is important because there seem to be a number of students

in the United States who have trouble with nonliteral comprehension. According to National Assessment of Educational Progress (NAEP) data, between 1971 and 1980 17-year-olds declined 2.1% in inferential comprehension, 13-year-olds showed no significant change, and 9-year-olds gained 3.5% (Micklos, 1982). NAEP findings are valuable because they provide a basis for evaluating nationwide achievement trends. "Modern society requires more than basic reading skills. The NAEP data suggest that as the effort to provide basic skills for all youngsters continues, schools must now concentrate also on helping students develop the higher level thinking skills needed to cope with today's complex reading tasks" (Micklos, 1982, p. 762).

Another reason improving nonliteral comprehension is important is because inferences play a major role in reading comprehension. The ability to draw inferences is a prerequisite to reading development. The reader must construct inferences in order to make sense of the story.

Limitations

A limitation of this review is that only the research literature published between January 1983 and February 1987 was reviewed. Also the research covered

in this paper is a sample of the available studies reported at the time the review of literature was done.

Definitions of Terms

Relevant terms in this review are defined as follows:

Reading: "Reading is the recognition of printed or written symbols which serve as stimuli to the recall of meanings built up through the reader's past experience. New meanings are derived through manipulation of concepts already in his possession. The organization of these meanings is governed by purposes clearly defined by the reader. In short, the reading process involves both the acquisition of meanings intended by the writer and the reader's own contributions in the form of interpretation, evaluation, and reflection of these meanings" (Bond, Tinker, & Wasson, 1979, p.52).

Literal Recognition or Recall: "Literal comprehension requires the recognition or recall of ideas, information, and happenings that are explicitly stated in the materials read" (Smith & Barrett, 1974, p. 53).

Inference: "Inferential comprehension is demonstrated by the student when he uses a synthesis of the literal content of a selection, his personal

knowledge, his intuition and his imagination as a basis for conjectures or hypotheses" (Smith & Barrett, 1974, p. 54).

Evaluation: "Evaluation is demonstrated by the student when he makes judgments about the content of a reading selection by comparing it with external criteria" (Smith & Barrett, 1974, p. 55).

Appreciation: "Appreciation has to do with students' awareness of the literary techniques, forms, styles, and structures employed by authors to stimulate emotional responses in their readers" (Smith & Barrett, 1974, p. 56).

Nonliteral comprehension: Nonliteral comprehension occurs above the literal level in Barrett's Taxonomy (Smith & Barrett, 1974); this term is synonymous with higher-level comprehension.

CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of this chapter is to review research pertaining to nonliteral comprehension. The first part of this chapter discusses how researchers have defined nonliteral comprehension. The second part discusses the status of nonliteral comprehension instruction. The last section discusses the effect various treatments have on students' nonliteral comprehension. This last section is divided into sections according to the type of teaching treatment.

Definitions of Nonliteral Comprehension

The labels that most researchers used to define nonliteral comprehension were either inference, textually implicit, or scriptally implicit. Of those researchers using the term inference, most stated that making connections between parts of a passage and using background knowledge were equally necessary.

"Drawing inferences requires the reader to go beyond what is explicitly stated in text. The reader must use his knowledge of the world in combination with clues found on the printed page to reach conclusions that are important to understanding underlying meanings" (McCormick & Hill, 1984, p. 219). Allen (1985) stated, "Inferred information is based on the

text, but not stated explicitly, thus requiring the reader to interpret the text through existing knowledge. Most questions requiring inferences are more difficult for children than those requiring explicit text recall" (p. 604).

Some researchers started with the term inference but then categorized them into types of inferences. Thompson and Myers' (1985) categories included logical inferences, constrained informational inferences, and unconstrained elaborative inferences. Logical inferences required the reader to make connections between events in a story. Constrained informational inferences were connected to the information in the story but involved the reader's world knowledge about objects and events specified in the text. Unconstrained elaborative inferences were connected with but not determined by the text.

