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Effect of cooperative learning (student teams - achievement divisions) on African American and Caucasian students' interracial friendships

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**EFFECT OF COOPERATIVE LEARNING
(STUDENT TEAMS-ACHIEVEMENT DIVISIONS)
ON AFRICAN AMERICAN AND CAUCASIAN STUDENTS'
INTERRACIAL FRIENDSHIPS**

by

James Edward Cook, B.A., M.A.

**A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education**

**COLLEGE OF EDUCATION
LOUISIANA TECH UNIVERSITY**

August 2000

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LOUISIANA TECH UNIVERSITY

THE GRADUATE SCHOOL

July 27, 2000

Date

We hereby recommend that the dissertation prepared under our supervision by James Edward Cook

entitled Effect of Cooperative Learning (Student Teams-Achievement Divisions) on African American and Caucasian Students' Interracial Friendships

be accepted in partial fulfillment of the requirements for the Degree of Doctor of Education

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ABSTRACT

The purpose of this study was to gauge the impact of cooperative learning teams on interracial friendships. The participants were 256 sixth, seventh, and eighth grade students in English classes (20% African American and 80% Caucasian) at a rural middle school in Louisiana. After delivery of instruction, the experimental group studied worksheets in teams, received rewards based upon the team's performance, and received individual grades based upon individual exam scores. The control group studied worksheets individually and received individual grades. This eight week study utilized the sociometric question, "Who are your friends in this class?" as the pretest and posttest instrument. The data were analyzed using dependent and independent samples *t*-tests. Cooperative learning did increase close cross-race friendships, although not significantly. However, results indicated that cooperative learning significantly ($p=.001$) increased the number of strong cross-race friendships. It was also determined that there was no significant difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships.

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Author James E. Cook
Date July 27, 2000

DEDICATION

This dissertation is dedicated to my wife, Connie—“my Angel,” and to my parents, Bill and Carolyn—“my inspiration.” My **Angel** and my **Inspiration** are always with me.

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ACKNOWLEDGEMENTS

To the members of my doctoral committee, Dr. Kathryn I. Matthew (Chair), Dr. Thomas P. Springer (Cognate), Dr. Andolyn B. Harrison, and Dr. Michael A. McCready, I am sincerely grateful and appreciative of your understanding, patience, guidance, and time given to me during this study.

To the LEC administrators and teachers, thank you for providing me with the knowledge base on which to perform this study.

To the school system administrators, school administrators, teachers, students, and parents where this research was conducted, I am sincerely thankful. Without your cooperation and participation, there would be no dissertation.

CHAPTER I

INTRODUCTION

Slavin (1995b) posited that the two most important events in racial integration were the *Brown v. Board of Education of Topeka* decision in 1954 and the *Civil Rights Act of 1964* because both events dismantled legal barriers to racial integration. Integration is “a life situation in which people of different races . . . deal with each other in realistic terms” (Epstein, 1968, p. 40). Cotton (1993) projected that in the year 2000, the proportion of Caucasians in America will be two out of three, and more than 50 major American cities will have a majority “minority” population. Weinberg (1975) stated that few of the positive effects of integration, in terms of appreciable achievement gains for African Americans or a lessening of racial splits between African Americans and Caucasians, have been observed.

Pettigrew (1975) contended that schools are merely desegregated if there is no racial interaction among the different ethnic students. Brandt (1989) posited that “we have desegregation without integration” (p. 8). Desegregation, the abolishing of segregation in schools (Oxford, 1980), is not synonymous with integration. Friendships across racial lines do not increase by simply assigning African American and Caucasian students to the same classes (Slavin, 1991). Experiences children have will greatly influence whether hostility or racial stereotyping grows or diminishes (Schofield, 1995). Consequently, integration of schools needs to be planned to promote greater results from

the interaction of students, not merely to expose races to each other (Silverman & Shaw, 1971). “Thus, the question of how to build and maintain positive relations among the increasingly diverse racial and ethnic groups in the United States is an issue of major importance and will remain so in the foreseeable future” (Schofield, 1995, p. 635).

Research supports cooperative learning as a way to improve intercultural relationships more than does any other single technique in education (Pate, 1988; Cotton, 1993). Cooperative learning fosters true integration. “Positive effects on social relationships, such as race relations, are . . . logical outcomes to expect, because cooperative learning is after all, a social intervention” (Slavin, 1981, p. 656).

Purpose of the Study

The purpose of this study was to gauge the impact of cooperative learning teams on interracial friendships. This study was designed to demonstrate that the cooperative learning method of organizing the classroom, Student Teams-Achievement Divisions (STAD) (Slavin, 1995a), fosters interracial friendships, thereby truly integrating schools as set forth by *Brown v. Board of Education of Topeka* (1954). The study was also designed to demonstrate that STAD improves racial interactions equally among African Americans and Caucasians.

Justification for the Study

The question of whether or not African American and Caucasian students create interracial friendships when engaged in cooperative learning activities is of utmost importance. Educators need methods that enhance integration. Fostering integration will eliminate racist traditions, folkways, and beliefs—the next step after desegregation (Garcia, 1991).

The cooperative learning method, though not researched in Louisiana, does promote the development of interracial friendships. However, it is not known whether African Americans and Caucasians receive the same social benefits concerning attitudes toward the other race (Slavin, 1983a; Piel & Conwell, 1989). Louisiana, a state that has had much Federally forced integration, has some schools with large African American student bodies while other schools have mostly Caucasian student bodies. Therefore, it is important for the improvement of racial interactions (cross-race friendships) in Louisiana schools to determine whether or not cooperative learning will increase interracial friendships when African American students are the minority (i.e., 20% or less).

Theoretical Model

Slavin (1995a) identified the following motivational perspective concerning cooperative learning: “cooperative goal structures create a situation in which the only way group members can attain their own personal goals is if the group is successful” (p. 16). Slavin explained that students, to meet personal goals, must help their teammates be successful. When successful, the students receive personal rewards (Slavin). Slavin posited that these rewards enhance the giving of praise and encouragement to fellow students. This process does away with the scorn of an achiever’s colleagues (Vroom, 1969). In contrast to traditional instruction, praise and encouragement of fellow students are the norm (Slavin). Cooperative learning teams foster pro-academic norms that improve student achievement among participating students (Slavin).

Cognitive theories address the effects of working together (Slavin, 1995a). These theories emphasize developmental theories, as well as cognitive elaboration theories (Slavin). Damon (1984) and Murray (1982) posited that the fundamental assumption of

developmental theories is that interaction among children improves the mastery of concepts. Slavin identified Vygotsky's Zone of Proximal Development (ZPD) as the basis for modeling within groups. Vygotsky (1978, p. 86) proposed the ZPD as follows: "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." ZPD is a way by which a person's development can be assisted by members of society in face-to-face interaction (Wells, 2000). Over time, the changing of participants in each group affects the way one thinks about learning (Wells). The classroom should be a community of joint activity that works toward shared goals that depend upon collaboration (Wells). Individually, children form mental functions during this collaboration (Vygotsky). Vygotsky stated that intellectual abilities "are a copy from social interaction; all higher mental functions are internalized social relationships" (p. 164). Piaget (1926) also identified knowledge as being learned only through human interaction. This human interaction is present in the cooperative learning model. "Students will learn from one another because in their discussions of the content, cognitive conflicts will arise, inadequate reasoning will be exposed, and higher-quality understandings will emerge" (Slavin, p. 18). Education should present the kind of "experiences that live fruitfully and creatively in future experiences" (Dewey, 1938, p. 28).

Cognitive elaboration theories posit that "one of the most effective means of elaboration is explaining the material to someone else" (Slavin, 1995a, p. 18). Slavin explained that students who receive explanations from other students learn more than students that work alone. Furthermore, he stated that the one explaining learns more than the one listening.

Traditional school organization does not provide opportunities to promote true integration. Among students, traditional instruction permits only superficial contact (Slavin, 1983b). Oishi, Slavin, and Madden (1983) judged that research concerning successful integration confirmed Allport's (1954) contact theory. Allport concluded the following:

Prejudice unless deeply rooted in the character structure of the individual may be reduced by equal status contact between majority and minority groups in the pursuit of common goals. The effect is greatly enhanced if this contact is sanctioned by institutional supports (i.e., by law, custom or local atmosphere), and provided it is of a sort that leads to the perception of common interests and common humanity between members of the two groups. (p. 281)

Where real integration has been found in education, its conditions resembled those mandated by the contact theory (Oishi et al., 1983). In other words, the conditions resembled those as described by Hallinan (1976)—open classrooms and built-in opportunities for frequent, task oriented interactions. Oishi et al. (1983) supported this contact theory as representing a promising strategy for reducing intergroup bias and conflict. The theory occurred under specific conditions: equal status between groups, cooperative intergroup action, opportunities for personal acquaintance, and a contact setting supporting egalitarian intergroup interaction (Oishi et al.).

Considering the past history of race relations and school integration in the United States, schools should implement strategies focused on increasing ethnic and racial friendships (Hendrix, 1996). Actions to improve friendly interaction appear to be enacted through policies aimed at increasing interracial contact (Patchen, Davidson, Hofmann, & Brown, 1975). Hence, the structure and management of a school must encourage and guide interpersonal contact, and foster positive cognitive and affective social interaction (Damico & Sparks, 1984). Moreover, improved racial interactions must be achieved

through some type of positive contact. Cooperative learning methods fulfill this need by students knowing the material, doing well, and contributing to the success of the group (Slavin, 1981). Schofield (1995) posited that each person is necessary to the final product, with each student making a contribution to the whole that could not possibly be achieved individually. Working together, students learn and are responsible for each other's learning, as well as their own (Slavin, 1996).

Hypotheses

H₁: In order to determine the effect of cooperative learning on close cross-race friendships, the following hypothesis was established: There is a statistically significant difference in the amount of change in close cross-race friendships of students in cooperative learning classes and the amount of change in close cross-race friendships of students in traditional instruction classes.

H₀: There is no statistically significant difference in the amount of change in close cross-race friendships of students in cooperative learning classes and the amount of change in close cross-race friendships of students in traditional instruction classes.

H₂: In order to determine the effect of cooperative learning on strong cross-race friendships, the following hypothesis was established: There is a statistically significant difference in the amount of change in strong cross-race friendships of students in cooperative learning classes and the amount of change in strong cross-race friendships of students in traditional instruction classes.

H₀: There is no statistically significant difference in the amount of change in strong cross-race friendships of students in cooperative learning classes and the amount of change in strong cross-race friendships of students in traditional instruction classes.

H₃: In order to determine the effect of cooperative learning on interracial friendships between African American and Caucasian students, the following hypothesis was established: There is a statistically significant difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships.

H₀: There is no statistically significant difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships.

Definitions

For the purpose of this study, certain definitions were used. These definitions address specific areas of the study that may be viewed differently from varied perspectives of researchers. These specificities provide clarity of the intended use of the terms that were applied during this study.

Cooperative Learning

“Cooperative learning refers to a variety of teaching methods in which students work in small groups to help one another to learn academic content” (Slavin, 1995b, p. 2).

Student Teams-Achievement Divisions

Student Teams-Achievement Divisions (STAD) (Slavin, 1991, 1995b), a general cooperative learning method, consists of five major components: class presentations, teams, quizzes, individual improvement scores, and team recognition. The students work in four or five member learning teams. Assignments to the teams are based upon the performance level, gender, and ethnicity of the students. Following the teacher's lesson presentation, each team works to make sure all members have mastered the lesson. Exams are given at which time the students may not receive assistance from each other.

A student's exam score is compared to the student's own past average. Each team is awarded points based upon the degree to which its members meet or exceed their own earlier performances. Each team score is determined by calculating the sum of the team members' earned points, then dividing the total obtained by the number of team members. Based upon team scores, earned rewards or certificates recognize the teams that meet predetermined criteria. After recognition of teams, the students reflect concerning their team efforts (Stahl, 1994).

Traditional Instruction

Traditional instruction exists in a classroom atmosphere that is quiet and orderly with the teacher delivering information and serving as a resource (Lampe, Rooze, & Tallent-Runnels, 1996). Rules and regulations are established to control behavior with students remaining in their seats most of the time while being addressed as an undifferentiated audience (Shachar & Sharan, 1995). The teacher stands in front of the class imparting information to the students that are sitting in rows (Rojas-Drummond, Hernandez, Velez, & Villagran, 1998).

Integration

Integration is "a life situation in which people of different races . . . deal with each other in realistic terms" (Epstein, 1968, p. 40).

Sociometric Question

"Who are your friends in this class?" (Slavin, 1979; Hansell & Slavin, 1981; Slavin & Oickle, 1981; Oishi et al., 1983)

Close Friendship

Friendship is close if a student is named on the sociometric question as a friend for one of the first six choices of a student (Hallinan, 1979; Hansell & Slavin, 1981).

Reciprocated Friendship

Reciprocated friendship occurs when two students name each other on the sociometric question (Hansell & Slavin, 1981). These friendships are more stable and longer-lasting than unreciprocated choices (Moreno, 1934; Hallinan, 1978).

Strong Friendship

Strong friendship is reciprocated and close (Granovetter, 1973). In other words, two students name each other as one of their first six choices on the sociometric question (Hansell & Slavin, 1981).

