


12-1991

# A Comparison of the Effects of Cooperative and Competitive Methods as Reinforcement of the Skill of Answering Inferential Questions in a Fifth Grade Reading Class

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A COMPARISON OF THE EFFECTS OF COOPERATIVE  
AND COMPETITIVE METHODS AS REINFORCEMENT OF  
THE SKILL OF ANSWERING INFERENTIAL QUESTIONS  
IN A FIFTH GRADE READING CLASS

THESIS

Submitted to the Graduate Committee of the  
Department of Education and Human Development  
State University of New York  
College at Brockport  
in Partial Fulfillment of the  
Requirements for the Degree of  
Master of Science in Education

by

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December 1991

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## Abstract

This study investigated whether a practice session in the previously learned skill of reading a paragraph and answering inferential comprehension questions was more effective when conducted competitively or cooperatively.

One fifth-grade homeroom class of 28 students was randomly divided into two groups: a cooperative group and a competitive group, each containing students from three different reading levels. A researcher-made pretest determined that there was no significant difference between the two groups before the treatment. A practice session was conducted in which the cooperative group worked in units of two or three. Each student in the unit was given an A if his/her unit achieved the criterion of 8 out of 10 correct answers. The competitive group worked on its own and a prize was given for the highest score. A posttest was given the next week.

A comparison of the posttest scores of the competitive and cooperative groups was made with a t test for independent measures. It was found that there was no significant difference between the mean posttest score of the competitive group and the mean posttest score of the cooperative group.

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## Chapter I

### Statement of the Problem

#### Purpose

The purpose of this study was to compare two methods of practice used to reinforce a previously learned skill. The study compared a cooperative group with a competitive group in order to determine whether there was a significant difference in their ability to answer inferential questions about a reading selection.

#### Question

Is there a significant difference in the posttest scores on a researcher-made test on answering inferential questions given to fifth-grade students who practiced the skill competitively and those who practiced cooperatively?

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#### Need for the Study

Many reading classes are competitive in nature (Winograd and Paris, 1988-89). The children are divided into ability groups. They are frequently tested, and the good students are rewarded by being given more reading time and more enrichment activities. The poor readers are given more worksheets. Their failures are



reinforced; many become passive and they fall further behind. The egos of the good students are enhanced at the expense of the poor students. Low achievers may become more concerned with avoiding embarrassment and failure than with learning to read. The students' self-perceptions become increasingly negative (Ames, Ames & Felker, 1977).

In a skill-based basal reading system, inferential comprehension is taught by having the students silently read passages and then answer workbook questions on characters' feelings, drawing conclusions and predicting outcomes. Usually, each student works alone, without group discussion. This study investigated whether a cooperative approach would be more helpful than the traditional competitive approach to practicing inferential skills.

Most of the studies on competition and cooperative learning have been conducted in other subject areas. Much has been discovered about behavior and attitude. It is important to see if these behaviors carry over into the reading class, and whether there are any significant differences in learning between a competitive situation and a cooperative situation.

#### Definitions of Terms

**Competitive learning:** Competitive learning is any learning situation in which there are one or more winners

and one or more losers. Any grading system is competitive in that it awards high marks and low marks by comparison. Ability groupings are competitive in the sense that there are "high" groups and "low" groups.

Cooperative learning: Cooperative learning is a learning situation in which all participants are working toward a common goal. Students usually work in small, mixed-ability groups to meet certain criteria.

#### Limitations of the Study

The following are factors which limited the results of the study:

1. Length of time was a limitation. This study was carried out over a two-week period which is very short practice time to show much growth in a skill. However, since the study was taking time from regular reading activities, this was all the time available.

2. It takes some time for groups to develop rapport. Because of the short length of time for the study, students may not have worked together in a group as well as they would have if they had been together for a longer period.

3. The students have been in competitive learning situations since they started school. Many of them, however, may not have encountered cooperative learning and could have benefitted from instruction or a training session in cooperative learning. This would be something to try if the study were again conducted.

## Chapter II

### Review of the Literature

#### Introduction

Cooperative learning is not a new concept. Before 1900, much of America was still rural and attending one-room schoolhouses where a lot of the learning was cooperative. By the 1920's, however, America had become increasingly urban. Emphasis in education was placed on efficiency and schools were run like businesses. Winograd and Paris (1988-89) state that "basal reading programs were designed to provide systematic, uniform instruction" which has fostered a "management mentality" in the teachers and students (p.31). Anything called cooperative became suspect because of the term's connection with Communism. Cooperative learning was viewed as un-American. Competitiveness was encouraged, and cooperation was downplayed (Pepitone, 1980).

Recently, the effectiveness of competition within the classroom has been questioned. Kohn (1986) makes a very strong argument against competition in all phases of life, and especially against its use in educational settings:

Children simply do not learn better when education is transformed into a competitive struggle. To be sure, from the teacher's perspective it can be seductive to turn a lesson into a competitive game in order to attract and hold students' attention. But the real appeal of this strategy is that it makes teaching easier, not more effective; it circumvents rather than solves pedagogical problems (p.50).

Other researchers have suggested that cooperativeness and competitiveness are not opposite ends of a scale, but are instead, independent constructs:

Since competitiveness is not the same as noncooperativeness, the oppositeness of cooperation and competition may have been exaggerated by structured experimental studies, and student attitudes toward cooperation and competition may be largely independent from one another (Johnson and Ahlgren, 1976, p.93).

