

The Effects Of Explicit Instructions
And Processing Demands On Comprehension Monitoring
Of Learning Disabled and Nondisabled Children.

by

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(ABSTRACT)

The present study explored whether explicit instructions would improve the ability of learning disabled and nondisabled children to monitor their comprehension for explicitly stated inconsistencies in stories particularly when the processing demands were increased. Specifically, 24 LD and 24 NLD third- and fourth-grade boys listened to three prose passages. Half of each group received explicit instructions describing exactly what type of anomaly was present in the story and the other half received general instructions. The processing demands were manipulated by presenting the stories to each child under three different conditions. In the easy presentation, the premise and contradictory sentences were adjacent. In the distractor task presentation, the premise and contradictory

sentences were adjacent, but the child had to simultaneously monitor a secondary task while listening to the story. In the hard presentation, the premise and contradictory sentences were separated by two filler sentences. Multiple measures of detecting inconsistencies and recall were obtained. Past research has determined that LD children exhibit a production deficiency for monitoring inconsistencies in prose passages (Bos & Filip, 1984). However, the present research found that LD children do not exhibit a production deficiency for monitoring explicitly stated inconsistencies in passages. Furthermore, LD and NLD children exhibited the same proficiency in identifying the inconsistencies and recalling the stories. This research provides additional information that must be considered before labeling the LD child as an "inactive learner" (Torgesen, 1980).

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Table of Contents

Abstract.....	ii
Acknowledgements.....	iv
List of Tables.....	viii
Chapter	
I. Introduction.....	1
A. Comprehension Monitoring in NLD Children.....	2
B. Comprehension Monitoring in LD Children.....	9
C. Relationship Between Production Deficiencies, Processing Demands and Comprehension Monitoring....	12
D. Purpose and Hypotheses of the Present Research.....	15
E. Differentiation of LD and NLD Groups.....	17
II. Method.....	18
A. Subjects.....	18
B. Materials.....	20
C. Design.....	21
D. Procedure.....	22
III. Results.....	25
A. Scoring Procedures.....	25
1. Identification of Inconsistencies.....	25
i. Correct and Incorrect Handraises.....	25
ii. D-prime.....	25
2. Recall Measures.....	26
i. Sentences.....	26
ii. Topic, Premise, and Contradictory Sentences.....	27
iii. Modified Ratio of Repetition.....	27
iv. Recall of Inconsistencies.....	27
3. Probability of Recalling an Inconsistency....	28
4. Latency Measures.....	28
B. General Analysis.....	29
1. Correct and Incorrect Handraises.....	29
2. D-prime scores.....	31
3. Recall Analyses.....	32
i. Total Number of Sentences Recalled....	32
ii. Recall of Topic, Premise, and Contradictory Sentences.....	32
iii. Modified Ratio of Repetition.....	35
4. Identification of Inconsistencies After Story Presentation.....	36
i. Spontaneous Recall of Inconsistencies.	36
ii. Probability of Identifying an Inconsistency.....	37

5.	Latencies for Topic, Premise and Contradictory Sentences.....	39
IV.	Discussion.....	40
A.	Initial Differences Between Subject Populations...	41
B.	Explanation of Results.....	42
1.	Effect of Group.....	42
2.	Effect of Instructions.....	43
3.	Effect of Story Presentation.....	44
4.	Limitations.....	49
5.	Implications.....	50
V.	Tables.....	52
VI.	References.....	66

List of Tables

Table 1: Hard Version, Corn..... 52

Table 2: Easy Version, Corn..... 53

Table 3: Hard Version, Koalas..... 54

Table 4: Easy Version, Koalas..... 55

Table 5: Hard Version, Clouds..... 56

Table 6: Easy Version, Clouds..... 57

Table 7: Mean Values for Correct and Incorrect Hands... 58

Table 8: Mean Values for the D-prime Values With 0.0
Scores and Without 0.0 Scores..... 59

Table 9: Mean Values for the Total Number of Sentences
Recalled..... 60

Table 10: Mean Values for the Number of Topic, Premise,
and Contradictory Sentences Recalled..... 61

Table 11: Mean Values for Modified Ratio of Repetition.. 62

Table 12: Mean Values for Spontaneous Recall of
Inconsistencies..... 63

Table 13: Mean Values for Probability of Recalling
an Inconsistency Given Recall of a Premise or
Contradictory Sentence..... 64

Table 14: Mean Values of Latencies (Milliseconds) Compared
for Topic, Premise, and Contradictory
Sentences..... 65

Introduction

Success in reading requires that children not only learn appropriate grammatical rules and vocabulary, but that they also learn to comprehend what they are reading. Comprehension monitoring is the metacognitive skills which individuals employ to assess their understanding of a passage. Baker (1979) defines comprehension monitoring as the ongoing process by which one evaluates and regulates comprehension. To evaluate is to keep track of the success of one's ongoing comprehension, and to regulate is to remediate any problems when the comprehension process fails. Many researchers have examined the concept of comprehension monitoring (Markman, 1979; Baker, 1979, 1982, 1984, 1985; Paris & Jacobs, 1984; Baker & Anderson, 1982; Markman & Gorin, 1981; Bos & Filip, 1984). Unfortunately, few of these studies have focused on the comprehension monitoring abilities of learning disabled (LD) children.

Preliminary research comparing LD children and poor readers to non-disabled peers indicates that poor comprehension monitoring may be an important factor limiting reading ability in these special populations. McKinney and Feagans (1984) conducted a longitudinal study with children 6-7 years old over a period of three years. By using standardized achievement tests as a measure of academic progress, they found that LD children progressively performed worse than their nondisabled peers in reading comprehension. Another study demonstrated that fourth-grade poor readers did not accurately monitor their

comprehension of prose passages as frequently as fourth-grade good readers (Paris & Myers, 1981). However, Paris and Myers (1981) determined that the poor readers were attempting to monitor, but they seemed to be unable to understand the overall meaning behind the stories that they read.

In this study, the comprehension monitoring abilities of learning disabled children will be more closely examined. First, the development of comprehension monitoring skills in non-disabled children will be reviewed to identify the different components of comprehension monitoring and potential sources of difficulty for the learning disabled child. Next, the relatively scarce literature concerning comprehension monitoring in LD children will be reviewed, and comparisons will be made between the deficits young children and learning disabled children display. In particular, the apparent "production deficiencies" in the comprehension monitoring of young and LD children will be discussed and an information-processing explanation for these deficiencies will be offered. Finally, the present study will test the information-processing hypothesis by looking at the effects of providing explicit instructions on the comprehension monitoring of LD and non-disabled children.

Comprehension Monitoring in Non-learning Disabled Children

Baker (1985) has identified five semantic standards which individuals must employ to monitor their comprehension:

"(1) propositional cohesiveness, checking that the ideas expressed in adjacent propositions can be successfully integrated; (2) structural cohesiveness, checking that the ideas expressed throughout the text are thematically compatible; (3) external consistency, checking that the ideas in the text are consistent with what one already knows; (4) internal consistency, checking that the ideas expressed in the text are consistent with one another; and (5) informational clarity and completeness, checking that the text clearly states all of the information necessary to achieve a specific goal." (p. 157)

I will be focusing on the internal inconsistency standard in this paper because children have the most trouble identifying these problems in prose passages (Baker, 1984a). Before children can check a text for internal consistency, they must be able to access a memory representation of the propositional statements within a prose passage and integrate the statements (Baker, 1984a). Once this integration has occurred, children must compare any contradictory information found to determine whether the story makes sense (Baker, 1985).

The awareness and use of comprehension-monitoring standards develop with age. Flavell, Speer, Green, and August (1981) found that kindergarten children were not able to verbalize their puzzlement when given inadequate instructions in trying to construct a building with different colored and shaped blocks. However, by the second-grade, children were five times more likely than the kindergarteners to monitor their comprehension of these instructions. Flavell et al. speculated that older children would be even more proficient at this monitoring task than second-graders. Flavell (1970) introduced the general concept of "production deficiency" to

describe the developmental sequence culminating in the spontaneous production of efficient strategies. Children can then learn to use these strategies for comprehension monitoring. Specifically, a production deficiency occurs when a child could have produced an appropriate strategy but failed to do so spontaneously. Flavell argues that production deficiencies are a "fairly frequent precursor to efficient production." (Flavell, 1970). There are two components to inferring production deficiencies: (1) a developmental increase in spontaneous use of efficient strategies; and (2) the finding that young children in some situations can be induced to use efficient strategies prior to spontaneous use.

A wide range of comprehension monitoring studies have been conducted with non-learning disabled (NLD) subjects. These studies confirm Flavell's developmental sequence from production deficiencies to spontaneous use of comprehension monitoring strategies. One study with NLD adults found that mature readers spontaneously monitor their comprehension for inconsistencies found in passages (Baker & Anderson, 1982). These inconsistencies were created by replacing a single noun or adjective with a word that conveyed an opposite or incompatible meaning. However, a study employing NLD children who were 5, 7, 9, and 11 years old showed that when children were asked to find three different types of problems in a passage (inconsistencies, nonsense words, and prior knowledge violations), the inconsistencies were least frequently

identified (Baker, 1984a). All of the age groups in Baker's (1984a) study were able to apply comprehension monitoring strategies to detect the three types of anomalies in the passages. However, as the children grew older, they became more proficient at applying the appropriate strategies for detecting nonsense words and prior knowledge violations, but not for detecting inconsistencies. Because the children could apply strategies in certain situations, but not in others, they could be exhibiting a production deficiency for general strategy use.

The Baker (1984a) study was broken into two experiments. In the first experiment, children who were 5, 7, and 9 years old listened to six short narrative passages. In the second experiment, 11-years-old children read the narrative passages to themselves. Even though one study employed a listening task and the other employed a reading task, the results of the two studies are comparable. Siegler (1986) addresses the difference between listening and reading comprehension in this way:

"Forming propositions, integrating propositions, and constructing a general model of the situation play the same role in comprehending spoken and written language. Lexical access from printed words, however, represents a unique demand of reading comprehension...At a general level of analysis, though, the idea that reading comprehension gradually approaches its potential as reflected in listening comprehension seems a reasonable way of thinking about changes in comprehension abilities." (p. 328)

A wide gap exists between children's reading and listening

comprehension abilities in the first and second grade, but this gap narrows and virtually closes by the seventh grade (Siegler, 1986). The present study will focus on fourth-grade children's listening comprehension monitoring abilities. The results from the present study can be compared to past research since listening and reading comprehension are closely related.