CHAPTER II

REVIEW OF THE LITERATURE

Children, each in their own way, are unique, and teachers must aspire to meet their individual needs (Foote, 1997). Cooperative learning has been touted as a significant way to fulfill the individual needs of students and to provide quality education. Cooperative learning is a classroom strategy that involves students completing activities in small groups with recognition/reward based on the groups' performances (Slavin, 1980). Slavin (1981) noted that all cooperative instructional methods that were developed (beginning in the 1970's) by researchers involved assigning students to groups based upon achievement, race, and gender—the groups being smaller images of the whole class. Each of the cooperative learning methods operates differently, while maintaining the cooperative idea of group goals, individual accountability, equal opportunities for success, team competition, task specialization, and adaptation to individual needs (Slavin, 1995a).

The researcher chose to review the literature from the perspective of traditional instruction versus cooperative learning instruction and the effect of cooperative learning on interracial friendships. The review begins with a section describing both methods of instruction. A division pertaining to cooperative learning instruction follows a division concerning the characteristics of traditional instruction. This section forms a mindset of what the two methods entail. Next, in the traditional instruction versus cooperative

learning section, the studies reviewed were categorized by elementary, middle, and secondary school levels. In the interracial contact section, the literature concerning racial interactions among African American and Caucasian students is identified. A summary, via comparing and contrasting the findings of the studies reviewed, was developed with conclusions, thus providing insight into the evidence revealed.

Methods of Instruction

In this section, two methods of instruction, traditional and cooperative, are differentiated. Lampe et al. (1996) characterized traditional instruction as a teacher-directed, whole-class, textbook-centered approach. On the other hand, in cooperative learning, students work together and are responsible for each other's learning as well as their own (Slavin, 1996).

Traditional Instruction

Traditional instruction exists in a classroom atmosphere that is quiet and orderly with the teacher delivering information and serving as a resource (Lampe et al., 1996). Rules and regulations are established to control behavior with students remaining in their seats most of the time while being addressed as an undifferentiated audience (Shachar & Sharan, 1995). The teacher stands in front of the class imparting information to the students that are sitting in rows (Rojas-Drummond, Hernandez, Velez, & Villagran, 1998). "The expectation is that the physical structure of the class is relatively permanent and need not be altered as conditions of learning change" (Shachar & Sharan, p. 51).

Traditional instruction is not always deemed beneficial to the individual needs of students. While the teacher transfers information to the students, discussion among students is considered disruptive (Shachar & Sharan, 1994). Class discussion is

dominated by the teacher deciding who talks and when (Rojas-Drummond et al., 1998). Whenever discussion occurs, the students respond to questions posed by the teacher (Lampe et al., 1996). Students tend to speak to the teacher in short statements (Rojas-Drummond et al.). Communication between the teacher and students is most often unilateral and then bilateral when the teacher asks students to respond (Shachar & Sharan). Activities are completed silently and independently (Lampe et al.). Pacing for this type of instruction is uniform for the entire class and standard curriculum materials are utilized, thus creating a tightly controlled bureaucratic organization (Shachar & Sharan).

Cooperative Learning Instruction

Stahl (1994) stressed that for cooperative learning groups to be successful in completing group tasks, essential elements must occur frequently and correctly. Heterogeneous groups must be formed based upon academic abilities, race, and gender. Students should be arranged for face-to-face contact and interaction, with the understanding that each member of the group is expected to master the objectives. The students must view the objectives as their own. An equal opportunity for success must be present. Every student must feel successful regardless of the grouping. Tied with this success must be positive interdependence—individuals must believe they receive rewards as a group or not at all. The teachers should encourage positive social interaction and attitudes. Teachers should describe the interaction expected and assign specific student roles to ensure that attributes such as trust building, encouragement, and negotiation occur. When students spend four or more weeks together in the same heterogeneous group, benefits of cooperative learning tend to emerge and be retained. These benefits are

higher academic achievement, higher self-esteem, positive social skills, and improved attitudes toward other races (Slavin, 1991; Stahl & VanSickle, 1992; Johnson, Johnson, & Holubec, 1993). Stahl (1994) emphasized that groups should reflect on how they achieved the goal, how they helped each other comprehend, and how they used positive interactions; and, they should reflect on what improvements need to be made to further the success of the group. Without these essential elements of cooperative learning, positive long-term results should not be expected (Stahl).

Cooperative learning methods reduce competition and allow students to combine their efforts to succeed (Foote, 1997). Motivation of group members to help each other succeed is enhanced if the students value doing well as a group (Slavin, 1995c). Each student must do the work, know the material, and contribute to the success of the group (Slavin, 1981). Schofield (1995) contended that each student is necessary to the final product. Hence, part of the responsibility for instruction transfers to the groups with the role of the teacher expanding to include coordinating and facilitating the groups (Rosberg, 1995). Students are accountable for their individual learning, but are rewarded based upon team performance (Slavin, 1995a). Therefore, it is to the team's advantage to ensure that everyone learns the material (Slavin). Free riders should not exist (Slavin). "By sharing information, students will not only learn from each other, but also motivate each other to respond constructively to failure and progressively to success" (Lan & Repman, 1995, p. 65).

Traditional Instruction versus Cooperative Learning Instruction

Traditional instruction and cooperative learning instruction are discussed in three divisions. These divisions identify the results obtained in studies conducted in

elementary, middle, and secondary schools; thus, providing insight into the effectiveness of cooperative learning instruction.

Elementary School

For one school year, Rojas-Drummond et al. (1998) investigated the effect of cooperative learning and traditional procedures on comprehension of text. In a school located south of Mexico City, students that performed socio-instructional procedures were able to independently address many new learning challenges. Cooperative learning procedures promoted application of strategies for comprehending text and produced significant gains in comprehension for the students as indicated by a posttest that measured comprehension of the lesson. Similarly, employing a researcher-constructed social studies unit test, Lampe et al. (1996) determined that Jigsaw II and Group Investigation (GI), types of cooperative learning, produced significant results that favored cooperative learning for low socio-economic, Hispanic students. The traditional instructional method was not as effective.

Yager, Johnson, Johnson, and Snider (1986) ascertained, through a multiple-choice posttest that addressed the material taught using computer-based instruction (CBI), that students engaged in the cooperative setting achieved significantly higher than those in the individual setting. Through individual testing, it was demonstrated that the experience gained from a cooperative learning setting resulted in group-to-individual transfer. Hooper, Temiyakarn, and Williams (1993) investigated the effect of cooperative learning on high- and average-ability students. After employing CBI for five weeks, it was determined by using the mathematics subscale of the California Achievement Test (CAT) that cooperative learning improved the achievement of students

on higher-level learning. Additionally, achievement on generalization questions was significantly higher while problem-solving differences approached significance. However, fact-based lesson differences were not significant. Brush (1997) disclosed that cooperative pairs using Integrated Learning System (ILS) addressing mathematics performed significantly better in achievement than students using individual ILS as indicated by the CAT (Fifth Edition) results. Also, Simsek and Hooper (1992) reported that high- and low-ability students using interactive videodisc science lessons cooperatively, significantly outscored, on quizzes, the same ability students that worked individually. Xin (1996) conducted two studies. In the first study, the effects of cooperative learning with CBI for learning-disabled students were significant. But in the second study, cooperative learning effects were not significant. Both studies used the Stanford Achievement Test: Mathematics Test (SAT) (1991) as the indicator of achievement to compare the whole-class method and the cooperative learning method. A study involving CBI using cooperative methods and individual treatments in a low socio-economic school in metropolitan Phoenix revealed that the performance was about the same (Cavalier & Klein, 1998). Cavalier and Klein determined that CBI using cooperative methods was found just as effective as individual CBI.

Investigating achievement in Team-Assisted Individualization (TAI), Slavin, Leavey, and Madden (1982) asserted that individual work isolates students with no healthy interaction, perhaps reducing motivation. Students in a predominantly Caucasian school worked for eight weeks either individually or in math teams. The individual treatment, comprised of teacher-directed homogeneous groups, used traditional texts. The Mathematics Computations subscale of the Comprehensive Test of Basic Skills (CTBS), Level 2, Form S, was administered. The TAI group gained significantly over the

individual learning situation group. The same process, utilized in a Maryland school that was more racially balanced (55% Caucasian, 43% African-American, and 2% Asian), produced the same results concerning mathematical achievement. Yet, in a study addressing inclusion students and using the same treatment as above, no significant difference was found between the students receiving TAI and those receiving the traditional method of instruction (Slavin, Madden, & Leavey, 1982).

In a two-year study, Stevens and Slavin (1995) compared cooperative elementary schools' academic achievement to those of traditional schools. The cooperative schools used CIRC (Cooperative Integrated Reading and Composition), TAI, Jigsaw II, TGT (Teams-Games-Tournament), and STAD (Student Teams-Achievement Divisions) while the traditional schools maintained the status quo during the two-year study. The Total Reading, Total Language, and Total Mathematics from the CAT, Form C, revealed that the cooperative elementary schools' academically disabled, regular education, and gifted students significantly outperformed their peers in the traditional schools. It is important to note that "well-structured cooperative learning is not detrimental to the achievement of gifted students" (Stevens & Slavin, p. 345).

Johnson, Johnson, and Scott (1978) discovered that high-achieving students in cooperative learning situations significantly outperformed students in the individual condition when the posttest (developed by the publisher of the math materials to measure student achievement) was administered following the treatment. However, when the cooperative group took the retention test (written by the teacher), there was a slight superiority over cooperative learning by the individualized condition about 50% of the time.

The cooperative learning method was determined to significantly improve the performance of students in most of the studies conducted. Regardless of the ability level of the students, except for one study involving inclusion students, cooperative learning affected comprehension in a positive manner. Traditional instruction did not produce such results.

Middle School

Perreault (1984) compared cooperative learning to individualized learning in industrial arts classes. He revealed a significant difference between academic achievement concerning knowledge and comprehension, as well as application. After a six-week period of using GI and STAD, a posttest designed by the teacher reflected the success of cooperative over traditional instruction.

For six months, Shachar and Sharan (1994) compared the cooperative learning method of GI to the traditional presentation-recitation method in geography and history classes. The teachers collectively created a comparison posttest. The comparison indicated that the achievement scores, based upon aggregated classroom and individual results, were significantly higher in the cooperative learning method than in the whole-class learning method.

Temiyakarn and Hooper (1993), studying the achievement of high- and low-achieving students, randomly assigned students to paired and individual treatment groups. Following a computer-based tutorial, immediate and one-week delayed generalization posttests were administered. The results indicated that the cooperative treatment scores were significantly higher for the high and low achievers than the scores for the achievers in the individual treatment groups. Singhanayok and Hooper (1998)

determined that both high and low achievers performed better than students working individually using CBI. In addition, the cooperative learning group improved significantly as indicated from the results of the teacher-created immediate and one-week delayed posttests. It is interesting to note that Hooper, Bozonie, Kochery, and Malikowski (1994) discovered that males performed significantly higher than did females in their study of paired CBI using a posttest designed to measure comprehension and higher levels of cognitive processing.

Studies involving students in middle schools paralleled results found at the elementary level. Most of the time, the cooperative learning groups demonstrated a higher level of achievement than the students in traditional settings exhibited. These results were evidenced by higher successes of the cooperative learning students on teacher-made tests.

Secondary School

Jones, Sullivan, and Klein's (1996) study investigated the effects of matching learner preference for instructional method to achievement of students. The students were randomly assigned to methods that did or did not match their preferences for cooperative or individual learning. A posttest referenced to the instructional objectives of the program measured the achievement of the students in each method. Students unmatched to their preferences scored significantly higher than those matched to their preferences. This indicated that matching students to their instructional method preferences did not yield positive achievement effect. Although the scores did not differ significantly, the cooperative students' posttest scores were higher than the scores of students in the individual learning method.

Whyte, Knirk, Casey, and Willard (1991), in a study designed to determine if paired/cooperative computer-assisted instruction (CAI) was as effective as an individualistic approach, used a posttest questionnaire concerning the disk-operating system (DOS) commands. There was no significant difference found between achievement of the students that worked cooperatively or individually. With low-level students, Leikin and Zaslavsky (1997) used an adapted Jigsaw cooperative learning method that allowed students to work individually whenever they wanted. Based on the mathematics unit test, the researchers discovered no difference in achievement between cooperative learning groups and traditional instruction groups. Snidow and Flanagan (1995) investigated the use of cooperative learning in an integrated class of social studies and senior English curricula for honor and advanced placement students. Snidow and Flanagan disclosed that the students in the cooperative learning setting had higher grades than students in a traditional instruction integrated class of government and English at another school.

The use of cooperative learning at the high school level produced interesting results. Although in some studies, scores were higher for students in the cooperative learning setting than the scores for those students utilizing the traditional instruction method, there was no significant difference found in achievement. Therefore, cooperative learning at the secondary level may not be as successful as when utilized in the elementary and middle school levels.

Interracial Interactions

Intergroup relations research inferred that Caucasian students' attitudes toward African American students are modified by cooperative learning, but perhaps African

American students' attitudes are not affected in the same manner (Weigel, Wisler, & Cook, 1975; Gonzales, 1979). Slavin (1983a) expressed that it is not known if the improvement of racial relations resulting from cooperative learning methods concerns majority or minority groups. Several studies have found various outcomes concerning racial interactions among African American and Caucasian students.

