

A COMPARISON OF INDIVIDUAL
AND TEAM LEARNING

by

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ABSTRACT

Thesis Title: A COMPARISON OF INDIVIDUAL AND TEAM LEARNING

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Purpose

The major purpose of this study was to determine the effectiveness of individual and team learning utilizing competitive and cooperative reward structures in terms of cognitive and affective outcomes. The research hypotheses were:

1. Students who work in learning teams and whose quiz scores are formed into team scores will exhibit greater academic achievement, percentage of time on task, percentage of time spent peer tutoring, and more positive attitudes toward school, self, and others, and will be more motivated and less anxious than will students who work individually and receive individual scores only.
2. Students who are rewarded based on the difference between their quiz scores and an individually prescribed expected score will show greater academic achievement, positive self-concept, and motivation than will control students who receive traditional competitively assigned grades.

Students in team and individual expectations at two schools supported the research expectations on two measures. Students' gains in the team condition in the measure of self esteem at one school were significant at $p < .01$ and at $p < .05$ for students in the individual expectation treatment. These results were as predicted showing higher scores in the team condition than the individual one. Students at another school showed improvement in achievement. This improvement was found for the Hoyum-Sanders Standardized Test only, and not on the Curriculum Specific Test. The improvement for the team condition over the individual was significant at $p < .01$ and for the individual condition at $p < .05$. These findings supported the hypotheses in these two instances.

Despite the fact that the hypotheses were not supported in every situation on all measures, the results obtained were significant and reflected the findings of previous research in this area. Students in the team treatment showed greater increase than students in the individual treatment, but both situations showed significantly higher scores on several variables than did control students. This raises the question of whether the increase was due to the team component or the individual expectations. These results appear to indicate that the components operating in the individual learning expectations of individual goal setting had an effect on increased achievement, but the achievement was more increased by the team reward structure.

Procedures

This study involved 1031 students in four middle schools from diversified communities within a public school system.

Students were randomly assigned by class to three treatment groups: team reward structure, individual reward structure, and control group. All treatment conditions used a ten week English mechanics unit consisting of worksheets and skilldrills (quizzes). In both team and individual reward groups, students received an individual goal setting treatment in which a performance goal was set for each student based on a pretest.

The instrumentation employed was as follows: (1) the amount of achievement as measured by Hoyum-Sanders Junior High School English tests and treatment specific achievement test; (2) the development of positive attitudes towards self and others as measured by the Classroom Perception Inventory, a sociometric measure, and a modified Piers-Harris Children's Self Concept Scale; and (3) the amount of time on task and in peer interaction as measured by the Flexible Observation Instrument for Student Behavior.

Findings

The research findings provided only partial support for the hypotheses. Students in the team condition at all schools showed an increase in the sociometric measure, "number of friends named", significant at $p < .05$. Students in no other treatment conditions showed any increase in this measure.

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CHAPTER I

INTRODUCTION

One of the foremost problems encountered in education is drawing casual relationships between the way rewards for learning are structured and the cognitive and affective outcomes that are attained as a result of these structures. In short, it becomes the problem of student effects. What causes student achievement and positive attitudes toward self and others to be maximized? What conditions can be created to act as motivators and reinforcers for learning to become optimum? These are questions that still need further investigation.

There is a long tradition of research and much evidence to indicate that the way learning and rewards for students' efforts are structured promotes academic achievement, mutual concern among students, and satisfaction with self and others.

Although there is much research and theory that lies at the heart of this educational problem, most classrooms are still structured around a competitive mode as the single way that the goals of learning are attained. In the majority of classrooms, students are expected to compete with each other and outperform their classmates in achievement. In a competitive system, the probability of success is usually low for low performing students, who may have little chance of attaining an "A" or "B" regardless of their effort or performance, while high performing students are not motivated to work at their maximum capacity, since their probability of success and rewards for maximum effort is often the same as those obtained for minimal effort. By utilizing only a competitive

reward structure, learning may actually be inhibited, and great anxiety, frustration and dissatisfaction may occur.

In educational settings, there are three basic reward structures that may be employed. The competitive reward structure, the most common, is one in which students compete for a limited number of good grades or teacher praise. The individual reward structure is one in which students' grades or other rewards depend only on their own performance, as found in contingency contracting and programmed instruction. The cooperative reward structure, the least employed, is one in which students work together and are rewarded as a group or team. The cooperative (team) reward structure has been the focus of research conducted by the Center for Social Organization of Schools at the Johns Hopkins University. That research has shown that certain carefully structured team learning techniques can increase students' learning, mutual attraction and mutual concern, commitment to school goals, etc.

The team techniques involve a pattern of activities in which students work in teams to learn academic material and are then tested individually. In some of these techniques, the test takes the form of a competitive academic game. The test scores are summed to form a team score and a weekly newsletter rewards successful teams and individuals who have contributed the most to their team scores.

I. PURPOSE

This study was designed to determine whether team or individual reward structures have an impact on student learning and attitude. The answer to this question will contribute to a growing body of knowledge

on the importance of classroom reward structures and incentive on student academic performance and will further refine the use of cooperative (team) reward structures. In addition, the study will evaluate a means of rewarding students for meeting an individually set learning objective. Finally, the study will seek to determine whether increasing opportunities for students of all ability levels to gain rewards and to interact with other students brings about more positive attitudes toward self and others and increased learning.

Thus, the study will investigate the effect of variations in probability of success coupled with an incentive value of success and the resulting attitudes that may occur. Student attitudes such as satisfaction, feeling of being liked, liking of others, probability of success, incentive value of success, peer support for academic performance, anxiety and motivation, number of friends and helpers, self esteem, as well as achievement will be measured.

II. PROBLEM STATEMENT

The problems to be researched in this study relate to specific questions concerning cooperative, competitive and individual reward structures and the success of the incentive employed.

1. What mode of learning, cooperative or individual, brings about the greatest achievement, higher percentage of time on task, higher percentage of time spent peer tutoring, and most positive attitudes toward self and others?
2. Does use of a reward system that increases probability of success for students of all ability levels bring about

greater academic achievement, higher percentage of time on task, and more positive attitude toward self and others?

III. SIGNIFICANCE OF PROBLEM

There is a need to investigate further techniques that promote academic achievement and positive attitudinal outcomes toward self and others.

Differentiation of the appropriateness of these techniques for a variety of classroom applications still remains to be defined. Many of the techniques and strategies employed by teachers presently to promote student achievement are based on myth or "feelings" rather than actual research findings. Rosenshine underlines the need for more research on classroom application of instructional techniques and the limited research base for instructional practice.¹

Evidence of competition as the dominant classroom goal structure is apparent in classrooms today. Students learn at an early age that they are winners or losers, and the emphasis of education shifts from learning to succeeding or failing. Is competition a natural condition, to be encouraged as the dominant channel for education to follow? Many teachers use competitive methods simply because they are there. If asked why they selected these goal structures for their particular classroom, the rationalized reply would probably involve some of the myths most frequently cited as justification for competition. A common reply to the question of, "Why competition?" is that it is a necessity for survival in a competitive society. Society is seen as ruthlessly competitive. The school is viewed as an institutional adjunct in a world ruled by

social Darwinism.² Only the fit will survive in the society, so the social screening process begins in the primary grades. Those who are not "winners" learn early that they are losers. They learn to protect themselves by avoiding failure. School becomes a show in which the game is to dissemble and counterfeit responses. The "losers" may be motivated, but motivated by anxiety rather than the true desire for achievement.³ Thus, it appears there is a hidden curriculum in schools in which children learn and are reinforced at an early age to the concept of winners and losers. One youngster's failure makes it possible for another to succeed. Campbell indicates that the entire system is built on mistrust. Standardized achievement tests, grading curves, entrance examinations and accountability are all intended to set one person against another. He states that, "winning and losing are what our schools are all about, not education".⁴ There is evidence which corroborates Campbell's views. Although teachers defend competition as a stimulus to learning and even character building, research indicates that gains may be limited to the student who is rewarded and that this advantage may be negated by performance losses on the part of other students. Purkey argues that if a classroom is intensely competitive, students are more likely to feel devalued than praised. The average student may feel inadequate because he is not at the head of the class. Intense pressures from competition may cause a student who is trustworthy to resort to cheating, stealing, or destroying another student's work.⁵

Research findings indicate that competition is not an instinctive phenomenon but appears to be a learned trait that is reinforced by the culture. Studies by Greenberg⁶ and McKee⁷ found that greater

competitiveness was noticed between and among older children than younger. Greenberg's⁸ study of children's behavior in controlled competitive situations showed no competitive behavior observed at two to three years of age, but from a 0.0 percent at that age period, competitive behavior increased to 86.5 percent at six to seven years. Staats also indicates that before conditioning, children do not respond positively to a situation where rewards are tied to competing and winning, where one child finds it rewarding to compete with and to excel over others.⁹

Educational systems in other cultures are not oriented to competition as the dominant mode of learning. As Clevenger points out, in some cultures individual competition is highly rewarded, in others group competition is rewarded; in still others competition is not rewarded at all.¹⁰ In the Israeli Kibbutz, students are taught both individually and in groups. All students are passed at the end of the year since it is believed failure would stigmatize the non-learner and violate principles of equality.¹¹ In Russia, individual attainment is rewarded when it takes place within a framework of group goals.¹² The collective, not the individual, receives the reward and may take the form of the entire class, an after-school group or an arithmetic team.¹³

Our own culture, however, rewards individual competition, and our classrooms are examples of this cultural orientation. Clevenger indicates that as a motivational technique, competition can only be considered a challenge if a student assumes he will be among the winners and not the losers. Students from deprived culture groups frequently bring a history of failure to the classroom so that a competitive structure serves as an additional environment for failure. At the same time, students who have

personal insecurities will also feel threatened in a competitive classroom.¹⁴

The extent to which and how educators should use competition as a motivational tool needs further investigation. Dreikurs claims:

The less competitive a person is, the better he can stand up under extreme competition. If he is overly content to do his job, then he is not disturbed by what his competitor may do or achieve. A competitive person can stand competition only if he succeeds. (p.78)¹⁵

Lindgren asserts that skills of cooperation are far more crucial in today's world than are the skills of competition. The survival of the civilized world will depend on our ability to learn to cooperate more effectively and to teach others how to do so.¹⁶ Boyer reiterates this thinking and states that the "time has come to formulate a new, unified central purpose for education, a purpose that can help us understand more clearly the interdependency of peoples and institutions in our world - not just in an ecological sense but in a social sense as well".¹⁷

Despite much evidence against competition, it is not to be overlooked, but rather to be differentiated and used in its most beneficial structure. Athletic competition with sports teams is an example of a collaboration of cooperative and competitive reward structures intermingled. The cooperative effort and interdependency of the team members are necessary to win the day. Johnson and Johnson's research reflects the need for this differentiation and further investigation. They assert: "The use of cooperative structure in the classroom does not eliminate competition. Much of the research on cooperation and competition in the classroom indicates that the most productive arrangement may be one that encourages competition between groups and cooperation within groups."¹⁸

There is evidence that indicates that the outcomes of learning can be determined in large part by the way in which the goal structure is implemented by the classroom teacher. Much work has been done on cooperative reward or goal structures, individualistic goal structures, and comparison of cooperative and competitive goal structures. However, as D. W. and R. T. Johnson point out, little research comparing individualistic goal structures with cooperative and competitive goal structure has been done.¹⁹ Thus, a comparative measure of a variety of techniques that have proved successful is needed.

Research also shows that academic success helps to increase satisfaction with school and thus will increase the possibility of future success.²⁰ Whether success in academic achievement will promote an increase in self concept as a result of this increased satisfaction still needs further investigation. De Vries, Lucasse and Shackman reported indications of positive effect on achievement and self-concept of students from team learning as contrasted with a form of individualized instruction.²¹

Slavin also found that team learning produced positive student effects on sociometric status gains and positive effects on peer interaction and friendship choices for students with special emotional and behavioral needs.²²

Further evidence of a direct correlation between increased opportunity for success in academic achievement, rewards to promote this achievement, and positive attitudes incurred towards self and others as a result of successful achievement still needs to be established.

IV. RESEARCH HYPOTHESES

1. Students who work in learning teams and whose quiz scores are formed into team scores will exhibit greater academic achievement, percentage of time on task, percentage of time spent peer tutoring, and more positive attitude toward school, self, and others, and will be more motivated and less anxious than will students who work individually and receive individual scores only.
2. Students who are rewarded based on the difference between their quiz scores and an individually prescribed expected score will show greater academic achievement, positive self concept, and motivation than will control students who receive traditional competitively assigned grades.

V. RESEARCH DESIGN

The design used was an elaboration of the non-equivalent control group design. The design takes this form.²³

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The experiment employed a 3 x 1 factorial design and was as follows:

Team (STILE)	Individual (ILE)	Control
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One-thousand thirty-one students in 42 classes involving 14 teachers participated in the research. Whenever possible, teachers taught different classes in all three conditions and classes were randomly assigned to the treatment within teacher. There were five teachers who did not teach classes in all three conditions and these classes were randomly assigned to experimental or control conditions.

There were three experimental treatments composed of a combination of two factors. The factors were:

Team vs. Individual Reward. In the team conditions, students were assigned to 4-5 member learning teams consisting of a high achiever, low achiever, and 2-3 average achievers. The teams were encouraged to help their members prepare for a quiz on material presented and taught in class. Points earned by individuals on their quizzes provided an individual score and contributed to a team score. Successful teams were rewarded as teams. The team conditions were designated student teams individual learning expectation (STILE). In the individual conditions and control, students worked on the same academic material by themselves to prepare for the same quiz. Students were rewarded for their individual performance only. The individual conditions were designated as individual learning expectations (ILE).

Individual Expectations. In all treatments except control, students received an individual goal setting treatment. In this system, a performance goal was set for each student based on a pretest. Students received points based on their performance relative to this goal. This goal changed gradually if a student consistently missed or exceeded it.

This system ensured every student, regardless of past achievement, a substantial chance to do well if he or she worked hard.

Incentives. In both the team and individual conditions, students received incentives in the form of a class newsletter prepared by the teacher. In the team incentive condition, the newsletter primarily rewarded teams and individuals who had contributed outstandingly to their team scores. In the individual incentive condition, the newsletter mentioned individuals who had earned the most points. In either case, the "points" were points earned in the individual goal setting system. In the control classes, students followed the same schedule, studied the same materials, and took the same quizzes as those used in the other treatments. However, control students received only a percentage score (not individual goal setting points) and did not receive any incentives for their performance. Students in all treatment conditions followed a schedule of activities which involved a cycle of teaching, practice and study sessions, and quiz. This cycle was repeated twice each week. The study took place over a ten week period.

VI. LIMITATIONS

The design has limitations due to the threat of external validity in use of intact groups. The analysis of variance on gain scores pre to post was employed to control for this factor and to statistically control for any academic achievement differences existing at the time of the pretest. The use of intact groups, however, could also strengthen the external validity, since in most schools students are not normally randomly assigned to classes but are experiencing curriculum in a situation

corresponding to similar grouping. In addition, the use of 42 groups involving 14 teachers reduces greatly the limitations of interpretation associated with the one group-pretest-posttest design or with a smaller number of classes. One threat to external validity could be that activities employed by teachers teaching more than one group could add ambiguity to the final interpretation. In order to diminish this threat, the researcher gave training, provided directions and specific instructional procedures.

VII. PLAN OF THE PAPER

This research paper consists of five chapters. Chapter I presents the background information relevant to the problem, a statement of the problem, the need for the study and the hypotheses to be tested. In addition, this chapter includes a section on the research design and limitations of the study.

Chapter II reviews the theoretical and empirical materials which have a bearing on individual and team learning in relation to competitive and cooperative reward structures in its connection to cognitive achievement and affective outcome. This chapter also reviews selected research of studies concerning interdependent and independent tasks and rewards, reward structures and classroom practices and team reward structures: The Johns Hopkins models.

Chapter III is divided into five sections. The first section includes an introduction and the research design. The second section includes the subject pool and the subject selection procedures. In the

third section a discussion is presented on the instrumentation used and the reliability and validity. In sections four and five, discussions are presented on the treatment procedures as well as the data analysis.

Chapter IV contains the results. All pertinent statistical data resulting from the various tests are summarized in tabular form.

The final chapter presents an analysis of the findings. The statistical data are related to the hypotheses presented in the first chapter. Implications of the research are discussed. In conclusion, this chapter contains suggestions for further research.

FOOTNOTES

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CHAPTER II

REVIEW OF SELECTED RESEARCH

This chapter reviews the theoretical and empirical research which has a bearing on competitive and cooperative reward structures. It examines the relationship of these structures to cognitive achievement and affective outcomes. Literature on the following topics related to the research has been given specific attention: Theoretical Framework; Selected Research Interdependent, Dependent Tasks and Rewards; Selected Research in Reward Structures and Classroom Practices; Research on Team Reward structures: The Johns Hopkins models; and Summary. Each of these topics are discussed separately in the sections that follow.

I. THEORETICAL FRAMEWORK

There is a long history of motivational theory pertinent to cooperative, competitive and individualistic reward structures. Reward structures refer to the way that reward for student learning is structured, i.e., cooperatively or competitively. The two main avenues of definition lie with extrinsic and intrinsic motivational theory. These two areas are not mutually exclusive but are frequently interrelated.¹

The extrinsic motivational theory evolved from a long history of behavioral learning theory; the intrinsic motivational work has been heavily influenced by Lewin's work with motivation. Since the research in both of these areas is so voluminous, this review has been delineated

to deal with those works directly related to the scope of this paper and research which has direct bearing upon this topic.

Lewin's² theory of motivation stated that tension within an individual motivates movement toward an accompanying goal. Johnson asserted in his review of goal structures that from Lewin's work, three types of goal states may be conceptualized: cooperative goal interdependence (team), competitive goal interdependence, and individualistic goal unrelated to others.³ Deutsch⁴ is credited with defining these goal structures when he constructed a theory of cooperation and competition. Deutsch designated a cooperative social situation as that in which the goals of separate individuals are so connected that there is a positive correlation between their goal achievements. With cooperative conditions, an individual can attain his goal only if the other persons with whom he is connected can obtain theirs. An example of cooperative goal structure is one in which any type of team sport is played. If one person wins or achieves, it benefits the score of the entire team. Deutsch delineated a competitive situation as one in which there is a negative correlation between the goal achievements of the individuals. In a competitive condition, a participant can obtain his goal only if others with whom he is associated cannot attain their goal. A contest between two chess players would be an example of this type of condition. If one player wins, the other one fails. On the other hand, an individualistic situation is one in which the goal attainment of each individual is independent of those of other individuals. The accomplishment of a goal by an individual has no impact upon whether other individuals accomplish their goals.

Deutsch further indicated that if the actions of a person in a cooperative relationship help bring the others to their goal, the others will engage in behavior which facilitates his actions. Because every group member contributes in some way in accomplishing the task, each one will have a successful experience.