### Reward Structures

One of the determining factors in whether a task performance is considered cooperative, competitive or individualistic is the reward structure. Slavin and Tanner (1979) define a reward structure as "a set of rules under which rewards are distributed to individuals contingent upon their performance" (p.294). Sherman (1988) says that a reward structure is "the means by which a teacher motivates students to perform school tasks" (p.55).

The three commonly studied reward structures found in the research are individualistic, competitive and cooperative. An individualistic structure is characterized by individual goals and a criterion-referenced evaluation. Competitive systems have individual goals, but a norm-referenced classroom-based evaluation. Also, in a competitive situation, there must be those who fail and only a few who succeed. In the cooperative structure, rewards are based on group performance (Sherman, 1988).

Ability to respond to a reward seems to be developmental. Younger children need to learn to become aware of reward structures within both competitive and cooperative situations. Older children are able to utilize reward structure and context clues spontaneously (Brady, Newcomb and Hartup, 1983).

In a review of research by Webb (1982), reward structure and student ability were found to be the most consistent predictor of student interaction. Rewarding students for their own achievement and the achievement of others in a cooperative reward structure was most conducive to student cooperative and on-task behavior. An experiment by Slavin (1980) studying effects on student achievement and time on task broke a cooperative learning technique into three components: cooperative

rewards, group tasks and focused instruction schedule. Cooperative or team reward structure resulted in significantly greater performance within the group task situation.

In another study, Slavin and Tanner (1979) compared two types of cooperative reward structures with an individual reward structure. One cooperative reward group worked together reading and discussing passages and then were quizzed individually. Another group read together and took the quizzes together. A third group worked individually. The two cooperative reward groups were higher in productivity and retention on the quizzes than the individual reward group. The cooperative group which took the quizzes together showed greater productivity than the cooperative group which took the quizzes independently. There was, however, no significant difference in retention between the two cooperative reward groups.

A study by Humphreys, Johnson and Johnson (1982) using a ninth-grade science class divided into cooperative, competitive and individualistic reward groups, also found greater retention and mastery in the cooperative group than in the other two. However, in a study of two secondary biology classrooms by Sherman (1988), no significant difference was found between a class using a competitive reward system and another class working

cooperatively with each group member receiving the same final grade for overall group completion of the project. Both groups scored significantly higher on the posttest than on the pretest. In this case, the rewards were grades.

The results of a study by Ames, Ames and Felker (1977) clearly indicate that reward structures in the form of prizes affect success and failure outcomes. In this study, 40 fifth-grade boys solved sets of puzzles working in pairs where one succeeded and one failed. Each winner was allowed to select a prize in the competitive structure. Both children selected a prize in the non-competitive situation. Students who won in the competitive condition rated themselves as more satisfied and more deserving of reward than the other. Children who failed rated themselves as less deserving of reward and less capable. This was not the case in the non-competitive setting. Competitive rewards appeared to accentuate negative self-feelings. The rewards served as an external cue for judging the value of achievement for these students.

Children were asked to evaluate performance of children in a story in a study by Ames and Felker (1979). In each story, the reward structure was based on com-

petitive, cooperative or individualistic achievements. The evaluations were influenced by both the outcome and the reward structure. In competitive settings, a successful outcome elicited greater reward giving and a higher opinion of ability. Competitive winners were felt to be more deserving of reward than winners in cooperative or individualistic settings. Group failure in cooperative settings elicited harsh judgments of both high- and low-performing students involved in the group. The reward structure cues were important in determining how children judged the achievement of the story children.

### Attitudes

Student attitudes vary under competitive and cooperative learning structures. Cooperative instruction tends to foster an attitude of equality. In a study by Johnson, Johnson and Stanne (1985) comparing the effects of cooperative, competitive and individualistic computer instruction, it was found that cooperation provided the greatest motivation to persist in accomplishing goals, especially for the girls, who under competitive conditions felt less confident, liked computers less and felt less supported by their teachers. Not only did the girls' attitudes toward computers improve, but also the girls' perceived status was increased. Students



were asked to give names of five people with whom they would like to work in the future. More females were chosen in the cooperative condition than in either the competitive or individualistic conditions.

Lucker, Rosenfield, Sikes and Aronson (1976) compared performances and attitudes of Anglos and minorities working in cooperative, interdependent groups with a teacher-focused, traditional classroom. While the Anglos' performance did not show significant difference between groups, the cooperative group did show increases in liking for minority classmates, self-confidence and liking for school. The minority group showed significant increases in performance, self-confidence and liking for classmates under the cooperative conditions.

The impact of cooperative and individualistic learning conditions on the attitudes, relationships and perceptions of handicapped and non-handicapped peers in mixed male/female and single-sex groups was examined in a study by Johnson, Johnson, Scott and Ramolae (1985). They found that working in a cooperative group was a positive experience for the handicapped students. The handicapped were included, not ignored, and perceived more friendship and liking under cooperative conditions. The cooperative group also promoted more liking between male and female students, although single-sex cooperative

groups were less likely to choose other-sex partners for future projects.

Johnson and Ahlgren (1976) made a study of attitudes toward cooperation and competition in an entire school from grades 2-12 using the Minnesota School Affect Assessment. The results suggest that competitiveness and cooperativeness are independent of each other rather than the opposites suggested by most studies. The same person can score high or low on both variables. Cooperativeness was found to be positively correlated at all levels to liking school personnel, while competitiveness was related to liking school personnel only in high school. The same relationship held true for a positive attitude toward school work and intrinsic motivation to do well. Cooperativeness was positively linked also to relating with other students, while competitiveness was positively correlated to liking to work alone. Cooperativeness was correlated positively to a good self-attitude. Competitiveness also had a positive relationship with good self-image beginning in junior high and getting stronger by senior high school. These findings suggest that cooperation relates with more positive attitudes, although both can exist simultaneously.