Patchen et al. (1975) indicated that among African American students, more contact with Caucasian students did not impact their attitudes toward Caucasian students. Patchen et al. examined the relative importance of factors such as opportunity for contact in the present situation and conditions of interracial contact. Using interviews of African American and Caucasian students in the public high schools of Indianapolis, Indiana, the study, through interview data concerning racial contact, determined that interracial contact contributed to a positive change of Caucasian students' attitudes toward African American students. However, African American students did not become more positive toward Caucasian students.

Various results from studies involving cross-race friendships accrued. Oishi et al. (1983) discovered that cooperative learning has positive effects on cross-race friendships. Separate analysis by race "suggest that these effects are primarily due to reductions of negative attitudes of Whites [*sic*] towards Black [*sic*] students" (p. 10). Two sociometric questions, "Who are your friends in this class?" and "Who [*sic*] would you rather not sit at the same table with?" were posed. Two rating scales, "How smart do you think this child is?" and "How nice do you think this child is?" were also applied. The questions and rating scales were utilized as pretests and posttests. The study identified cooperative learning as reducing negative attitudes, not increasing positive ones. Slavin and Oickle (1981) studied the effect of cooperative learning on racial interactions using the question,

“Who are your friends in this class?” Cooperative learning significantly increased Caucasian students’ choices of African Americans as friends, but not vice versa. However, Slavin (1979) differed in results. Students, using the cooperative learning strategy, answered a sociometric instrument used as the pretest and posttest that consisted of the question, “Who are your friends in this class?” The results indicated that “blacks [sic] named more whites [sic] as friends than whites [sic] named blacks [sic]” (Slavin, p. 384), but there was no significant difference between African American and Caucasians’ choices. Artzt (1983) uncovered no difference in cross-racial interactions between student-team classes and teacher-centered classes. Hansell and Slavin (1981) asked the sociometric question, “Who are your best friends in this class?” The study revealed that new cross-race friendships were “made and received equally” by African Americans and Caucasians (p. 104). Another study of cooperative learning on the effect of cross-racial friendship choices noted that African Americans chose other African Americans as friends, while Caucasian Americans chose Mexican Americans as friends (Weigel et al., 1975).

It is interesting to note that Jackson (1998) found, using the sociometric question posed by Hansell and Slavin (1981), that African American males in cooperative learning groups reported significantly more cross-race friendships than did African American males in traditional classrooms. Even more interesting is the fact that Jackson found no effects for Caucasian males, African American females, or Caucasian females. No more interracial friendships were created for Caucasian males, African American females, and Caucasian females in the cooperative learning classes than in the traditional learning classes.

Cooperative learning allows students to view one another in a positive light and to create friendships based on human qualities, not skin color (Slavin, 1987). African American and Caucasian students liked cooperative learning and increased their liking for their peers because of the experience (Johnson, Johnson, Johnson, & Anderson, 1976). Both African American and Caucasian students had more friends of the other race after engaging in cooperative learning strategies (DeVries, Edwards, & Slavin, 1978). Johnson and Johnson (1981) found no significant difference in the amount of times that majority students initiated interaction with minority students or vice versa. Aronson (1975) studied students in cooperative learning groups and determined that the students liked their peers. This was especially true of African American and Caucasian students.

Disparate effects for African American and Caucasian students exemplify that students perceive cooperative learning experiences differently (Slavin & Oickle, 1981). Perceptions of self and opinions toward other race students were two factors studied by several researchers. Piel and Conwell (1989) established through interviews that African American and Caucasian children “may not be getting the same experience from a cooperative learning experience” (p. 14). The aforementioned study of African American and Caucasian students’ perceptions concerning group experiences revealed that Caucasian students’ cooperative learning experiences improved their self-perceptions; however, African Americans’ self-perceptions did not improve. Subsequently, it was concluded that cooperative learning was not making adjustments to students’ self-perceptions and that race appeared to be an important predictor of how students perceive themselves. Conwell, Piel, and Cobb’s (1988) research investigated whether cooperative learning had an effect on perceptions of students based on race. More Caucasian students than African American students experienced positive feelings when

working in cooperative groups. Patchen et al. (1975) ascertained that change in opinion toward other race students was attributed to the positive or negative contact, not the presence of contact alone. A positive perception of contact by the individual ingroups lowered bias in affective reactions toward outgroups (Gaertner, Rust, Dovidio, Bachman, & Anastasio, 1994). Students' ratings of intergroup contact supported the idea that the conditions of contact reduced bias in part because they transformed students' cognitive representations from " 'us' and 'them' to a more inclusive 'we' " (Patchen et al., p. 242).

It is of utmost importance to find ways to guarantee that all members contribute to their group's goal (Schofield, 1995). Desforges et al. (1991) suggested that if interactions were structured rather than left to people's own designs, their pre-existing schemata were less likely to pervade. Slavin (1995c) affirmed that there is evidence "that carefully structuring the interactions among students in cooperative groups can . . . be effective" (p. 11). Patchen et al. (1975) similarly concluded that compatible goals under favorable norms were necessary to enhance positive intergroup relations, and the status of students had a very small effect on interracial attitudes. This conclusion conflicted with the contact theory that "equal-status" is necessary for favorable outcomes concerning racial interactions (Patchen et al.). Furthermore, "equality of status between the student and schoolmates of another race does not seem to be necessary for favorable outcomes to occur" in racial interactions (Patchen et al., p. 28). Gaertner et al. (1994) posited that a common identity for a group may be achieved by introducing tasks that are shared by the group, thus reducing member bias. Cohen (1992) stressed that in using cooperative learning to improve intergroup relations, equal-status interaction is not the only concern. Cohen emphasized that students should treat each other as a person rather than a member of a race.

Sleeter and Grant (1985) favored proper planning and deliberate action as the key to extending the understanding of race. The researchers contended that when schools make only minor changes to their programs, the status quo continues. This continuation of the status quo actually maintains a lack of understanding of diversity among races.

Farivar (1991), using the Social Relationships Questionnaire (SRQ), determined that preparation for group work increased students' regard for their classmates. Preparation for group work included classbuilding activities and cooperative work that was sequenced and structured. Classbuilding activities were described as "preparation for group work/teambuilding, communication, cooperation and helping skills [*sic*] and instruction and practice in effective explaining activities they carried out to prepare them for working with others" (p. 11). It is noteworthy that teambuilding, preparing students for group work, effectively increased cross-ethnic regard for teammates.

Summary and Conclusions

Cooperative learning provides group to individual transfer. The literature brought to the forefront that in most scenarios cooperative learning is more beneficial than traditional instruction for the academically disabled student, the regular education student, and the gifted student. For low socio-economic students, cooperative learning provided the benefit of higher student achievement more than did traditional instruction. In addition, at all school levels, cooperative learning CBI most often provided instruction that was better than or equal to individual computer instruction. This point is important to note whenever the number of computers in a class is insufficient.

Educators have discovered through research and the application of the principles of cooperative learning that it is a successful tool for achievement and for increasing the

interaction between the races. Some degree of positive effects on intergroup relations has resulted from cooperative learning methods, albeit African American and Caucasian students may not be receiving the same social benefits concerning attitudes toward the other race. In other words, the literature indicated that the creation of interracial friendships might not equally materialize for African American and Caucasian students. The research literature also revealed that positive, structured, and planned contact among students in cooperative settings, such as teambuilding activities, should promote social interactions.

CHAPTER III

RESEARCH METHODOLOGY

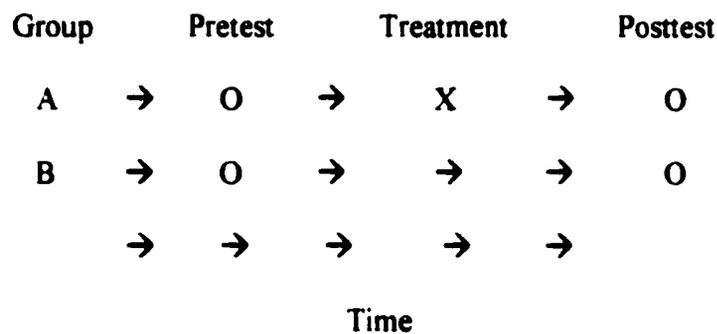
The purpose of this study was to determine the impact of cooperative learning teams (STAD) on interracial friendships. Cooperative learning is a classroom strategy that involves students completing activities in small groups with recognition/reward based on group performances (Slavin, 1980). The presence of students of different races or ethnicities enables cooperative learning methods to enhance intergroup relations (Slavin, 1995b). Teachers can play a positive or negative role in developing intergroup relations at the classroom level (Schofield, 1995). The student intuitively knows that intergroup interaction is sanctioned when a teacher assigns groups of varying races (Slavin).

Programs that foster group contact and interaction utilize cooperative learning techniques. Each of the cooperative learning methods operates differently, while maintaining the cooperative idea of group goals, individual accountability, equal opportunities for success, team competition, task specialization, and adaptation to individual needs (Slavin, 1995a). Slavin (1981) noted that all cooperative instructional methods developed by researchers (beginning in the 1970's) involved assigning students to groups based upon achievement, race, and gender—the groups being smaller images of the whole class.

Research Design

The researcher utilized the quasi-experimental design of Nonequivalent Groups Pretest-Posttest. McMillan and Schumacher (1997) identified this design as the one to apply whenever researchers must use already intact groups. The researcher could not randomly assign the participants because the students were already assigned to specific English classes.

Nonequivalent Groups Pretest-Posttest Design



(McMillan & Schumacher, 1997, p. 335)

Sample

The research occurred in a middle school in a rural town with a population of 3,532 (20% African American and 80% Caucasian). The surrounding community increased the population of the school's zone to about 6,000. The school was integrated through forced busing by a Federal court order in August, 1970. The student body of 279 students consisted of (20%) African Americans and (80%) Caucasians. The socio-economic status of the school community was reflected by the fact that 46% of the student body was on free or reduced lunch. The participants (see Table 1) in the study were 51 (20%) African American and 205 (80%) Caucasian students for a total of 256 (136 females [32 African Americans and 104 Caucasians] and 120 males [19 African

Americans and 101 Caucasians]) participants in grades six through eight. Nine students did not return permission slips granting participatory status in the study, nine students were in special education English classes, one student moved out of the school zone, two new students were added to the school population during the research, and two students were not present for the posttest. Therefore, these students were not included in the participating student sample.

Table 1

Population Sample

	Control			Experimental			Grand Total
	Female	Male	Total	Female	Male	Total	
African							
American	18	9	27	14	10	24	51
Caucasian	47	53	100	57	48	105	205
Total	65	62	127	71	58	129	256

Predetermined English classes composed of 9% to 27% African American students and 73% to 91% Caucasian students comprised the groups for this study. Four elementary, Louisiana certified, Caucasian female teachers taught a total of twelve English classes during this study. To teach English at this school, the teachers were selected—based on interviews concerning the teachers' subject preferences, likes and dislikes—by the principal. Three of the teachers had bachelor's degrees with ten (Teacher "Z"), three (Teacher "W"), and twenty-six (Teacher "X") years teaching experience. One participating teacher (Teacher "Y") had a master's degree with six years teaching experience.

Procedures

Teachers were trained in the application of the cooperative learning method by the researcher (Oishi et al., 1983). Each teacher received a participant's manual describing the particulars of cooperative learning and traditional instruction that were utilized during this study. The teachers also received assistance from the researcher during the eight-week time span of the study to ensure that the proper procedures established for this study were applied in the experimental group, as well as the control group. The researcher spent an average of three days a week at the middle school where this study took place.

The teachers created the same content learning materials for their respective control and experimental classes. STAD "can be used with materials adapted from textbooks or other published sources or with teacher-made materials" (Slavin, 1995a, p. 73). Teacher-made materials for students consisted of a worksheet, an answer sheet, and an exam (Slavin). The teachers taught their respective control class(es) using the traditional approach: "teach the content in whole-class, textbook-centered, teacher-directed format" (Lampe et al., 1996, p. 188). As described, the teachers participating in this study created the materials for their respective traditional instruction class(es) exactly as they did for their experimental class(es). The only difference in utilizing the materials was that the control group participants worked independently of each other. Furthermore, the teachers accepted that the traditional, individualized method is ideal for teacher-to-student interaction; and, promotes the identification of individual student learning problems by the teacher (Weigel et al., 1975). In other words, teachers were made aware that traditional, individualized instruction should not be disdained.

The study provided data that were collected using a random assignment procedure. The four eighth grade English classes of Teacher “Z” were randomly assigned as two experimental classes and two control classes. Teacher “W” taught two seventh grade English classes randomly assigned as one experimental class and one control class. Teacher “Y” taught two seventh grade English classes, one class as experimental and the other class as control. Teacher “X” taught four sixth grade English classes that were randomly assigned as two experimental classes and two control classes. A drawing by the teacher determined the teacher’s experimental classes. Each class that was drawn became an experimental class for that teacher. Therefore, half of their classes was experimental and the other half remaining was control classes. These drawings resulted in two classes in the sixth grade, two classes in the seventh grade, and two classes in the eighth grade becoming the experimental group, as well as two eighth grade classes, two seventh grade classes, and two sixth grade classes becoming the control group.