He also pointed out that an individual has a tendency to facilitate other's actions when they promote his opportunities for goal attainment and to obstruct the actions of others when he feels they will be detrimental to his goal attainment.⁵

Kelley and Thibaut, in their work based upon learning theory, have asserted that the reward distribution motivates individuals to behave cooperatively, competitively, or individualistically depending upon the reward structure.⁶ Johnson and Johnson pointed out that for Kelley and Thibaut, the reward distribution motivates individuals to behave cooperatively, competitively or individualistically and for Deutsch, it is the drive for goal accomplishment that motivates cooperative, competitive or individualistic behavior. Kelley and Thibaut's definition is more helpful when one focuses upon extrinsic motivation and Deutsch's conceptualization is more helpful when one focuses upon intrinsic motivation.⁷

Motivational theories of behavior, Lewin et al.,⁸ Tolman,⁹ Edwards,¹⁰ Rotter,¹¹ and Atkinson,¹² can be categorized as expectancy value theories of motivation. The expectancy value theory of motivation is of particular importance in examining the basis for student achievement. According to this point of view, motivation is a function of two situational variables: perceived probability of success and incentive value of success.¹³ Most recent efforts in examining competitive and cooperative

reward structure have attributed the motivational basis to Atkinson's expectancy theory of motivation.¹⁴ In this theory, he asserted that an individual's motivation to perform a given task is a function of his probability of success at the task and the incentive value of success at the task.¹⁵ In most traditional classrooms, both the probability of success and the incentive value of success are often particularly low for low performing students, who have little or no chance of receiving a good grade despite their individual effort or increase in performance. Similarly, grades may be of little incentive value to the high performing student because they may be obtained with slight effort. Therefore, Slavin¹⁶ has extended Atkinson's model to include the prediction of maximum effort. He theorizes that to the degree the probability of success given maximum effort is greater than the probability of success given minimum effort, holding incentive value of success constant, effort will be exerted.

Based upon this extension of expectancy theory, it is important for students to perceive a probability of success for their efforts as well as recognize that their efforts will be rewarded regarding their performance. Designs for recent research have moved away from a straight cooperative reward structure and are based on techniques which increase the student's probability of success as well as the incentive value of success. The structure of student teams-individual learning expectations (STILE) and individual learning expectations (ILE) increases the probability of success for all students by providing students with a reward system which is responsive to improvements or decreases in performance for all students, both low and high achievers. This system also increases the

expectancy of success as low achieving students have the same opportunity of achieving success as their fellow classmates. In both the team and the individual treatment, a performance goal is set for each individual on the basis of a pretest but the goal may change or be adapted in terms of their weekly quizzes if students continuously exceed or miss the goal. This system ensures every student, regardless of past achievement, the opportunity to do well if he or she works hard.

Clifford's¹⁷ research indicated a need for providing a system which offers fair or equal chances of success for students to ensure optimum performance. In a study on motivational effects, involving fifth and sixth grade students performing a substitution task in a variety of grouping arrangements, she found greater performance among students competing with others of like ability than among unequally matched students. She asserts that although students feel justified in striving for an award which represents superior performance among equals, it is far less socially acceptable to seek recognition when competitors are poorly matched on ability. This is especially true for those who have a marked advantage.

The team condition that is part of STILE also provides for equalizing opportunity as well as incentive value. Each of the teams is comprised of high achievers, average achievers and low achievers, and the team score is based upon the sum of the member's scores. In the team condition, points are equally valuable from a low achiever as among a high achiever, so students will encourage each other to do their best. The opportunity for peer interaction and tutoring in the team condition provides additional opportunities for low achieving students to have assistance in learning the materials. The team work in team practice sessions permits students

to share their knowledge and help other students in acquiring skills to increase the team score. Positive changes as a consequence of children teaching children have been noted in the area of motivation, attitudes and self concept.¹⁸ The research in this area has been predominantly in cross age tutoring, but it is logical to assume that there will be similar benefits among students of the same age.

Allen and Feldman¹⁹ noted that children who have participated in tutoring programs have expressed a consistent and positive reaction to them. They indicate that it would appear reasonable to expect that enacting the role of teacher would increase self esteem and produce more positive attitudes toward school and teachers, as well as increased achievement.

II. SELECTED RESEARCH ON INTERDEPENDENT AND INDEPENDENT TASKS AND REWARDS

The research on cooperative learning is quite varied. The best overall view and interpretations have been done by Johnson and Johnson²⁰ and Slavin.²¹ Much of the research has been done as laboratory experimental efforts on a wide variety of tasks and does not reflect actual classroom practices. Therefore, significant research related to group efforts has been highlighted to trace relationships between these findings and specific experimental models of cooperative learning related directly to this study.

In an effort to determine the contradiction in performance results between cooperative and competitive reward structures, Miller and Hamblin²² investigated the effects on group productivity across two interacting dimensions of competition and cooperation: differential

rewarding and task interdependence. Their investigation also presented a comprehensive review of the earlier studies and correlated the results of their findings with previous research. In the Miller and Hamblin research, ninety male university students involved in the study were assigned to thirty three-person groups. These groups were tested for productivity in conditions of high task and low task interdependency and to varying degrees of differential rewarding. In the high task interdependence condition, rewards were shared equally by group members and were based upon the total efforts of the group as a whole depending on the time taken by them to solve a problem. The tasks employed were ten sequential problems requiring the group member to determine which one of thirteen members was the one selected by the experimenter. Each subject was privately informed of four numbers which had not been selected. The subjects involved in the task were seated separately in isolated booths connected to booths of other group members by an electrical system. The clues were different for each subject so they could pool their clues through an electrical communication system to determine the correct answer. Guessing was discouraged by a substantial penalty. The task was considered completed only when each group member knew the answer. Since the group could not win points after ninety seconds, the trial was terminated if a solution was not reached. In the low interdependence condition, subjects did not depend on each other for information, were encouraged to guess by the absence of a penalty, and could resolve the problem and be rewarded individually. The findings indicated that the relationship between interdependence and productivity (i.e., guessing the number) was significant across all reward conditions. In the high interdependence condition, the

relation between differential rewarding and productive efficiency was significant and strong. In the task interdependent condition, as differential rewarding increased productive efficiency decreased. In the low interdependent condition, the relation between differential rewarding and productive efficiency was very weak.

In an effort to test the generality of their results, Miller and Hamblin made a compilation of previous studies of cooperation and competition. They discriminated between interdependent and independent task situations in previous research. They differentiated between the studies of Deutsch,²³ Grossack,²⁴ and Smith, Madden, and Sobel²⁵ involving discussion problem tasks and those of De Charms,²⁶ Phillips,²⁷ and Sims²⁸ involving mechanical tasks. In the discussion problem tasks, cooperative reward structures were associated with greater group productivity than competitive reward structure, while in the mechanical tasks (low interdependence conditions), the competitive reward structures were associated with greater group productivity.

The compiled studies were then examined to determine if the results of their experiment were representative of other findings and if other variables influenced the strength and nature of the relationship between differential rewarding and productivity. Their findings indicated that for the experiments involving low interdependence situations, none of the control variables greatly affected the strength of the relationship between differential rewarding and group productivity. In the high interdependence situation, they discovered the correspondence between the findings from past studies and their experiment was quite striking.

The studies since Miller and Hamblin's work have paralleled to a great degree the categories investigated by them. Research by Ravin and Eachus²⁹ and Crombag³⁰ involved tasks in which each participant's performance score depended on the behavior of two other subjects. Both studies found better performance with participants in the interdependent reward structure than those in an independent one.

Other research has involved attempts to further define the factors involved in competitive or cooperative reward structures. Hammond and Goldman³¹ conducted a performance study to explore the following factors: (a) the difference between competition and non-competition generally; (b) the difference between competition and non-competition only when individuals are working for themselves; (c) the difference between competition and non-competition when individuals are working for the groups they are in; (d) the difference between working as a group and working as an individual that extends across competition and non-competition; and (e) the difference between working as a group and as an individual in competition and non-competition.

The subjects in this study were recruited from general psychology college classes and received credit toward their final course grade for participation. The task involved discussion questions and subjects were not informed how the task would be rated. The effects of the treatment groups were compared on reports or solutions written by the groups and the method and quality of discussion in which group members engaged. The written reports were provided a scoring criteria which allotted one point for each alternate course of action to the problem and one point for each logically related set of consequences.

Significant differences were found favoring non-competition on all measures and group over individual on adequacy of recommendations. Similar findings of better performance in group productivity in cooperative discussion groups than in competitive ones were made by Haines and McKeachie³² and Laughlin and McGlynn.³³ A more recent study by Scott and Cherrington³⁴ revealed greater productivity under cooperation in an independent task.

Despite the fact that the majority of the studies seem to reflect Miller and Hamblin's assertions that the seemingly contradiction in results stem from an inconsistency in tasks and a variety of dependent variables among the various studies, Slavin³⁵ pointed out that several studies demonstrated a discrepancy in Miller's and Hamblin's assertions. He cited three studies, Klugman,³⁶ Thomas,³⁷ and Weinstein and Holzbach³⁸ to make this point. In the Klugman study, pairs of children working under a group contingency were compared with children working under an individual contingency. The task required was arithmetic solving problems with no time factor set. The children working in pairs required significantly more time to finish the tasks than children working alone. The Thomas study contrasted productivity of workers on a double assembly line where each worker completed part of the task to workers finishing the whole task independently. The findings revealed no differences between cooperative and competitive reward structures and no interaction between reward and task. The data in the study seemed to indicate an inclination toward an interaction effect reversed in direction to the Miller and Hamblin results.

The Weinstein and Holzbach³⁹ research involved specific reward and task structures involving coding tasks accomplished in one condition by both of the participants working interdependently on an assembly line and in another condition by participants working independently on tasks. Their findings showed that a group competition structure was related to better performance under all task conditions.

On the basis of the ambiguity in findings concerning reward structure and performance, Slavin⁴⁰ indicated that a more comprehensive accounting is required to interpret these diverse results. He states: "According to expectancy theory constructs, pure cooperation in the sense of mutual dependence between persons for reward is a rather inefficient reward structure."⁴¹ He pointed out that competition can be an efficient reward structure if the abilities of the person are equally matched and the opportunities of reward not too limited or too easy. However, believing that the cooperative reward structures encourage participants to assist the production of others in the group under the same contingency, he suggested two ways members of a group can improve the performance of other members. First, reinforcers or sanctions can be provided for group members based upon individual performance. This reinforcement may be set up by the group itself toward members and may supplement or be stronger than any concrete reinforcers superimposed. Evidence of this type of mutual reinforcement has been noted by the research of Thomas⁴² as pressures by group members or a high correlation between sociometric status gains and performance by Slavin, DeVries or Hulten.⁴³ Secondly, group members may increase the performance of others by sharing resources which may reduce the cost of performance or facilitate increased performance by other members.