In a study by Wheeler and Ryan (1973) of cooperatively- and competitively-structured social studies classes, there was no significant difference in achievement.

Two attitudinal measures, however, indicated that the cooperative group had a significantly greater liking for social studies than the competitive group.

Peterson and Janicki (1979) pre-tested fourth-, fifth- and sixth-grade students with a scale to assess attitudes toward math and preference for small- or large-group learning to see if student preference was the best indicator of student performance in a particular approach. After a two-week math unit in which half of the students were taught in a large-group, teacher-focused class and half in a small-group, cooperative class, students took an achievement test and again completed attitude scales toward math and teaching approach. Attitude toward math was not changed by either teaching method. Students initially preferring small groups did better in the large-group approach. Students initially preferring the large group actually did better in the small group. High-ability students in the small group had a more positive attitude. Low-ability students' attitudes were more positive in the large-group setting. Neither approach proved most effective for all students, and group preference did not seem to be a good indicator of student performance.

Four studies focused on children's achievement attributions. Success or failure can be attributed to effort, ability, luck or task difficulty. The beliefs can be influenced by reward structure. Ames, Ames and

Felker (1977) found that a competitive structure with a limited reward increased both the positive and negative effects for success and failure. Performance was more likely to be attributed to luck in the competitive condition, and to effort in the non-competitive. In a later study by Ames, Ames and Felker (1979), a questionnaire was given to 400 children, examining beliefs about ability and reward under competitive, cooperative and individualistic reward structures. The individualistic group reacted as self-competitive, with results similar to the competitive group. The competitive group showed an emphasis on outperforming others, and success was rewarded highly while failure was harshly evaluated. The perceptions of the cooperative group were influenced by whether the group was successful or not. A cooperative failure elicited strong negative achievement evaluations.

Ames and Ames (1981) made a study of children working in either a competitive or an individualized setting to examine the effect of past performance on children's attributional response to success and failure. The individual group was given a mastery criterion to remove competitive response, while the competitive group was norm-based. The outcomes in the competitive setting were attributed to luck, and past performance had no effect. This group focused entirely on outcome, as luck is not personally controllable. In the individualistic setting,

success and failure were seen as effort-related, and self-satisfaction and reward were greater if the student had a successful past history. Attributing performance to effort was found by Ames (1984) to be indicative of mastery-oriented children. Effort attribution leads to success-oriented behavior. These children approach a task with the question "How can I do this task?" (p.486). Helpless children tend to focus on ability or luck, and on winning and losing. They worry about whether they are smart enough to successfully complete the task.

The focus on winning and losing, rather than on mastery of a subject can be seen in a study of a ninth-grade science class by Humphreys, Johnson and Johnson (1982). Students were tested for achievement and attitude after three units taught under cooperative, competitive and individualistic conditions. Students in the cooperative group were more interested in learning, felt the learning was more important and worthwhile, and felt less anxiety than students in the other two groups. The results indicated that "having students compete against each other may promote an intrinsic motivation to learn without a great deal of intrinsic interest in remembering and using the information" (p.355).

### Behavior

Cooperative and competitive structures elicit different types of behaviors in students. Cooperative situations

tend to produce interdependent behavior where students work together for mutual benefit (Luckner, Rosenfield, Sikes and Aronson, 1976). In small group teaching approaches, students tutor other students and the one doing the explaining has better understanding and retention of the material (Peterson and Janicki, 1979).

Time-on-task behavior is also enhanced by cooperative structure. Johnson, Johnson and Stanne (1985) found that in a cooperative computer group, students made more on-task or management statements and fewer social statements than the students in the competitive or individualistic conditions. In a study by Slavin (1980), the effects of reward structure were separated from the task structure in a cooperative learning technique called Student Teams-Achievement Division (STAD). The students in the team reward conditions were on task significantly more than the students in the individual reward condition, whether they were in a group or individual task condition. This would suggest that cooperative reward structure is more important than cooperative task structure in promoting on-task behavior.

Vega-Lahr and Field (1986) found that competitive situations elicit impatient and aggressive behavior in certain children as early as the preschool years. These children were assessed as having type A behavior using

The Matthews Youth Test for Health. During free play, aggressive behaviors were not predominant in any of the children. In structured, competitive situations such as tower-building races and car races, impatient and aggressive behavior did emerge more significantly in type A children.

Another study which indicates that situational context is important in determining competitive or cooperative behavior was made in 1983 by Brady, Newcomb and Hartup. First, third and fifth-grade children played a board game with an unseen companion. Some of the children played under cooperative conditions where the object was to have both players collect as many chips as possible. Some played under competitive conditions in which each player was to try to collect more chips than the other. Pre-programmed responses made the unseen companion act either 100% cooperatively or 100% competitively. At all ages, the children with cooperative partners were cooperative and with competitive partners were competitive. The first-grade children were not affected by the incentive conditions. Third graders used both incentive and response cues independently. Fifth graders combined the two cues and reacted cooperatively when either incentive or companion were said to be cooperative.

### Motivation

Closely tied to attitude and behavior is motivation. Slavin (1984) describes student motivation as "students' interest in doing academic work and learning academic material" (p.53). Teachers use many incentives to motivate students including grades, stars, rewards, recognition or praise. Slavin feels that competitive grading creates norms against doing well because one person's success reduces the chances for any other to succeed. Under cooperative reward systems, students are evaluated on group performance which creates norms favoring achievement, as students encourage each other to do well for the group to succeed. Slavin believes that using "group rewards for individual learning" (p.60) motivates students to perform well.