Other researchers referred to Pearson and Johnson's (1978) categories of comprehension that include text explicit, text implicit, and script implicit. A question was text explicit if the answer was stated directly in the text. A question was text implicit if the answer was in the text but required the integration of text information. A question was script implicit if the answer came from the reader's

background knowledge. Raphael (1984) modified this approach so it could be presented to children. She called the three categories right there, think and search, and on my own. Right there meant that the words used to create the questions and words used for the answer were in the same sentence. Think and search meant that the words to create the question and those used for an answer were not in the same sentence. On my own meant that the answer was not found in the text.

Other researchers described other ways of categorizing comprehension. Conley (1986) divided comprehension into literal, interpretive, and applied. Literal statements were explicitly stated in the text. Interpretive statements were supported by implicit relationships among explicit text statements. Applied statements resulted from the integration of information gained from the literal and interpretive levels with their own background knowledge. Langer (1985) felt that comprehension should be labeled as local or global. "Local questions were defined as those calling for information that appeared in the envisionment at a point in time but that was not an integral part of the final envisionment. Global questions were defined as those tapping the final integrated envisionment of the text as a whole" (p. 591). Finally, Halpain, Glover,

and Harvey (1985) defined higher order comprehension as anything above the knowledge level on the Bloom (1956) taxonomy.

In summary, all authorities believed that connecting parts of a passage and using background knowledge were needed to comprehend beyond the literal level. Most researchers either used the term inference or the terms textually implicit and scriptally implicit.

Status of Nonliteral Comprehension Instruction

Inferencing is closely linked to background experience. Children seldom state inferences without the aid of probe questions (Carr, 1983). For children to predict, the material must be potentially meaningful to them, and they must feel confident that they are at liberty to predict (Smith, 1983).

Inferencing is an important aspect of comprehension, but very little school time is devoted to this skill. Durkin (1981) found that comprehension instruction does not occur. Children are not told why they are studying topics or how they relate to reading. Even though teachers rarely teach children to comprehend, they spend considerable time assessing it at the literal level. "Evaluation of children's comprehension abilities has tended to deal in a

fragmented way with lower-level comprehension skills and with limited units of language. Children's responses to tasks on the higher levels of comprehension, to larger units of language, and to different types of literature need to be included in evaluation" (Harms, 1982, p. xii).

Ruddell (1978) found that most classroom inquiries concern facts. Higher levels of questioning could be possible. The question is a basic and commonly accepted way to stimulate thinking as well as to improve the cognitive process and comprehension ability. Questions give the teacher a guided exploration approach to stimulating children to search for specific information clues, establish cause and effect relationships, and make inferences.

It seems that teachers have little opportunity to develop either competence or confidence in understanding questioning strategies or to seriously consider the importance of comprehension levels and skills competencies. Guzak (1967) reported that 70% of the questions teachers used were trivial fact questions.

The effort a teacher expends in building the comprehension program will be shown in students' abilities to effectively derive, interpret, and apply

meaning from oral and written communication experiences encountered throughout life. At this level readers or listeners must modify and manipulate the content by analyzing, reconstructing, and inferring relationships.

Treatments to Improve Nonliteral Comprehension

Researchers studied various strategies to improve nonliteral comprehension. These were divided into three categories: inferencing, self-questioning, and organizing.

Inferencing

Several researchers studied teaching inferencing to students. When inferencing, readers find the main idea, relate it to their own experiences, and then make predictions. The purpose of a study by Hansen and Pearson (1983) was to evaluate the effect of Hansen's (1981) approaches to teaching inference skills by combining a strategy-training procedure with a practice-only procedure. They also wanted to see if it could be used in regular classrooms, with older students, and what differences might be obtained from good and poor readers.

The children used in this study were 40 fourth graders that were randomly selected from a group of 125. They attended elementary school in a small town that included various socioeconomic levels. Twenty

were good readers and 20 were poor readers. Students from each ability group were assigned randomly to either experimental or control treatments.

Instruction was given over a 10-week period. After 5 weeks, the teachers switched conditions. For the experimental group, six questions were discussed before the selections. Two questions were asked for each of the three main ideas in the story. These two questions had students relate personal experiences to the story and asked them to predict what might happen under similar circumstances in the selection.