According to Slavin, the opportunity of sharing resources, not task independencies versus task interdependencies, is the determining factor in which cooperative structures are more effective than competitive structures in improving task performance.⁴⁴

III. SELECTED RESEARCH IN REWARD STRUCTURES AND CLASSROOM PRACTICES

Most of the early research in cooperative and competitive reward structures involved laboratory settings, mechanical tasks or discussion problems. These activities to a great degree were removed from actual classroom instructional practices and did not necessarily employ structures and techniques which promoted academic achievement or positive attitudes toward self and others in terms of an instructional classroom environment.

The current research in this area has focused more predominantly on instructional systems within the classroom which would improve academic achievement as well as increase satisfaction toward self and others. Significant research efforts in reward structures reflecting these goals have been traced which have been directly applied to the classroom as well as efforts in the design and technique of cooperative and competitive reward structures from which this study has been derived.

Hamblin, Hathaway and Wodarski (Hamblin et al.)⁴⁵ conducted research on five experimental groups of inner city fourth graders during mathematics, reading and spelling period based on five contingency conditions for three weeks. The purpose was to compare the effects of academic achievement of the average, high and low performance group contingencies with individual performance contingencies. Group contingencies were

based on each member of their respective groups receiving reinforcement based on the average score of the group, the highest three scores in the group and the lowest three scores, respectively. This reinforcement took the form of a token. Thus, if average score of the top three performances in the high performance group was 90, each group member received nine tokens, etc. Regular curricular material was used for a period of three weeks. The results showed that high achieving students performed best on the high performance group contingency and the low achieving students performed best on the low performance group contingency. The overall performance of all students, however, showed that on the average the class as a whole did better under the low performance contingency.

Wodarski, Hamblin, Buckholdt and Ferritor (Wodarski, et al.)⁴⁶ performed a second experiment to determine if different combinations of individual and low performance group contingencies would be more effective in improving academic achievement than a straight low performance group contingency. The experiment was conducted with inner city fifth graders during a twenty-five minute math period per day. Four experimental treatment conditions were established: One in which students had one hundred percent individual contingencies and were paid a play dollar for each correct problem; one in which they had one hundred percent low performance group contingency and students received the play dollar for the average of the bottom four performances of group members; two intermediate conditions in which students were paid a portion of a dollar for their performance and a fraction of a play dollar for the average of the bottom four performances of group members. On alternate days during the experiment, the students were told they could tutor other members of the groups if they chose after their work was finished. Data

were collected on the percent of time the students spent tutoring and the rate of improvement on the math tests for each of the groups under each experimental condition. The results showed that the peer tutoring increased as the proportion of group reinforcement increased, but complete analyses of the data indicated that the slower students benefited more than the gifted and the gifted students performed better on the one hundred percent low performance group contingencies than they did on the individual contingencies. The assumption was made that working problems and helping slower students made them learn more than just doing the problems themselves under the individual contingencies.

A third experiment using shared group reinforcement was conducted by Buckholdt, Ferritor and Tucker (Buckholdt, et al.).⁴⁷ This experiment included a training dimension for cooperation in instructional tasks. Participants were sixty fourth grade students from a deprived neighborhood in a city school. The experiment employed two factors: non-contingent reinforcement versus shared group contingent reinforcement; and tutoring (no training) versus trained tutoring. Students were stratified into high, middle, and low ability on reading. Two members of each ability level were assigned to each group for a total of six groups. All groups worked on reading assignments for a twenty-five minute period three days a week for four weeks. Reinforcers were of a wide variety involving free period, gym time or opportunities to socialize, etc. Two dependent variables were employed: a reading comprehension measure and a measure of student cooperative and tutoring behavior.

The results showed contingency groups performed better than non-contingency groups and trained tutor groups performed better than groups

without training. There was no significant interaction, however, between the two groups.

The studies by Hamblin et al. and Wodarski et al. provided the opportunity of demonstrating the superiority of a cooperative structure over competitive and individualistic structures. These results are of limited practical importance, however, since the low performance contingency for cooperative effort would not necessarily be the target for academic achievement in a typical school setting. The study by Buckholdt, et al. established more achievement in the contingency group over the non-contingency group, but the members in the non-contingency group were only awarded for participation, not achievement. These studies, however, paved the way for other studies on classroom practices which followed and were the first to offer a comparison of group contingencies to individuals in terms of academic achievement in an actual classroom setting.

Another study by Wheeler and Ryan⁴⁸ was conducted on the effects of cooperative and competitive structures on attitudes and achievements of elementary school students involved in social studies activities. Eighty-eight fifth and sixth graders were randomly assigned to three treatment conditions: cooperative, competitive or control. The experimental groups received the same content and worked on inquiry related problems cooperatively within subgroups or independently (competitively). Results indicated that students within the cooperative treatment had significantly more positive attitudes toward the class, toward working together, and toward receiving group grades versus individual grades than students within the competitive treatment. However, there was no significant difference between cooperative and competitive groups on achievement, although both groups were superior to the control group.

Much research has been performed to account for the discrepancies in findings concerning the superiority of cooperative over competitive or individualistic structures in terms of academic achievement on school tasks. D. W. and R. T. Johnson have indicated their belief in the superiority of cooperative reward structures employed for the majority of learning, and have pointed out that a reason for these discrepancies in results are a lack of investigation into the types of task correlated to the appropriate reward structure. Much experimentation has been done by them to test their belief. Johnson and Johnson have summarized and reviewed their studies in 1975⁴⁹ and 1978.⁵⁰ In a more recent series of studies, in collaboration with Skon,⁵¹ they examined the relative effects of cooperative, competitive, and individualistic goal structures on a variety of school related tasks. These studies investigated a variety of learning tasks performed by first and fifth grade white students from both urban and suburban settings and black high school students from an urban setting. Their findings indicated that cooperative structures promoted higher achievement than either competitive or individualistic structures on the following tasks: mathematical and verbal drill-review tasks; spatial-reasoning and verbal problem solving; pictorial and verbal sequencing tasks; and tasks involving the comparison of the attributes and a knowledge retention task. On a specific-knowledge-acquisition task both cooperation and competition promoted higher achievement than individualistic efforts.⁵²

Additional research of Johnson and Johnson as well as Davis, Laughlin and Komorita⁵³ have found that tasks involved with successful mastery, retention and transfer of concepts, rules and principles

were higher in cooperatively structured learning than in competitive or individualistic learning structures.

Other studies by Laughlin, Branch, and Johnson⁵⁴ and Laughlin and Branch⁵⁵ demonstrated the importance of ability levels related to instructional tasks. These investigations employed a learning task involved with synonyms and antonyms from the Terman Concept Mastery Test with 528 college students. They found that group performance on achievement was proportional to the number of high-ability group members within the group. Although these studies did not involve students in an instructional situation, the required task and process was analogous to language tasks performed in the classroom setting. In an attempt for further analysis of the processes involved in these findings, Laughlin, Kerr, Davis, Halff and Marciniak⁵⁶ analyzed the previous study of Laughlin and Branch in terms of Social Decision Scheme Matricies, based on the social decision scheme theory of Davis,⁵⁷ involving a probability classification of achievements occurrence for the ability grouping of each type of group. The matricies provided the best fit for the grouping of findings in the study. The matricies were then used in a further study by Laughlin, Kerr, Munch, and Haggarty,⁵⁸ with high school student groups of four on another set of verbal achievement items such as vocabulary, general information, anograms, analogies, etc., from the Otis Quick Scoring Mental Ability Test which they believed sampled a wider range of intellectual tasks than Terman's vocabulary items. They found that the composition of the group in relation to task was significant. The number of high-ability students who could answer correctly influenced greatly the

groups response. These findings provided support for the need of including high-ability members in the composition of the group.

Although research evidence has not always clearly delineated positive findings for cooperative learning in academic tasks, positive results are almost always found for affective outcomes. Much of the empirical research performed by Johnson and Johnson and their colleagues concerns itself with investigations into relationships between student attitudes about cooperation and competition, and attitudes toward schooling.⁵⁹ They have also conducted correlation studies concerned with attitudinal outcomes and interpersonal effects, in addition to their work with reward structures applied to classroom instruction.⁶⁰

In their book, Learning Together and Alone: Cooperation, Competition and Individualization, Johnson and Johnson describe the use of cooperative, competitive and individualistic goal structures in an instructional setting. They recommend that the teacher should decide upon the appropriate structure in terms of the learning tasks and that students involved in problem solving should be encouraged to divide the labor, share ideas, and work together toward a common goal.