Ames and Ames (1981) found that a belief that effort affects outcome is crucial for motivated behavior. In their study, failure and success were more often attributed to effort in the individualistic setting. Because effort is a controllable, internal factor, failure was not followed by feelings of helplessness and success produced a feeling of accomplishment. Competing children attributed their performance to luck, which didn't contribute to feeling personal responsibility or success-oriented motivation.



In their attitude study of students in grades 2 to 12, Johnson and Ahlgren (1976) found cooperativeness consistently related to intrinsic motivation such as doing school work because it is interesting and fun. Competitiveness did not have a strong positive relation to intrinsic motivation until high school. Competitiveness was strongly related to extrinsic motivation such as working to please parents, teachers or other students. Competitiveness was also positively related to feeling that success was determined by other people's behavior and luck until high school.

Winograd and Paris (1988-89) feel that schools must develop a motivational agenda for reading instruction:

All children cannot score above average on normative tests of reading; but all children can be encouraged to read more frequently, to enjoy what they read, to share what they read, and to develop positive attitudes about themselves as readers (p.32).

Children who are competing with each other are focused on extrinsic goals. If they do not meet with success, they may avoid reading. Winograd and Paris feel that these children need to become more involved in task situations which do not require them to compete, such as free reading or listening to stories, to develop independent motivation for reading.

### Cooperative Learning Strategies

Several techniques for cooperative learning have been devised for the classroom. One of the most comprehensive of these approaches is Cooperative Integrated Reading and Composition (CIRC) described by Stevens, Madden, Slavin and Farnish (1987). Students work in heterogeneous teams for all reading, writing and language arts activities. The three principal elements of CIRC are basal-related activities, direct instruction in reading comprehension and integrated language arts and writing. Students worked with partners on follow-up activities during reading class. Direct instruction was followed by team practice. A process approach to writing was used in language arts and writing, with peer conferences for editing and revising. Students were required to read at home every evening for at least twenty minutes in place of homework. In two studies by Stevens, Madden, Slavin and Farnish (1987), the CIRC group scored significantly higher on the Reading Vocabulary, Reading Comprehension, Language Expression and Spelling subtests of the California Achievement Test, and significantly higher on the Durrell Analysis of Reading Difficulty. The CIRC students also had better performance on writing samples.

Another cooperative technique is Student Teams Achievement Division (STAD). Slavin (1980) lists three

components of STAD as cooperative rewards, group tasks and a focused schedule of instruction. The effects of the reward structure were separated from the task structure by forming four groups: Team Reward, Group Task; Team Reward, Individual Task; Individual Reward, Group Task; Individual Reward, Individual Task. The comparison school used traditional methods of teaching. The results found significantly higher performance in cooperative than traditional structures. Within the cooperative groups, group task structures scored significantly lower than individual task structures.

Computers are usually thought to be an individualistic learning tool, but it is possible to have computer-assisted cooperative instruction. Johnson, Johnson and Stanne (1985) structured a computer unit to be used in a competitive, cooperative or individualistic learning condition. In the cooperative condition, four students worked together, rotating specific roles focused on task and maintenance. They completed individual worksheets and a final test. Their unit grade was based on the average of their scores, and bonus points were given based on group achievement. In the competitive condition, students took turns at the computer, were graded on where their performance ranked in their group and received bonus points for being first. Winning was emphasized. In the individualistic condition, students took turns at

the computer, were graded in comparison with pre-set criteria and received bonus points for individual achievement. The cooperative group did significantly better on the daily tasks and final exam.

Lucker, Rosenfield, Sikes and Aronson (1976) used the jigsaw technique to compare performances of Anglos and minorities on a social studies unit on colonial America. The jigsaw groups were small, interdependent learning groups. The students in these groups were each responsible for a unique portion of the unit to teach to their peers. While the Anglo students did well in both traditional and interdependent classes, the minorities performed significantly better in the jigsaw classes.

Slavin (1984) describes five other cooperative learning methods. In the category of group study/group reward for individual learning are Teams-Games-Tournament (TGT) and Team Assisted Individualization (TAI). In TGT, students compete against students from other teams to add points to a team score. TAI students work on individualized materials at their own rates and levels within heterogeneous teams. Certificates are given to teams based on units completed and accuracy on final tests. David and Roger Johnson developed "Learning Together" methods for group study/group reward for group project. Students work together, complete a single worksheet and are rewarded as a group. Under the condition

of task specialization/group reward for individual learning is Jigsaw II. Each student within a team becomes an expert on a unique topic. The students with the same topics from different teams meet in expert discussion groups and then return to teach their own teams what they have learned. Finally, in the category of task specialization/group reward for group product is a method called Group Investigation. Small groups choose sub-topics from a class unit. Subtasks are chosen by students within the group. A group report is prepared and presented to the class. Students are evaluated on the quality of the group presentation.

Slavin (1987) presents a model for a comprehensive, cooperative school program. The model would include cooperative learning techniques in most classrooms and subject areas with students regarding each other as learning resources. ~~Mainstreaming of special education and remedial classes would be essential in this model.~~ Peer coaching by teachers would help them learn new methods and exchange ideas. Teachers would plan cooperatively and teachers and administrators work together to determine school direction, with a building-level steering committee. Parents and community members would be invited to become involved in this ideal cooperative school envisioned by Slavin.

### Cooperative Classrooms and Cognitive Development

Winograd and Paris (1988-89) propose that reading classes need to be restructured using a cognitive and motivational agenda. They envision a cognitive agenda which integrates metacognition, strategic reading, use of prior knowledge and text structure to enhance comprehension and help students become independent readers.