To ensure that cooperative learning occurred in the experimental group and not in the control group, each participating class was observed using the Traditional and Cooperative Learning Observation Form (see Appendix C) created by the researcher. This form also identified the use or non-use of bonus points to enhance the cooperative social process (see Appendices D and E). The researcher trained the assistant principal (master’s degree) and the school media specialist (bachelor’s degree) in the recognition of the behaviors indicative of cooperative learning and traditional instruction as pertained to this study and the completion of the Traditional and Cooperative Learning Observation Form. The observers received a participant’s manual describing the particulars of cooperative learning and traditional instruction that were utilized during this study. The researcher and either the assistant principal or the media specialist observed each

participating English class once a week during this eight-week study. Also, the researcher, the assistant principal, and the media specialist made a combined total of 49 independent, unofficial observations to ensure that cooperative learning or traditional instruction was occurring in the proper classes. Furthermore, to ensure that the participating teachers were not “role playing” or “acting out” for the observer’s benefit, the participating teachers were not always aware that the classes were being observed. The researcher, the assistant principal, and/or the media specialist observed in the classroom or from the classroom entryway.

A pretest was given to the students in both the traditional instruction and cooperative learning groups. The pretest was the sociometric question, “Who are your friends in this class?” as utilized by Slavin (1979), Hansell and Slavin (1981), Slavin and Oickle (1981), and Oishi et al. (1983). The students were asked to list their friends in the particular class to which the question referred. The students were provided a list of class members (see Appendix F) to avoid the error of students being listed that were not in the particular class to which the question referred. The students were verbally told by the researcher to list their friends in order from the best to the least best. At the end of the proposed study, the same sociometric question used as the pretest was used as the posttest. The question measured cross-race friendship choices. The responses were analyzed using the paired samples and independent samples *t*-tests, thus assessing the effects of the treatment on African American and Caucasian students’ interracial friendships.

To help the students work cooperatively, the *Team Name, Banner, Logo, and/or Mural* teambuilding activity (Kagan, 1992) was used. First, the students created a name for their respective team. Secondly, the team created a logo. Lastly, each student of every

team was given a writing utensil that wrote in a different color from the other team members' writing utensils. All colors were present in the resulting artwork, thus signifying that every member of the team contributed to the activity. The rules for this activity were as follows: (a) each team member has a say, (b) the decision must be by consensus, and (c) the team does not agree to a consensus if even one student has an objection. In other words, the team members had to work together to solve any disagreement they might have had. This process of working together was utilized during all team efforts. In addition, to further social interactions, bonus points (see Appendix D) were awarded to students for the performance of social skills as identified by Johnson and Johnson (1990). Also, to assist in promoting social interactions, team member rules (Slavin 1991, 1995a), team structure (Silver, 1997), and students' reflections (Stahl, 1994) were applied during the cooperative learning method (STAD).

All classes studied the regular English curriculum as set forth by the *Louisiana English Language Arts Content Standards* (1997). The participants were engaged in the study for a period of eight weeks. The schedule of the school was the "AB Block." (For example: "Block A" met on Mondays, Wednesdays, and Fridays; "Block B" met on Tuesdays and Thursdays; "Block B" met on Mondays, Wednesdays, and Fridays; "Block A" met on Tuesdays and Thursdays; then, the cycle repeated.) During the eight weeks, twenty class meetings of 90 minutes each occurred. Within each 90-minute period, cooperative group work (a minimum total of 30 minutes, a maximum total of 45 minutes) transpired in the experimental group, in addition to lecture/discussion and an exam when the teacher deemed appropriate. The exam was done individually. The class activities of the control group consisted of lecture/discussion, worksheet done individually, and an exam done individually.

Delivery of instruction was done as described in the *Louisiana Teacher Assistance and Assessment Program* (1998). Each class received instruction, worksheets, and exams. The difference in the experimental and control groups was (a) group or non-group activities and (b) the use or non-use of the students' scores for rewards. The experimental treatment was STAD (Hansell & Slavin, 1981). The students were assigned to four or five member learning teams. Based on race, gender, and academic standing, each team was a miniature representation of the class.

After the students studied in their respective groups, each student was individually assessed through the use of an exam as deemed appropriate by the teacher. The exam was a part of the cooperative learning process that determined rewards for the teams, as well as determined individual grades to be used in grade reporting. The cooperative learning process for determining rewards was followed (see Appendix A). Except for working independently and receiving no rewards, the control group followed the same process as the experimental group (Slavin, 1981). The teacher used the exams to determine individual grade reports. Most of the literature has revealed that cooperative learning does promote higher achievement than traditional instruction. Therefore, this research study did not assess whether or not cooperative learning promoted achievement more than did traditional instruction.

Internal Validity

McMillan and Schumacher (1997) identified selection as the inherent threat to internal validity when applying the Nonequivalent Groups Pretest-Posttest Design. They further explained that the selection threat is the possibility that "groups may differ in characteristics that affect the dependent variable" (McMillan & Schumacher, p. 335).

Since the groups were not equal as to the number of African American and Caucasian students, a dominance effect of more Caucasian students could result (Hansell & Slavin, 1981). This dominance effect could alter the findings and lead to a false hypothesis. To avoid this possibility of a Type II error, the teacher of the experimental groups assigned each team's members to roles (Silver, 1997) (see Appendix A) and reassigned the students to new roles every third class meeting. This assignment of roles avoided the pre-existing status differences (Cohen, 1980) that could affect the interactions that create interracial friendships.

The observations of the researcher, the assistant principal, and the media specialist further assured internal validity. The researcher and one of the other two observers observed each class once a week during the eight-week time span of this study. In addition, the researcher, the assistant principal, and the media specialist made independent, unofficial observations. The Traditional and Cooperative Learning Observation Form (see Appendix C) and the unofficial observations provided evidence that STAD and the use of bonus points as outlined by Johnson and Johnson (1990) were occurring in the experimental groups and not in the control groups. The researcher assisted the teacher participant(s) whenever requested to do so by the teacher(s). For example, at the beginning of the study, the researcher assisted teachers in setting-up teams per this study's guidelines, as well as aiding the teachers in calculating base scores for each student. Early in the study, the researcher also helped the teachers determine the teams that received recognition/rewards. Assistance by the researcher ensured that cooperative learning instruction was being done properly within the respective group, thus maintaining the specifications of this described research.

To ensure interrater reliability, during the first five weeks of the study, the researcher and the assistant principal observed each experimental and control class. After each concurrent observation, the researcher and the assistant principal compared the results of their respective Traditional and Cooperative Learning Observation Form. If an observation consensus had failed to occur, the researcher and the assistant principal were to immediately discuss the observation differences. However, a consensus was evident in the observations.

During the sixth week of the study, the media specialist began performing observations with the researcher when the workload of the assistant principal prevented him from doing so. To ensure interrater reliability, the researcher and the media specialist followed a similar process as that of the observations made by the researcher and the assistant principal. The only difference was that the researcher and the media specialist used the same Traditional and Cooperative Learning Observation Form as documentation. This was done because the researcher and the media specialist observed the classes at the same time and through discussion determined that they agreed concerning the outcome of each of the observations.

As identified by Hansell and Slavin (1981), to minimize the influence of the expectations of teachers and students about the outcomes of the proposed study, the researcher did not convey that interracial friendships were being studied. The parents, students, teachers, and school administrators were told that the effect of cooperative learning on friendships was being studied. However, the school system administrators were aware that interracial friendships were being studied.

Instruments

The single sociometric question, "Who are your friends in this class?" (see Appendix F) was posed to the students as the pretest and posttest instrument to measure cross-race friendship choices. This procedure was used by Slavin (1979), Hansell and Slavin (1981), Slavin and Oickle (1981), and Oishi et al. (1983). Slavin (1991) pointed out that most research on intergroup relations asked students to name their best friends at the beginning and at the end of a study. He explained that the measure of intergroup relations was the number of choices the students made of the opposite race. To ensure confidentiality for the participants, each student was given an identification number (Jackson, 1998). In this study, as used in Hansell and Slavin (1981), *close* friendship was identified as one of the first six choices each student made on the sociometric question. Furthermore, reciprocated close friendship choices were considered as *strong* (Granovetter, 1973; Hansell & Slavin, 1981).

To ensure that traditional instruction was occurring in the control group and to ensure that cooperative learning was occurring in the experimental group, the Traditional and Cooperative Learning Observation Form was utilized (see Appendix C). The Traditional and Cooperative Learning Observation Form was created by the researcher based upon research (Johnson and Johnson, 1990; Slavin, 1991, 1995a, 1995b; Stahl, 1994; Lampe et al., 1996) that identified essentials of the cooperative learning strategy. Also, the work of Shachar and Sharan (1994, 1995) and Lampe et al. (1996) that identified the characteristics of traditional instruction was included. To further ensure that the procedure of this study was followed as intended, the researcher was readily available to address any teacher concerns.

Data Analysis

The effects of the treatment were assessed using inferential statistics to compare group means to assess each hypothesis. Paired samples *t*-tests were utilized to better comprehend the analyses of data regarding the hypotheses. The paired samples *t*-test is appropriate concerning the data gathered in this study because “as long as there is a systematic relationship between the groups it is necessary to use the **dependent samples *t*-test**” (McMillan & Schumacher, 1997, p. 365). (This researcher refers to the dependent samples *t*-test as a paired samples *t*-test.) The control group was examined with respect to the following: close cross-race friendships, strong cross-race friendships, African American friendships, and Caucasian friendships. Likewise, the experimental group was examined with respect to the following: close cross-race friendships, strong cross-race friendships, African American friendships, and Caucasian friendships.

An independent samples *t*-test was done to determine if the control and experimental groups were different at the onset of this study. This analysis was done for both close cross-race friendships and strong cross-race friendships. Then, a difference score was computed as the dependent variable in subsequent independent *t*-tests. The difference score took into account the repeated measures nature of the design (a pretest and a posttest). The difference score (the increase or decrease of interracial friendships) was computed by subtracting the number of pretest interracial friendships from the number of posttest interracial friendships. In other words, the number of close cross-race friendships on the pretest was subtracted from the number of close cross-race friendships on the posttest; and, the number of strong cross-race friendships on the pretest was subtracted from the number of strong cross-race friendships on the posttest. Then, these data were analyzed using the independent samples *t*-test because the samples were

unrelated groups of participants with different participants in each group, and the participants were in randomly assigned groups (McMillan & Schumacher, 1997). The groups were the control and experimental, as well as the African American and Caucasian groups. "Therefore, if a researcher is testing the difference between an experimental group and a control group mean, the **independent samples *t*-test** would be appropriate" (McMillan & Schumacher, p. 365).

The independent samples *t*-test ascertained if any significant difference existed between the means' increase or decrease in close cross-race friendships of the control and experimental groups. Similarly, an independent samples *t*-test was utilized to ascertain if any significant difference existed between the means' increase or decrease in strong cross-race friendships of the control and experimental groups. In addition, the independent samples *t*-test was used to determine if any statistically significant difference in the impact of the cooperative learning intervention existed concerning African American and Caucasian students.

As was intended in this study, the Traditional and Cooperative Learning Observations, as well as the unofficial observations, documented that traditional instruction did occur in the control group. Also, the Traditional and Cooperative Learning Observations and the unexpected observations documented that cooperative learning was present, as intended, in the experimental group. If either traditional instruction or cooperative learning instruction had not been present in the respective group; then, the researcher would have assisted the teacher participant(s) in utilizing the appropriate method, thereby ensuring the proper procedure of the study. However, this problem did not occur.

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

This chapter focuses on analyzing the data collected on close cross-race friendships, strong cross-race friendships, and the impact of cooperative learning on African American and Caucasian students. The sample providing the data consisted of 51 (20%) African American and 205 (80%) Caucasian middle school students in sixth, seventh, and eighth grade English classes. The control (traditional instruction) group consisted of 27 (21%) African American and 100 (79%) Caucasian participants. The experimental (cooperative learning) group consisted of 24 (19%) African American and 105 (81%) Caucasian participants. A pretest and a posttest were administered to the participants in both the randomly assigned control and experimental groups. The pretest and the posttest consisted of the sociometric question, "Who are your friends in this class?" The students listed their friends from their first choice to their last. The sociometric question measured cross-race friendship choices. A close cross-race (interracial) friendship choice indicated that a student was named as a friend for one of the first six choices by a student (Hallinan, 1976; Hansell & Slavin, 1981). A strong cross-race (interracial) friendship choice indicated that two students named each other as one of their first six choices (Hansell & Slavin). The data were analyzed using independent samples *t*-tests, as well as paired samples *t*-tests.

Reliability and Treatment Integrity

Both the experimental and control groups were observed, once each week by the researcher and either the assistant principal or the media specialist. The Traditional and Cooperative Learning Observation Form (see Appendix C) was used to document results of these observations. In addition, 49 unofficial observations were performed. Both types of observations indicated that the experimental and control groups performed the outlined activities as described in this document (see Appendix A).

Preliminary Analyses

Paired samples *t*-tests were utilized to better comprehend the analyses of data regarding the hypotheses assessed in this study. The control group was examined with respect to the following: close cross-race friendships, strong cross-race friendships, and interracial friendships. Likewise, the experimental group was examined with respect to the following: close cross-race friendships, strong cross-race friendships, and interracial friendships.

