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ABSTRACT

A study examined the effects of instruction versus no instruction of comprehension monitoring strategies and the effects of direct instruction of a written or checksheet comprehension monitoring strategy on the metacognitive awareness and reading achievement of students. Subjects, 57 fifth-grade and 51 third-grade students from 6 intact classrooms enrolled in 4 city schools in an Indiana community, were randomly assigned to either the written strategy, the checksheet strategy, or the control. One experimental group was taught the K-W-L comprehension monitoring strategy, and the other experimental group was taught the Predicting/Evaluating comprehension monitoring strategy. Metacognitive awareness and reading achievement were measured using separate evaluation instruments. Results indicated that metacognitive awareness may be a late-developing process that is not sensitive to type of strategy taught and difficult to accurately assess with a current informal assessment measure. Reading achievement was not affected by comprehension monitoring instruction. (Six tables, a figure of data, a K-W-L strategy sheet, and a Predicting/Evaluating checksheet are included.) (Contains 28 references.) (Author/RS)

# Effects of Two Comprehension Monitoring Strategies on the Metacognitive Awareness and Reading Achievement of Third and Fifth Grade Students

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**Abstract**

Although numerous studies have been done to examine metacognition in reading comprehension, and multiple comprehension monitoring strategies have been used, no comparison between or among different types of comprehension monitoring strategies has been done. This study looked at the effects of instruction versus no instruction of comprehension monitoring strategies on the metacognitive awareness and reading achievement of third and fifth grade students. In an attempt to take the research one step further, this study also examined the effects of direct instruction of a written or checksheet comprehension monitoring strategy on the metacognitive awareness and reading achievement of the same students. Data indicated that metacognitive awareness may be a late developing process that is not sensitive to type of strategy taught, and difficult to accurately assess with a current informal assessment measure. Reading achievement was not affected by comprehension monitoring instruction.

# EFFECTS OF TWO COMPREHENSION MONITORING STRATEGIES ON THE METACOGNITIVE AWARENESS AND READING ACHIEVEMENT OF THIRD AND FIFTH GRADE STUDENTS

Reading is currently viewed as an active process where the reader interacts with print clues to construct text meaning. Knowledge possessed by the reader, information from the text, and the contextual situation act together to produce comprehension (Anderson et al., 1985; Dewitz, Carr, & Patberg, 1987; Paris, Oka, & DeBritto, 1983; Valencia & Pearson, 1987). As the definition of reading changed from one of mastery of isolated subskills to one of an integrated process for understanding of text, a reader's metacognition has been emphasized. Brown (1980) defined metacognition as the deliberate conscious control of one's own cognitive actions. "In reading, metacognition means being aware of what one's purpose for reading is, how to proceed in achieving this purpose, and how to regulate progress through self-checking of comprehension" (McNeil, 1987). Applying metacognition to reading occurs when a reader detects failure of comprehension processing and uses appropriate reading strategies to facilitate

understanding. Thus, awareness of behavior during reading, and techniques used to monitor and regulate reading are metacognitive strategies used during reading comprehension.

In the last decade, researchers' attention has focused on metacognitive awareness and comprehension monitoring during the reading process. Conclusions from multiple studies include the generalization that older and skilled readers demonstrate more metacognitive awareness and use of comprehension monitoring during reading than younger and less skilled readers (Baker & Brown, 1984; Palincsar & Ranson, 1988; Paris, Oka, & DeBritto, 1983). This generalization has resulted in researchers suggesting that students " ... need to be taught comprehension monitoring strategies to use when comprehension fails and text does not make sense" (Wham, 1987). Research evaluating metacognitive strategy instruction suggests that students can be taught when and how to use comprehension monitoring strategies through explicit instruction (Palincsar, 1986; Paris & Oka, 1986; Pearson & Dole, 1987; Pearson & Gallagher, 1983; Weinstein & Roberts, 1985; Wham, 1987). Results from studies by Paris, Cross, and Lipson (1984), Paris and

Jacobs (1984), Paris and Oka (1986), and Jacobs and Paris (1987) have concluded that direct instruction of comprehension monitoring strategies increases metacognitive awareness with older readers outperforming younger readers and females outperforming males.