One of the objectives of the CIRC program described by Stevens, Madden, Slavin and Farnish (1987) is to help increase students' comprehension and metacognition skills. Students worked in pairs to identify story structure, make story predictions and retell stories which they read. Each week, students were given direct instruction on comprehension skills such as drawing conclusions and comparing and contrasting ideas. Students then practiced these skills with teammates through games and worksheets.

Sharan, Ackerman and Hertz-Lazarowitz (1980) state that cooperative learning groups can be a context for problem-solving and investigation which activate the higher-level cognitive functions of judgment making, analysis and application. They conducted a study in which half of the students worked in cooperative groups and half studied in a traditional classroom. In three out of five grade levels, the children in the cooperative groups scored higher on high-level questions than the

students from the traditional classroom. Classes did equally well on the low-level cognitive questions.

### Summary

There is a great deal of interest in cooperative learning in the education field and so there is a lot of literature involving studies of cooperative techniques. Most of these studies seem to suggest that cooperative learning is beneficial to students. There is less literature that focuses on competition, except as a comparison to cooperation. However, some of the studies suggested that competitiveness and cooperativeness are not opposites and can co-exist in the same classroom.

The majority of the research involving attitudes, motivation and behavior finds positive results and significant improvement in the cooperative setting over competitive or individualistic settings. The results of achievement are mixed. However, even where cooperative methods did not produce significantly higher performance, they did not produce significantly lower performance either. This would suggest no harm, and perhaps much benefit from integrating cooperative learning into the classroom.

## Chapter III

### The Research Design

#### Null Hypothesis

The null hypothesis stated that there is no significant difference between the mean posttest score of the competitive group and the mean posttest score of the cooperative group of fifth graders on a researcher-made test of inferential comprehension.

#### Subjects

The subjects for this study were 28 fifth-grade students in the same homeroom in a suburban elementary school. The students represented three different reading groups: high, average and low-average. The homeroom teacher placed cards with each student's name in three different piles corresponding to the three reading groups. Each pile was then divided in half to create one cooperative group and one competitive group, each containing students from all three reading groups.

#### Materials

1. The pretest was a researcher-made test on answering inferential questions. This test consisted of five short



excerpts from the book The Whipping Boy by Sid Fleischman. Each excerpt was followed by two multiple-choice inferential comprehension questions. The length of the test was determined by the fifth-grade teacher and the researcher to be reasonable for the time frame and abilities of the students, and was loosely based on a reading comprehension pretest given the reading groups at the beginning of the year.

2. The test used in the practice session consisted of five excerpts from the same book, each followed by two multiple-choice inferential comprehension questions.

3. A posttest of the same format as the pretest used the same book, but different paragraphs and questions. The fifth-grade teacher determined that this test was comparable to the pretest.

### Procedure

The 28 students were given the pretest during a homeroom period early in the week. On Friday, the class was randomly divided into two groups, with each group having students from all three reading groups. During their regular reading period of 40 minutes, the competitive group worked in one room with the fifth-grade teacher. At the same time, the cooperative group worked in another room with the researcher. Neither group was told what the other group was doing.

The subjects in the competitive group were given the practice paragraphs and questions to complete on their own with no talking. They were told that the student doing the best work would receive a prize of anything from the student store costing \$1.00 or under.

The subjects in the cooperative group were allowed to work in units of two or three of their own choice. They were told to talk over ideas and decide on answers as a unit. They were given a mastery criterion of 8 out of 10 correct answers. Any group meeting this criterion would receive an A for all group members.

The posttest was administered during homeroom period on the Monday following the practice.

#### Analysis of Data

The posttest scores were compared with a t test for independent measures.

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#### Summary

For this research, twenty-eight fifth-grade students were given a pretest on inferential comprehension. After a practice session in which half the students worked cooperatively and half worked competitively, a posttest was administered. A t test was used to determine if there was a significant difference between the mean scores of the two groups on the posttest.

## Chapter IV

### Analysis of Data

#### Purpose

The purpose of this study was to compare two methods of practice used to reinforce a previously learned skill. The study compared a cooperative group with a competitive group in order to determine whether there was a significant difference in their ability to answer inferential questions about a reading selection.

#### Findings and Interpretation

The students in the competitive and cooperative groups were given a pretest which established that there was no significant difference between the two groups before treatment. Both groups started the experiment at the same level.

The two groups were given a practice session, and five days later were given a posttest. The posttest scores for the two groups were compared to see if either group made significant gains over the other in the skill of answering inferential questions. The null hypothesis was: There is no significant difference between the posttest scores of competitive group A and cooperative group B.

Table 1

Data from Posttest on Answering Inferential Questions

Group	Mean	SD	<u>t</u> value	df
Competitive (Group A)	8.00	1.81	0.15	20
Cooperative (Group B)	8.10	1.29		20

t crit (.05)=2.086

A t test for independent means was run to compare the mean scores of the two groups on the posttest. The calculated t was 0.15. The critical t at the 0.05 level with a df=20 was 2.086. This resulted in failure to reject the null hypothesis. There was no statistically significant difference between the mean posttest scores of competitive group A and cooperative group B.

### Summary

The cooperative group and the competitive group were given a pretest which established that both groups began the experiment at the same level. After a practice session, the two groups were given a posttest. The t test comparing the mean scores of the cooperative group and the competitive group showed no statistically significant difference in performance.

## Chapter V

### Conclusions and Implications

#### Purpose

The purpose of this study was to compare two methods of practice used to reinforce a previously learned skill. The study compared a cooperative group with a competitive group to determine whether there was a significant difference in their performance on a posttest on answering inferential questions about reading passages.