Within the control group, the number of close cross-race friendships on the pretest ($M=1.51$) was compared to the number of close cross-race friendships on the posttest ($M=1.48$) (see Table 2). A paired samples *t*-test yielded a *t* of .425, $p=.672$. No statistically significant difference in the number of close cross-race friendships on the pretest and the number of close cross-race friendships on the posttest was found (see Table 3).

Table 2

Paired Samples Statistics: Control Group Close Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>
Pretest number of Close				
Cross-Race Friends	127	1.51	1.65	.15
Posttest number of Close				
Cross-Race Friends	127	1.48	1.62	.14

Table 3

Paired Samples Test: Control Group Close Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Close						
Cross-Race Friends—						
Posttest number of Close						
Cross-Race Friends	.0315	.84	.0741	.425	126	.672*

* $p < .05$, two-tailed.

Within the control group, the number of strong cross-race friendships on the pretest ($M=.71$) was compared to the number of strong cross-race friendships on the posttest ($M=.57$) (see Table 4). A paired samples *t*-test yielded a *t* of 2.216, $p=.028$. A statistically significant difference in the number of strong cross-race friendships on the pretest and the number of strong cross-race friendships on the posttest was found (see Table 5). The number of strong cross-race friendships decreased.

Table 4

Paired Samples Statistics: Control Group Strong Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Strong				
Cross-Race Friends	127	.71	1.02	.0909
Posttest number of Strong				
Cross-Race Friends	127	.57	1.83	.0738

Table 5

Paired Samples Test: Control Group Strong Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Strong						
Cross-Race Friends—						
Posttest number of Strong						
Cross-Race Friends	.14	.72	.0640	2.216	126	.028*

* $p < .05$, two-tailed.

Within the experimental group, the number of close cross-race friendships on the pretest ($M=1.36$) was compared to the number of close cross-race friendships on the posttest ($M=1.42$) (see Table 6). A paired samples t -test yielded a t of -0.943 , $p=.347$. No statistically significant difference in the number of close cross-race friendships on the pretest and the number of close cross-race friendships on the posttest was found (see Table 7).

Table 6

Paired Samples Statistics: Experimental Group Close Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Close				
Cross-Race Friends	129	1.36	1.77	.16
Posttest number of Close				
Cross-Race Friends	129	1.42	1.69	.15

Table 7

Paired Samples Test: Experimental Group Close Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Close						
Cross-Race Friends—						
Posttest number of Close						
Cross-Race Friends	-.0543	.65	.0575	-.943	128	.347*

* $p < .05$, two-tailed.

Within the experimental group, the number of strong cross-race friendships on the pretest ($M=.51$) was compared to the number of strong cross-race friendships on the posttest ($M=.67$) (see Table 8). A paired samples t -test yielded a t of $-.2512$, $p=.013$. A statistically significant difference in the number of strong cross-race friendships on the pretest and the number of strong cross-race friendships on the posttest was found (see Table 9). The number of strong cross-race friendships increased.

Table 8

Paired Samples Statistics: Experimental Group Strong Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Strong				
Cross-Race Friends	129	.51	.95	.0839
Posttest number of Strong				
Cross-Race Friends	129	.67	1.06	.0936

Table 9

Paired Samples Test: Experimental Group Strong Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Strong						
Cross-Race Friends—						
Posttest number of Strong						
Cross-Race Friends	-.16	.70	.0617	-2.512	128	.013*

* $p < .05$, two-tailed.

Within the control group, the number of African Americans' close cross-race friendships on the pretest ($M=4.11$) was compared to the number of African Americans' close cross-race friendships on the posttest ($M=3.93$) (see Table 10). A paired samples t -test yielded a t of .866, $p=.394$. No statistically significant difference in the number of close cross-race friendships on the pretest and the number of close cross-race friendships on the posttest was found (see Table 11).

Table 10

Paired Samples Statistics: Control Group African Americans' Close Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Close				
Cross-Race Friends	27	4.11	1.05	.20
Posttest number of Close				
Cross-Race Friends	27	3.93	1.27	.24

Table 11

Paired Samples Test: Control Group African Americans' Close Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Close						
Cross-Race Friends—						
Posttest number of Close						
Cross-Race Friends	.19	1.11	.21	.866	26	.394*

* $p < .05$, two-tailed.

Within the control group, the number of African Americans' strong cross-race friendships on the pretest ($M=1.67$) was compared to the number of African Americans' strong cross-race friendships on the posttest ($M=1.26$) (see Table 12). A paired samples t -test yielded a t of 1.893, $p=.070$. No statistically significant difference in the number of strong cross-race friendships on the pretest and the number of strong cross-race friendships on the posttest was found (see Table 13).

Table 12

Paired Samples Statistics: Control Group African Americans' Strong Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Strong				
Cross-Race Friends	27	1.67	1.39	.27
Posttest number of Strong				
Cross-Race Friends	27	1.26	1.13	.22

Table 13

Paired Samples Test: Control Group African Americans' Strong Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Strong						
Cross-Race Friends—						
Posttest number of Strong						
Cross-Race Friends	.41	1.12	.22	1.893	26	.070*

* $p < .05$, two-tailed.

Within the control group, the number of Caucasians' close cross-race friendships on the pretest ($M=.81$) was compared to the number of Caucasians' close cross-race friendships on the posttest ($M=.82$) (see Table 14). A paired samples t -test yielded a t of $-.134$, $p=.894$. No statistically significant difference in the number of close cross-race friendships on the pretest and the number of close cross-race friendships on the posttest was found (see Table 15).

Table 14

Paired Samples Statistics: Control Group Caucasians' Close Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Close				
Cross-Race Friends	100	.81	.92	.0918
Posttest number of Close				
Cross-Race Friends	100	.82	.91	.0914

Table 15

Paired Samples Test: Control Group Caucasians' Close Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Close						
Cross-Race Friends—						
Posttest number of Close						
Cross-Race Friends	-.0100	.75	.0745	-.134	99	.894*

* $p < .05$, two-tailed.

Within the control group, the number of Caucasians' strong cross-race friendships on the pretest ($M=.45$) was compared to the number of Caucasians' strong cross-race friendships on the posttest ($M=.38$) (see Table 16). A paired samples t -test yielded a t of 1.261, $p=.210$. No statistically significant difference in the number of strong cross-race friendships on the pretest and the number of strong cross-race friendships on the posttest was found (see Table 17).

Table 16

Paired Samples Statistics: Control Group Caucasians' Strong Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Strong				
Cross-Race Friends	100	.45	.72	.0716
Posttest number of Strong				
Cross-Race Friends	100	.38	.62	.0616

Table 17

Paired Samples Test: Control Group Caucasians' Strong Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Strong						
Cross-Race Friends—						
Posttest number of Strong						
Cross-Race Friends	.0700	.56	.0555	1.261	99	.210*

* $p < .05$, two-tailed.

Within the experimental group, the number of African Americans' close cross-race friendships on the pretest ($M=4.50$) was compared to the number of African Americans' close cross-race friendships on the posttest ($M=4.42$) (see Table 18). A paired samples *t*-test yielded a *t* of .569, $p=.575$. No statistically significant difference in the number of close cross-race friendships on the pretest and the number of close cross-race friendships on the posttest was found (see Table 19).

Table 18

Paired Samples Statistics: Experimental Group African Americans' Close Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Close				
Cross-Race Friends	24	4.50	.88	.18
Posttest number of Close				
Cross-Race Friends	24	4.42	1.06	.22

Table 19

Paired Samples Test: Experimental Group African Americans' Close Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Close						
Cross-Race Friends—						
Posttest number of Close						
Cross-Race Friends	.0833	.72	.15	.569	23	.575*

* $p < .05$, two-tailed.

Within the experimental group, the number of African Americans' strong cross-race friendships on the pretest ($M=1.29$) was compared to the number of African Americans' strong cross-race friendships on the posttest ($M=1.79$) (see Table 20). A paired samples *t*-test yielded a *t* of -1.958 , $p=.062$. No statistically significant difference in the number of strong cross-race friendships on the pretest and the number of strong cross-race friendships on the posttest was found (see Table 21).

Table 20

Paired Samples Statistics: Experimental Group African Americans' Strong Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Strong				
Cross-Race Friends	24	1.29	1.55	.32
Posttest number of Strong				
Cross-Race Friends	24	1.79	1.61	.33

Table 21

Paired Samples Test: Experimental Group African Americans' Strong Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Strong						
Cross-Race Friends—						
Posttest number of Strong						
Cross-Race Friends	- .50	1.25	.26	-1.958	23	.062*

* $p < .05$, two-tailed.

Within the experimental group, the number of Caucasians' close cross-race friendships on the pretest ($M=.65$) was compared to the number of Caucasians' close cross-race friendships on the posttest ($M=.73$) (see Table 22). A paired samples t -test yielded a t of -1.378 , $p=.171$. No statistically significant difference in the number of close cross-race friendships on the pretest and the number of close cross-race friendships on the posttest was found (see Table 23).

Table 22

Paired Samples Statistics: Experimental Group Caucasians' Close Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Close				
Cross-Race Friends	105	.65	.95	.0928
Posttest number of Close				
Cross-Race Friends	105	.73	.86	.0837

Table 23

Paired Samples Test: Experimental Group Caucasians' Close Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Close						
Cross-Race Friends—						
Posttest number of Close						
Cross-Race Friends	-.0857	.64	.0622	-1.378	104	.171*

* $p < .05$, two-tailed.

Within the experimental group, the number of Caucasians' strong cross-race friendships on the pretest ($M=.33$) was compared to the number of Caucasians' strong cross-race friendships on the posttest ($M=.41$) (see Table 24). A paired samples *t*-test yielded a *t* of -1.646 , $p=.103$. No statistically significant difference in the number of strong cross-race friendships on the pretest and the number of strong cross-race friendships on the posttest was found (see Table 25).

Table 24

Paired Samples Statistics: Experimental Group Caucasians' Strong Cross-Race Friendships

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Pretest number of Strong				
Cross-Race Friends	105	.33	.65	.0630
Posttest number of Strong				
Cross-Race Friends	105	.41	.68	.0659

Table 25

Paired Samples Test: Experimental Group Caucasians' Strong Cross-Race Friendships

	<i>M Difference</i>	<i>SD</i>	<i>SE of Mean</i>	<i>t</i>	<i>df</i>	<i>Sig.</i>
Pretest number of Strong						
Cross-Race Friends—						
Posttest number of Strong						
Cross-Race Friends	-.0762	.47	.0463	-1.646	104	.103*

* $p < .05$, two-tailed.

Independent samples *t*-tests were performed to ascertain if the control and experimental groups were different on the pretests. The number of close cross-race friendships on the pretest of the control group ($M=1.51$) was compared to the number of close cross-race friendships on the pretest of the experimental group ($M=1.36$) (see Table 26). There was no statistically significant difference in the number of close cross-race friendships in the control group and the number of close cross-race friendships in the experimental group, $t(254)=.689$, $p=.492$ (see Table 27). This test determined that there

was no statistically significant difference between the control and experimental groups at the onset of this study concerning the number of close cross-race friendships.

Table 26

Group Statistics: Comparison of Control and Experimental Groups' Close Cross-Race Friendships Pretests

Student's Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Control	127	1.51	1.65	.15
Experimental	129	1.36	1.77	.16

Table 27

Independent Samples Test: Comparison of Control and Experimental Groups' Close Cross-Race Friendships Pretests

	<i>t</i>	<i>df</i>	<i>Sig.</i>	<i>M Difference</i>
Pretest number of Close Cross-Race Friendships				
Equal variances assumed	.689	254	.492*	.15

* $p < .05$, two-tailed.

Also, the number of strong cross-race friendships on the pretest of the control group ($M=.71$) was compared to the number of strong cross-race friendships on the pretest of the experimental group ($M=.51$) (see Table 28). There was no statistically significant difference in the number of strong cross-race friendships in the control group and the number of strong cross-race friendships in the experimental group, $t(254)=1.594$, $p=.112$ (see Table 29). This test determined that there was no statistically significant difference between the control and experimental groups at the onset of this study concerning the number of strong cross-race friendships.

Table 28

Group Statistics: Comparison of Control and Experimental Groups' Strong Cross-Race Friendships Pretests

Student's Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Control	127	.71	1.02	.0909
Experimental	129	.51	.95	.0839

Table 29

Independent Samples Test: Comparison of Control and Experimental Groups' Strong Cross-Race Friendships Pretests

	<i>t</i>	<i>df</i>	<i>Sig.</i>	<i>M Difference</i>
Pretest number of Strong Cross-Race Friendships				
Equal variances assumed	1.594	254	.112*	.20

* $p < .05$, two-tailed.

Hypothesis I

The control and experimental groups were both examined for any statistically significant difference with reference to close cross-race friendships. It was determined utilizing the paired samples *t*-test that the control group's pretest to posttest scores were not statistically significantly different ($p = .672$) concerning close cross-race friendships (see Table 3). There was a decrease in the mean from pretest to posttest. The mean difference was .0315. It was also determined utilizing the paired samples *t*-test that the experimental group's pretest to posttest scores were not statistically significantly different ($p = .347$) concerning close cross-race friendships (see Table 7). There was an increase in the mean from pretest to posttest. The mean difference was -.0543. Even though no

statistically significant difference was found, the experimental group was experiencing an increase in close cross-race friends while the control group decreased in close cross-race friends.