The Baker (1984a) and Baker and Anderson (1982) studies together demonstrate that young children do not spontaneously monitor internal inconsistencies, external consistency (prior knowledge violations), or informational clarity (nonsense words). However, as children get older they become more proficient at monitoring external consistency and informational clarity, and, by adulthood, individuals can spontaneously monitor all three types of textual anomalies. This developmental progression once again supports Flavell's "production deficiency" characterization of young children's comprehension monitoring because these studies show a developmental increase in spontaneous use of efficient strategies. From the available evidence, Baker's young children were capable of comprehension-monitoring strategies, they simply failed to use the appropriate strategies with a particular type of textual anomaly--internal inconsistencies.

Markman (1979) conducted a study that further supports Flavell's idea of a production deficiency in NLD children. She looked at the comprehension monitoring of inconsistent information in children who were in the third through the sixth

grades. She found that these children did not spontaneously employ comprehension monitoring strategies, and when they were specifically instructed in these strategies, they were better at finding explicit rather than implicit contradictions. An implicit contradiction required the child to make an inference to detect the inconsistency. A similar study was conducted with fourth- and fifth-grade poor readers. When these students were instructed to use mental imagery as a comprehension monitoring strategy, their performance improved for identifying both implicit and explicit contradictions relative to a no-strategy control group (Gambrell & Bales, 1986). Once again, these students were not able to employ spontaneously a comprehension monitoring strategy to detect the contradictions. The Markman (1979) and Gambrell and Bales (1986) studies directly address the second component of the production deficiency explanation identified earlier. Young children and poor readers can be induced to use comprehension monitoring strategies, even in identifying internal inconsistencies when given the appropriate instructions.

Other research has specified which type of monitoring instruction facilitates the detection of different types of textual anomalies. Markman and Gorin (1981) found that NLD children identified different problems in a passage, depending on the instructions that they received. Children, 8 and 10 years old, found relatively more inconsistencies when instructed to find inconsistencies, and relatively more

falsehoods when instructed to find falsehoods. Furthermore, the older children benefitted more from explicit instructions about the types of inconsistencies than the younger children. In the no-instructions group, the younger children found the same number of problems as the older children.

Baker (1984b) found that children who received specific instructions concerning how they should monitor their comprehension for different types of problems performed better on detecting nonsense words, prior knowledge violations, and internal inconsistencies than children simply told to look for problems. The children in the Baker (1984b) study varied in their reading proficiency. They were enrolled in the fourth- and sixth-grades, and were placed in either the poorer or better reading group on the basis of their reading scores on the California Achievement Test. For both reading groups, specific instructions aided their identification of problems. However, the poorer readers did not show the same statistically significant gains exhibited by the better readers. Unfortunately, poorer readers were not obtaining as much benefit from the explicit instructions as the better readers. In another study, metacognitive instruction concerning how, when, and why reading strategies should be employed to aid comprehension enabled 8- and 10-year-old NLD students to exhibit superior performance on reading comprehension tasks relative to children who received general instructions (Paris & Jacobs, 1984).

Thus, the available research regarding the type of monitoring instruction which facilitates the detection of textual anomalies can be summarized in the following manner: (a) explicit instructions and examples aid children during comprehension monitoring tasks; (b) instructions explicitly identifying the type of textual anomaly presented are more effective than nonspecific instructions; (c) the benefits of receiving explicit instructions increases developmentally; and (d) better readers obtain more benefit from explicit instructions than do poorer readers.

Comprehension Monitoring in Learning Disabled Children

The developmental patterns that are observed in NLD children are similar to the comparisons made between LD and NLD children. Torgesen (1980) suggests that an inability to use recently acquired skills may explain LD children's inability to generate spontaneously active, organized strategies in memory and reading. Torgesen's hypothesis of the LD child as an "inactive learner" is consistent with Flavell's idea of a production deficiency. In both hypotheses, deficits in comprehension are not caused by cognitive structural deficits, but rather by differences in understanding when to apply appropriate strategies. The children who exhibit these characteristics may need additional help in attending to or focusing on important information.

Unfortunately, very few studies have looked at the comprehension monitoring processes of preschool and early

elementary school-age children with learning disabilities. Kotsonis and Patterson (1980) looked at the comprehension-monitoring abilities of learning disabled and nondisabled boys who were 7-8 years old and 9-10 years old. They found that the learning disabled boys were less sensitive to the adequacy of information they received in the context of incoming messages during a game-learning task than nondisabled boys. Kotsonis and Patterson concluded that the learning disabled boys were deficient in comprehension-monitoring skills.

Wong (1979) found that learning disabled fifth-graders exhibited a production deficiency rather than an ability deficiency in comprehension-monitoring skills. Specifically, questions preceding particular target paragraphs increased the LD children's retention and comprehension of the main idea of the passage relative to a no-question control group. The questions prompted the children to use the appropriate strategies needed to comprehend the passage, similar to the effect of explicit instructions. The questions enabled the LD children to perform comparable to their NLD peers, whereas the NLD children's performance was unaffected by the questions.

Furthermore, Wong (1980) found that when LD second- and sixth-graders listened to a story, they did not spontaneously employ the appropriate strategies during encoding that are later needed for drawing inferences. Such strategies included employing a questioning technique to answer inference questions correctly. In this study, Wong found that the ability to use

effective strategies increases developmentally. The sixth-graders were able to draw inferences better under strategy instruction than second-graders.

Further support for production deficiencies in LD children's comprehension monitoring comes from a study by Bos and Filip (1984). These researchers found that seventh-grade NLD students spontaneously monitored their comprehension when given a standard set of instructions; although, the seventh-grade learning disabled students were only able to detect textual confusions when they were directed by specific instructions to use comprehension-monitoring strategies. However, this study was adapted from Markman's (1979) research and all of the inconsistencies were implicitly rather than explicitly stated. An inference must be made for the detection of implicit inconsistencies. Therefore, implicit inconsistencies are harder to detect than explicit inconsistencies.

In summary, the available research on LD children suggests a pattern which could be described as a production deficiency. First, LD children are only able to monitor their comprehension of prose passages when provided with appropriate strategies. Second, the benefit of strategy instruction improves developmentally. Third, LD children are unable to monitor spontaneously their comprehension for inconsistencies requiring an inference (implicitly stated). However, researchers have not investigated whether LD children show this same production-

deficiency pattern with explicitly stated inconsistencies found in prose passages. Therefore, the present research will investigate both LD and NLD children's performance in identifying explicitly stated inconsistencies to determine the range of situations under which children exhibit production deficiencies.

Relationship Between Production Deficiencies, Processing Demands and Comprehension Monitoring

Paris and Oka (1986) urge researchers to view the label, "inactive learner", placed on a LD child only as a descriptive starting point. These children may be more passive in typical learning situations, but we must determine when and why they are unable to employ spontaneously the appropriate comprehension monitoring strategies. Similarly, "production deficiencies" describe rather than explain the developmental sequence of strategy application. Studies with NLD children have conclusively shown that explicit instructions enable children to monitor their comprehension for inconsistencies (Markman, 1979; Baker 1984b; Paris & Jacobs, 1984). The explicit instructions may help in situations in which children are faced with excessive processing demands. The capacity required for decoding the verbal or written text and comprehending separate propositions may preclude the integration and monitoring required to detect inconsistencies. Explicit instructions may allow the young child or the LD child to detect inconsistencies by reducing some of those requisite

processing demands. Thus, to establish the extent of young or learning disabled children's production deficiencies in monitoring their comprehension, the processing demands when listening to prose passages must be manipulated. Explicit instructions may be more necessary in high-demand situations than when processing demands are reduced.

One way to increase children's processing demands when evaluating stories for inconsistent information is to manipulate the integration of the contradictory statements (Zabrocky & Ratner, 1986, Markman, 1979). Zabrocky and Ratner (1986) presented third and sixth graders with passages containing inconsistent information either in sentences that were adjacent or in sentences that were separated by four short informational sentences. They measured the amount of time that the children spent reading inconsistent target sentences. They demonstrated that third graders spent more time reading target sentences that were far apart as opposed to inconsistent sentences that were close together. Although neither the third nor sixth graders detected more inconsistencies in the close rather than far passages, in the close condition the children were more likely to recall inconsistencies when probed with questions. Markman (1979) also tested third and sixth graders. She found that sixth graders were able to identify inconsistencies when they were presented adjacently; whereas third graders were unable to identify even adjacent inconsistencies. Once the sentences are related in memory,

sixth graders, unlike third graders, may spontaneously initiate the appropriate comparisons. Therefore, increasing the amount of information intervening between inconsistencies in a passage may increase the amount of processing that a child must perform in identifying the inconsistent statements.

Another way to increase the processing demands placed on children is to engage them in a secondary task while they are performing the primary task of listening to a prose passage (Kerr, 1973). Secondary tasks can be used to measure the demands that mental operations place on an individual's limited cognitive capacity. A study by Britton, Westbrook, and Holdredge (1978) required adults to monitor the auditory presentation of clicks while they were reading either easy or difficult prose passages. The subjects were instructed to depress a button and release it when they heard the click. Their reaction time in this task was measured. The clicks were arranged so that each subject received a click approximately every 34 seconds. However, the clicks were randomly placed so that the subjects could not anticipate them. They found that reaction times for the secondary task were longer while subjects were reading the difficult passages than the easy passages. The subjects were paying closer attention to the easier passage, and thus using more cognitive capacity. Kerr (1973) states that "a mental operation that requires processing capacity will tend to interfere with many operations that also require processing capacity." Therefore, requiring a child to

perform a secondary task can increase the processing demands placed on the child, decreasing the resources available for monitoring a prose passage for inconsistent information.