Results on comprehension worksheets showed that the experimental method improved the inferential comprehension of the poor readers. In addition, the results from students' reading transfer stories indicated that the poor readers who received the inferential instruction benefited from it. Both their answers to inferential and literal questions were superior to those of the students in the control group. There were no treatment effects for the good readers. When the students read a common story, the experimental group did well on inferential questions. The poor reader experimental group could answer inferential questions as well as those in the good reader control group.

Students may have trouble with inferencing because they make a distinction between their life and what happens in reading class. The Hansen and Pearson approach might have "legitimized a behavior that students use in other environments but do not use when trying to understand textual information" (Hansen & Pearson, 1983, p. 827). Poor students usually receive little instruction in inferential comprehension. When it was provided in this study, poor readers learned the strategy and used it to their advantage. Thus, the poor reader experimental group benefited from the treatment.

McCormick and Hill (1984) also did a project to partially replicate the Hansen (1981) study. The study was done to find the effects of two procedures for increasing students' ability to draw inferences when reading. McCormick and Hill extended Hansen's study to intermediate grade level children who were disabled readers.

The subjects in this study were 80 black and white fifth-grade students from a low socioeconomic area of a large metropolitan city. Forty-three were boys and 37 were girls. Each child was in a Chapter 1 remedial reading program. The students used in the study were selected because of the similarities in their

instructional reading levels. Each group was assigned randomly to one of the three experimental groups.

Experimenter-designed tests and Metropolitan Achievement Tests were used as pretests and posttests. Six reading teachers were trained and assigned randomly to strategy, question, or control groups. All groups used the same reading materials.

For the strategy group, six questions were used to structure discussion before reading. For each of the three main ideas, two questions were used. One helped students relate their own backgrounds to the story and the other required them to make predictions about the story. For the question group, six questions were used after the story was read. All were inferential questions.

At the end of the treatment, the inference question scores on end-of-story tests were significantly higher on the strategy and question groups than the control group. On the posttest this was not true. The treatment groups' inference question scores were not significantly higher than the control group. The experimenter felt this might have happened because the posttest was given during the last week of the school year. The number of activities scheduled during that week might have affected the concentration

or effort given during testing. In addition, the students might not have been able to apply learned inferencing skills to the posttest material because the material differed from the weekly stories in length or they were not able to rehearse the skills directly before answering the questions. Unlike the results from the Hansen and Pearson study, there were no significant differences in posttest scores of literal comprehension.

Even though the posttests did not show it, the students and teachers believed the instruction was effective. McCormick and Hill concluded that the strategy treatment which gave opportunities to use previous experiences in predicting story outcomes, and the question treatment, which provided practice answering inference questions, were beneficial in teaching inferential comprehension to disabled readers.

Holmes (1985) used the term inferences, but defined it using the term scriptally implicit from Pearson and Johnson's (1978) categories. She did a study to determine whether teaching disabled readers a directive inferencing strategy using sequenced materials would improve their inferential comprehension and enhance their attitude toward reading.

The subjects used in this study were fourth- and fifth-grade students attending a low socioeconomic urban school. All students had been placed in a remedial reading class. Twelve students from each grade were randomly placed into groups of 3 and then assigned to one of the four conditions: Strategy Plus Materials, Strategy Only, Materials Only, and Control.

The Nelson Reading Test was used for pre- and postassessment. There were two sets of materials used in the study. Materials designated as "simplified instructional material" were used with the Strategy Plus Materials and the Materials Only groups. These materials were sequentially arranged from easy to hard. The materials for the Strategy Only and Control groups had longer passages followed by inferential questions.

The experimenter met with the students in four groups of 3. Each group had eight sessions of instruction that were 20 minutes long. The instructional strategy consisted of teacher modeling and student modeling of a directive inferencing strategy. The students learned how to confirm their responses by reading the passage and questions, hypothesizing tentative answers, identifying key words, and formulating and answering yes/no questions based on the final selection of the answer.

The analysis of covariance on inference questions designed by the experimenter showed that the Strategy Plus Materials group performed significantly better than the other three groups. All four groups showed significant gains. The analysis of covariance on the scores of the Nelson Reading Test also showed a significant treatment effect. The Strategy Plus Materials group and the Materials only group scored significantly higher than the Control group.