#### Conclusions

The results of this study led to the conclusion that there was no significant difference between the mean scores of the two groups on the posttest. The statistical results showed a trend of a slightly higher mean score and slightly lower standard deviation for the cooperative group over the competitive group. This trend, however, was not large enough for a statistical difference. There are several factors which might have affected the outcome.

One of these factors was the short length of the practice session. The students may have been used to working competitively, but did not have much time to adjust to working together. It takes time for a group

to build trust and rapport. Similar results were attained in a study of two biology classes by Sherman (1988). In this study, both the cooperative and competitive groups scored significantly higher on the posttest, with no significant difference between the two groups. Sherman felt that two reasons for this lack of difference could have been the short time length of the study and the time of year. His research was conducted at the end of the school year when friendship circles were already formed, which may have made intergroup relationships more difficult to establish. This same factor may have influenced the present study which was also conducted at the end of the school year.

Another possible reason for the lack of significant difference was suggested in a study by Wheeler and Ryan (1973). They felt that achievement testing on the pretest and posttest were biased in favor of the competitive group, since the tests were administered under competitive-type conditions in which students worked individually, without talking to each other. The pretest and posttest in the present study were administered under similar conditions.

The small size of the sample may have been another influence on the lack of significant difference. Only one class was divided and tested in this study, which

meant a total of 22 students completed a pretest, practice session and posttest. A larger sample might have produced clearer results.

Students might have needed more instruction in both the skill of answering inferential questions and the technique of cooperative learning. Although the students were taught inferential reading skills in both the fourth and fifth grade, a review might have been appropriate. The students were given separate instructions for the competitive and cooperative practice sessions, but perhaps could have benefitted from an extra session to explain cooperative strategies.

#### Implications for Classroom Practice

Cooperative learning techniques are a valuable teaching tool. Although this study failed to find a significantly higher performance for the cooperative group, it did not show a significantly lower performance either. The review of the literature found many studies which supported equal or higher performance for cooperative groups over competitive. The present study suggests that cooperative practice on a comprehension skill such as answering inferential questions could be used as an alternative to having students work alone and being graded competitively. Cooperative techniques could be used in conjunction with the traditional teaching methods without lowering student performance.

### Implications for Further Research

This study could be lengthened so that the actual practice of the skill would take place over several class sessions. This would give the cooperative group time to build rapport within its units and time for all the students to show growth in answering inferential questions. Perhaps more instruction in both the skill and the cooperative technique would be useful in future studies.

The researcher noticed in both observation and conversation with students in the cooperative group, that the students enjoyed working together. The affective domain of cooperative learning might be a topic which warrants further research.

### Summary

This study did not find any significant difference between the group which practiced competitively and the group which practiced cooperatively. The two groups began the study at the same level. Neither group performed significantly better on the posttest.

Further study is warranted on both attitude and performance, as cooperative learning has been shown by other studies to be a good technique for promoting positive attitudes about school (Johnson and Ahlgren, 1976).



Creating a positive attitude while building cognitive skills such as inferential reasoning is important in providing motivation for reading. In spite of not producing a significant difference in performance on the posttest, the cooperative practice investigated in this study could still benefit the students.

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## Appendices

Appendix A - Pretest

Appendix B - Practice Session

Appendix C - Posttest

All reading passages were taken from The Whipping Boy by Sid Fleischman, Troll Associates, 1986.

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## Appendix A - Pretest

Read the passage. Read the questions and circle the letter of the best answer.

I. The young prince was known here and there (and just about everywhere else) as Prince Brat. Not even black cats would cross his path.

One night the king was holding a grand feast. Sneaking around behind the lords and ladies, Prince Brat tied their powdered wigs to the backs of their oak chairs.

Then he hid behind a footman to wait.

When the guests stood up to toast the king, their wigs came flying off.

The lords clasped their bare heads as if they'd been scalped. The ladies shrieked.

1. Young Prince Brat
  - a. Is well-liked by everyone.
  - b. Is scared of people.
  - c. Is disliked by people.
  - d. Has a good sense of humor.
2. The king will probably
  - a. Be amused by what the prince did.
  - b. Be angry at the prince.
  - c. Send everyone home.
  - d. Go for a long walk.

II. The king spied him and he looked mad enough to spit ink. He gave a furious shout.

"Fetch the whipping boy!"

Prince Brat knew that he had nothing to fear. He ~~had never been spanked in his life. He was a prince!~~ And it was forbidden to spank, thrash, cuff, smack, or whip a prince.

A common boy was kept in the castle to be punished in his place.

"Fetch the whipping boy!"

The king's command traveled like an echo from guard to guard up the stone stairway to a small chamber in the drafty north tower.

1. The small chamber is most likely
  - a. The prince's room.
  - b. A storeroom.
  - c. The kitchen.
  - d. The whipping boy's room.
2. Prince Brat probably feels
  - a. Unafraid.
  - b. Sad
  - c. Frightened.
  - d. Angry.

III. In the main hall, the king said, "Twenty whacks!"

Defiantly biting back every yelp and cry, the whipping boy received the twenty whacks. Then the king turned to the prince. "And let that be a lesson to you!"

"Yes, Papa." The prince lowered his head so as to appear humbled and contrite. But all the while he was feeling a growing exasperation with his whipping boy.

In the tower chamber, the prince fixed him with a scowl. "You're the worst whipping boy I ever had! How come you never bawl?"

"Dunno," said Jemmy with a shrug.