In conclusion, Flavell's idea of a production deficiency may be one way to view comprehension monitoring strategies in very young and learning disabled children. Torgesen (1980) also supported this view of learning disabilities when he described the LD child as an "inactive learner." Although several different types of anomalies can be used to assess comprehension of a passage (Baker, 1985), the proposed study will concentrate on inconsistencies found in prose passages. If the processing demands explanation of the benefits of explicit instructions is correct, monitoring should improve either when demands are low or when explicit instructions are presented. Therefore, the hypothesis of the present research was that explicit instructions would enable third and fourth grade children to overcome their deficiencies and accurately monitor the stories particularly when the processing demands to monitor the stories were increased.

Purpose and Hypotheses of the Present Research

1. Baker (1984b), Markman (1979) and Paris and Jacobs (1984) found that specific instructions aided NLD children's comprehension monitoring abilities for inconsistencies found in prose passages. Also, Baker (1984a) found that inconsistencies were identified less often by NLD children than nonsense words and prior knowledge violations. Therefore, the present study

investigated whether LD children also benefitted from explicit instructions with examples in detecting inconsistencies in short prose passages. Bos and Filip (1984) found evidence that seventh grade LD students were able to monitor their comprehension for inconsistent passages with implicit contradictions when given explicit instructions, however, no one has looked at the ability of younger students to perform this task with explicit contradictions. Thus, the present study looked at a younger population of third- and fourth-grade LD children to see if explicit instructions improved their ability to monitor inconsistent passages containing explicit contradictions.

2. Kerr (1973) states that requiring an individual to monitor a secondary task will increase the processing demands in attending to a primary task. Also, higher processing demands can be achieved by increasing the amount of information presented between the inconsistent statements in a prose passage (Zabrucky & Ratner, 1986). Both of these methods were employed in the present study to increase the processing demands placed on the children while they were identifying the inconsistent statements. Therefore, the present study investigated the joint influence of the explicit instructions and increased processing demands on LD and NLD children's comprehension monitoring strategies.

Differentiation of LD and NLD Groups

Unfortunately, many researchers have employed very lenient standards for inclusion of subjects in LD populations. Studies investigating children with reading deficiencies have defined subjects in a wide variety of ways. For example, some researchers rely on teacher reports that the child is learning disabled (Idol-Maestas, 1985), whereas others differentiate good and poor readers by cutoff scores on standardized tests (Reis & Spekman, 1983). One of the most common definitions of LD populations states that the LD subjects must be performing 2 grade levels below his or her nondisabled peers (Siegel & Heaven, 1985). However, instead of using this particular criterion, standard scores should be used to describe the LD child's deficit in comparison to their nondisabled peers. Especially in younger children (grades 1-4), a small absolute delay in academic achievement may represent a significant problem (Siegel & Heaven, 1986).

Spear and Sternberg (1986) also addressed the issue for defining LD subject populations by listing the following minimum requirements which should be reported in LD research:

1. IQ scores should be reported for both the learning disabled and the non-learning disabled control groups.
2. Reading achievement scores should be reported for both groups.
3. All groups in a given experiment should be administered the same IQ and achievement tests.

4. The learning disabled and the nondisabled groups should be matched on IQ.

5. The reading disabled groups should be one grade level below their nondisabled peers in the first through the fourth grades, and two grade levels below their nondisabled peers in the fifth grade and above.

Therefore, in the present study both the LD and the NLD subjects were administered the Peabody Picture Vocabulary Test (PPVT) and the Gates-MacGinitie Reading Achievement Test. The PPVT score was used as a predicted IQ score for the LD and NLD groups. The Gates-MacGinitie was used as a measure of Reading Achievement scores. Both of these tests were used in the same manner by Wong (1980). Because younger children will be included in the present study, the more lenient criterion that the LD children must perform on the Gates-MacGinitie test one grade level below their NLD peers was adopted (Siegel & Heaven, 1986; Spear & Sternberg, 1986).

Method

Subjects

The children were third and fourth grade boys attending elementary schools in Southwest Virginia. Only boys were tested because the majority of children labeled LD are male, and restricting the sample to males eliminated sex as a factor in the analyses. A total of 48 subjects was tested with 24 learning disabled (mean age = 9-11; S.D. = .91) and 24 nondisabled children (mean age = 9-9; S.D. = .73).

Initially, the LD subjects were identified by teacher reports and the NLD subjects were recruited from an average reading level classroom. Permission from the school and the parents was obtained to gain access to the child's school records. Also, parental permission was obtained before children in either group could participate.

The LD and the NLD subjects were matched as closely as possible on grade and PPVT scores. More LD third graders participated in the study than NLD third graders, so 3 LD third graders were matched with NLD fourth graders. Also, because of the difficulty of obtaining parental permission for LD children's inclusion in the study, only a limited number of LD children were initially screened. Therefore, the LD and NLD children could not be exactly matched on the PPVT scores. The mean performance of the LD children on the PPVT was 94.666 (S.D. = 11.35). The mean performance of the NLD children on the PPVT was 104 (S.D. = 7.94). These two scores were significantly different ($t(46) = 3.30, p < .005$), however the PPVT scores for the two experimental conditions of instructions did not significantly differ for either the LD or NLD groups. The mean performance of the LD children on the PPVT in the explicit instructions condition was 92.08 (S.D. = 12.25), and in the general instructions condition was 97.25 (S.D. = 10.23), ($t(22) = 1.12, n.s.$). The mean performance of the NLD children on the PPVT in the explicit instructions condition was 103.25

(S.D. = 9.62), and in the general instructions condition was 105.583 (S.D. = 6.97), ($t(22) = .6803$, n.s.).

The subjects included in the LD group performed on the achievement test (Gates-MacGinitie) one grade level below the Gates-MacGinitie norms. The mean reading level of the LD children was 1.3 grades below grade level (S.D. = .8645) on the Gates-MacGinitie Reading Comprehension Test. The mean reading level of the NLD children was 1.25 grades above grade level (S.D. = 1.12).

Materials

Two of the three prose passages are extended versions of essays used by Markman and Gorin (1981). The third passage follows the same format as the other two. Because Baker (1984a) found that inconsistencies were the least frequently identified problems in her study, this study focused on inconsistencies and they were the only problems that were contained in the passages. Also, all of the inconsistencies were explicitly rather than implicitly stated. A hard and an easy version of each prose passage was written. Both versions contained the same amount and type of information, however, in the easy version the inconsistent statements were adjacent to one another, and in the hard version the inconsistent statements were separated by two filler sentences. In the easy version the filler sentences were found right after the inconsistent statements. The order in which the passages were

read to the child was randomized for each subject. The passages appear in Tables 1 through 6.

Insert Tables 1 through 6 here

For the hard story version, the inconsistent information was always found in the last sentence of the paragraph, and it contradicted information found in the second sentence of each paragraph. For example, the "corn" story in Table 1 states that "More than three hundred kinds of corn are grown," then the last sentence states "Very few kinds of corn are known to exist." For the easy story version the inconsistent information was found in the third sentence in each paragraph and it contradicted information found in the second sentence of each paragraph. A filler sentence was added to the end of each story to alleviate any recency effects that may occur during recall.

Also, the experimenter read a three-sentence practice story to the child before reading the three test stories. The practice story contained one inconsistency and was used to familiarize the child with the testing procedure. The results of the practice story were not analyzed.

Design

A 2 (subject: LD vs NLD) X 2 (instructions: explicit vs general) X 3 (story presentation: easy, hard, and easy with

secondary task) factorial design was employed. Subject and instructions were between-subjects factors, and story presentation was manipulated within subjects.

Procedure

Each child was tested individually by a graduate student or a trained undergraduate assistant. Each child was administered both a screening session and a testing session. In the screening session the PPVT and the Gates-MacGinitie Reading Comprehension Test were administered to the child. After these two tests were scored, the LD group was assigned and matched as closely as possible to the NLD group on the PPVT scores. Approximately twelve weeks elapsed between sessions, because all children were administered the PPVT and the Gates-MacGinitie before any child was read the three stories.

Each pair of matched LD and NLD children were randomly assigned to either a general or an explicit instructions condition. All children were read three prose passages. Each child listened to an easy version story, a hard version story, and an easy version story presented while the child performed a secondary task of listening for a tone on a tape recorder. The children were instructed to depress a button and release it when they heard a tone. The tones were randomly placed (from 5 to 20 secs) so that the children could not anticipate them. Every child heard the same tape recording of the tones. The children's reaction time to the tone was not measured.

The conditions under which the children received each story were counterbalanced and the presentation order was randomized. Each child's performance was tape recorded. Also, all children were read a standard set of instructions before hearing the passages. All of the instructions were similar to the ones used by Markman and Gorin (1981).

"These stories were written by other children who are just like you. I want you to help me decide if the stories are okay or if they have any problems. As I read the story, think about it and decide whether or not there are any problems in this story. I will read the story sentence by sentence. After each sentence I will look at you, if you think the sentence is okay, then say okay. If you think the sentence has a problem then raise your hand. Some of the stories might be boring or too long or too short. But only raise your hand if there is a problem in the story. After I have read each story I will ask you a couple of questions about the story. Then, I will ask you to retell the story back to me, so listen carefully to the story that I am going to read."

The children in the control condition received only these instructions. For all children, the experimenter read the story sentence by sentence. The next sentence was read whenever the child raised his hand or said "Okay". If the child raised his hand, then the experimenter said, "Okay" so that the latencies between sentences could be timed later. An asterisk was placed at the point in the story where the child raised his hand.

Children in the explicit instruction condition were given additional information. At the point in the general instructions where the children are told " I want you to help me decide if these stories are okay or if they have any

problems in them," the child was given this additional information:

"A problem is something that might confuse people or something that people might have trouble understanding. For example, suppose you heard, 'John loves to ski' then later on you heard, 'John hates to ski.' Those two sentences do not make sense together. Any time two parts of a story don't make sense together, that would be confusing. Suppose one part of a story said, 'Suzie is a tiny baby' then another part said that 'Suzie is big enough to walk to school.' It would be confusing to have two sentences like that that do not make sense together."

After each story was read, the children in all conditions were asked the following questions in this order:

1. "Do you have any questions about this story?"

"Did everything make sense?"