These studies used a forced-choice instrument called the Index of Reading Awareness (IRA) to measure metacognitive awareness (Paris, Cross, & Lipson, 1984; Paris & Oka, 1986; Jacobs & Paris, 1987). Jacobs and Paris (1987) stated that the 20-item IRA indicated reading awareness in the areas of evaluation, planning, regulation, and conditional knowledge. They also stated that the IRA was designed to meet four criteria: (a) it was objective; (b) it was based on empirical research of children's responses to metacognitive questions and accurately reflected knowledge about reading strategies; (c) it was easy to administer and score; and, (d) it was designed to be sensitive to individual and age related differences in awareness about reading. However, there were several unanswered questions concerning the reliability and validity of the IRA. Jacobs and Paris (1987) failed to report the internal consistency reliability of the scale. A study

by Mayer-McLain, Gridley, and McIntosh (1991) using a subject pool of 145 third, fourth, and fifth graders attempted to examine the psychometic properties of the Index of Reading Awareness (IRA). Cronbach alphas were calculated for the total score of the IRA and for the four subscales: evaluation, planning, regulation, and conditional knowledge. Using an item analysis procedure, total score internal consistency reliability was .61. Reliabilities of the four subscales ranged from .15 to .32. Without a doubt the scale should never be divided into the four subscales as suggested by Jacobs and Paris (1987). Use of the instrument as a total score lends itself to more reliability. Since the constructs of metacognitive awareness are somewhat questionable, a total internal consistency reliability of .61 is at least acceptable.

These same studies used a standardized comprehension subtest to measure reading achievement. The interventions failed to improve reading achievement scores for any subjects when using these product type standardized achievement measures of comprehension (Paris, Cross, & Lipson, 1984; Jacobs & Paris, 1987).

Although research indicates that readers should have a repertoire of strategies from which to select,

studies have not been done to look at the effectiveness of different types of strategies with different population samples. Questions such as "Will a written comprehension monitoring strategy be more effective than a checksheet strategy in increasing metacognitive awareness in reading comprehension for third graders?" or "Will a checksheet strategy be just as effective as a written comprehension strategy in increasing metacognitive awareness in reading comprehension for fifth graders?" have not been asked. A need for the comparison among or between specific strategies exists as such knowledge could be used by classroom teachers to design a more effective reading program. This study examined strategy versus no strategy instruction on the metacognitive awareness and reading achievement of third and fifth grade students. It also examined the effects of direct instruction of a written or checksheet comprehension monitoring strategy on the metacognitive awareness and reading achievement of third and fifth grade students. Although numerous studies have been done to examine metacognition in reading comprehension, and multiple comprehension monitoring strategies have been used, no comparison between or among different types of strategies has been

done. Perhaps different types of strategies produce different results. The following questions were asked: (a) Will students who receive instruction and practice in a comprehension monitoring strategy increase their metacognitive awareness and reading achievement more than students who do not receive instruction and practice in a comprehension monitoring strategy, and will the differences between the groups vary with grade level and gender, and (b) Will students who receive instruction and practice using a written comprehension monitoring strategy increase their metacognitive awareness and reading achievement more than students who receive instruction and practice using a checksheet comprehension monitoring strategy, and will the differences between the groups vary with grade level and gender?

## METHOD/SUBJECTS

Subjects were 57 fifth grade students and 51 third grade students from six intact classrooms enrolled in four city schools in an Indiana community. Treatment (written strategy, checksheet strategy, control) was randomly assigned to the three fifth and three third grade classrooms. Table 1 reports (by treatment, grade, and gender) the distribution of the sample

utilized. Three schools housed the experimental groups; the fourth, the control group. School A served 344 students and housed the fifth grade Predicting/Evaluating experimental group. School B served 379 students and housed the third grade Predicting/Evaluating experimental group. School C served 344 students and housed the third and fifth grade K-W-L experimental groups. School D served 272 students and housed the third and fifth grade control groups. All school represented a range of demographic and socioeconomic characteristics as determined by interviews with the principals. The classes within each school represented a heterogeneous group of students as identified by the same interview. Using four schools eliminated criterion interference and also allowed for voluntary teacher participation.