"A whipping boy is supposed to yowl like a stuck pig! We dress you up fancy and feed you royal, don't we? It's no fun if you don't bawl."

Jemmy shrugged again. He was determined never to spring a tear for the prince to gloat over.

1. Jemmy won't cry when he's whipped because
  - a. It doesn't hurt him.
  - b. He likes the prince.
  - c. He knows the prince wants him to cry.
  - d. He thinks crying would be ungrateful.
2. After Jemmy was whipped
  - a. The prince felt contrite.
  - b. The prince was angry at Jemmy.
  - c. The prince was taught a good lesson.
  - d. The prince felt sorry for Jemmy.

IV. On a night when the moon gazed down like an evil eye, the young prince appeared in Jemmy's chamber.

"Boy! Tumble out of bed. I need a manservant."

Jemmy saw that the prince was wearing a black cloak and carrying a wicker basket the size of a sea chest. "What you up to now? Walkin' in your royal sleep, are you?"

"I'm running away."

The whipping boy sat bolt upright. Hardly a day passed that he didn't make one plan or another to run off - but a prince? What horrible new mischief was this? "You can't hop off like you was common folks. What's bitin' you?"

Said the prince, "I'm bored."

1. When the prince said he was running away, Jemmy felt
  - a. Happy.
  - b. Surprised.
  - c. Bored.
  - d. Afraid.
2. The prince wants to run away
  - a. In the morning.
  - b. The next day.
  - c. During the night.
  - d. Never.



V. Why me? Jemmy thought. Can't you find a friend to run off with? But no - not you, Prince Brat. You've got no friends. That's why me.

Jemmy pointed to the window. "It's night out," he protested.

"The best time," replied the prince.

"But ain't you afraid o' the dark? Everyone knows that! You won't even sleep without a lit candle."

"Lies! Anyway, the moon's up, good and bright. Come on."

Jemmy stared at him with dreadful astonishment.

"The king'll have a gory-eyed fit!"

"Positively."

"He'll hunt us down. You'll get off light as a feather, but I'll be lucky if they don't whip me to the bone. More likely I'll be hung from the gallows."

1. Jemmy thinks that
  - a. Running away is a good idea.
  - b. The king will be happy.
  - c. The king will punish the prince.
  - d. The king will punish him.
2. The prince probably picked Jemmy because
  - a. He's afraid to go alone.
  - b. He likes Jemmy.
  - c. He and Jemmy are good friends.
  - d. His friends are all busy.



## Appendix B - Practice Session

I. "Soon as I can, I aim to give you the slip," Jemmy warned. "You'll be on your own."

The prince said nothing.

The tide was low and they traveled out of sight of the road, below a grassy embankment. In the distance, against billowing white clouds, stood a jackstraw jumble of ships' masts.

"You can fend for your own self, can't you?" Jemmy asked suddenly.

"Of course I can!" answered the prince in a stinging voice. "I don't need flocks of servants to fetch and carry for me."

"It's settled, then."

"Settled! Skip off anytime you like."

1. Jemmy wants to
  - a. Get away from the prince.
  - b. Stay with the prince.
  - c. Go back to the castle.
  - d. Ride on a ship.
2. The prince wants to
  - a. Have lots of servants.
  - b. Go back to the castle.
  - c. Stay with Jemmy.
  - c. Take care of himself.

II. From long habit, Jemmy kept his eyes peeled for treasure. Sandpipers scattered like mice before him. He spotted a barrel stave and pounced upon it.

"Trash," remarked the prince. "What are you doing?"

"Mudlarking. I've got to eat, don't I? If I can collect enough driftwood, I can sell it as firewood."

The prince shrugged and walked on ahead. Jemmy gazed after him for a moment. What did a prince know about living off the streets? His meals had always appeared on China plates and silver trays as if by magic. Left to himself, he'd starve.

"It's not my worry," Jemmy muttered.

1. Why is Jemmy worried about the prince?
  - a. The prince can't find treasures.
  - b. The prince has never taken care of himself.
  - c. The prince can do magic.
  - d. The prince is starving.
2. If Jemmy were alone
  - a. He could take care of himself.
  - b. He would build a fire.
  - c. He would eat from China plates.
  - d. He would starve.

III. They rounded a bend and the crack of a whip sounded in the air like a firecracker. Jemmy crawled up the embankment for a look.

A weary old coach was mired in a mudhole on the road. The coachman, looking just as old and rickety, held the reins of his two-horse team and cracked his whip in the air again.

"Pull, gents! Be good lads! It's me own fault, not leadin' you around this bog. Me eyesight ain't what it was, is it, old tars?"

Jemmy watched for another moment as the horses tried to pull the coach free. The coach was enameled blue, with yellow lettering painted on the door panel:

Capt. Harry Nips  
Hot-Potato Man

1. Capt. Harry Nips is probably
  - a. Young.
  - b. Rich.
  - c. Old.
  - d. Energetic.
2. The coachman will
  - a. Be able to pull the coach free.
  - b. Need help to free the coach.
  - c. Drive the horses through the mud puddle.
  - d. Lead the horses around the bog.

IV. Jemmy crawled over the embankment. A ride to the city would suit him fine.

"Sir? Would you take on a passenger? Here, let me set these barrel staves under the wheels."

"Don't mind if you do," said Captain Nips. "I'm late for the fair as it is."

Jemmy busied himself, laying a firm track for the wheels. Prince Brat watched from the edge of the embankment.

"You must be carrying a heavy load," Jemmy cried out. "Try again, Cap'n!"

The old man cracked his whip, the horses strained and the coach rolled up out of the bog.

"Hop in, lad."