A different design and technique for classroom instruction involving cooperation was developed by Aronson, Blaney, Sikes, Stephan, and Snapp,⁶¹ which incorporated beneficial features of cooperation and peer teaching into classroom instruction. These researchers called their process for instruction the "Jigsaw" Technique. This method of learning requires students to work together and teach each other. Students are dependent upon one another to accomplish their goal and to use each other as resources. Since all students were required to participate, it was felt

that students with low self esteem would begin to experience success and realize that they have abilities. Similarly, students who perceived others as failing and or as having little ability or worth would come to recognize that their prejudgment was false. Thus, the "jigsaw" structure encouraged students contributions that were ego-enhancing. In this instructional model students work in small groups of five or six with each student in the group having and being responsible for teaching one segment of the day's lesson to other group members. Since the other group members have no other way to obtain the information, interdependence is established. The entire process is similar to a jigsaw puzzle with students possessing a piece of the entire picture.⁶²

The first systematic experiment which utilized this technique investigated attitudinal outcomes in ten fifth grade classrooms in seven elementary schools in Austin, Texas, which had recently been desegregated. A great deal of tension existed which was heightened by the competitive atmosphere existing in most classrooms. Three classes from among the same schools were used as controls. The experimental class met in a jigsaw group for a forty-five minute period per day, three times a week for six weeks. Membership in each jigsaw group consisted of approximately three Anglos, one Black, and one Mexican-American student. The curriculum was the same for experimental and control classes. The results indicated that Anglo students in jigsaw classes increased their liking for school while control Anglos decreased in their liking for school. The Blacks in the jigsaw classes decreased to a small degree in their liking for school, but in the control classes

this same measure decreased substantially. The Mexican-Americans in control classes increased in their liking for school while in the experimental condition these students increased only slightly. The researchers believed these results were due to a language barrier faced by Mexican-Americans when they interacted in peer groups. The self esteem of the students increased significantly in the experimental classes as opposed to control and liking for group members and other classmates increased in the jigsaw classes than the control classes.⁶³

Geffner⁶⁴ used the jigsaw technique and investigated the attitudes that fifth grade students have about themselves, about other students, and about school in a California School which was 50% Anglo and 50% Mexican-American. His experiment involved classes taught in three types of treatments: the jigsaw method, in a traditional manner, and classes taught with cooperative techniques other than jigsaw. The results showed that students in the cooperative and jigsaw classes improved or maintained positive attitudes about their academic abilities while students in the traditional classes showed a decline on all of the attitudes. The pictorial measure of self esteem which was employed showed that the interdependent learning either maintained or improved the students' self esteem, while the more traditional methods of teaching produced a drop in self esteem. The researchers believed that the positive feedback, support and successful experiences led to this increase.⁶⁵

These studies employing the jigsaw technique established its superiority for increasing self esteem and interpersonal relationships, but no studies had been made in terms of academic achievement. Therefore, Lucker, Rosenfield, Sikes, and Aronson,⁶⁶ conducted an experiment

to determine the effects of the jigsaw method on interdependent learning in terms of improved academic performance.

Fifth and sixth grade students were involved with six classrooms employing the jigsaw method for instruction and in five classrooms students were taught in a traditional manner. The experiment lasted for two weeks. Achievement tests were given to students before and after the experiment. The results indicated that the jigsaw classes showed significantly more improvement in achievement than students in control classes. These results were primarily because of the increased performance of minority students in the classes. Anglo students performed about the same as Anglo students in the traditional classes, but the minority students in the jigsaw technique showed increased performance in comparison with minorities in the traditional classes.

The study also showed that this was not related to any particular ability level. Thus, high-ability minority students benefited as much as low ability minority students.

Bridgeman⁶⁷ investigated the relationships between cooperative learning and role taking abilities with 120 fifth-grade students from three California schools. A revised version of Chandler's role taking cartoon series was used to assess children's ability to take the perspective of others. This role taking task measure was used with classes before and after eight weeks of instruction with either the experimental jigsaw method or traditional methods. Results indicated that students who had participated in the jigsaw classes were much more successful at taking another's role than children in the traditionally taught classes.

The jigsaw studies confirmed the fact that cooperative processes transfer from the classroom context of interaction into the social development and affective attitudes of students toward themselves and others. Bridgeman's findings were consistent with Piaget's assertions that social interaction allows children to recognize the difference between their preoccupations with self and their concern for others.⁶⁸ This is consistent with the findings of Johnson and Johnson concerning the development of perspective taking in students as a result of cooperative structures, and offers additional support for the importance of cooperative structuring in the classroom.

IV. RESEARCH ON TEAM REWARD STRUCTURES:

THE JOHNS HOPKINS MODELS

Another design for cooperative learning was developed at Johns Hopkins University's Center for Social Organization for Schools in 1971 by David DeVries and Keith Edwards.⁶⁹ The unique feature of this design is that it combined cooperation (teams) with competition (game tournaments), as an instructional technique. It was named Teams-Games-Tournaments (TGT). This technique has two main features, student learning teams and game tournaments. The teams are made up of four to five students assigned so that each team is balanced in terms of able and less able students, blacks and whites, males and females. Curriculum material is presented to the teams and then team members receive a worksheet covering the material. Team members are taught to quiz each other to be sure that every student on the team knows the worksheet answers and the reason behind them.

After the team studies together, the team members compete individually on simple, content-relevant academic games in the game tournament to add points to their team scores. The content of the games is the curriculum being studied. The students compete at "tournament tables". The three students from different teams with the best past scores compete at table 1, the three next best at table 2 and so forth. Thus, competition is fair at each table. The winner at every table brings the same number of points to the team score regardless of whether the tournament table has high or low performers. This offers the students with the lowest past performance the same opportunity of contributing the same amount of points to the team as the students with the highest past score. A "bumping" procedure changes the tournament table assignment each week, but maintains the fair competition. The team composition always remains the same. A weekly class newsletter recognizes the teams that have done best in their total score.

Although TGT involves both cooperation and competition, its outcomes have been similar to outcomes seen in a cooperative structure. TGT has increased academic achievement, mutual concerns among students, race relations and such attitudinal dimensions as peer norms in support of academic performance and attitudes toward school. The competition in TGT provides individual accountability for team members since there is no way for a team to do well if each member does not learn as much as he can to perform in the game tournament.⁷⁰

Much research has been conducted on the TGT model involving a variety of subject content areas and different variations of the model. The TGT design for instruction is probably the most widely researched and publicized of all the cooperative structures being commercially published as an instructional process in 1976.⁷¹ Because of the great amount of research which has been done on TGT, representative studies have been selected for review. A final report on the TGT research⁷² and single reports on the individual studies are available at Johns Hopkins University, Center for Social Organization of Schools.

Ten studies conducted on TGT involving 2,800 students have been reviewed by DeVries and Slavin.⁷³ Although the studies involved variations on different dimensions, they all were performed in public schools and were administered by public school teachers. All of the studies employed were random assignments of classes to treatments and in some, students were randomly assigned to classes. In each study teachers were given the same curriculum materials and objectives for both experimental and control groups. Four studies were conducted from four to six weeks, the other six were from nine to twelve weeks. The achievement results of the ten studies showed that students in the team gained significantly more than students in the control learning situations. The achievement effects were particularly interesting in terms of content results. TGT was far more successful in the subject areas of basic math, language arts, and reading vocabulary than it was in social studies. In the three studies in which social studies curriculum was used, the

achievement results were marginally significant in only one. In comparison, all the other studies found that TGT had significant effects on academic achievement.⁷⁴

Positive effects on attitudes toward school, however, were inconsistent. Only three of the studies evidenced positive effects in this area. Additional attitudinal effects, however, in comparison to traditional instruction were found relatively consistent on mutual concern, race relations and peer norms supportive of academic achievement.⁷⁵

TGT has also proved to be an effective instructional strategy for promoting cross racial friendships in integrated classes. DeVries, Edwards and Slavin⁷⁶ reported on four field experiments conducted in a wide variety of school settings which indicated its capability for this purpose. In these investigations a broad selection of students from seventh to twelfth grades in a variety of subject areas (mathematics, social studies, science and English) were involved. Each study was varied in experimental design, level of random assignment and sociometric measures.

The first study employed a TGT and control group with seventh grade students for a period of nine weeks. Thirty percent of the students were black, and in the TGT condition they were placed on racially mixed teams. A sociometric questionnaire was administered before and after treatment which asked students to list names of classmates whom they considered friends and to list names of students who had helped them with their work. Each student's response was coded for within race choices and number of cross race choices.

The second experiment involved stratified random assignment of individual students (based upon achievement level, race and sex) to three treatment conditions: TGT (involving cooperation within teams and competition across teams); TGT cooperative treatment focusing on within team cooperation without team competition; and traditional control group. Sociometric items were administered after treatment only. Fifty-one percent of the students were black. Students were asked to list classmates for each of these categories: best friend, friends outside of school, friends in school, would work with/go to for help, and helped you.

The third study employed a two-group comparison: TGT versus control group. Ten percent of the students were black. Sociometric measures were administered before and after treatment. Students were asked to list classmates for each of these categories: best friend, friends outside of school, friends in school, would work with/go to for help, and helped you. The last experiment involved treatments which compared task (quiz versus game) and reward (team versus individual). Forty-three percent of the students were black. Sociometric measures administered after treatment only asked the questions, friends in school and who has helped you.⁷⁷

Findings for all four of the studies showed that students' response in the team condition on the sociometric measures exhibited significantly positive effects in seven of the thirteen dimensions and marginally significant effects on two. No effects were found in favor of the control condition.⁷⁸

The results obtained from the TGT research has established the effectiveness and importance of this model in promoting academic

achievement. In addition, the research findings supported the results obtained by Aronson et al.⁷⁹ and Slavin⁸⁰ in the use of teams in promoting positive race relations.

Another team model for cooperative learning was developed by Slavin⁸¹ in 1975. Although the results of the research on TGT provided strong support for this team technique, additional questions still remained. "The most important was whether the effects of TGT were due to the way in which this particular team technique was constructed."⁸² Since TGT was a combination of many components such as games and tournaments, a simpler team design was needed to test team effectiveness separated from these other factors.⁸³

The new model developed to investigate these factors was called Student Teams-Achievement Divisions or STAD. Essentially, it is a simpler model than TGT since it removes the games and tournaments, but the tournaments are replaced by achievement divisions. In the achievement divisions, there are no face to face competitions which are in TGT. Students do not sit or interact with division members. The divisions are essentially a mechanism for an equalizing device. Divisions are formed homogeneously by achievement like the tournament groupings. Students who are division winners are bumped into the next division where their quiz scores will be compared with those of classmates who have comparable achievement. Each top division winner regardless of the division rank receives the same number of points to contribute to his team. Points are given in descending order in terms of first, second or third place. All other division members receive two points to contribute to their team.