## Procedures

### Strategies

**The K-W-L Comprehension Monitoring Strategy.** One experimental group (one fifth and one third grade) was taught the K-W-L comprehension monitoring strategy while reading the assigned expository text using whole class instruction during the 30 minute scheduled time.

On Monday, the teachers introduced and modeled the strategy using the assigned story in the text. The students brainstormed what they knew about the topic while the teacher listed their ideas on the chalkboard. Then they grouped their suggestions into similar categories. The students then recorded the results on their strategy sheet under K-What I Know. (See Figure 1.) Next, the students suggested what they would like to learn from their reading and listed those suggestions under W-What Do I Want to Learn. Finally, after reading the text, the students listed L-What They Learned During Reading. On Wednesday and Friday of week one, and Monday, Wednesday, and Friday of week two, the teachers followed a similar format using a new story in the text each day.

On Tuesday of week three, the teacher assigned the next story. The students worked through the three steps of the strategy independently. The teacher observed and answered all questions while the students worked. After reading and completion of step three, the teacher and students discussed the strategy sheet. Thursday of week three, and Tuesday and Thursday of week four followed a similar format. If the students were having difficulty applying the strategy, the

teacher prompted them by either asking a question or making a suggestion. During these last two weeks, the teacher released responsibility for using the strategy to the students.

**Predicting/Evaluating Comprehension Monitoring Strategy**

The other experimental group (one fifth and one third grade) was taught the Predicting/Evaluating comprehension monitoring strategy while reading the assigned expository text using whole class instruction during the 30-minute scheduled time. On Monday, the teachers introduced the strategy using the assigned story in the text. Prior to reading, the teacher and students read the four questions in the What I Predict Will Happen section of the checksheet (See Figure 2.) They orally discussed and checked off each statement as they completed it. After reading the text, the teacher and students completed section two, Assessing My Predictions of the checksheet. On Wednesday and Friday of week one, and Monday, Wednesday, and Friday of week two, the teachers followed a similar format using a new story in the text each day.

On Tuesday of week three, the teacher assigned the next story. The students worked through the What I

Predict Will Happen section independently prior to reading the assigned text. After reading, the students worked through the Assessing My Prediction/Predictions section independently. After completion of part two, the teacher and students discussed the checksheet. Thursday of week three, and Tuesday and Thursday of week four followed a similar format. If the students were having difficulty applying the strategy, the teacher prompted them by either asking a question or making a suggestion. During these last two weeks, the teacher released responsibility for using the strategy to the students.

### Control Group Reading

The control group students read the expository text during sustained silent reading. No instruction in comprehension monitoring strategies occurred prior to reading in the expository text.

### Assigned Expository Text and Staff Development Sessions

All subjects in the study read the same stories from identical text in an assigned sequence. The researcher met with the teachers in the experimental groups to teach and model the strategies. Information sheets were distributed which outlined day-by-day

teaching procedures. The researcher met with the control group teachers to distribute instruction sheets for day-by-day story reading in the expository text. During the study, the researcher visited the schools at least twice a week to verify use of assigned procedures.

**Instruments**

The Index of Reading Awareness (IRA) (Jacobs & Paris, 1987) was used as the covariate and measure of the dependent variable, metacognitive awareness. The instrument was designed to measure four aspects of metacognition: evaluation, planning, regulation, and conditional knowledge. The IRA questions assess "children's knowledge about reading and their abilities to evaluate tasks, goals, and personal skills; to plan ahead for specific purposes; to monitor progress while reading; and to recruit fix-up strategies as needed" (Jacobs & Paris, 1987, p. 268).

Fifteen of the questions were devised by Paris and Jacobs (1984). The last five questions which measure conditional knowledge were devised and added later by Jacobs and Paris (1987). Each question has three alternative responses. The inappropriate response

receives zero points, the partially adequate answer, one point, and the strategic response, two points.

The comprehension subtests (forms K & L) of the Gates-MacGinitie Reading Tests third edition (1989) were used as the covariate and measure of the dependent variable, reading achievement. These comprehension subtests are product tests and were used in this research to replicate the Paris, Cross, and Lipson (1984), Paris and Jacobs (1984), Paris and Oka (1986), and Jacobs and Paris (1987) studies.