The results suggest that using the experimental strategy and sequenced structured materials helped intermediate-grade disabled readers answer inferential questions. A direct systematic strategy may help poor readers with the difficulties they have with logical problem solving. Holmes concluded the "poor readers in the intermediate grades can improve inferential comprehension through a direct systematic strategy and sequential materials" (Holmes, 1985, p. 546).

In brief, students can be taught to make inferences when they are given opportunities to use previous experiences in predicting and are provided practice in answering inferential questions. This skill can be transferred to new situations.

Self-Questioning

Some researchers studied teaching students to self-question to improve their nonliteral comprehension. Davey and McBride (1986) did a study to evaluate the effects of generating questions on comprehension. Both literal and inferential comprehension processes were assessed. Literal questions assessed explicitly stated information that could be located directly within the text. Inferential questions tapped ideas implied by passage information, which required integration of information from one sentence with information from another sentence or the generation of a central idea.

The subjects were 52 randomly selected sixth-grade students with reading comprehension scores between the 3.0 and 7.0 grade level on the California Achievement Test. They were randomly assigned to either the question-generation group or the read-reread group. The subjects in the question-generation group read a passage and then were told to think of two "think-type" questions before questions were asked. The subjects in the read-reread group were told to "read-reread, and study" each passage before answering questions.

The results of this study suggested that students who are directed to generate higher-level questions

after reading a passage demonstrate greater comprehension than do students who do not. Regardless of the level of reading skill, inferential comprehension was enhanced by self-questioning after reading.

Raphael (1984) used Pearson and Johnson's (1978) classifications of text explicit, text implicit, and script implicit then modified the terms to right there, think and search, and on my own for children. The subjects were students in fourth through eighth grade with a variety of abilities. They were trained in the concept of Question Answer Relationships. The training began with the trainer and the booklet providing the text, question, answer, Question Answer Relationship label, and the reason why the label was appropriate. Gradually, step-by-step, the teacher did less modeling and the student did more of their own thinking.

Raphael found that teaching students about information sources both sensitizes them to task demands of questions and improves the quality of their answers. Training showed the most impact on students of average and low ability.

In a later report, Raphael (1985) further modified the training. Questions were divided into in the book and in my head. The in the book category was then

divided into right there and think and search. The in my head category was then divided into author and you and on your own. It should be noted that Raphael did not present any data to support the modification of the categories.

Poindexter and Prescott (1986) also used Pearson and Johnson's (1978) categories. Similar to Raphael, they designed a student strategy to see if the answer is given directly, given indirectly, or if the answer must come from their own thoughts. The steps were designed to cue the mental processes which in turn produce an inference.

The subjects in this study were 400 students in grades 4, 5, and 6 from five schools in a large urban school district. The teacher modeled the strategy then directed practice in using the strategy. The mean pre-posttest difference scores for the treatment and control groups reflected positive differences in all three types of questions. They concluded that students of all ages could increase comprehension with this technique.

In summary, teaching students to ask themselves about information sources was effective. Students became sensitized to different demands of questions and the quality of their comprehension improved.

Organizing

Some researchers studied the effect of teaching students organization strategies on students' nonliteral comprehension. The purpose of a study done by Carr, Dewitz, and Patberg (1983) was to find out whether a specific strategy alone can develop inferential comprehension or if that strategy must be combined with the building of background knowledge. They defined inferential as textually implicit.

The subjects were 75 sixth-grade students who attended a suburban elementary school. They were in self-contained classes that were randomly assigned to one of three treatment groups. One group was a control group. One treatment group was instructed only in the cloze technique. The other treatment group received a combination of a structured overview and the cloze technique. Both treatments groups used a self-monitoring checklist.

The materials used for the groups came from the students' regular social studies text. All groups were given a pretest, three posttests, a transfer test and delayed transfer test. All the tests were made up of ten literal comprehension questions and ten textually implicit questions.

The structured overview-cloze treatment had three parts: (a) the students were presented a structured overview which gave them a leveled view of the material in each unit. This was done "to activate background knowledge and order textual information to facilitate assimilation of the information" (Carr, Dewitz, & Patberg, 1983, p. 6), (b) a modified cloze procedure to get students to integrate background and text information, and (c) the application of a self-monitoring checklist to encourage transfer.