STAD uses a fifteen minute quiz instead of a forty-five minute tournament which allows more time for covering more instructional material. With this team technique, students are assigned to a four to five member team so that each team has a high achiever, a low achiever and two to three average achievers. The teams are balanced in terms of both sex and race of students. Teammates are assigned seats together and are allowed to help each other prepare for twice-weekly skill drills. A weekly newsletter announces each team's score and recognizes individual performance using student teams.⁸⁴

In the STAD model, a cooperative reward structure revolves around the situation of a competitive structure. In the cooperative team, each member's performance helps others to meet their goals. As a result, students encourage one another to do well, and express strong norms in favor of performance that moves the team toward success in competition with other teams.⁸⁵

Four studies involving STAD were reviewed by Slavin.⁸⁶ The first study in which STAD was employed was conducted to validate the STAD model and to separate the effects of the team and achievement divisions. The factors compared were reward structure (team versus individual) and comparison group (comparison with equals versus comparison with the entire class). Two hundred five seventh-grade students in eight intact English classes were involved for a ten week period. Measurement was made in terms of academic achievement, attitudes and time on task. The study showed that both teams and the comparison with equals contributed to increasing student's time on task, attitudes toward one another and toward academic achievement and number of friendship choices. Neither of the factors revealed any differences in academic achievement.⁸⁷

A second study was conducted which compared STAD (as the team reward comparison with equals) and control (performed in study one as the individual reward-comparison).⁸⁸ This study repeated the conditions of study one, but focused on a different set of outcomes relating to race relations since sixty percent of the students in this study were black. Measurement was made for academic achievement, but interest was directed towards cross-racial friendship choices. TGT as previously cited had shown significant increases in cross-racial friendship choices with the use of biracial teams. The findings revealed that black students learned far more in the team condition as measured by Standardized Achievement Test of Language Arts and curriculum specific test. However, whites learned only marginally more in the team condition than the control. This finding was similar to that of Lucker, Rosenfield, Sikes, and Aronson previously cited in a cooperative team study conducted with the jigsaw method.⁸⁹ The study also showed that cross-race choices over all choices increased more in the experimental condition.⁹⁰

Study three investigated the separate effects of team reward (assignment to teams and recognition for team performance) and team task (peer tutoring within teams). Also this study investigated the effects of the intensive schedule of instruction by itself (teaching, worksheet practice, quiz) without peer tutoring or team reward in comparison to traditional classes. The subjects were four hundred twenty-four students in intact classes in an elementary school. The findings indicated that reward effects for the team structure were found for time-on-task, frequency of peer tutoring, and treatment specific academic measures. However, the same measure also showed greater achievement in

the no peer tutoring classes than in the peer tutoring classes. These findings indicate that it is the team reward structure that produces the effects of team techniques on achievement, not peer tutoring or peer interaction. However, as Slavin has pointed out this study shows that it is very likely that the success of all the team techniques found in jigsaw, TGT, and STAD in comparison with control groups in increasing achievement is at least partly due to the fact that all of the methods employ very structured schedules of instruction.⁹¹

The fourth study was directed toward the question of race relations effects in terms of treatment on academic achievement. Four hundred twenty-four students in inner city junior high schools were involved. The experiments and control groups were the same as was established in the second study: STAD for the team condition and control using the intensive schedule of instruction and the same curriculum. Interactions were observed in terms of same race interaction versus cross-race interactions. Findings revealed that in the team condition students interacted more across race lines than in the control condition. No academic achievement effects were found and no race by treatment interaction. However, the findings indicated an increase in cross racial friendships for the team condition.⁹²

V. SUMMARY

The amount of research and the important topics of investigation concerning team reward structures applied to classroom practices indicates the need for educators to adopt these techniques as a major intervention strategy for instruction. Although further research is needed to more precisely assess the various components and factors operating within the team learning situation, much evidence has already been established to indicate successful outcomes for students in both cognitive and affective areas. The research findings have shown increased positive attitudes towards self and toward others. The findings of Johnson and Johnson, Aronson et al., Blaney et al., Lucker et al., DeVries, and Slavin that have been reviewed in this chapter provide evidence of the effectiveness of cooperation and team intervention strategies in promoting these affective outcomes. The research findings has offered much evidence for team techniques to be effective for all students, but especially strong for minority students. What the research indicates most clearly is how a teacher structures a classroom facilities positive race relations and interpersonal relations for students.

In the areas of academic achievement, the research indicates strong support for the use of team techniques to promote learning. The team strategies have shown increased achievement as a result of team techniques to be especially strong for minority students. The studies of DeVries and Slavin have indicated these strategies to be particularly effective in the area of basic skill subjects such as Language Arts and Mathematics.

This study attempts to add some data to the store of available information concerning increased achievement, attitudes towards self, others and school, peer interaction and time on task. Specifically, the research focuses on comparing team learning, individual goal setting, and regular classroom instruction in terms of effects on these variables.

FOOTNOTES

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CHAPTER III

STEPS IN THE INVESTIGATION

There is a long tradition of research in motivational psychology to document the importance of reward structures and incentives in motivating individual performance. Research on classroom reward structures conducted at the Center for Social Organization of Schools indicates that the way in which classroom rewards are distributed can have a major impact on academic achievement, mutual concern among students, and positive attitude toward self and others. There are three basic reward structures in use in educational settings. These are the competitive reward structure, the one most predominantly employed in classrooms today, in which students compete for a limited number of good grades; the individual reward structure, in which students' grades or other rewards depend only on their own performance; and the cooperative reward structure, in which students work together and are rewarded as a group or team. Cooperative reward structures have received the least attention in schools, but have been a focus of research for the Center for Social Organization of Schools. That research has indicated that structured team learning techniques can increase students' learning and have positive effects on attitudes towards others. The question then raised as a result of this prior research was how effective was a team learning structure for cognitive and affective gains in comparison to other modes of learning.

This study was then designed to investigate: 1) whether students who work cooperatively and participate in a cooperative reward structure will exhibit greater achievement and more positive attitudes than those who work individually; and 2) whether students who are rewarded individually based on an individually prescribed expected score exhibit greater achievement and more positive attitudes than students who received traditionally assigned grades.

This chapter sets forth the research design employed to secure answers to these questions. It includes a description of the subject pool and selection procedures, the treatment procedures, the instrumentation utilized to collect data, and the statistical design employed to the data analysis.

I. RESEARCH DESIGN

The design used was an elaboration of the non-equivalent control group design. The design takes this form.¹

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The experiment employed a 3 x 1 factorial design. The factors were as follows: The Team Treatment, Student Teams-Individual Learning Expectations (STILE); Individual Treatment, Individual Learning Expectations (ILE); and control as defined in Chapter 1. The team condition was a modification of the Student Teams Achievement Divisions (STAD) developed by Slavin.²

One thousand thirty-one students in grades six to eight representing forty-two English classes and fourteen teachers participated in the

research. Teachers taught a ten-week English mechanics unit for the study. The intact English classes were randomly assigned to treatment conditions within teacher. Whenever possible, teachers in each school taught different classes in all three conditions. There were five teachers who did not teach classes in all three conditions, and these classes were randomly assigned to experimental or control conditions. Teachers, therefore, acted as their own control. Teachers participating in the study were trained in the process and procedures for the experimental conditions and were given detailed instructions for their treatments (including control).

II. SUBJECT SELECTION PROCEDURES

Students involved in the study were from four middle schools in Anne Arundel County, Maryland and represented diversified communities within each school's attendance area.

Two hundred seventy-four students representing twelve classes and five teachers participated in the study from Windmill and Bayview Middle schools. These schools were side by side under one roof with two separate administrative structures. Since only one teacher from Bayview participated in the study, the Windmill/Bayview schools have been categorized as one school for purposes of data. The school area serves a portion of the county where approximately thirty per cent (30%) of the population reside in waterfront communities, and the remaining seventy per cent (70%) reside in a variety of suburban subdivisions and single family dwellings. The geographic location is in the northeastern area of the county. Five hundred forty-two students from twenty classes and

four teachers from Old Mill Middle School were involved in the study. This school is located in the northwestern corridor of the county and the population in its attendance area reflects a similar economic range as Windmill/Bayview. The area has no waterfront community and is more densely populated. Two hundred fifteen students in ten classes and five teachers were involved in the study at Southern Middle School. It is located in the extreme southern end of the county and draws upon a rural population in which many of the students' families were engaged in water industries such as oystering or in agricultural occupations. This school had a minority population of 33.9 percent and had the only black students participating in the study.

Intact English classes were randomly assigned to treatment conditions, stratifying on school and teacher so that each teacher but one taught an experimental (STILE or ILE) and control condition. All students within each class were pretested in terms of cognitive and affective measures emphasized in the research.

Students were assigned to teams within the team condition based on the pretest score on a fifty item curriculum specific test. In this condition, students were ranked as a high achiever, average achiever or low achiever and were assigned by the researcher to four-five member teams consisting of a high achiever, low achiever, and two-three average achievers. Teams were also balanced in terms of sex and race wherever possible.

III. TREATMENT PROCEDURES

The treatment involved the study of a ten-week English Mechanics unit divided into eighteen two-day units (which allowed one-week leeway for schedule interruptions). The unit presented materials on such topics as capitalization, punctuation, usage and grammar and consisted of worksheets and skill drills (quizzes) which were given at the end of each two-day unit. The schedule followed by teachers for all treatments consisted of the following two-day cycle. On the first-day period, the teachers presented the lesson and the students were given worksheets to study in their teams or individually, depending on their treatment. The second day students worked in groups or individually with the worksheets (which provided answers to examples presented) to study and learn the material. At the end of this period, students took a twenty-five item quiz. One day, usually the middle of the week (Wednesday), was used for other English activities such as composition or literature. The schedule was repeated again for the remaining two days. (Appendix A)

All students except control were involved in an individual goal setting treatment. An initial base score was established for each student based on a fifty-item pretest. A standard median was arbitrarily set at 40. For example, if the true class median were thirty-five, five points would be added to each score. This was done so that future quizzes could be easily adjusted to the same median as the pretest. This adjustment procedure was then also applied to weekly quizzes, so that each quiz could be considered equal in difficulty to the pretest, thus removing the problem of variations in quiz difficulty. The "base score" was set

ten points below each student's adjusted pretest score to give each student a realistic, individually prescribed minimum score they could be expected to make.