2. "Can you tell me back the story I read to you about corn?"

[At this point the child free recalled the story]

3. "Did everything make sense?"

If the child did not mention an inconsistency in the story, then a direct question was asked about that information.

4. "How many kinds of corn exist?"

"Who enjoys eating corn?"

"What kinds of corn make popcorn?"

The child's responses to the questions were written verbatim. The child's recall of the story was checked off and numbered in the order in which the child retold the sentences in the story. The latencies between the experimenter reading the sentence and the child signalling to experimenter to proceed were timed and recorded for each sentence from the

tapes. One-fourth of the latencies were recorded by 2 separate raters to obtain a reliability score.

Results

Scoring Procedures

Identification of Inconsistencies

Correct and Incorrect Handraises. During the testing procedure, the experimenter drew an asterisk after the sentence in the story at which the child raised his hand. The asterisks that were drawn directly after inconsistent statements were added and counted as correct hand raises. All other asterisks were counted as incorrect.

D-prime. To separate frequency of handraises from accuracy of handraises, a measure of d-prime was calculated using a ratio score for correct and incorrect handraises. A total of 3 inconsistent sentences, and 13 other sentences were found in each story. The total number of correct handraises (percent "hit") for each story was divided by 3 (total possible), and the total number of incorrect handraises (percent "false alarm") for each story was divided by 13 (total possible). A d-prime score was then calculated for each story, for each child, based on the hit and false alarm scores. For any child who did not raise his hand at all during a story, a d-prime score of 0.0 was given. The assumption was made that under this condition, children were insensitive to the difference between the signal and noise distributions in monitoring their comprehension.

Recall Measures

Sentences. The total number of sentences recalled for each story was determined. Lenient criteria were used by two independent raters to determine if a child recalled a sentence. A child had to recall at least one major noun and/or verb in the presented sentence. Scoring of and reliability for sentences depended on order judgements in addition to content congruence. However, the primary criterion for crediting a recalled sentence was distinctiveness from other sentences. In some cases a single noun or verb could provide this distinctiveness. For example, "Koalas eat the tops" would be credited for "They like to eat the tender, light green shoots that grow on the top of the branches." because "top" only appears once in the passage. In other instances, a single word would not be sufficient for crediting a sentence as recalled. For example, "Koalas are animals" would not be credited in the absence of other material because "Koalas" appears several times in the passage, and the story is about how Koalas are a special kind of animal. Reliability scores for the recall procedures were obtained by having a second rater listen to the tapes and record which sentences were recalled and the order in which the child recalled the sentences. The second rater was blind with respect to the original recall scoring. Reliability, based on percent agreement between raters, was calculated to be 98%. In cases of a discrepancy, the original protocol was used.

Topic, Premise, and Contradictory Sentences. The topic sentence was the first sentence in each paragraph. This sentence loosely establishes the theme of the paragraph. The premise sentence was the second sentence in each paragraph. The contradictory sentence was the sentence that contained information that was inconsistent with the premise sentence. The total number of sentences recalled for each sentence type was added for each story. The type of sentence recalled was an indirect measure of the saliency of that type of sentence. This measure was used to infer whether the children were focusing on the premise or the contradictory sentence while listening to and recalling the stories. The topic sentence was used as a control.

Modified Ratio of Repetition (MRR). The modified ratio of repetition (e.g., Bower et al., 1969) was used to assess the degree to which children clustered recall for sentences in the story according to the paragraph in which the sentence occurred. This ratio tapped the organization of story recall. The number of pairs of adjacent sentences that was recalled together that was originally presented together in a paragraph was added for each story. A percentage score was obtained using the following formula: (number of pairs of adjacent sentences) / [(total number of sentences recalled from the paragraph) - 1].

Recall of Inconsistencies. After the story was read, and before the child was asked to recall the story, each child was

asked "Do you have any questions, or Did everything make sense?" Any inconsistent statements that the child recalled were added together. Reliability scores for the recall of inconsistent statements were obtained by having a second rater listen to the tapes and record which sentences were recalled after the question was asked "Did everything make sense?". The second rater was blind with respect to the original recall scoring of inconsistencies. Inter-rater reliability was calculated to be 100% for independent scorings of spontaneous recall of inconsistencies.

Probability of Recalling an Inconsistency. Three separate probability measures were calculated which included the probability that the child recalled an inconsistency, given that he recalled the premise sentence, the contradictory sentence, or either sentence was calculated for the three inconsistencies in each story. This measure was used to determine if remembering the premise and/or the contradictory sentence would facilitate the recall of inconsistencies.

Latency measures.

The amount of time that the child required before signaling the experimenter to read the next sentence (latency) was timed and recorded from the tapes of the testing session. The latencies were recorded in milliseconds by using a stopwatch while listening to the taped protocols. Also, the latencies were timed and recorded twice by two independent raters to obtain a reliability measure. The raters' times that

were the same to the millisecond were counted as an agreement. Inter-rater reliability was calculated to be 93% for independent scorings of latencies. This indicates that differences in the latencies can not be attributed to the idiosyncratic timing of one individual. During the analysis, only the latencies for the topic, premise, and contradictory statements were compared.

General Analysis

Each univariate analysis of variance and multivariate analysis of variance reported below employed the following design: 2 (subject: LD vs NLD) X 2 (instructions: explicit vs general) X 3 (story presentation: easy, hard, and easy with secondary task). Subject and instructions were between-subjects factors, and story presentation was manipulated within subjects. Significant interactions found in the ANOVA's were further pursued with corresponding simple effects tests.

Correlations were calculated for the LD children between the scores on the Peabody Picture Vocabulary Test and the fullscale WISC-R scores when those scores were available. The WISC-R scores were available for all but 2 of the LD children. Unfortunately, the correlation ($r = .60$) was not significant.

Correct and Incorrect Handraises

Correct handraises were the number of sentences which contained inconsistent information correctly identified by the child while the experimenter was reading the story. The

incorrect handraises were the number of sentences that the child misidentified as having a problem. A univariate ANOVA was conducted on each set of data. Mean values for correct and incorrect hand raises are presented in table 7.

Insert Table 7 about here

No significant differences were found between the LD and NLD children for either correct, $F(1,44) = .72$, n.s., or incorrect handraises. $F(1,44) = .54$, n.s. However, an univariate ANOVA revealed that with explicit instructions, significantly more hands were raised correctly than with general instructions, $F(1,44) = 4.37$, $p < .04$. Also, a significant effect was found for the type of story presentation, $F(2,43) = 6.12$, $p < .005$. Newman-Keuls tests on the story presentation means indicated that significantly more correct hands were raised for the hard story presentation than for either the easy or the distractor story presentation, $p < .01$, which did not differ on this measure.

Another univariate ANOVA revealed no significant effects for incorrect handraises, however, the mean values for the incorrect handraises showed that more LD children than NLD children were incorrectly raising their hand, $F(1,44) = .54$, n.s., and more children were incorrectly raising their hand for the hard story presentation, $F(2,43) = .75$, n.s., than for the easy or distractor task story presentation.

D-prime scores

The d-prime scores were a measure to take into account both frequency and accuracy of hand raises. This measure determined whether the child was sensitive to the difference between the signal and noise distribution in monitoring their comprehension while listening to the story. A univariate ANOVA was conducted on the d-prime scores. The children who were insensitive to the difference between the signal and noise distributions, were recorded as having d-prime scores of 0.0. Mean values for the d-prime scores are presented in Table 8.

 Insert Table 8 about here

A univariate ANOVA was conducted on the d-prime scores. These d-prime scores revealed no significant main effects, however, there was a Group X Directions interaction, $F(1,37) = 4.52$, $p < .04$. Simple effects analyses indicated that the nondisabled group was performing significantly better with explicit than with general instructions, $F(1,44) = 5.69$, $p < .02$, though the effect of directions was nonsignificant for the learning disabled group, $F(1,44) = .12$, n.s. Also, surprisingly, the LD group's d-prime scores were significantly better than the NLD group for the general instructions condition $F(1,44) = 4.85$, $p < .03$. However there was no significant difference between the groups for the explicit instructions condition, $F(1,44) = .28$, n.s. Therefore, the d-

prime scores for the LD and NLD children only differed for general instructions with the LD children being the ones who were performing better. The NLD children were having trouble identifying inconsistencies when only given general instructions.

Recall Analyses

Total Number of Sentences Recalled An univariate ANOVA was conducted on the total number of sentences recalled. Mean values for the total number of sentences recalled are presented in Table 9.

Insert Table 9 about here

No significant effects were found for the total number of sentences recalled.

Recall of Topic, Premise, and Contradictory Sentences

The number of sentences recalled was compared for three specific types of sentences which included premise, contradictory, and topic sentences. The recall of sentences was used as an indirect measure of the saliency of the premise and contradictory sentences with the topic sentence used as a control. This measure was used to determine whether the children were focusing on the premise or the contradictory sentence while they were listening to and recalling the story. An univariate ANOVA was conducted on the number of topic compared to the number of premise compared to the number of

contradictory sentences recalled. Mean values for the premise, contradictory, and topic sentences can be found in Table 10.

Insert Table 10 about here

This ANOVA revealed no significant main effects, but did reveal several 2-way interactions between story presentation and directions, $F(2,43) = 3.92, p < .03$, story presentation and sentence, $F(4,41) = 3.36, p < .03$, and a 3-way interaction involving sentence, group, and directions, $F(2,43) = 3.39, p < .04$. First, simple effects analysis on the sentence X group X directions interaction revealed that NLD children recalled significantly more premise sentences with explicit than with general instructions, $F(1,44) = 3.82, p < .05$. The simple effects analysis also revealed that NLD children recalled significantly more premises relative to contradictory sentences with explicit instructions, $F(2,43) = 10.51, p < .0002$, but the difference in recall of premise and contradictory sentences was nonsignificant with general instructions, $F(2,43) = 1.91, n.s.$ Furthermore, LD children recalled significantly more premise sentences relative to contradictory sentences with general instructions, $F(2,43) = 8.81, p < .0006$, but their recall of premise and contradictory sentences did not significantly differ for the explicit instructions condition, $F(2,43) = 2.15, n.s.$

Second, a simple effects analysis of the story presentation X directions interaction revealed that explicit instructions improved the recall for the distractor task condition, $F(1,44) = 5.87$, $p < .02$, but not for the easy task, $F(1,44) = .28$, n.s., or hard task, $F(1,44) = .06$, n.s. condition. However, there were no significant differences between the three types of story presentations for either the explicit instructions, $F(1,43) = 2.95$, n.s., or the general instructions, $F(1,43) = 1.22$, n.s.