Hypothesis I stated that there is a statistically significant difference in the amount of change in close cross-race friendships of students in cooperative learning classes and the amount of change in close cross-race friendships of students in traditional instruction classes. For each student in the control group and the experimental group, the increase or decrease of close cross-race friendships was computed by subtracting the number of close cross-race friendships on the pretest from the number of close cross-race friendships on the posttest. This difference score took into account the repeated measures nature of the design. An independent samples *t*-test was performed to ascertain if any statistically significant difference existed between the means' increase or decrease in close cross-race friendships of the experimental group ($M = .0543$) and the control group ($M = -.0315$) (see Table 30). The mean number of close cross-race friendships of the control group decreased ($-.0315$), while the mean number of close cross-race friendships of the experimental group increased ($.0543$). However, no statistically significant difference was found between the two groups, $t(254) = -.916$, $p = .361$ (see Table 31). Consequently, the null hypothesis was not rejected: There is no statistically significant difference in the amount of change in close cross-race friendships of students in cooperative learning classes and the amount of change in close cross-race friendships of students in traditional instruction classes.

Table 30

Group Statistics: Change from Pretest to Posttest in Close Cross-Race Friendships

Student's Group	N	M	SD	SE of Mean
Control	127	-.0315	.84	.0741
Experimental	129	.0543	.65	.0575

Table 31

Independent Samples Test: Change from Pretest to Posttest in Close Cross-Race Friendships

	t	df	Sig.	M Difference
Close Cross-Race Change				
Equal variances assumed	-.916	254	.361*	-.0858

* $p < .05$, two-tailed.

Hypothesis II

The control and experimental groups were both examined for any statistical significance with reference to strong cross-race friendships. It was determined utilizing the paired samples *t*-test that the control group's pretest to posttest scores were statistically significantly different ($p = .028$) concerning strong cross-race friendships (see Table 5). There was a decrease in the mean from pretest to posttest. The mean difference was .14. It was also determined utilizing the paired samples *t*-test that the experimental group's pretest to posttest scores were statistically significantly different ($p = .013$) concerning strong cross-race friendships (see Table 9). There was an increase in the mean from pretest to posttest. The mean difference was -.16. The experimental group was showing an increase in strong cross-race friendships while the control group was indicating a decrease.

Hypothesis II stated that there is a statistically significant difference in the amount of change in strong cross-race friendships of students in cooperative learning classes and the amount of change in strong cross-race friendships of students in traditional instruction classes. For each student in the control group and the experimental group, the increase or decrease of strong cross-race friendships was computed by subtracting the number of strong cross-race friendships on the pretest from the number of strong cross-race friendships on the posttest. This difference score took into account the repeated measures nature of the design. Therefore, an independent samples *t*-test was performed to ascertain if any statistically significant difference existed between the means' increase or decrease in strong cross-race friendships of the experimental group ($M=.16$) and control group ($M= -.14$) (see Table 32). The mean number of strong cross-race friendships of the control group decreased (-.14) and the mean number of strong cross-race friendships of the experimental group increased (.16). It was determined that there was a statistically significant difference, $t(254)= -3.340$, $p=.001$, in the mean change of strong cross-race friendships in the experimental group when compared to that of the control group (see Table 33). The null hypothesis was rejected because there was a statistically significant difference in the amount of change in strong cross-race friendships of students in cooperative learning classes and the amount of change in strong cross-race friendships of students in traditional instruction classes.

Table 32

Group Statistics: Change from Pretest to Posttest in Strong Cross-Race Friendships

Student's Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
Control	127	-.14	.72	.0640
Experimental	129	.16	.70	.0617

Table 33

Independent Samples Test: Change from Pretest to Posttest in Strong Cross-Race Friendships

	<i>t</i>	<i>df</i>	<i>Sig.</i>	<i>M Difference</i>
Change Pre Post Strong Cross-Race Friendships				
Equal variances assumed	-3.340	254	.001*	-.30

* $p < .05$, two-tailed.

Hypothesis III

The control and experimental groups were both examined for any statistically significant difference with reference to African Americans' close cross-race friendships. It was determined utilizing the paired samples *t*-test that the control group's pretest to posttest scores for African Americans were not statistically significantly different ($p = .394$) concerning close cross-race friendships (see Table 11). There was a decrease in the mean from pretest to posttest. The mean difference was .19. It was also determined utilizing the paired samples *t*-test that the experimental group's pretest to posttest scores for African Americans were not statistically significantly different ($p = .575$) concerning close cross-race friendships (see Table 19). There was a decrease in the mean from the pretest to the posttest. The mean difference was .0833. Although the African Americans' close cross-race friendships were decreasing in both the control and experimental groups,

the mean difference in the control group was more than twice that of the experimental group.

The control and experimental groups were both examined for any statistically significant difference with reference to Caucasians' close cross-race friendships. It was determined utilizing the paired samples *t*-test that the control group's pretest to posttest scores for Caucasians were not statistically significantly different ($p=.894$) concerning close cross-race friendships (see Table 15). There was an increase in the mean from pretest to posttest. The mean difference was $-.0100$. It was also determined utilizing the paired samples *t*-test that the experimental group's pretest to posttest scores for Caucasians were not statistically significantly different ($p=.171$) concerning close cross-race friendships (see Table 23). There was an increase in the mean from pretest to posttest. The mean difference was $-.0857$. This mean difference was approximately 8 times that of the control group's mean difference ($-.0100$). Both groups were increasing in close cross-race friendships, but the experimental group increased at a much greater rate.

The control and experimental groups were both examined for any statistically significant difference with reference to African Americans' strong cross-race friendships. It was determined utilizing the paired samples *t*-test that the control group's pretest to posttest scores for African Americans were not statistically significantly different ($p=.070$) concerning strong cross-race friendships (see Table 13). There was a decrease in the mean from pretest to posttest. The mean difference was $.41$. It was also determined utilizing the paired samples *t*-test that the experimental group's pretest to posttest scores for African Americans were not statistically significantly different ($p=.062$) concerning

strong cross-race friendships (see Table 21). There was an increase in the mean from pretest to posttest. The mean difference was $-.50$.

The control and experimental groups were both examined for any statistically significant difference with reference to Caucasians' strong cross-race friendships. It was determined utilizing the paired samples *t*-test that the control group's pretest to posttest scores for Caucasians were not statistically significantly different ($p=.210$) concerning strong cross-race friendships (see Table 17). There was a decrease in the mean from pretest to posttest. The mean difference was $.0700$. It was also determined utilizing the paired samples *t*-test that the experimental group's pretest to posttest scores for Caucasians were not statistically significantly different ($p=.103$) concerning strong cross-race friendships (see Table 25). There was an increase in the mean from pretest to posttest. The mean difference was $-.0762$.

Hypothesis III stated that there is a statistically significant difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships. The amount of change in close cross-race friendships from pretest to posttest of African Americans in the control and experimental groups was compared to the amount of change in close cross-race friendships from pretest to posttest of Caucasians in the control and experimental groups. For each student participating in the study, the increase or decrease of close cross-race friendships was computed by subtracting the number of close cross-race friendships on the pretest from the number of close cross-race friendships on the posttest. This difference score took into account the repeated measures nature of the design. Therefore, an independent samples *t*-test was performed to ascertain if any statistically significant difference existed between the means' increase or decrease in close cross-race friendships of African Americans ($M= -.14$) and Caucasians

($M=.0488$) (see Table 34). It was determined that there was no statistically significant difference, $t(254) = -1.593$, $p = .113$, between African American and Caucasians' number of close cross-race friendship change (see Table 35).

Table 34

Group Statistics: Change from Pretest to Posttest in Close Cross-Race Friendships by Race

Student's Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
African American	51	-.1400	.94	.1300
Caucasian	205	.0488	.69	.0483

Table 35

Independent Samples Test: Change from Pretest to Posttest in Close Cross-Race Friendships by Race

	<i>t</i>	<i>df</i>	<i>Sig.</i>	<i>M Difference</i>
Change				
Equal variances assumed	-1.593	254	.113*	-.19

* $p < .05$, two-tailed.

The amount of change in strong cross-race friendships from pretest to posttest of African Americans in the control and experimental groups was compared to the amount of change in strong cross-race friendships from pretest to posttest of Caucasians in the control and experimental groups. For each student participating in the study, the increase or decrease of strong cross-race friendships was computed by subtracting the number of strong cross-race friendships on the pretest from the number of strong cross-race friendships on the posttest. This difference score took into account the repeated measures nature of the design. Therefore, an independent samples *t*-test was performed to ascertain

if any statistically significant difference existed between the means' increase or decrease in strong cross-race friendships of African Americans ($M=.0196$) and Caucasians ($M=.00488$) (see Table 36). It was determined that there was no statistically significant difference, $t(254)=.130$, $p=.897$, between African American and Caucasians' number of strong cross-race friendships change (see Table 37).

Table 36

Group Statistics: Change from Pretest to Posttest in Strong Cross-Race Friendships by Race

Student's Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>SE of Mean</i>
African American	51	.0196	1.26	.1800
Caucasian	205	.00488	.52	.0363

Table 37

Independent Samples Test: Change from Pretest to Posttest in Strong Cross-Race Friendships by Race

Change	<i>t</i>	<i>df</i>	<i>Sig.</i>	<i>M Difference</i>
Equal variances assumed	.130	254	.897*	.0147

* $p < .05$, two-tailed.

An independent samples *t*-test indicated that there was no statistically significant difference in the impact of cooperative learning on African American and Caucasian students' close cross-race friendships. In addition, an independent samples *t*-test indicated that there was no statistically significant difference in the impact of cooperative learning on African American and Caucasian students' strong cross-race friendships. Consequently, the null hypothesis was accepted: There is no statistically significant

difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships.

Summary

This study was based on a pretest/posttest sociometric questionnaire. Two independent samples *t*-tests were performed to ascertain if the control and experimental groups were different on the pretest at the onset of this study. There was no statistically significant difference in the number of close cross-race friendships in the control group and the number of close cross-race friendships in the experimental group. Also, the number of strong cross-race friendships on the pretest of the control group was compared to the number of strong cross-race friendships on the pretest of the experimental group. There was no statistically significant difference found. Both independent samples *t*-tests determined that there was no statistically significant difference between the control and experimental groups at the onset of this study concerning the number of close and strong cross-race friendships.

Using a paired samples *t*-test, the researcher examined the control and experimental groups for any statistically significant difference with reference to close cross-race friendships. Even though no statistically significant difference was found, the experimental group was experiencing an increase in close cross-race friendships while the control group decreased in close cross-race friendships. Likewise, the groups were examined for any statistically significant difference with reference to strong cross-race friendships. A statistically significant difference was found. The experimental group showed an increase in strong cross-race friendships, while the control group demonstrated a decrease.

The control group and experimental groups were both examined using a paired samples *t*-test to determine any statistically significant difference with reference to African Americans' close cross-race friendships. There was no statistically significant difference for either the control or experimental group concerning their close cross-race friendships. The Caucasians' close cross-race friendships in the control and the experimental groups were examined in the same manner. There was no statistically significant difference concerning close cross-race friendships for the control or experimental group.

The control and experimental groups were both examined using a paired samples *t*-test for any statistically significant difference for African Americans' strong cross-race friendships. There was no statistically significant difference for either the control or experimental group. Furthermore, no statistically significant difference was found concerning Caucasians' strong cross-race friendships in the control or experimental group.

The data analyses utilized the *t*-test of independent samples comparing the means' increase or decrease in African American and Caucasians' interracial friendships from the pretest to the posttest for both the experimental group (cooperative learning) and the control group (traditional instruction). Regarding Hypothesis I, cooperative learning caused no statistically significant difference in the amount of change in close cross-race friendships between African Americans and Caucasians. Regarding Hypothesis II, cooperative learning did demonstrate a statistically significant increase in the amount of change in strong cross-race friendships among African American and Caucasian

students. Regarding Hypothesis III, there was no statistically significant difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to gauge the impact of cooperative learning teams on interracial friendships. The utilization of the cooperative learning method of organizing the classroom, Student Teams-Achievement Divisions (STAD) (Slavin, 1995a), demonstrated that interracial friendships were fostered, thereby aiding in truly integrating schools. A sociometric questionnaire was administered to obtain data for assessing the impact of cooperative learning on interracial friendships. The study supported cooperative learning as a method that can be used by teachers in Louisiana because it has the potential to positively impact integration in schools.

Discussion

This study disclosed that cooperative learning did not statistically increase close cross-race friendships between African American and Caucasian students. The first hypothesis—there is a statistically significant difference in the amount of change in close cross-race friendships of students in cooperative learning classes and the amount of change in close cross-race friendships of students in traditional instruction classes—was not confirmed by the data analysis. This finding did not confirm the research of DeVries et al. (1978) and Slavin (1977, 1979) that determined both African American and Caucasian students had more friends of the other race after engaging in cooperative learning activities. The cooperative learning intervention used in this study

did not find any statistically significant difference in the increase of close cross-race choices between the students in the control or experimental group. This result differed with five previous studies that found significant differences concerning cooperative learning with English as the subject area (Weigel et al., 1975; Slavin, 1977; DeVries et al., 1978; Slavin, 1979; and Slavin & Oickle, 1981). However, the data from this study suggested some indication of improvement in the number of close cross-race friendships. By examining the data in the students' groups for cross-race friendship changes, insight into probable explanations concerning the effect of cooperative learning on cross-race friendships was formulated.