Each week, students took two twenty-five item quizzes on the material they were studying. Their quiz scores were combined and adjusted to the standard class median of forty. Students then received "pluspoints" based on the degree to which their quiz scores exceeded their "base scores". Students earned no pluspoints if they did not make their base score, one if they just made it or exceeded it by one-two points, two if they exceeded it by three-five points, and so on to a maximum of seven pluspoints for exceeding their base scores by eighteen points or more. Students with perfect papers earned seven pluspoints regardless of their base scores or adjusted scores. Base scores were changed each week to correct any mistakes in the pretest score and to reflect current performance.

This system was not difficult to use since teachers only had to find a class median each week, adjust scores, and then consult a chart that gave pluspoints and a new base score for any combination of an old base score and a student quiz score. This improvement scoring system was developed by Slavin.³

The treatment condition consisted of the following: Team vs. Individual Reward. In the team condition, students were ranked in terms of a fifty item curriculum specific pretest and were assigned by the researcher to four-five member learning teams consisting of a high achiever, low achiever and two-three average achievers. The teams were encouraged to help their members prepare for quizzes on the material

presented and taught in class. Points earned by individuals on their quizzes were summed to form the team score and successful teams were rewarded as teams. Individual members within the team received an individual goal setting treatment score and points earned within this system contributed to the team score.

Successful teams were recognized in the class newsletter as well as individuals who contributed the most to their team score.

In the individual treatment condition, students received the same individual goal setting treatment as students in the team condition, were presented with the same curriculum material, worksheets and quizzes and followed the same schedule. Students worked individually and received points based on their performance relative to the goal set in the individual goal setting system. The goal changed gradually if a student consistently missed or exceeded his expected score (Base +10). This system ensured every student, regardless of past achievement, a substantial chance to do well if he or she worked hard. Individuals were recognized in the newsletter in terms of the points they earned.

Incentives were given in both the team and individual conditions in the form of a class newsletter prepared by the teacher. In the team incentive condition, the newsletter primarily rewarded teams and individuals who had contributed outstandingly to their team scores. In the individual incentive condition, the newsletter mentioned individuals who had earned the most points. In both team and individual incentive conditions, these points were points earned in the individual goal setting system.

In the control classes, students followed the same schedule, studied the same material, and took the same quizzes as those used in the other treatments. However, control students received only a percentage score (not individual goal setting points) and did not receive any incentive for their performances.

IV. INSTRUMENTATION

This research focused on the effects of different classroom reward structuring on student achievement and positive attitudes toward self and others. The independent variables in this research were group and individual learning structures with rewards for improvement, and a control learning structure with traditional percentage grades. The dependent variables were: (1) the amount of achievement as measured by Hoyum-Sanders Junior High School English Test and a curriculum specific test designed to test achievement of the actual curriculum received by all students; (2) the development of positive attitudes towards self and others and self concept as measured by the Classroom Perception Inventory, sociometric measure and a modified Piers-Harris test of self concept, and (3) the amount of time on task and peer interaction as measured by the Flexible Observation Instrument for Student Behavior (Slavin).⁴

V. ACHIEVEMENT MEASURE

The Hoyum-Sanders Junior High School English Tests were used to measure cognitive achievement before and after treatment. This test was developed by Hoyum and Sanders for the purpose of measuring objectively student proficiency on the essential mechanics of English. The authors

report that the tests can be used (1) for determining pupil achievement; (2) for checking the efficiency of instruction; (3) for analyzing student and class weakness; (4) for assigning school marks; (5) for motivating student effort. The tests had three divisions representing grades two through eight, with four equivalent forms for each division.

The third division of the tests (grades VII and VIII) was employed using two equivalent forms of tests, A II and B II, respectively, for pre and post test. These tests consisted of 135 questions based on categories covering sentence recognition, capitalization, punctuation, correct usage, and reference materials such as guide words and index words. According to the authors, construct validity was established through the inclusion of items which were common content of leading textbooks. A content analysis was made of eleven sets of recently published textbooks in order to include a fair sampling of valid items in proportion to the degree stressed in the texts. Criticism from teachers, supervisors, and test construction specialists were carefully considered in making revisions and improvements while tests were in process of standardization.

Percentile norms were obtained from the computation of scores of 50,078 students located in many representative schools in forty-six different states. Reliability of each test form was determined by the split half method.

The tests had a coefficient of reliability of .92, .91, .93 for grades 6, 7, and 8, respectively, for forms Test II A and .92 and .92 and .91 for grades 6, 7, and 8, respectively, for form Test II B.

Additional achievement measures included a curriculum specific test covering a fifty item sampling of questions from curriculum material employed in the study. This test was used initially to set an individual goal for each student. Mean gain scores were used in all treatment conditions from pre and post measures of both the Hoyum-Sanders Junior High School English Test and curriculum specific test to measure student achievement. (Appendix B)

VI. AFFECTIVE MEASURES

Measurement of self concept was conducted by means of the Piers-Harris Children's Self Concept Scale (The Way I Feel About Myself). The 140-item scale was developed by Piers and Harris in 1964 from a pool of items developed from Jersild's (1952) collection of children's statements about what they like and dislike about themselves.

The scale measured as a direct self report six dimensions: (1) behavior; (2) intellectual and school status; (3) physical appearance and attributes; (4) anxiety; (5) popularity; and (6) happiness and satisfaction.

The majority of the reliability data came from the original study using the ninety-five item scale. This reliability data on an N of 363 representing grade levels 3, 6 and 10 employing Kuder-Richardson Formula 21 resulted in coefficients ranging from .90 to .88.

The Spearman-Brown formula was employed for half of the grade six and grade ten samples, with resulting coefficients of .90 and .87, respectively. A retest after four months on half of the original sample of grades 3, 6 and 10 resulted in coefficients of .72, .71, and .72,

respectively. The revised eighty item scale on a two and four month test-retest resulted in coefficients of .77 for 244 fifth graders.

According to the authors, content validity was established by employing items in which children reported qualities they like or disliked about themselves. Presumably, these are an accurate reflection of a child's general self concept.

Some concurrent validities applying Pearson r with Piers-Harris total score reveal .68, .64, .49 at $p < .01$ comparing Piers-Harris self concept measure with Lipsitt Children's Self Concept Scale with ninety-eight students, twelve-sixteen years; big problems checked on S R A Junior Inventory 97, six to ninth grade students; and peer ratings of fifty-eight sixth grade boys at $p < .01$.

The present Piers-Harris Children's Self Concept Scale was modified to delete sensitive questions concerning family that could cause concern in the community and are not applicable to a school situation. Pre and posttests were given to all treatment conditions. Mean gain scores were reported as the self esteem measure (Appendix C).

A sociometric measure consisting of one question was employed to measure the increase in friendship. This question was used by Slavin in his research on team learning and requested students to list who were their best friends in the class. Students were given twenty-two lines on which to indicate their choices. This data was reported under the measure, Number of Friends Named.

Classroom Perception Inventory was used to measure attitudes on a five item scale. The inventory was developed by DeVries from Anderson's Learning Environment Inventory (DeVries, Edwards, and Livingston).⁵ It

was extended further by Slavin in 1976. Reliabilities were obtained from an N of 514 fourth graders. Utilizing a KR 20 and Spearman-Brown Correction, they were:

	KR 20	Spearman-Brown Correction
Satisfaction	.69	.82
Feeling of Being Liked	.59	.74
Liking of Others	.35	.52
Probability of Success	.52	.69
Importance of Success	.39	.56
Peer Support for Academic Performance	.60	.75
Anxiety	.41	.58
Motivation	.30	.46

Both Classroom Perception Inventory and sociometric measure were given pre and post treatment and the data from these measures were reported as mean gain scores (Appendix D and E, respectively).

VII. BEHAVIORAL MEASURES

Classroom observations of appropriate and inappropriate student task and interaction behavior were made by trained observers employing Slavin's Flexible Observation Instrument for Student Behavior (FOISB).⁶ Students were observed in the last five weeks of the study in terms of the following categories: individual on task, individual off task, peer on task (interacting appropriately with peers), peer off task (inappropriate behavior with peers), interaction with staff, and no task opportunity. Observers at each school were trained to an interobserver reliability of .90 through the process of paired observations with the researcher. During the training, the observer and researcher used separate observation instruments and monitored each student's behavior within treatment classes for five second intervals, going through the entire class in an

observation period. After each training session, the observer's observations were compared with the researcher. This process was repeated until a reliability of .90 was obtained. Observations required the observer to note if students were on/off task and if on task, working alone or with a peer; and if off task, alone or interacting with a peer. Observations were made during an entire class period, but only during the periods when students were working with their worksheets. After the training, an observer at each school monitored each student's behavior within treatment conditions employing the same process. Data was analyzed in terms of a Chi Square Contingency Table to compare off-task and peer task behavior between treatment groups (Appendix F).

VIII. DATA ANALYSIS

The specific procedures which were used to analyze the data are summarized after the following research hypothesis:

1. Students who work in learning teams and whose quiz scores are formed into team scores will exhibit greater academic achievement, percentage of time on task, percentage of time spent peer tutoring, and more positive attitude toward school, self, and others, and will be more motivated and less anxious than will students who work individually and receive individual scores only.
2. Students who are rewarded based on the difference between their quiz scores and an individually prescribed expected score will show greater academic achievement, positive self concept, and motivation than will control students who receive traditional competitively assigned grades.

All tests were administered by the teachers in a total class setting. Students were given Form A II of Hoyum-Sanders Junior High School English Tests and the Curriculum Specific Test - Language Arts.

The following day the Classroom Perception Inventory, the Piers-Harris Children's Self Concept Scale and a sociometric measure were administered.

During the last five weeks, classroom observations of appropriate and inappropriate student task and interaction behavior were made by trained observers employing Slavin's Flexible Observation Instrument for Student Behavior. Students were observed in terms of the following categories: Individual on task, individual off task, peer on task (interacting appropriately with peers), peer off task (inappropriate behavior with peers), interaction with staff, and no task opportunity. Observations were made only during the periods when students were working with their worksheets. Observers monitored each student's behavior for five seconds, going through the entire class several times in an observation period.