Finally, a simple effects analysis of the story presentation X sentence interaction revealed that more premise than contradictory sentences were recalled for the easy story presentation, $F(2,43) = 4.03$, $p < .02$, the hard story presentation, $F(2,43) = 23.38$, $p < .0001$, and the distractor task story presentation, $F(2,43) = 7.98124$, $p < .03$. Therefore, for each type of story presentation, more premise than contradictory sentences were recalled. Furthermore, a simple effects analysis showed a significant effect for the recall of contradictory sentences for the three types of story presentation, $F(2,43) = 4.95$, $p < .01$. Post-hoc t-tests revealed that the mean values for the contradictory sentence were significantly less for the hard story presentation, $t(46) = 3.01$, $p < .05$, than for the easy or distractor story presentation. In the hard story presentation the premise and contradictory statements were separated by two filler sentences.

To summarize, all of the simple effects analyses on the premise, contradictory, and topic sentences revealed that the LD and NLD children did not differ in their overall recall of the three types of sentences. However, looking at the two groups separately, the NLD children recalled more premise than contradictory sentences with explicit instructions, while the LD children recalled more premise than contradictory sentences with the general instructions. Therefore, only the NLD children were obtaining benefit, with respect to recalling premise sentences, with the explicit instructions. We can infer that the NLD children were using the explicit instructions to help them focus more on the premise sentences and disregard the contradictory sentences.

Viewing the two groups together, explicit instructions only aid recall with the distractor task. Furthermore, the premise sentences were recalled better than the contradictory sentences with all three types of story presentation (hard, easy, and distractor) and this difference was the greatest for the hard story presentation.

Modified Ratio of Repetition (MRR) The modified ratio of repetition was employed as a measure of clustering to determine the organization of sentence recall. An univariate ANOVA was conducted on the modified ratio of repetition measures. Mean values for the modified ratio of repetition can be found in Table 11.

Insert Table 11 about here

The ANOVA conducted on the modified ratio of repetition revealed no significant effects.

Identification of Inconsistencies After Story Presentation

Spontaneous Recall of Inconsistencies. The spontaneous recall of inconsistencies was a measure of whether the child could identify a problem after listening to the story, but before retelling the story back to the experimenter. A multivariate ANOVA was conducted on the mean values for the recall of inconsistencies before and after the recall procedure. Only the the spontaneous recall of inconsistencies before the child retold the story are reported because the recall of inconsistencies after the recall procedure were at floor level. Mean values for spontaneous recall of inconsistencies are presented in Table 12.

Insert Table 12 about here

The multivariate ANOVA for recall of inconsistencies revealed significant main effects for directions, $F(1,44) = 6.35$, $p < .04$, and story presentation, $F(2,43) = 3.40$, $p < .04$, with children identifying significantly more inconsistencies with explicit instructions than with general instructions. Newman-Keuls performed on the story presentation means revealed

that significantly more inconsistencies were identified under the hard story presentation than under the easy or distractor story presentations, $p < .05$, which did not differ on this measure. The main effect for group was nonsignificant, $F(1.44) = .40$, n.s.

Probability of Identifying an Inconsistency. Two different sets of analysis were conducted on the probabilities of identifying an inconsistency given that a premise or a contradictory sentence was recalled. The probabilities revealed whether recalling either the premise or the contradictory sentence facilitated the child's identification of an inconsistency after hearing the story. However, since the recall procedure occurred after the identification of the inconsistencies, the interpretation of these results are limited. First a multivariate ANOVA was conducted on the probabilities that a child identified an inconsistency given that the child recalled the premise sentence and/or the contradictory sentence. Only the mean values for the probabilities given that a child recalled a premise or a contradictory sentence are reported because the probabilities that a child recalled a premise and a contradictory sentence were at floor level. Then a univariate Anova was conducted comparing the probability of recalling an inconsistency given that the child recalled a premise sentence to the probability of recalling an inconsistency given that the child recalled a

contradictory sentence. Mean values for the three sets of probabilities are presented in Table 13.

Insert Table 13 about here

The multivariate ANOVA revealed a significant main effect of story presentation when either the premise or the contradictory sentence was recalled $F(2,43) = 3.04, p < .05$. Newman-Keuls performed on the probability means for the story presentations revealed that with the hard story presentation the probability that the child identified an inconsistency given that he recalled the premise or contradictory sentence was greater than the probability for the distractor task story presentation and the easy story presentation, $p < .05$, which did not differ on this measure.

The univariate ANOVA was conducted to determine whether the probability of identifying an inconsistency varied depending on whether the premise or the contradictory sentence was remembered. A significant main effect was revealed with a greater probability of identifying the inconsistency given that the child recalled the premise sentence than the probability given that the child recalled the contradictory sentence $F(1,44) = 8.71, p < .005$. Also a significant 2-way interaction between story presentation and sentence was revealed, $F(2,43) = 5.07, p < .01$. A simple effects analysis indicated that for the hard story presentation, the probability for the premise

sentence was greater than the probability for the contradictory sentence, $F(1,44) = 13.02$, $p < .0008$. However, the difference in probabilities was nonsignificant for the easy story presentation, $F(1,44) = .01$, n.s., and the distractor story presentation, $F(1,44) = .72$, n.s. Also, for the premise sentence, the probability mean values were highest for the hard story presentation condition ($M = 32.65$) and lowest for the easy story presentation ($M = 13.54$), $F(2,43) = 3.95$, $p < .05$. For the contradictory sentence, the probability mean values were lowest for the hard story presentation ($M = 8.33$) and highest for the distractor task story presentation ($M = 19.48$), $F(2,43) = 3.20$, $p < .05$.

Latencies For Topic, Premise, and Contradictory Sentences

The amount of time before the child signalled the experimenter to read the next sentence either by raising his hand or saying okay were compared for the topic, premise and contradictory sentences. An univariate ANOVA was conducted on the mean values for the latencies compared across the topic, premise, and contradictory sentences. Mean values for the latencies are revealed in Table 14.

Insert Table 14 about here

The univariate ANOVA revealed no significant main effects, and only one significant 3-way interaction between sentence, group, and directions, $F(2,41) = 5.21$, $p < .05$. Simple effects

analysis revealed that this interaction was caused by a greater latency in the LD group for the topic sentence in the explicit instructions condition $F(2,41) = 4.06$, $p < .05$, than for the premise or contradictory sentences. No significant differences were revealed between the LD and NLD group for either the premise, $F(1,42) = .02$, n.s., or contradictory sentences, $F(1,42) = 1.27$, n.s. Also, no significant differences were revealed between explicit and general instructions for either the premise, $F(1,42) = .39$, n.s., or contradictory sentences, $F(1,42) = .01$, n.s.

Discussion

Past research has demonstrated that presenting explicit instructions helps NLD children to identify more inconsistencies in prose passages than general instructions (Markman, 1979; Markman & Gorin, 1981; Baker, 1984b; Paris & Jacobs, 1984). Also, a study by Bos & Filip (1984) found that explicit instructions helped LD children to identify more implicitly stated inconsistencies in prose passages. However, the hypothesis that explicit instructions would improve LD third- and fourth-grade children's ability to monitor their comprehension for explicitly stated inconsistencies in stories particularly when the processing demands were increased was not supported with the data from the present study. The LD children were able to identify explicit inconsistencies with either general or explicit instructions. From these results,

LD children do not seem to exhibit a production deficiency for explicitly stated inconsistencies.

The following discussion will present the results by organizing the measures into group, instruction, and story presentation differences. Each of these sections will offer explanations for any contradictory findings contained in the present research by highlighting differences in the present study compared to past research. Also, initial subject differences will be discussed to help explain the lack of group differences found in the present study. To conclude, limitations and future implications of the present study will be described to integrate this research with past views of LD children as "inactive learners".

Initial Differences Between Subject Populations

During the screening session, both the LD and the NLD children were administered the Peabody Picture Vocabulary Test (PPVT). The NLD children scored significantly higher on the PPVT than the LD children which would lead us to believe that the NLD children would be better at detecting inconsistencies. However, this pattern of results was not found. Also, the within group differences on the PPVT were insignificant, so subject differences can not be used to explain any of the within group pattern of results.

The two groups of children were matched as closely as possible on age and grade, and were all recruited from the same schools. The only significant differences between the two

groups were on their PPVT and Gates-MacGinitie Reading Comprehension test scores. Also, the NLD children who showed superior reading performance were not included in the study. Furthermore, a large number of the parents of LD children refused to return the parental permission letters, thus the LD group of children may be a biased sample. The equalization of groups and the sample of LD children who participated in the study may explain why the LD and NLD children did not significantly differ in their recall and comprehension monitoring abilities.

Explanation of Results

Effect of Group

The only significant group difference between the LD and NLD groups involved the d-prime scores under the general instructions condition. Under the explicit instructions condition, the d-prime scores did not differ for the LD and NLD groups. The d-prime scores were a measure of both frequency and accuracy of the child identifying an inconsistency while he was listening to the story. There were no other significant group differences found in the present study.

Bos and Filip (1984) found that LD children exhibit a production deficiency for monitoring implicitly stated inconsistencies. However, in the present study the inconsistencies were explicit rather than implicit. The LD children were able to monitor spontaneously passages that

contain explicitly stated inconsistencies. Therefore, LD children do not exhibit a production deficiency for the task provided in the present research.

Effect of Instructions

The type of instructions read to the child, either general or explicit, was a between-subjects factor. The first significant instructions effect reported involved children's correct identification of inconsistencies through hand raises. All children identified inconsistencies correctly more often with explicit instructions than with general instructions.