Although no statistical difference concerning close cross-race friendships was determined as hypothesized, indications emerged that students in the control group (traditional instruction) were more likely to decrease their number of close cross-race friends than students in the experimental group (cooperative learning instruction). The data showing the change in the number of close cross-race friendships were examined. Twenty-two percent (22%) (28 out of 127) of the control group exhibited a decrease in the number of close cross-race choices as compared to 11% (14 out of 129) of the experimental group (see Table 38). This 2 to 1 ratio between the control group and the experimental group suggests that the cooperative learning experience had a positive effect on close cross-race friendships.

Table 38

Crosstabulation: Student's Cross-Race Change

Cross-Race Change	Student's Group		Total
	Control	Experimental	
-3	2		2
-2	2	3	5
-1	24	11	35
0	73	95	168
1	22	16	38
2	4	4	8
Total	127	129	256

The position that cooperative learning promotes the creation of close cross-race friendships was further supported by the comments of a teacher participating in the study. While on duty, the teacher noticed that students appeared to be friendlier, with less negative remarks and improper behavior, toward other students. The teacher attributed this positive change to the study's fostering more tolerant feelings toward one another by the students through the building of students' self-esteem and the development of appreciation for individual differences.

The length afforded this study might have been a factor that negatively affected the increase of close cross-race friendships. Slavin (1977) proposed a nine to ten week time span concerning cooperative learning strategies, while Stahl (1994) posited that a

time span of four or more weeks is sufficient for the benefits of cooperative learning to emerge and be retained. In this study, no statistically significant difference in the increase of close cross-race friendships was found. Perhaps a time span of more than eight weeks would have produced a statistically significant increase for close cross-race friendships. More interactions among African American and Caucasian students would have been possible.

The study might have been at an inopportune time. The results might have been different if the study had been initiated in the fall, not the spring. Degirmencioglu, Urberg, Tolson, and Richard (1998) determined that “half of all close friendships are stable over the school year” (p. 13). They posited that 50% of the close friends that a student has at the beginning of the year will be present at the end of the school year. Also, they emphasized that close friendships are stable during the school year. This position may explain why the close cross-race friendships did not significantly change.

Context discontinuity (school holidays, breaks in class meetings for testing, etc.) affects friendships (Degirmencioglu et al., 1998). Two holidays occurred during the time span of this study. One holiday was on a Monday, while the second holiday was from Friday through the following week. These interruptions might have inhibited the production of new close cross-race friendships. The students involved in this study met their English class every other day. Perhaps the lack of consecutive days of class meetings attributed to the discontinuity of the effect of the cooperative learning intervention.

Schofield (1982) identified adolescent friendships as gradually developing with interactions over time. The middle school where this study was conducted is within a school zone that requires all students to attend the same elementary school, middle

school, and high school. Therefore, the students participating in this study might have already established close cross-race friendships that were not affected by the cooperative learning intervention. Degirmencioglu et al. (1998) stated that there is moderate stability and continuity at this grade level. Since many of the students have known each other during their younger school years, the formation of close cross-race friendships might have been more difficult to effect. The interactions of the cooperative learning structure might not have been sufficient to overcome friendships that were previously developed.

Patchen et al. (1975) ascertained that change in opinion toward other race students was attributed to the positive or negative contact, not the presence of contact alone. The control group received traditional instruction with no intervention as to the type of contact—positive or negative. Either type of contact might have been present in the control group. On the other hand, cooperative learning is structured to promote positive contact. Cooperative learning methods reduce competition and allow students to combine their efforts to succeed (Foote, 1997). Schofield (1995) contended that each student is necessary to the final product. Students are accountable for their individual learning, but are rewarded based upon team performance (Slavin, 1995a). Negative contact might have surfaced at times whenever the group did not receive a reward (recognition of successful acquisition of knowledge by all members of the group). As identified by Schofield, this action might have reinforced the negative stereotypes contributed by one race to another.

The low percentage of African Americans (20%) involved in this study might have accounted for the lack of increase in the number of close cross-race friendships. Each cooperative learning team had a maximum of one African American. Therefore, the inherent design of this interracial friendship study with cooperative learning and

involving a small number of African Americans (20%) limited the possible interaction among African Americans and Caucasians. However, this conjecture was contradicted by Jackson (1998) who supported the claim “that increases in cross-racial friendships can be produced with small minority representation” (p. 97).

This study has demonstrated that cooperative learning created strong cross-race friendships between African American and Caucasian students. Hence, the second hypothesis—there is a statistically significant difference in the amount of change in strong cross-race friendships of students in cooperative learning classes and the amount of change in strong cross-race friendships of students in traditional instruction classes—was supported. As did Hansell and Slavin’s (1981) study, this research determined that students in the experimental group had significantly more strong cross-race friendships than did students in the control group. Furthermore, the results of this study confirmed their findings that cooperative learning is a way of structuring interracial contact to foster strong cross-race friendships. The present findings of this study also supported Johnson, Johnson, Johnson, and Anderson’s (1976) findings that cooperative learning increased students’ liking of their peers.

Hartup (1992) identified the essentials of friendship as reciprocity and commitment between equals, as well as empathy toward one another. These essentials of friendship were in the design of the cooperative learning activities used in this study. When the students worked in cooperative groups, the structure that the cooperative learning provided applied functions of friendships as identified by Hartup. These functions included the following: a) utilizing cognitive resources for problem-solving and knowledge acquisition, b) inhibiting school failure, and c) students teaching one another. With reference to students teaching one another (item c), cooperative learning required

that the students contribute to the problem solving and benefit from shared rewards (Hartup). The interdependence (Stahl, 1994), students' need of one another to succeed, could have initiated empathy. In succession, this empathy toward one another by the African American and Caucasian students could have developed friendship reciprocity.

Hartup (1992) stressed that "friendships are unique contexts for transmitting information from one child to another" (p. 3). This position aligned with Vygotsky's (1978) position that intellectual abilities "are a copy from social interaction; all higher mental functions are internalized social relationships" (p. 164); and, with the position of Piaget (1926) that identified knowledge as being learned only through human interaction. "Friends talk more, take more time to work out differences in their understanding of rules, and compromise more readily than nonfriends do" (Hartup, p.3). Hartup identified this interaction as the basis of reciprocal friendships. This interaction might have been the catalyst that fostered the development of more strong interracial friendships.

Hartup (1992) emphasized that old relationships generalize to form new ones. Perhaps the creation of strong cross-race friendships among students in the cooperative learning team during the first four weeks of this study provided the reciprocal friendships on which to build more strong cross-race friendships among students in the new cooperative learning team during the following four weeks of the study. In other words, the strong cross-race friendships formed in a team fostered the creation of more strong cross-race friendships when the students interacted in another team. This chain reaction might have been the impetus that developed a more statistically significant difference in strong cross-race friendships of the experimental group.

Sleeter and Grant (1985) favored proper planning and deliberate action as the key to understanding race. This study supported Sleeter and Grant's position that major

changes in school teaching programs foster interracial friendships. Preparation for group work in this study included classbuilding activities, and the sequencing and structuring of the cooperative learning activities (Farivar, 1991). Farivar posited that preparing students for group work effectively increases cross-ethnic regard for teammates. Perhaps the structuring of the interactions in the cooperative learning teams of this study contributed to the development of strong interracial friendships. This development is supported by the following statement: "Cooperative group projects can foster peer acceptance of children who are trying to improve their social reputations, including children who are seen as different by their classmates" (Burton, 1986, p. 3).

This study has determined that cooperative learning did not impact African American and Caucasian interracial friendships differently. Consequently, the third hypothesis—there is a statistically significant difference in the impact of cooperative learning on African American and Caucasian students' interracial friendships—was not supported. Intergroup relations research inferred that African American students' attitudes are modified differently (Weigel et al., 1975; Gonzales, 1979). Slavin (1983a) emphasized that it was not known if cooperative learning methods affected majority or minority groups. Piel and Conwell (1989) also agreed with this statement. In the present study, no different effect was found. The findings of the present study confirmed previous studies by Slavin (1979), and Hansell and Slavin (1981) where no significant difference in the choices of African American and Caucasian students was ascertained. A student's race did not influence the impact of cooperative learning on close cross-race or strong cross-race friendship choices.

Conclusions

The promoting of structured social interactions among African American and Caucasian students facilitated an increase in the number of close cross-race friendships, albeit not a statistically significant one. It is a possible that the time span of this study lessened the chance of African American and Caucasian students creating more close cross-race friendships. If the time span of the study had been longer, perhaps the results concerning close cross-race friendships would have been significant. Other possible negative effects included the timing of the study, the low percentage of African Americans, and the context discontinuity of the evolution of this study.

This cooperative learning interracial friendship study promoted social interactions among African American and Caucasian students as was indicated by the statistically significant increase in the number of strong cross-race friendships. The students participating in this middle school study concerning cooperative learning and interracial friendships were zoned to have attended the same elementary school. It is possible that the strong cross-race friendships developed during the eight weeks of this study in the cooperative learning teams were initiated as a result of a previously formed foundation. This reasoning may explain why strong cross-race friendships were significantly developed, while close cross-race friendships were not.

Romo (1997) stated that “researchers in multiethnic schools have found that students tend to resegregate themselves School policies may also contribute to resegregation” (p. 2). Cooperative learning is a teaching method that structures the classroom to promote interactions among students that may not occur naturally. This study determined that there is no statistically significant difference in the impact of cooperative learning on African American and Caucasian students’ interracial

friendships. Therefore, school policies that utilize the cooperative learning intervention will promote the integration of schools through the nurturing of strong interracial friendship development even when the minority of the student body is as low as 20%.

This study, the *Effect of Cooperative Learning (Student Teams-Achievement Divisions) on African American and Caucasians' Interracial Friendships*, was based on Robert E. Slavin's work concerning the cooperative learning method and its effect on interracial friendships. The cooperative learning method applied in this study was modeled after Slavin's (1995a) cooperative learning (STAD). However, minor changes (see Appendix A) were made to the computing of the base score, the determining of team recognition, and the assigning of team roles. The minor changes concerning base scores and team recognition were similar to Kagan (1990) and Dubois (1993), respectfully. The changes concerning base scores and team recognition were necessary to adapt the cooperative learning method's procedure to the grading scale that was utilized at the middle school where this research was performed. The assigning of team roles was utilized as specified by Silver (1997).

Slavin (1983a) acknowledged that it was not known whether or not racial relations of minority or majority groups were affected by the cooperative learning method. Applying the sociometric question, "Who are your friends in this class?" differing results were ascertained by Slavin. Although not statistically significant, Slavin (1979) determined that African Americans named more Caucasians as friends than Caucasians named African Americans as friends. Hansell and Slavin (1981) revealed that new cross-race friendships were made and received equally by African Americans and Caucasians. Slavin and Oickle (1981) found that the cooperative learning intervention increased Caucasian students friendships' choices, but not vice versa. Oishi et al. (1983)

identified cooperative learning as having positive effects on cross-race friendships because of a reduction of African Americans' negative attitudes toward Caucasians. However, this researcher determined that cooperative learning's effect on interracial friendships was not statistically significantly different for African Americans and Caucasians.

This researcher determined that the cooperative learning model (STAD) statistically significantly increased the amount of positive change in strong cross-race friendships. Although not statistically significant, the number of close cross-race friendships also increased. Therefore, this study concerning the effect of cooperative learning on interracial friendships determined that cooperative learning does have an effect on increasing interracial friendships among African Americans and Caucasians.

Recommendations

In order to increase the development of close cross-race friendships, the specific length of time that overcomes established factors, such as the students' lengthy attendance in the same school zone with the same friends, needs to be determined. This concern should be addressed at a school that includes students from different elementary school zones, such as a school system that has massive busing. The students should not have formed close cross-race friendships before a study commences.

Future studies should also include research conducted at the high school level. Students at this level may have established close or strong friendships that are not interracial. These studies may provide insights into the length of time essential to overcome established factors that may impede the development of interracial friendships.

Any future study addressing close cross-race friendships should be done with as few interruptions of class meetings as possible. Perhaps the study should be conducted during the period of a school year having the least holiday interruptions affecting class meetings. Also, consideration should be given to the scheduling of classes. Research with classes that meet on alternate days, as well as other types of block scheduling, should be compared to research in schools that utilize traditional scheduling. This comparison is deemed necessary to determine if certain types of scheduling affect interracial friendships when applying the cooperative learning intervention. This information would assist teachers in successfully promoting interracial friendships.

Research, similar in design to this study, should include the gathering of qualitative data. This data gathering should address observing student interactions in the cooperative teams, as well as follow-up interviews with students. The qualitative data might provide information as to what actually occurs when cross-race friendships increase during the application of the cooperative learning intervention.