## RESULTS

Since metacognitive awareness was measured using a process test and reading achievement was measured using a product test, two separate 3 (treatment: K-W-L, Predicting/Evaluating, Control) X 2 (third grade, fifth grade) X 2 (gender) analyses of covariance were used to address the two research questions dealing with planned orthagonal comparisons. These planned comparisons first looked at using a strategy versus no strategy, and second between two different types of strategies. A hierarchical interpretation of the relationship between the dependent variables and the various effects was conducted for each research question.

### Metacognitive Awareness (Index of Reading Awareness)

Table 2 presents the pretest, posttest, and adjusted posttest means for the two experimental groups compared to the control group. The ANCOVA three-way interaction among treatment, grade, and gender for strategy versus no strategy was significant. Because the effect of treatment depended not only on grade level but also gender ($F[1,99] = 5.27$, $p = .024$), the interaction was clarified by examining adjusted cell means. Table 3 reports the adjusted cell means of the combined experimental groups and the control group by grade level and gender. Figure 3 graphically displays the adjusted cell means of the combined experimental groups and the control group by grade level and gender. To explain the variability in the three way interaction, simple effects analyses were performed on the adjusted cell means between the experimental and control groups holding grade level and gender constant. Results indicated third grade males in the strategy groups were significantly different from third grade males in the no strategy group ($F[1,99] = 15.99$, $p = .0001$) with third grade males in the no strategy group outperforming third grade males in the strategy groups.

Table 4 presents the pre-test, posttest, and adjusted posttest means for the comparison between the

two experimental groups. The main effect for both grade level ($F[1,64] = 4.64$, $p = .035$) and gender ($F[1,64] = 4.27$, $p = .043$) was significant for the difference between the two strategies. Fifth graders ($x = 27.6$) outperformed third graders ($x = 25.94$) regardless of gender and regardless of strategy taught. It was also concluded that females ($x = 27.6$) outperformed males ($x = 25.94$) regardless of grade level and regardless of strategy taught.

**Reading Achievement (Comprehension Subtest of the Gates MacGinitie Reading Tests)**

Table 5 presents the pretest, posttest, and adjusted posttest means for the two experimental groups compared to the control group. The ANCOVA showed no significant differences between third and fifth grade males and females in the strategy versus no strategy analyses ($p<.05$). Table 6 presents the pretest, posttest, and adjusted posttest means for the comparison between the two experimental groups. In the ANCOVA analyses of the differences between two strategies, the main effect of grade level was significant ($F[1,64] = 5.35$, $p = .024$). Third graders ($x = 44.8$) outperformed fifth graders ($x = 37.13$) regardless of gender and regardless of strategy taught.

## DISCUSSION

Numerous researchers have found that metacognitive awareness could be improved by direct instruction in comprehension monitoring strategies (Jacobs & Paris, 1987; Paris, Cross, & Lipson, 1984; Paris & Jacobs, 1984; Paris & Oka, 1986). Jacobs and Paris (1987), using the Index of Reading Awareness (IRA), found that fifth graders scored higher than third graders and females scored significantly higher than males when instructed in comprehension monitoring strategies. The results from this study were not supportive of these differences. Simple effects analyses to interpret the three-way interaction lead to the conclusion that third grade males in the no strategy instruction group actually outperformed third grade males in the strategy instruction groups. Several explanations are possible. First, the IRA may not measure what it is Jacobs and Paris had hoped it would measure. When Jacobs and Paris utilized the IRA in multiple studies, they used instructional programs designed to reflect items on it. Naturally, students would improve in performance. In this study, no specific instruction to "teach the test" took place. Therefore, unpredictable results occurred. Perhaps the IRA lacks enough internal consistency (.61)

to make it a reliable measurement of metacognition. A second possibility is that metacognition is such a "gray area" construct that consistent measurement is impossible. If metacognitive awareness is a developmental process then it comes as no surprise that Jacobs and Paris found fifth graders outperforming third graders and females outperforming males. Going one step further, with an internal consistency reliability of only .61 and metacognitive awareness a difficult construct to measure, perhaps the IRA is not sensitive enough to measure beginning developmental differences due to instruction. Maybe the instrument only measures later development due to instructional procedures and maybe only then when instruction is specific to the test.