Contrary to expectations, explicit instructions improved the d-prime scores for the NLD children, however, the instructions did not help the LD children. The explicit instructions improved the NLD children's accuracy for detecting a difference between the signal and noise distributions. LD and NLD children can monitor their comprehension with the same level of proficiency, but the factors which bring them to that level of proficiency are dependent upon population and instructions. One explanation for this puzzling finding is that LD children were insensitive to the instructions. The LD children evaluated passages the same way, regardless of the instructions that they received. They only monitored the passages for obvious anomalies such as the ones found in the present study. However, the NLD children failed to monitor their comprehension when given general instructions which did not explain how to monitor the passages. One possibility is

that the NLD children were hindered by the general instructions and were looking for a wider variety of anomalies causing them to miss the inconsistencies.

The d-prime measure tapped into the children's ability to identify inconsistencies while they were listening to the stories. The children were also asked to identify the inconsistencies after listening to the entire story. Similar to the findings of Markman and Gorin (1981), Baker (1984b), and Bos and Filip (1984), LD and NLD children spontaneously identified more inconsistencies when given explicit rather than general instructions.

Furthermore, NLD children recalled more premise than contradictory sentences with the explicit instructions. However, the LD children recalled more premise than contradictory sentences with the general instructions. Once again, only the NLD children were obtaining benefit from the explicit instructions. Therefore, both groups of children benefitted from the explicit instructions for identifying inconsistencies after listening to the entire story. However, only the NLD children benefitted from the explicit instructions for identifying inconsistencies while listening to the story, and for recalling more premise than contradictory sentences.

Effect of Story Presentation

The effect of story presentation was a within subject factor. The three types of story presentations were easy, hard, and distractor task. Contrary to what was predicted,

more correct hands were raised with the hard story presentation than either the easy or distractor story presentation. In the hard story presentation, the inconsistent statements were separated by two filler sentences so the child had to remember and integrate the information presented in order to identify an inconsistency. In the easy and distractor task story presentations, the inconsistent sentences were adjacent so the integration was presumably easier. Zabrocky and Ratner (1986) found that children spent more time reading inconsistent statements that were separated by other sentences, but they did not find that these inconsistencies were detected less often than inconsistencies that were adjacent. However, in the present study, the inconsistencies that were separated were easier to identify.

One explanation for these results is that when the inconsistencies were presented adjacently, which occurred in the easy and the distractor task presentations, the children were reluctant to raise their hand. The adjacent presentation may have confused the children because they may have assumed that the reader was self-correcting by immediately contradicting a misread sentence. In the Zabrocky and Ratner (1986) study the filler sentences interposed between the premise and contradictory sentences changed the topic. However, in the present study the sentences separating the premise and contradictory sentences did not change the topic. Therefore, the filler sentences may have provided additional

clues that the inconsistent sentences had problems, or may have aided in the integration of the sentences. For example, in the cloud story, the paragraph that states that people that study the weather do not pay attention to clouds contains filler sentences which describe how "low thick clouds cause rain...and high, dark clouds usually bring a thunderstorm." Furthermore, the increased processing demands associated with the distractor task had no effect on monitoring the inconsistencies while the child was listening to the story.

Additionally, more hands were raised incorrectly with the hard story presentation than with either the easy or the distractor task presentation, although this effect was not significant. When you look at the d-prime scores, which take into account both frequency and accuracy of handraises, the effect of story presentation disappears. Therefore, under the hard story presentation children may have been raising their hands more overall, both correctly and incorrectly.

Also, more inconsistencies were spontaneously identified and the probability that an inconsistency was identified given that the premise or the contradictory sentence was recalled was better with the hard story presentation than with the easy or distractor task story presentation. Once again, the filler sentences between the premise and contradictory sentences seem to be aiding the children's identification of inconsistencies rather than hurting them. Future research should use passages in which the filler sentences contain information that is

totally unrelated to the premise and contradictory sentences. Also, interview methods should be used to ascertain exactly what children think when two sentences are adjacent and completely contradictory.

One significant effect favored the distractor task story presentation. Explicit instructions improved recall of the topic, premise, and contradictory sentences for the distractor task presentation. The explicit instructions did not improve recall for the easy and hard story presentations. In the distractor task presentation, children had to monitor a tone and press a button whenever they heard the tone. Monitoring the tone may have disrupted the children's ability to concentrate on the content of the sentence which is needed for later recall. For the distractor task, the explicit instructions may have helped the children focus on the problems and subsequently improved their later recall of the premise and contradictory sentences. In the other two story presentations, the child's processing of the content of the story was not directly hampered.

With regard to the specific type of sentence that was best recalled, the premise sentences were recalled better than the contradictory sentences with all three types of story presentation, however, this effect was the greatest for the hard story presentation. The addition of the filler sentences to separate the premise and contradictory enables both LD and NLD children to recall more premise than contradictory

sentences. Also, for the hard story presentation, the probability that an inconsistency was recalled given that the child recalled the premise rather than the contradictory sentence was greater than the probabilities for the easy or distractor task story presentations. Therefore, we can conclude that for the hard story presentation, children are focusing on and better recalling the premise sentences than for the easy or distractor task story presentation.

Limitations

The LD children performed better than the NLD children with regard to the d-prime scores under the general instructions condition. Two explanations can be offered for this finding. First, the two groups of subjects may have originally differed in some way. However, screening tests were given to both groups of subjects, before the experimental task was conducted. The LD children performed a grade level below their NLD peers on the Gates-MacGinitie Comprehension Test, and the NLD children performed significantly higher than the LD children on the PPVT. Therefore, we would predict that under the general instructions condition, the NLD children would perform better than the LD children. However, lenient criteria were employed to differentiate the two groups on the Gates-MacGinitie in that the LD children were only required to be one grade level below the Gates-MacGinitie norms. This difference in reading achievement scores may not have been great enough to cause a

significant difference in performance between the LD and NLD groups.

However, a second explanation for the LD subjects better performance could be that the general instructions were not an appropriate control. The general instructions specified that problems were present in the story without explicitly defining the problems. The pattern of results show that LD and NLD children perform with the same proficiency with explicit instructions, however, the NLD children are hindered in their monitoring abilities with the general instructions. In future research general instructions should not focus on the fact that problems are present, or should state that problems could be inconsistencies without explicitly describing inconsistencies.

Also, contrary to what was expected, under the hard story presentation more correct hands were raised, more inconsistencies were spontaneously identified, and the probability that an inconsistency was identified given that the premise or contradictory sentence was recalled was higher than under the easy or distractor task story presentation. This suggests that the filler sentences that separated the premise and contradictory sentences were helping the children rather than increasing their processing demands for monitoring the stories. The present research does not disqualify that under increased processing demands, children will benefit from explicit instructions describing how to monitor passages. Unfortunately, the conditions in the present study did not

sufficiently accomplish the task of making the stories more difficult to monitor. To remedy this situation, future research should use passages in which the filler sentences contain information that is totally unrelated to the premise and contradictory sentences. Also, new conditions need to be developed to increase the processing demands placed on the child while monitoring passages. The number of filler sentences between the premise and contradictory sentences could be increased so that the child has to remember and integrate more information. Also, the distractor task could compete more for the child's attention, such as monitoring a list of words rather than a tone.

Implications

Most obviously, because the LD and NLD children did not significantly differ for identifying explicitly stated inconsistencies, LD children did not exhibit a production deficiency for explicitly stated inconsistencies. If Torgesen's (1980) view of the LD as an "inactive learner" is correct, LD children should not be able to generate spontaneously active, organized strategies in memory and reading. Bos and Filip (1984) concluded that LD children exhibited a production deficiency for identifying inconsistencies, however the inconsistencies were implicitly rather than explicitly stated. The present research findings showed that LD children do use monitoring strategies with general instructions when the anomalies are obvious.

Therefore, LD children are not totally deficient in strategies needed to monitor their comprehension.

Also, only the NLD children varied their monitoring performance depending upon the type of instructions given. Therefore, LD children may be insensitive to the information contained in instructions. The LD children appear to monitor the prose passages the same regardless of the instructions. Also, LD and NLD children are equally capable of monitoring passages when given explicit instructions. Therefore, the effect of instructions can not be attributed to a production deficiency. The discrepancies between the findings of this research compared to past research needs to be investigated more thoroughly.

Table 1

Hard Version

Corn

Maize, more commonly known as corn, is one of America's most popular vegetables. More than three hundred kinds of corn are grown for different reasons. The American Indians were the first people to grow and use corn. The Indians used corn for many different things such as food, decoration, and in religious ceremonies. Very few kinds of corn are grown.

** Corn can be served in many different ways. I've never met any people who didn't consider corn, in one form or another, one of their favorite foods. Corn can be steamed and served with melted butter or mixed with flour and egg to make a bread. Also, corn is made into popcorn for a favorite snack. The people I know don't enjoy eating corn very much.

Almost everyone has bought popcorn at the movies. Popcorn is only made from one special kind of corn. The grain is the part of the corn that is eaten. When the grain is heated, the water inside of the grain explodes and this part makes the popcorn look white and fluffy. Any kind of corn can be heated to make popcorn. Think about how popcorn is made next time you buy some at the movies.

(** This paragraph was used by Markman and Gorin, 1981).

Table 2

Easy Version

Corn

Maize, more commonly known as corn, is one of America's most popular vegetables. More than three hundred kinds of corn are grown for different reasons. Very few kinds of corn are grown. The American Indians were the first people to grow and use corn. The Indians used corn for many different things such as food, decoration, and in religious ceremonies.

Corn can be served in many different ways. I've never met any people who didn't consider corn, in one form or another, one of their favorite foods. The people I know don't enjoy eating corn very much. Corn can be steamed and served with melted butter or mixed with flour and egg to make a bread. Also, corn is made into popcorn for a favorite snack.

Almost everyone has bought popcorn at the movies. Popcorn is only made from one special kind of corn. Any kind of corn can be heated to make popcorn. The grain is the part of the corn that is eaten. When the grain is heated, the water inside of the grain explodes and this part makes the popcorn look white and fluffy. Think about how popcorn is made next time you buy some at the movies.