As previously discussed, there may be incidental factors that impede the formation of close cross-race friendships. Future research should also address if a lack of earned group rewards may interfere with students significantly developing close cross-race friendships. Based upon the literature and this study, it is the belief of this researcher that teachers need to know the particulars of what to address to ensure the creation of interracial friendships.

Summary

Cooperative learning is a teaching method that assists in truly integrating schools by applying the Contact Theory (Allport, 1954) to education in the classroom. School

systems faced with the task of desegregating schools are urged to include cooperative learning in their classroom teaching strategies. Cooperative learning is a teaching method that structures the classroom to promote interactions among students that may not occur naturally.

In this study, there was no statistically significant difference in the impact of cooperative learning on African American and Caucasians' interracial friendships. Cooperative learning increased cross-race friendships for both races. However, it was only statistically significant for strong cross-race choices, not close cross-race choices.

This researcher believes that teachers can easily incorporate cooperative learning into the classroom curriculum, thus effecting a change in a positive direction concerning true integration. While engaging in instruction, classroom teachers can use cooperative learning activities that successfully establish an environment that promotes students' positive contact with each other. This positive contact among students should be explicitly inherent in our schools.

APPENDICES

Appendix A

COOPERATIVE LEARNING MODEL

STUDENT TEAMS-ACHIEVEMENT DIVISIONS

Basic Schedule of Activities (Slavin, 1991, p. 14)

Teach

Team Study

Test

Team Recognition

Setting-Up Teams

The teacher assigns the students to cooperative learning teams consisting of four or five students. The teams are a reflection of the class as a whole (Slavin, 1981). The procedure entails determining and arranging students' reference scores, then specifying base scores prior to actually assigning members to each team. The strategy hinges upon the students judging their improvement against some prior value. The teacher averages each student's last three test scores (Dubois, 1993). This average is the reference score. As explained by Dubois, the teacher arranges the reference scores in descending numerical order noting the students' names, accordingly. Dubois recommended percent averages to determine a student's base score. The middle school performing the activities of this study utilizes letter grades only. Therefore, similar to Kagan (1990), the base score system uses the letter grades of A, B, C, D, and U. The teacher uses the student's reference score as the student's base score. The teacher assigns the base score to each student as a value on which to judge improvement (Slavin, 1991). "Students should know their own base scores [*sic*] but not those of other students" (Slavin, p. 31).

Slavin (1991) explained that the teacher determines the number of teams by dividing the number of students by four. If the division results in no remainder, then the quotient is the number of teams. However, if the division results in a remainder of one, two, or three, the teacher must create one, two, or three of the teams, respectively, with five students, not four. From the top of the ordered list, the teacher selects students to be classified as high. The number of students to be selected as high is the same as the number of teams in the class. Likewise, from the bottom of the list, the teacher selects the same number of students to be classified as low. The remaining students in the list are considered average. (High, average, and low refer to a student's standing in the class at a particular point in time. This classification is not based on national norms, but is relative to the class.) The base score is refigured after every two exams. Next, the teacher selects a high and a low student for each team, then completes the teams using students that are classified as average. For example, four teams indicate that four students are high achievers, four students are low achievers, and the remaining students are identified as average achievers. When assigning students to teams, the teachers ensure heterogeneous teams by assigning students to teams based on the racial and gender make-up of the class. In addition, if the teacher's class does not have sufficient African Americans to have at least one African American in each group, the groups are adjusted from four to five members to ensure more interracial contact. Also, the groups are adjusted from four to five members when special needs students are present in the class. The special needs student becomes the fifth member.

Teambuilding

To help the students work cooperatively, one of the teambuilding activities included by Kagan (1992), *Team Name, Banner, Logo, and/or Mural*, is utilized. The students create a name for their respective team. The students adhere to the following rules: (a) each team member has a say, (b) the decision must be by consensus, and (c) the team does not agree to a consensus if even one student has an objection. The team also creates a banner, logo, and/or mural. Each student of every team is given a specific colored writing utensil that writes in a different color from the other team members' writing utensils. All colors are to be present in the artwork, thus signifying that every member of the team contributes to the whole.

Instruction

Instruction in STAD (Slavin, 1991) consists of five activities: teaching, teaming, testing, calculating individual improvement scores, and recognizing teams. The teacher presents the lesson to the students as is expected by the *Louisiana Teacher Assistance and Assessment Program* (1998). After teaching the lesson, the teacher places the students into their assigned teams. During the time allotted to team study, the teacher spends time with each group informally assessing how the group is performing. Testing is conducted individually; not in groups.

Team Study (Slavin, 1991, 1995a)

The students study together in their teams after the teacher has taught the lesson. Two copies of a worksheet and corresponding answer sheets are provided to each team. During the study sessions, the team members are asked to master the material of the lesson, as well as to help their teammates master the material. After four weeks, the

students are assigned to new teams. The setting-up teams' process, previously explained, is followed in forming new teams. This allows students that were members of low scoring teams an opportunity to be on a high scoring team, to work with others, and to keep STAD interesting.

Rules for Team Members (Slavin 1991, 1995a)

Rules for the team members are as follows: (a) students continue studying until they believe all members of the team will make 100% on the exam, (b) students understand that the worksheets are for studying, (c) students explain answers to each other, not just perform checks for right or wrong answers, (d) students who have a question ask a teammate before they ask the teacher, and (e) students talk softly.

Team Structure Interactions

Silver (1997) described the roles of team members as principal investigator, data collector, materials manager, and timekeeper. The principal investigator performs the following activities: reads instructions, leads group discussions, asks questions of the teacher, checks the activity results, and helps with cleanup. The data collector records data on the group's worksheet, returns worksheets to the teacher, writes activity results, has all members check the worksheet, and helps with cleanup. The materials manager collects and returns all materials, reports broken/missing equipment, assembles equipment, checks activity results, and helps with cleanup. The timekeeper keeps track of time, watches for group safety, encourages group members, checks the activity results, and helps with cleanup.

Testing (Slavin, 1991)

The teacher distributes the exams and provides sufficient completion time for the students. Members of each team are not sitting by one another because the students will not work together on the exams. The teacher scores the exams before the next class meeting.

Team Recognition

Similar to Dubois (1993), the team scores are computed based on the individual points earned by each member of the team. The individual point system is as follows:

1. the test score is perfect, the student receives 40 points
2. the test score is above base, the student receives 30 points
3. the test score is the same as base, the student receives 20 points
4. the test score is one grade below base, the student receives 10 points
5. the test score is two grades below base, the student receives 0 points

EXCEPTIONS:

1. the base score is an "A" and the test score is an "A," the student receives 30 points
2. the base score is a "U" and the test score is a "U," the student receives 0 points

To determine each team's average, the teacher divides the sum of individual points the team members earn by the number of students in the respective team. The resulting number is the team average. To determine the teams that receive rewards, the following rankings similar to Dubois (1993) are used: (a) a superior team has a 25-40 point team average, (b) an excellent team has a 20-24 point team average, and (c) a very

good team has a 15-19 point team average. Each member of a superior team, excellent team, and/or very good team receives a reward that is announced prior to the beginning of the STAD lesson.

Grading

The grade of each student is based upon the student's own exam grades (Slavin 1991, 1995a). The students' individual grades are not to be based on improvement points or team scores (Slavin, 1991, 1995a). However, if so desired, bonus points may be used as a reward to the students (Slavin, 1995a). In addition, the teachers use bonus points to encourage social interactions among members of each group (see Appendix E).

Rewards

Rewards (for this study) consist of the following:

1. Bonus Points
2. Book Marks
3. Certificates
4. Door Knob Hangers
5. Folders
6. Key Chains
7. Lanyards
8. Note Pads
9. Pencils
10. Pens
11. Plastic Cups
12. Sipper Bottles

Students' Reflection (Stahl, 1994)

After distribution of rewards, each team reflects on achievement, comprehension, and social interactions. Possible improvements for the next collaboration are addressed: "(a) how well they achieved their group goals, (b) how they helped each other comprehend the content, resources, and task procedures, (c) how they used positive

behaviors and attitudes to enable each individual and the entire group to be successful, and (d) what they need to do next time to make their groups even more successful” (p. 2). (Students work together in the same heterogeneous team for four weeks, then they are to be assigned to another heterogeneous team for the same length of time.)

Appendix B

TRADITIONAL INSTRUCTION

Basic Schedule of Activities

Teach

Individual Study

Test

Basic Approach

Teacher directs class (Lampe, Rooze, & Tallent-Runnels, 1996).

Teacher utilizes whole class instruction (Lampe et al.).

Teacher dominates discussion (Rojas-Drummond, Hernandez, Velez, & Villagran, 1998).

Lesson is textbook centered (Lampe et al.).

Students remain in seats (Shachar & Sharan, 1995).

Discussion among students is considered disruptive (Shachar & Sharan).

Interaction is teacher to student or vice versa (Shachar & Sharan, 1994).

Students complete activities silently and independently (Lampe et al.).

Uniform pacing of the whole class is applied (Shachar & Sharan).

Standard curriculum is followed (Shachar & Sharan).

Organization of the class is bureaucratic (Shachar & Sharan).

Appendix C

TRADITIONAL AND COOPERATIVE LEARNING OBSERVATION FORM

Teacher: _____ Written Lesson Plan: Yes/No

Grade: _____ Date: ___/___/___

-
- | | | | | |
|-----|---|-----|----|----|
| 1. | Teacher presented a lesson.
(Slavin, 1991, 1995a) | Yes | No | NA |
| 2. | Students worked on worksheets individually and silently.
(Lampe, Rooze, & Tallent-Runnels, 1996) | Yes | No | NA |
| 3. | Students worked on worksheets in a team setting.
(Slavin) | Yes | No | NA |
| 4. | Students helped their teammates with the worksheets.
(Slavin) | Yes | No | NA |
| 5. | Students asked teammates before asking the teacher.
(Slavin) | Yes | No | NA |
| 6. | Teacher recorded bonus points to promote social
interactions. (Johnson & Johnson, 1990) | Yes | No | NA |
| 7. | Students completed exams individually.
(Slavin) | Yes | No | NA |
| 8. | Teacher provided team recognition.
(Slavin) | Yes | No | NA |
| 9. | Students reflected as a team on their success.
(Stahl, 1994) | Yes | No | NA |
| 10. | Students did not discuss among themselves; discussion
was dominated by teacher. (Lampe et al.) | Yes | No | NA |

OBSERVER COMMENT: _____

Observer Signature: _____

Appendix D

USING BONUS POINTS (Johnson & Johnson, 1990)

Research has demonstrated that using targeted cooperative skills that result in bonus points for students teaches them interpersonal and small-group skills. "Bonus points can be accumulated for academic credit or for special rewards, such as free time or minutes listening to one's own choice of music" (Johnson & Johnson, p. 31).

The teacher uses the following procedure:

1) identify, define, and teach a social skill

examples:

- staying with the group
- using quiet voices
- giving direction to the group's work
- encouraging participation
- explaining answers
- relating present learning to past learning
- criticizing ideas without criticizing people
- asking probing questions
- requesting further rationale

in addition to social skills

examples:

- following directions
- completing assigned tasks
- on task
- handing in homework

2) use group points and group rewards to increase the use of social skills

- each time a student engages in the targeted skill, the group receives a point
- points are awarded for positive action only
- points are never taken away

3) points summarize on a daily basis

4) observe each group's work equally

5) set a reasonable number of points for earning the reward

6) rewards are social or tangible

examples of social rewards: "that shows thought"
 "that's a good way of putting it"
 "remarkably well done"

examples of tangible rewards: points traded in for ___? ___
 free educational time
 computer time
 library time
 any other permissible activity that students value

Appendix E

BONUS POINTS FOR THE COOPERATIVE SOCIAL PROCESS
 (Adapted from Johnson & Johnson, 1990)

Team Name: _____

Teacher: Circle the “+” each time you see or hear the social process.



Social Skills

- | | | | |
|---|---|---|---|
| 1) staying with the group | + | + | + |
| 2) using quiet voices | + | + | + |
| 3) giving directions to the team’s work | + | + | + |
| 4) encouraging participation | + | + | + |
| 5) explaining answers | + | + | + |
| 6) relating present learning to past learning | + | + | + |
| 7) criticizing ideas without criticizing people | + | + | + |
| 8) asking probing questions | + | + | + |
| 9) requesting further rationale | + | + | + |

In addition—

- | | | | |
|------------------------------|---|---|---|
| 1) following directions | + | + | + |
| 2) on task | + | + | + |
| 3) completing assigned tasks | + | + | + |

Total Bonus Points _____/number of students in the group = number of bonus points each group member will receive.

Appendix F

Sociometric Questionnaire

Teacher's Name (Numbers X-Y)

Student ID: _____ **Race:** _____ **Sex:** _____

Who are your friends in this class?
(Arrange the names in order of your first choice to your last.)

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____
- 6) _____
- 7) _____
- 8) _____
- 9) _____
- 10) _____
- 11) _____
- 12) _____
- 13) _____
- 14) _____
- 15) _____
- 16) _____
- 17) _____
- 18) _____
- 19) _____
- 20) _____
- 21) _____
- 22) _____
- 23) _____
- 24) _____
- 25) _____

Use the following list: (You may mark through each name as it is used.)

Do not choose your own name.

(The students' names for each respective class were listed here.)

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