Various researchers have examined the effectiveness of written comprehension monitoring strategies (Carr & Ogle, 1987; Heller, 1986; Ogle, 1986) and the effectiveness of checksheet comprehension monitoring strategies (Preul & Dewitz, 1986; Smith & Vanbiervliet, 1986; Wong & Jones, 1982) on metacognitive awareness. Results indicated that instruction in both written and checksheet strategies increased metacognitive awareness. Studies have not

been done to compare the effectiveness of the two types of strategies. In this study, no differences between the effect of strategy were found. However, females outperformed males and fifth graders outperformed third graders in metacognitive awareness regardless of type of strategy taught. Again, this is not surprising. Metacognitive awareness is a part of comprehension monitoring, and research in this area indicates that comprehension monitoring usually increases with reading experience and age. Also, if the IRA is only sensitive to the later developmental differences, then this result seems logical.

Various researchers have had mixed results when measuring students' reading achievement performance on a normed, standardized test after instruction and practice in comprehension monitoring strategies (Jacobs & Paris, 1987; Paris, Cross, & Lipson, 1984; Paris & Jacobs, 1984; Paris & Oka, 1986). Paris and Jacobs (1984) reported a positive relationship between awareness and comprehension for all subjects with fifth graders outperforming third graders. Subjects' levels of awareness were highly related to reading achievement as measured by the Gates-MacGinitie Reading Tests. Paris, Cross, and Lipson (1984) found that performance

scores on the Gates-MacGinitie Reading Tests were comparable for students who received instruction and practice in comprehension monitoring strategies and those who did not. This study, using the same normed, standardized test, suggested similar results. Third and fifth graders and males and females performed equally well in reading achievement whether or not they received instruction and practice using a comprehension monitoring strategy. Comprehension subtests of standardized tests such as the Gates-MacGinitie measure overall comprehension. Metacognitive awareness is only one small portion of the entire picture. As a result, standardized tests appear to be insensitive to any kind of metacognitive training. Only relationships between metacognitive awareness and reading achievement are mentionable. Another explanation of the above result is possible. The Gates-MacGinitie is a product test where comprehension is measured by students selecting answers to forced-choice questions after reading a short three to four line paragraph. The reading process, of which metacognitive awareness is a part, may not be addressed. Prior knowledge is not assessed, no purpose for reading is given, and lengthy paragraphs with predictable story structure are missing. It is

not surprising that such instruments do not measure metacognitive awareness when it is debatable as to whether their format even allows for measurement of comprehension in the reading process.

The unpredicted result occurred in this study when third graders outperformed fifth graders in reading achievement on the standardized subtest regardless of gender and strategy taught. The reason for the discrepancy is unknown, but one explanation is possible. Fifth graders lack of prior knowledge of content areas covered in the posttest may have contributed to the finding. While administering the posttest to the fifth grade classrooms, many students questioned the content of the test. Since many paragraphs were short with no predictable story structure and lack of background building, the students were very uncomfortable answering passage dependent questions about unfamiliar content areas. Their frustration was apparent during the testing situation. Third graders did not have this problem. This situation reinforces researchers conclusions that standardized tests fail to measure comprehension in reading because they do not develop prior knowledge allowing students

to connect reading on the test with what they already know (Valencia & Pearson, 1987).

## IMPLICATIONS

Since comprehension is the goal of all reading, and because it has been shown that awareness of metacognition is characteristic of good comprehenders (Paris & Jacobs, 1984; Schmitt, 1988), the effect of teaching comprehension monitoring strategies to students to increase comprehension, metacognitive awareness, and reading achievement will continue to be a major question of reading process research. From this study, the effect of teaching comprehension strategies on metacognitive awareness and reading achievement is questionable. The results do have several implications for future research. First, some subjects who read text without strategy instruction outperformed those who read the same text and received strategy instruction. A question asked by other researchers comes to mind: Does strategy instruction teach students to be better readers or just to be better at using strategies (Pearson & Dole, 1987; Rosenshine, 1980)? In this study strategy instruction did not teach students to be better, more metacognitively aware readers as measured by the Index

of Reading Awareness.