1. Jemmy helps free the coach because
  - a. He's friends with Capt. Nips.
  - b. He's hungry for potatoes.
  - c. He doesn't know what else to do with his barrel staves.
  - d. He wants to get a ride.
2. Jemmy thinks the load is heavy because
  - a. Potatoes are heavy.
  - b. The horses are old.
  - c. The coach is stuck in the mud hole.
  - d. The coachman needs a whip.

V. Jemmy opened the door and saw that the coach was heavily loaded with raw potatoes and a huge iron kettle. Jemmy settled himself as best he could, and the coach lurched forward.

At last, Jemmy thought, you're free of the prince! But he couldn't resist a backward glance.

Prince Brat was standing in the center of the road. He'd dropped his load of driftwood and merely gazed at the receding coach.

Jemmy straightened and folded his arms. The prince wasn't his lookout any longer. But he'd stood there like a wounded bird. Blast him! A prince hadn't a cockeyed notion how to fend for himself.

"Stop, Cap'n!" Jemmy shouted. "We left me friend behind."

1. At first Jemmy is
  - a. Scared to get in the coach.
  - b. Glad to get away from the prince.
  - c. Sad to leave the prince.
  - d. Angry at the prince.
2. After Jemmy looks back he
  - a. Feels worried about the prince.
  - b. Is angry with the prince.
  - c. Doesn't care about the prince.
  - d. Is happy to stop and get the prince.

## Appendix C - Posttest

I. As soon as the wheels rattled on cobbled streets, Jemmy felt an immense sense of relief. This was his turf, the city, and he knew more places to hide than a rat.

Approaching the waterside fairgrounds, he saw prisoners in chains being marched aboard a convict ship. It lay in sharp contrast to the festive stalls and banners of the fair.

Captain Nips eased the coach between a seller of live fowl and a juggler tossing colored balls into the bright noonday air.

1. Why was Jemmy relieved to be in the city?
  - a. He likes cobbled streets.
  - b. He can hide from the king in the city.
  - c. He wants to go to the fair.
  - d. He can play hide and seek with the prince.
2. Jemmy knows the city and feels relief. The prince probably feels
  - a. Excited.
  - b. Sad.
  - c. Angry.
  - d. Sick

II. "Don't rush off, lad," said Captain Nips, hauling out a canvas load of firewood from under the seat. "Ain't I been listening to your stomach rumbling-bumblin' for the last hour? Do me the kindness of filling the kettle at the pump. Soon as the potatoes are boiled up, we'll feast, eh?"

Anxious as he was to be on his way, Jemmy hesitated. He was powerful hungry.

Then Captain Nips laid a coin in his hand. "And while you're at it, stop off at the cow lady, the both of you and get yourselves a couple of mugs to drink."

1. Captain Nips is
  - a. A mean man.
  - b. A stupid man.
  - c. A generous man.
  - d. An angry man.
2. What will Jemmy and the prince get to drink from the cow lady?
  - a. Water.
  - b. Cider.
  - c. Milk.
  - d. Juice.

III. Jemmy picked up the handle of the kettle. But almost at once Prince Brat snatched it out of his hands. "I'll do that."

"You?" Jemmy replied. "It's servant's work."

"Then who'd take me for a prince, toting water?" He smiled. He laughed. "I've never been allowed to carry anything! Not in my entire life."

Jemmy led the way. He'd never regarded fetching and carrying as a privilege. Princes and such-like were hard to fathom! But the sound of merriment lingered in his head. He'd never before heard Prince Brat laugh.

1. Why did Prince Brat want to carry the kettle?
  - a. It was something new and different.
  - b. He wanted to be strong.
  - c. He liked to carry things.
  - d. He wanted to help Jemmy.
2. Why did Prince Brat laugh?
  - a. He thought Jemmy was funny.
  - b. He felt free and happy.
  - c. He wanted to be a servant.
  - d. He wasn't allowed to laugh before.

IV. "New milk!" the cow lady called out. "New milk, fresh from the cow! Best in the land! New milk!"

Jemmy handed over the coin. The milk lady fished two mugs out of a tub of water, sat on a stool, and began to milk the cow directly into the mugs. Her aim was as skilled as an archer's.

"Have you heard the earful?" she asked. "Our prince has been abducticated. Imagine!"

"Imagine," the prince replied coolly.

1. This story takes place
  - a. In the future.
  - b. In the past.
  - c. In the 1980's.
  - d. Right now.
2. The milk lady
  - a. Knows she is talking to the prince.
  - b. Is passing along gossip she has heard.
  - c. Is warning the prince.
  - d. Has captured the prince.

V. It took the two of them to carry the iron kettle, now full of water. They passed a magician with a bald head, a street fiddler, and an umbrella seller, his wares opened around his feet like black silken mushrooms. Suddenly there loomed up a soldier on horseback, his eyes on the search.

There was nothing to do but brazen it out. Jemmy took a tighter grip on the handle, but was ready to fly if he had to. The soldier passed by with only the merest glance.

What was he looking for, a prince in fine velvets and a crown cocked on his head? Was it clothes that made a prince, Jemmy wondered, just as rags made a street boy? He had a notion that the prince felt secretly disappointed not to be recognized by any of his subjects. Wasn't he getting his head stuffed with surprises!

1. Who was the soldier looking for?
  - a. Robbers.
  - b. A magician.
  - c. Nobody.
  - d. The run-away prince and whipping boy.
2. Why didn't the soldier recognize the prince?
  - a. The prince was hiding.
  - b. The prince wasn't clean and dressed-up.
  - c. The prince was lost.
  - d. The prince was selling umbrellas.