Table 3

Hard Version

Koalas

** Koalas are fuzzy little animals that look a bit like bears. They will sleep only high up on the tops of trees. Most Koalas are found in Australia. In Australia, we would find that they sleep all day long. They sleep on the ground in the cool soft grass.

The favorite foods of Koalas are the leaves of eucalyptus, or gum, trees. They like the tender, light green shoots that grow on the top of the branches. The Koalas move from tree to tree looking for food. Koalas sniff each leaf before eating it. Koalas only eat the tough, outer leaves that grow on the bottom of the branches.

Koalas look like bears, but they are actually a kind of animal called a marsupial. Many furry animals live in Australia, and most of them are marsupials. A female marsupial has a special pouch on her belly where she carries and feeds her baby. The baby koala remains in the pouch for about seven months. Koalas are the only marsupials that live in Australia. We often see Koalas in pictures of Australia showing places you can visit for vacations.

(** This paragraph was used by Markman and Gorin, 1981)

Table 4

Easy Version

Koalas

Koalas are fuzzy little animals that look a bit like bears. They will sleep only high up on the tops of trees. They sleep on the ground in the cool soft grass. Most Koalas are found in Australia. In Australia, we would find that they sleep all day long.

The favorite foods of Koalas are the leaves of eucalyptus, or gum, trees. They like the tender, light green shoots that grow on the top of the branches. Koalas only eat the tough, outer leaves that grow on the bottom of the branches. The Koalas move from tree to tree looking for food. Koalas sniff each leaf before eating it.

Koalas look like bears, but they are actually a kind of animal called a marsupial. Many furry animals live in Australia, and most of them are marsupials. Koalas are the only marsupials that live in Australia. A female marsupial has a special pouch on her belly where she carries and feeds her baby. The baby koala remains in the pouch for about seven months. We often see Koalas in pictures of Australia showing places you can visit for vacations.

Table 5

Hard Version

Clouds

Clouds are really drops of water floating in the sky. Clouds are made when warm air with lots of water in it hits cold air. Some clouds are big, white, and fluffy like cotton, and other clouds cover the sky in a dark, thick blanket. Clouds are one thing that makes the sky look pretty. No one is sure when clouds are made.

Clouds play an important part in the earth's weather. A person that studies the weather looks carefully at clouds because certain kinds often show up before storms. Many times low thick clouds bring rain or snow, while thin clouds cause ice to fall from the sky. Clouds that form a high, dark tower usually bring a thunderstorm. People that study the weather usually do not pay attention to different clouds.

Clouds are always changing their size and shape. Anyone can form a cloud by blowing out air from their mouth on a cold day. Parts of clouds can disappear when the air that touches them is warmer than the cloud. Cloud shapes also change by the wind and air movements. People can not make clouds by themselves. The next time it rains or snows, think about the clouds that are causing it.

Table 6

Easy Version

Clouds

Clouds are really drops of water floating in the sky. Clouds are made when warm air with lots of water in it hits cold air. No one is sure when clouds are made. Some clouds are big, white, and fluffy like cotton, and other clouds cover the sky in a dark, thick blanket. Clouds are one thing that makes the sky look pretty.

Clouds play an important part in the earth's weather. A person that studies the weather looks carefully at clouds because certain kinds often show up before storms. People that study the weather usually do not pay attention to different clouds. Many times low thick clouds bring rain or snow, while thin clouds cause ice to fall from the sky. Clouds that form a high, dark tower usually bring a thunderstorm.

Clouds are always changing their size and shape. Anyone can form a cloud by blowing out air from their mouth on a cold day. People can not make clouds by themselves. Parts of clouds can disappear when the air that touches them is warmer than the cloud. Cloud shapes also change by the wind and air movements. The next time it rains or snows, think about the clouds that are causing it.

Table 7

Mean Values for Correct and Incorrect Hand Raises

Correct Hand Raises				
	Easy	Hard	Distractor	X
<u>LD</u>				
Explicit	1.83 (.94)	2.25 (1.14)	1.17 (.83)	1.75 (1.05)
General	1.33 (.98)	1.75 (1.05)	1.50 (1.00)	1.52 (1.00)
X	1.58 (.97)	2.00 (1.10)	1.33 (.92)	1.64 (1.03)
<u>NLD</u>				
Explicit	1.58 (1.16)	2.08 (1.16)	1.83 (1.27)	1.83 (1.18)
General	.75 (.87)	1.25 (1.06)	1.08 (.90)	1.03 (.94)
X	1.17 (1.09)	1.67 (1.17)	1.45 (1.14)	1.43 (1.14)
<u>Overall</u>				
Explicit	1.71 (1.04)	2.17 (1.13)	1.50 (1.10)	1.79 (1.11)
General	1.04 (.95)	1.50 (1.16)	1.29 (.95)	1.28 (1.00)
X	1.38 (1.04)	1.83 (1.14)	1.40 (1.03)	

Incorrect Hand Raises				
	Easy	Hard	Distractor	X
<u>LD</u>				
Explicit	2.25 (2.30)	3.08 (2.27)	2.08 (2.02)	2.47 (2.18)
General	1.67 (2.64)	1.83 (2.04)	1.58 (1.51)	1.69 (2.05)
X	1.95 (2.44)	2.45 (2.21)	1.83 (1.76)	2.08 (2.14)
<u>NLD</u>				
Explicit	1.75 (1.82)	1.50 (1.51)	1.50 (1.62)	1.58 (1.61)
General	1.75 (1.86)	1.92 (1.88)	1.92 (2.20)	1.86 (1.87)
X	1.75 (1.80)	1.71 (1.68)	1.71 (1.81)	1.72 (1.74)
<u>Overall</u>				
Explicit	2.00 (2.04)	2.29 (2.05)	1.79 (1.82)	2.02 (1.96)
General	1.71 (2.24)	1.88 (1.92)	1.75 (1.75)	1.78 (1.95)
X	1.85 (2.12)	2.08 (1.98)	1.77 (1.77)	

Standard Deviation in Parentheses

Table 8
Mean Values for the D-prime Scores

	Easy	Hard	Distractor	X
<u>LD</u>				
Explicit	2.28 (1.45)	2.81 (1.54)	1.99 (1.34)	2.36 (1.45)
General	2.24 (2.06)	2.50 (1.39)	2.83 (1.73)	2.53 (1.72)
X	2.26 (1.74)	2.65 (1.44)	2.41 (1.58)	2.44 (1.58)
<u>NLD</u>				
Explicit	2.22 (1.57)	2.82 (2.00)	2.82 (2.14)	2.62 (1.89)
General	1.82 (1.51)	1.06 (1.00)	1.45 (1.30)	1.44 (1.29)
X	2.02 (1.52)	1.94 (1.79)	2.14 (1.87)	2.03 (1.71)
<u>Overall</u>				
Explicit	2.25 (1.48)	2.81 (1.75)	2.40 (1.80)	2.49 (1.67)
General	2.03 (1.78)	1.78 (1.40)	2.15 (1.66)	1.99 (1.60)
X	2.14 (1.62)	2.30 (1.65)	2.28 (1.71)	

• Standard Deviation in Parentheses

Table 9

Mean Values for the Total Number of Sentences Recalled

	Easy	Hard	Distractor	X
<u>LD</u>				
Explicit	3.75 (2.05)	3.83 (2.12)	3.75 (2.76)	3.78 (1.23)
General	3.58 (1.88)	3.58 (1.24)	3.67 (1.44)	3.61 (1.50)
X	3.67 (1.93)	3.71 (1.71)	3.71 (2.10)	3.70 (1.89)
<u>NLD</u>				
Explicit	4.50 (2.50)	4.33 (2.10)	4.92 (2.19)	4.58 (2.22)
General	4.00 (1.76)	3.50 (1.73)	3.50 (2.07)	3.67 (1.82)
X	4.25 (2.13)	3.92 (1.93)	4.21 (2.21)	4.13 (2.07)
<u>Overall</u>				
Explicit	4.13 (2.27)	4.08 (2.08)	4.33 (2.46)	4.18 (2.25)
General	3.79 (1.79)	3.54 (1.47)	3.58 (1.74)	3.64 (1.66)
X	3.96 (2.03)	3.81 (1.81)	3.96 (2.14)	

Standard Deviation in Parentheses

Table 10

Mean Values for the Number of Topic, Premise, and Contradictory Sentences Recalled

	Premise	Contradictory	Topic	X
<hr/>				
<u>Explicit</u>				
Easy	.79 (.83)	.54 (.78)	.75 (.68)	.69 (.76)
Hard	.91 (.93)	.21 (.51)	.83 (.82)	.65 (.83)
Distractor	1.13 (.95)	.63 (.82)	.96 (1.04)	.90 (.98)
X	.94 (.90)	.46 (.77)	.85 (.85)	.75 (.86)
<u>General</u>				
Easy	.83 (.96)	.38 (.58)	.63 (.82)	.61 (.81)
Hard	.83 (.70)	.21 (.41)	1.00 (.88)	.68 (.77)
Distractor	.67 (.82)	.42 (.58)	.46 (.59)	.51 (.67)
X	.78 (.83)	.33 (.53)	.70 (.80)	.60 (.75)
<u>Overall</u>				
Easy	.81 (.89)	.46 (.68)	.69 (.75)	.65 (.79)
Hard	.88 (.82)	.21 (.46)	.92 (.85)	.67 (.79)
Distractor	.90 (.90)	.52 (.77)	.71 (.87)	.71 (.86)
X	.86 (.87)	.40 (.66)	.77 (.83)	
<hr/>				
	Premise	Contradictory	Topic	X
<u>LD</u>				
Explicit	.75 (.73)	.47 (.81)	.78 (.83)	.67 (.80)
General	.86 (.96)	.22 (.42)	.64 (.76)	.57 (.79)
X	.81 (.85)	.35 (.65)	.71 (.80)	.62 (.79)
<u>NLD</u>				
Explicit	1.14 (1.02)	.44 (.73)	.92 (.87)	.83 (.80)
General	.70 (.67)	.44 (.61)	.75 (.84)	.63 (.72)
X	.92 (.88)	.44 (.67)	.83 (.86)	.73 (.83)
<u>Overall</u>				
Explicit	.94 (.90)	.46 (.77)	.85 (.85)	.75 (.86)
General	.78 (.83)	.33 (.53)	.69 (.80)	.60 (.75)
X	.86 (.87)	.40 (.66)	.77 (.83)	
<hr/>				