Second, females outperformed males and fifth graders outperformed third graders in metacognitive awareness regardless of strategy taught. This may confirm some researchers suggestions that metacognition is a late developing skill (Baker & Brown, 1984). If so, should teachers teach comprehension monitoring strategies to early readers to develop metacognitive awareness or will the awareness actually develop as students get older and continue to read?

Third, additional research needs to be done looking at the effectiveness between or among different comprehension monitoring strategies. If strategy instruction does increase comprehension and metacognitive awareness, then this could be important information for classroom teachers. Perhaps younger students need written strategies while older students can perform just as well with an oral strategy. Or perhaps as this study concluded, type of strategy instruction does not produce significance. Since this is the first study to look at a written strategy versus a checksheet strategy, more research is needed.

Fourth, the use of a normed, standardized test to measure reading achievement resulted in the usual

discrepancies. Although the standardized test was used in this study to replicate several prior studies, a reading process test would have been a more effective measure of reading achievement (Valencia & Pearson, 1987; Meyers & Kundert, 1988). Since reading is a process where the reader's prior knowledge and role during reading play a major part, instruments that measure these areas should be used. Only then will the effectiveness of strategies on reading achievement be measured.

Finally, this study's results add to a number of researchers' views about the reading process and the reader's active role in this process. Do children learn to read by being taught strategies or will they learn strategies as they read to learn. Perhaps, to increase metacognitive awareness and reading achievement, all students really need to do is read (Bridge, Winograd, & Haley, 1983; Cambourne, 1988; Goodman, 1986; Smith, 1988; Sulzby, 1985).

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Table 1

Distribution of Sample Population in the Study

| | Fifth | | Third | | Total |
|---|---|---|---|---|---|
| | Males | Females | Males | Females | |
| K-W-L | 11 | 10 | 7 | 9 | 37 |
| P/E | 8 | 9 | 11 | 8 | 36 |
| Control | 10 | 9 | 4 | 12 | 35 |
| Total | 29 | 28 | 22 | 29 | 108 |

Note: K-W-L = What I Know, What Do I Want to Learn, What I Learned During Reading

P/E = Predicting/Evaluating

Table 2

Two Experimental Groups Compared to Control Group: Means of the Scores on the Index of Reading Awareness Adjusted for the Covariate

| Source | N | Pretest Mean | Observed Posttest Mean | Adjusted Posttest Mean |
|---|---|---|---|---|
| Experimental: | | | | |
| Males | | | | |
| Grade 3 | 18 | 26.44 | 25.00 | 25.84 |
| Grade 5 | 19 | 27.68 | 28.00 | 28.03 |
| Females | | | | |
| Grade 3 | 17 | 25.47 | 26.53 | 28.00 |
| Grade 5 | 19 | 26.16 | 18.11 | 29.13 |
| Control: | | | | |
| Males | | | | |
| Grade 3 | 4 | 27.50 | 32.25 | 32.40 |
| Grade 5 | 10 | 30.80 | 30.60 | 28.62 |
| Females | | | | |
| Grade 3 | 12 | 29.50 | 29.50 | 28.36 |
| Grade 5 | 9 | 28.33 | 29.89 | 29.50 |

Table 3

Summary of Analysis of Covariance Table - Index of Reading Awareness - Two Experimental Groups Compared to Control

| Source | SS | df | MS | F | Probability |
|---|---|---|---|---|---|
| Pretest | 602.54 | 1 | 602.54 | 68.37 | .000 |
| Method | 42.00 | 1 | 42.00 | 4.77 | .031* |
| Gender | 18.69 | 1 | 18.69 | 2.12 | .148 |
| Grade | 32.86 | 1 | 32.86 | 3.73 | .056 |
| Method by Gender | 26.92 | 1 | 26.92 | 3.05 | .084 |
| Method by Grade | 29.09 | 1 | 29.09 | 3.30 | .072 |
| Gender by Grade | 2.73 | 1 | 2.73 | .31 | .579 |
| Method by Gender by Grade | 46.43 | 1 | 46.43 | 5.27 | .024* |
| Residual | 872.52 | 99 | 8.81 | | |