The results of the posttest showed that there were significant differences among groups. The adjusted mean was highest for the structured overview-cloze group, next highest for the cloze group and lowest for the control group. The results of the transfer test were the same except the means for the cloze group were higher than the structured overview-cloze group. The results of the delayed transfer test were the same as the results of the posttest.

The interaction of ability and treatment was also studied. On the posttest and the delayed test, the performance of the below average readers reached the level of the above average readers on implicit questions. These were the readers who had the most to learn about inferential comprehension.

This study shows that children can be trained to increase their inferential comprehension and can apply this training to comprehend new material. The study also showed that this type of training seems to have the most benefit for below average readers.

To clarify some issues from their 1983 study, Dewitz, Carr, and Patberg (1987) did another study in order to clarify which treatments best improved inferential comprehension and what teaching procedures led to the transfer of these techniques.

The subjects were 101 fifth graders at a suburban elementary school. The students were assigned to four treatment groups of equal reading ability--cloze procedure group, a structured overview group, a cloze procedure/structured overview group, and a control group.

Passages used for the study were from the pupil's social studies text. The tests in the study included a metacognitive pretest, a comprehension pretest, three background knowledge tests, three comprehension posttests, an immediate transfer test, two delayed transfer tests, and a metacognitive posttest.

Students in the structured overview group were given an overview that gave a total hierarchical view of the unit. It was presented by the teacher and

discussed every day. Students in the cloze treatment group were taught the use of a modified cloze procedure. The training went from single sentences to paragraphs and from teacher-directed to individual work. The students in the structured overview/cloze treatment were presented a structured overview, used the modified cloze procedure, and applied the self-monitoring checklist. The control group used the same passages but used no additional strategies.

Like the earlier studies, the results showed that children can be trained to increase their inferential comprehension and can apply skills to comprehending unfamiliar materials. In this study, the cloze treatment yielded superior results whether taught alone or in combination with the structured overview.

Unlike the earlier study in which the below-average readers benefited most from the combined treatment, all the ability groups benefited from the combined treatment in this study. In addition, the second study revealed that the use of the structured overview alone had little effect on students' literal or inferential comprehension. "The study reveals that comprehension skills can be taught, transferred to unfamiliar text, and applied by the students sometime after instruction ceases. The success of the training

appears to have been the result of a well-modeled strategy that comes eventually under the control of the reader. When instruction extends over several weeks and emphasizes the students' self-monitoring of the strategy, the effects are durable and the students seem to understand the process necessary to ensure correct answers to comprehension questions" (Dewitz, Carr, & Patberg, 1987, p. 118).

In brief, teaching students a strategy to organize their comprehension was effective. The use of a structured overview in combination with the use of cloze or the use of cloze alone improved nonliteral comprehension.

CHAPTER III

SUMMARY AND RECOMMENDATIONS

The purpose of this review was to determine how researchers have defined nonliteral comprehension and how various treatments affected students' nonliteral comprehension. It was found that no matter how nonliteral was defined, all authorities believed that connecting parts of a passage and using background knowledge were needed to comprehend beyond the literal level. Most researchers either used the term inference, even though it was not always considered synonymous with nonliteral, or the terms textually implicit and scriptally implicit.

It was found that direct instruction can be effective in improving nonliteral comprehension. Strategies that helped students make predictions and relate background knowledge were found effective. Asking students nonliteral questions while reading helped. The use of a structured overview in combination with the use of cloze passage or the use of cloze alone improved nonliteral comprehension. In many of the treatments, the instruction was most effective with the below average readers. An important part of many studies was the teacher modeling the procedure, or strategy. It seems that students can be trained in

nonliteral comprehension and that this training can be transferred to a new situation.

The studies reviewed here investigated different teaching procedures or different conditions to have present in order to develop nonliteral comprehension. A different but related aspect deserving research is the proportion of time spent on nonliteral comprehension versus literal comprehension in developing nonliteral comprehension. This is important because nonliteral comprehension might be interactive with literal comprehension. The process might be to get some facts, form inference, then get some more facts. A study could be done to find the most effective mix of literal and nonliteral questions in developing nonliteral comprehension.

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