Standard Deviation in Parentheses

Table 11

Mean Values for Modified Ratio of Repetition (Clustering) --

Percentage Score

	Corn	Koalas	Clouds	X
<u>LD</u>				
Explicit	18.83 (29.88)	33.83 (28.27)	41.00 (29.65)	31.22 (29.93)
General	30.83 (21.46)	33.83 (28.99)	25.00 (28.05)	29.89 (25.88)
X	24.83 (26.17)	33.83 (28.00)	33.00 (29.39)	30.56 (27.79)
<u>NLD</u>				
Explicit	42.42 (33.23)	39.67 (10.21)	25.33 (25.90)	35.81 (25.46)
General	29.75 (34.34)	36.92 (32.01)	34.75 (35.35)	33.81 (33.09)
X	36.08 (33.76)	38.29 (23.28)	30.04 (30.69)	34.81 (29.33)
<u>Overall</u>				
Explicit	30.63 (33.17)	36.75 (21.00)	33.17 (28.38)	33.52 (27.69)
General	30.29 (28.01)	35.38 (29.91)	29.88 (31.61)	31.85 (29.56)
X	30.46 (30.37)	36.06 (25.57)	31.52 (29.76)	

Standard Deviation in Parentheses

Table 12

Mean Values for Spontaneous Recall of Inconsistencies

	Easy	Hard	Distractor	X
<u>LD</u>				
Explicit	.50 (.80)	1.00 (.74)	.50 (.90)	.67 (.83)
General	.17 (.39)	.50 (.67)	.25 (.62)	.31 (.58)
X	.33 (.64)	.75 (.74)	.38 (.77)	.49 (.73)
<u>NLD</u>				
Explicit	.75 (1.06)	1.00 (1.13)	.83 (.83)	.86 (.99)
General	.25 (.45)	.42 (.51)	.33 (.50)	.33 (.48)
X	.50 (.83)	.71 (.91)	.58 (.72)	.60 (.82)
<u>Overall</u>				
Explicit	.63 (.92)	1.00 (.93)	.67 (.87)	.76 (.91)
General	.21 (.41)	.45 (.59)	.29 (.55)	.32 (.53)
X	.41 (.74)	.73 (.82)	.48 (.74)	

Standard Deviation in Parentheses

Table 13

Mean Values for Probability of Recalling an Inconsistency
Given Recall of a Premise or Contradictory Sentence

	Premise Alone	Contradictory Alone	Either Premise or Contradictory
<u>LD</u>			
Easy	.1458 (.3451)	.8330 (.2823)	.1458 (.3451)
Hard	.3125 (.4377)	.8330 (.2823)	.3125 (.4377)
Distractor	.1875 (.3555)	.1387 (.3392)	.1529 (.3222)
x	.2153 (.3830)	.1018 (.2994)	.2038 (.3745)
<u>NLD</u>			
Easy	.1250 (.3040)	.1875 (.3848)	.2083 (.3878)
Hard	.3404 (.4624)	.8330 (.2823)	.3404 (.4624)
Distractor	.2850 (.4272)	.2500 (.4423)	.3058 (.4250)
x	.2501 (.4884)	.1597 (.3768)	.2849 (.4238)
<u>Overall</u>			
Easy	.1354 (.3219)	.1354 (.3380)	.1771 (.3645)
Hard	.3265 (.4456)	.8330 (.2793)	.3265 (.4456)
Distractor	.2363 (.3920)	.1948 (.3940)	.2294 (.3810)
x	.2327 (.3949)	.1377 (.3410)	.2443 (.4006)

Standard Deviation in Parentheses

Table 14
 Mean Values of Latencies (Milliseconds) Compared for Topic,
 Premise, and Contradictory Sentences

	Premise	Contradictory	Topic	X
<u>LD</u>				
Explicit	856.94 (686.61)	846.64 (394.70)	1055.31 (648.89)	919.63 (593.47)
General	784.06 (618.62)	840.67 (461.07)	747.14 (430.55)	790.62 (506.80)
X	820.50 (649.92)	843.65 (426.15)	901.22 (568.35)	855.13 (544.34)
<u>NLD</u>				
Explicit	858.06 (801.04)	727.45 (589.97)	641.09 (495.50)	742.20 (641.39)
General	746.61 (639.38)	707.70 (598.48)	768.85 (533.13)	741.05 (586.43)
X	802.33 (721.33)	717.58 (589.73)	704.97 (514.73)	741.63 (612.96)
<u>Overall</u>				
Explicit	857.48 (737.98)	789.64 (497.57)	857.20 (612.95)	834.77 (621.73)
General	766.14 (624.26)	777.07 (531.46)	757.52 (478.84)	766.91 (545.55)
X	811.81 (682.53)	783.36 (512.95)	807.36 (550.26)	

Standard Deviation in Parentheses

References

- Baker, L. (1979). Comprehension monitoring: identifying and coping with text confusions. Journal of Reading Behavior, 11, 365-373.
- Baker, L. (1982). An evaluation of the role of metacognitive deficits in learning disabilities. Topics in Learning & Learning Disabilities, 27-35.
- Baker L. (1984a). Children's effective use of multiple standards for evaluating their comprehension. Journal of Educational Psychology, 76, 588-597.
- Baker, L. (1984b). Spontaneous versus instructed use of multiple standards for evaluating comprehension: effects of age, reading proficiency, and type of standard. Journal of Experimental Child Psychology, 38, 289-311.
- Baker, L. (1985). How do we know when we don't understand? Standards for evaluating text comprehension. In (Ed.), Metacognition, Cognition, and Human Performance, vol.1, (pp. 155-205). New York: Academic Press.
- Baker, L., & Anderson, R. I. (1982). Effects of inconsistent information on text processing: evidence for comprehension monitoring. Reading Research Quarterly, 2, 281-293.
- Bos, C.S., & Filip, D. (1984). Comprehension monitoring in learning disabled and average students. Journal of Learning Disabilities, 17, 229-233.

- Bower, J. D., Lesgold, A. M., & Tieman, D. (1969). Grouping operations in free recall of randomly arranged associates. Journal of Verbal Learning and Verbal Behavior, 8, 481-493.
- Britton, B. K., Westbrook, R. D., & Holdredge, T. S. (1978). Reading and cognitive capacity usage: effects of text difficulty. Journal of Experimental Psychology, 4, 582-591.
- Flavell, J. H. (1970). Developmental studies of mediated memory. In Reese, H. W., & Lipsitt, L. P. (Eds.), Advances in Child Development and Behavior (vol 5) (pp.182-213). New York: Academic Press.
- Flavell, J. H., Speer, J. R., Green, F. L., & August, D. L. (1981). The development of comprehension monitoring and knowledge about communication. Monographs of the Society for Research in Child Development, 46(5, Serial No. 192).
- Gambrell, L. B., & Bales, R. J. (1986). Mental imagery and the comprehension-monitoring performance of fourth- and fifth-grade poor readers. Reading Research Quarterly, 21, 454-464.
- Idol-Maestas, L. (1985). Getting ready to read: guided probing for poor comprehenders. Learning Disability Quarterly, 8, 243-254,
- Kerr, B. (1973). Processing demands during mental operations. Memory & Cognition, 1, 401-412.
- Kotsonis, M. E., & Patterson, C. J. (1980). Comprehension monitoring skills in learning-disabled children. Developmental Psychology, 16, 541-542.

- Markman, E. M. (1979). Realizing that you don't understand: elementary school children's awareness of inconsistencies. Child Development, 50, 643-655.
- Markman, E. M., & Gorin L. (1981). Children's ability to adjust their standards for evaluating comprehension. Journal of Educational Psychology, 73, 320-325.
- McKinney, J. D., & Feagans, L. (1984). Academic and behavioral characteristics of learning disabled children and average achievers: longitudinal studies. Learning Disability Quarterly, 7, 251-265.
- Oka, E. R., & Paris, S. G. (1986). Patterns of motivation and reading skills in underachieving children. In S. J. Ceci (Ed.), Handbook of cognitive, social and neuropsychological aspects of learning disabilities. Hillsdale, N.J.: Erlbaum.
- Paris, S. G., & Jacobs, J. E. (1984). The benefits of informed instruction for children's reading awareness and comprehension skills. Child Development, 55, 2083-2093.
- Paris, S. G., & Myers, M. (1981). Comprehension monitoring, memory, and study strategies of good and poor readers. Journal of Reading Behavior, 13, 5-22.
- Reis, R., & Spekman, J. (1983). The detection of reader-based versus text-based inconsistencies and the effects of direct training of comprehension monitoring among upper-grade poor comprehenders. Journal of Reading Behavior, 15, 49-60.

- Siegel, L. S., & Heaven, R. K. (1986). Categorization of Learning Disabilities. In S. J. Ceci (Ed.), Handbook of Cognitive, Social, and Neuropsychological Aspects of Learning Disabilities, (pp. 95-122). Hillsdale, N. J.: Erlbaum.
- Siegler, R. S. (1986). Children's Thinking, New. Jersey: Prentice-Hall.
- Spear, L. C., & Sternberg, R. J. (1986). An information processing framework for understanding reading disability. In S. J. Ceci (Ed.), Handbook of Cognitive, Social, and Neuropsychological Aspects of Learning Disabilities (pp. 3-32). Hillsdale, N. J.: Erlbaum.
- Torgesen, J. K. (1980). Conceptual and educational implications of the use of efficient task strategies by learning disabled children. Journal of Learning Disabilities, 13, 364-371.
- Wong, B. Y. L. (1979). Increasing retention of main ideas through questioning strategies. Learning Disability Quarterly, 2, 42-47.
- Wong, B. Y. L. (1980). Activating the inactive learner: use of question/prompts to enhance comprehension and retention of implied information in learning disabled children. Learning Disability Quarterly, 3, 29-37.
- Zabucky, K., & Ratner, H. H. (1986). Children's comprehension monitoring and recall of inconsistent stories. Child Development, 57, 1401-1418.

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