* $p<.05$

Table 4

K-W-L Experimental Group Compared to Predicting/Evaluating Group: Means of the Scores on the Index of Reading Awareness Adjusted for the Covariate

| Source | N | Pretest Mean | Observed Posttest Mean | Adjusted Posttest Mean |
|---|---|---|---|---|
| K-W-L: | | | | |
| Males | | | | |
| Grade 3 | 7 | 20.86 | 21.29 | 24.68 |
| Grade 5 | 11 | 26.73 | 27.82 | 27.52 |
| Females | | | | |
| Grade 3 | 9 | 23.67 | 25.33 | 26.96 |
| Grade 5 | 10 | 26.20 | 28.00 | 28.04 |
| Predicting/ Evaluating: | | | | |
| Males | | | | |
| Grade 3 | 11 | 30.00 | 27.36 | 25.01 |
| Grade 5 | 8 | 29.00 | 28.25 | 26.53 |
| Females | | | | |
| Grade 3 | 8 | 27.50 | 27.88 | 27.09 |
| Grade 5 | 9 | 26.11 | 28.22 | 28.31 |

Table 5

Two Experimental Groups Compared to Control Group: Means of the Scores on the Comprehension Test of the Gates-MacGinitie Reading Tests Adjusted for the Covariate

| Source | N | Pretest Mean | Observed Posttest Mean | Adjusted Posttest Mean |
|---|---|---|---|---|
| Experimental: | | | | |
| Males | | | | |
| Grade 3 | 18 | 52.22 | 47.78 | 45.11 |
| Grade 5 | 19 | 40.37 | 34.95 | 40.70 |
| Females | | | | |
| Grade 3 | 17 | 49.06 | 49.06 | 48.64 |
| Grade 5 | 19 | 42.26 | 34.32 | 38.72 |
| Control: | | | | |
| Males | | | | |
| Grade 3 | 4 | 48.00 | 56.00 | 56.33 |
| Grade 5 | 10 | 58.10 | 55.30 | 48.46 |
| Females | | | | |
| Grade 3 | 12 | 49.58 | 43.50 | 42.70 |
| Grade 5 | 9 | 48.11 | 47.00 | 47.25 |

Table 6

K-W-L Experimental Group Compared to Predicting/Evaluating Group: Means of the Scores on the Comprehension Test of the Gates-MacGinitie Reading Tests Adjusted for the Covariate

| Source | N | Pretest Mean | Observed Posttest Mean | Adjusted Posttest Mean |
|---|---|---|---|---|
| K-W-L: | | | | |
| Males | | | | |
| Grade 3 | 7 | 39.71 | 32.43 | 35.49 |
| Grade 5 | 11 | 41.55 | 31.55 | 33.62 |
| Females | | | | |
| Grade 3 | 9 | 47.78 | 47.89 | 46.59 |
| Grade 5 | 10 | 42.30 | 37.00 | 38.66 |
| Predicting/ Evaluating: | | | | |
| Males | | | | |
| Grade 3 | 11 | 60.18 | 57.55 | 49.53 |
| Grade 5 | 8 | 38.75 | 39.63 | 43.21 |
| Females | | | | |
| Grade 3 | 8 | 50.50 | 50.38 | 47.60 |
| Grade 5 | 9 | 42.22 | 31.33 | 33.04 |

Figure 1

K-W-L STRATEGY SHEET

| WHAT I KNOW | WHAT I WANT TO FIND OUT | WHAT I LEARNED OR STILL NEED TO KNOW |
|---|---|---|
| | | |

Figure 2

## PREDICTING/EVALUATING CHECKSHEET

**PREDICTING**

**BEFORE READING: What I Predict Will Happen**

_____ 1. I looked over entire reading selection examining titles, subtitles, pictures, and graphs.

_____ 2. If there were pictures, I used them to predict what I will read.

_____ 3. I used titles or subtitles to predict what I will read.

_____ 4. If possible, I combined the above 2 and 3 and predicted what I will read.

**EVALUATING**

**AFTER READING: Assessing My Prediction/Predictions**

_____ 1. My prediction was correct.

_____ 2. My prediction was not correct.

_____ 3. I understand what I read.

_____ 4. What did it say?

_____ 5. What do I remember

_____ 6. I do not understand or remember what I read.

_____ 7. I will begin the checksheet again. Then I will reread.

Figure 3

Adjusted Cell Means for the Experimental Groups Compared to the Control Group Across Grade and Gender - Index of Reading Awareness