After the ten weeks treatment period, Form BII of the Hoyum-Sanders Junior High School English Test and the Curriculum Specific Test - Language Arts were administered. The Classroom Perception Inventory, the Piers-Harris Children's Self Concept Scale and a sociometric measure were administered the following day.

The scores obtained from all pre and post measures were used in the final analysis of the data. The criterion of significance was the .05 level, but whenever the probability level was .01 or .001 this was also reported. The Analysis of Variance as prepared by Robert E. Slavin of Johns Hopkins University was used to compare mean gain scores for each of the treatment groups on all variables except the Behavioral Observations. A Chi Square Contingency Table was employed to compare off task and peer task behavior between treatment groups.

¹ Donald T. Campbell and Julian Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago: Rand McNally and Co., 1963), p. 47.

² Robert E. Slavin, "Student Teams and Achievement Divisions," Journal of Research and Development in Education, Vol. 12, No. 1, (1978), pp. 39-49.

³ Robert E. Slavin, "Improvement Scoring System," (Baltimore: Johns Hopkins University, Center for Social Organization of Schools).

⁴ Robert E. Slavin, "A Flexible Observation Instrument for Student Behavior," Report No. 197, (Baltimore: Johns Hopkins University, Center for Social Organization of Schools, 1975).

⁵ David L. DeVries,, Keith J. Edwards, and Samuel A. Livingston, Center for Social Organization of Schools, Changing The Focus of Response in Assessing Classroom Learning Environments, Report No. 154, June 1973.

⁶ Robert E. Slavin, loc. cit.

CHAPTER IV

PRESENTATION OF FINDINGS

I. INTRODUCTION

This chapter compares the effectiveness of three modes of learning: cooperative, individual and the usual mode of competitive instruction (control) on student achievement, time on task, peer tutoring and positive attitude toward self and others. It further examines the use of a reward system that increases the probability of success for students of all ability levels to bring about greater academic achievement, higher percentage of time on task, and more positive attitude toward self and others.

Students within this study from four middle schools were randomly assigned to three treatment conditions: cooperative or team learning (STILE), individual learning expectations (ILE), and control group receiving usual mode of instruction and percentage grade. In all treatments except control, students received an individual goal setting treatment in which a performance goal was set based on a pretest. Students received points based on their performance relative to this goal. The goal changed gradually if students consistently missed or exceeded it and was adjusted in terms of quizzes. This system ensured every student, regardless of past achievement, a substantial chance to do well if he or she worked hard. Students received incentives in the form of a class newsletter. In the team condition, the newsletter mentioned teams and individuals who had earned the most points and contributed outstandingly to their team scores. In the individual condition, the newsletter mentioned individuals who earned the most points. In both conditions, points were points earned in the individual goal setting system.

Curriculum used was a ten-week English mechanics unit. The effects of the learning structure and reward system was measured on academic achievement, time on task, attitudes toward school and achievement, attitudes toward self and others, time off task, and peer interaction.

II. STATISTICAL ANALYSES

Analysis of variance, as prepared by Robert Slavin of Johns Hopkins University, was used in this section to compare mean gains for three treatment groups for each school on each of the measures. The criterion of significance was the .05 level, but whenever the probability level was .01 or .001 this was also reported. A chi square measure was employed for behavioral task observations.

III. TREATMENT EFFECTS FOR ACADEMIC ACHIEVEMENT

Academic achievement of English mechanics skills was one of the categories of dependent variables measured across the three treatment conditions. The Hoyum-Sanders standardized test of English mechanics skills and a curriculum specific test were the instruments employed. Data from these measures were compiled to assess gains in achievement means for each school across the three treatment conditions. Data for each of these measures were subjected to an analysis of variance to determine whether or not there was a difference due to treatment conditions.

Findings. The analysis of variance of data from the Hoyum-Sanders measure revealed differences at only one school between treatment groups which were significant at the confidence levels of $p < .05$ and $p < .01$. Southern middle school showed an F of 3.85 for a 3x1 comparison significant

at the $p < .05$ level. The comparison of treatments STILE vs. ILE revealed an F of 6.99 significant at the $p < .01$ level. STILE vs. CONTROL had an $F < 1$ and ILE vs. CONTROL presented an F of 2.08 showing no significance. F's for Hoyum-Sanders measures were < 1 for all treatment conditions at Old Mill and Windmill/Bayview with an F of 1.42 for ILE vs. CONTROL exhibiting no significance.

The curriculum specific test had F's < 1 across all treatment conditions for all schools. Summaries of these analyses are presented in tables 1 and 2 which follow:

Table 1: ACADEMIC ACHIEVEMENT MEANS

Measure	Hoyum-Sanders (Standardized)									
	Treatment	Old Mill (N=542)			Windmill/Bayview (N=274)			Southern (N=215)		
		N	Pre	Post	N	Pre	Post	N	Pre	Post
	STILE	231	68.12	75.29	91	64.73	68.31	89	66.51	71.32
	ILE	191	71.65	79.61	127	62.94	65.97	86	72.16	72.49
	CONTROL	111	73.67	80.00	56	64.25	67.62	40	72.10	74.86

Measure	CURRICULUM SPECIFIC TEST									
	Treatment	Old Mill (N=542)			Windmill/Bayview (N=274)			Southern (N=215)		
		N	Pre	Post	N	Pre	Post	N	Pre	Post
	STILE	231	55.68	63.95	91	51.40	59.50	89	53.08	58.32
	ILE	191	57.64	66.18	127	51.47	58.94	86	57.29	62.12
	CONTROL	111	57.95	65.88	56	51.71	59.35	40	54.60	50.13

TABLE 2: ANALYSIS OF VARIANCE, GAINS IN ACADEMIC ACHIEVEMENT

Measure	<u>Hoyum-Sanders (Standardized)</u>		
<u>Comparison</u>	<u>Old Mill</u> (N=542)	<u>Windmill/Bayview</u> (N=274)	<u>Southern</u> (N=215)
3 x 1	<1 (2,539)	<1 (2,271)	3.85 * (2,212)
STILE vs. ILE	<1 (1,423)	<1 (1,216)	6.99 ** (1,173)
STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
ILE vs. CONTROL	1.42 (1,346)	<1 (1,145)	2.08 (1,127)

Measure	<u>Curriculum Specific Test</u>		
<u>Comparison</u>	<u>Old Mill</u> (N=542)	<u>Windmill/Bayview</u> (N=274)	<u>Southern</u> (N=215)
3 x 1	<1 (2,539)	<1 (2,271)	<1 (2,212)
STILE vs. ILE	<1 (1,423)	<1 (1,216)	<1 (1,173)
STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
ILE vs. CONTROL	<1 (1,346)	<1 (1,145)	<1 (1,127)

NOTE: TABLE ENTRIES ARE F's, FOLLOWED BY DEGREES OF FREEDOM.

* $p < .05$
 ** $p < .01$

IV. TREATMENT EFFECT FOR AFFECTIVE MEASURES

Attitudes toward school and achievement were measured across all treatment conditions in each school. The Classroom Perception Inventory was employed as instrumentation for affective measures of attitudes toward school, achievement, self, and others. The self-esteem measure was adapted from the Piers-Harris Children's Self-Concept Scale. A sociometric measure assessed increased friendship.

Attitudes toward school and achievement were measured on five dimensions: liking of school, perceived probability of success, incentive value of success, motivation and anxiety. Data from these measures were compiled to determine mean gain scores. Data were subjected to an analysis of variance to determine significant differences due to treatment conditions.

Findings. There were no significant differences on all four dimensions of measures across all treatment groups at all schools. F's for liking of school, perceived probability of success, motivation and anxiety measures were predominantly non-significant, with a few exceptions. Statistical significance was obtained on one dimension at Old Mill. The incentive value of success measure on a 3 x 1 comparison (STILE vs. ILE vs. CONTROL) exhibited $F=3.42$ and F's of 5.57 for STILE vs. ILE comparison and 3.93 for ILE vs. CONTROL. These were significant at the $p < .05$ level. The comparison of STILE vs. CONTROL showed an $F < 1$.

Tables 3 and 4 summarize the mean scores and analyses of variances for all treatment conditions at all schools.

TABLE 3: MEAN ATTITUDES TOWARD SCHOOL AND ACHIEVEMENT

Measure	Treatment	Old Mill (N=542)			Windmill/Bayview (N=274)			Southern (N=215)		
		N	Pre	Post	N	Pre	Post	N	Pre	Post
Liking of School	STILE	231	12.86	16.57	91	12.61	15.96	89	13.94	17.28
	ILE	191	12.69	15.89	127	10.62	13.48	86	12.73	15.72
	CONTROL	111	13.32	16.61	56	11.60	15.25	40	14.85	18.07
Perceived Probability of Success	STILE	231	19.67	20.07	91	19.19	18.68	89	20.09	20.28
	ILE	191	20.03	20.26	127	18.35	18.33	86	19.84	20.07
	CONTROL	111	20.14	20.76	56	18.43	17.55	40	20.25	20.55
Incentive Value of Success	STILE	231	14.44	20.37	91	14.21	19.73	89	14.06	19.20
	ILE	191	14.60	19.73	127	14.20	18.99	86	13.97	18.96
	CONTROL	111	14.44	20.40	56	13.86	18.94	40	14.57	19.65
Motivation	STILE	231	17.63	17.71	91	16.99	17.19	89	16.73	17.41
	ILE	191	17.14	17.34	127	16.16	15.69	86	16.34	16.89
	CONTROL	111	17.64	17.79	56	16.78	17.18	40	17.00	17.73
Anxiety	STILE	231	16.43	17.20	91	16.17	17.02	89	16.77	17.85
	ILE	191	16.38	17.01	127	14.70	15.27	86	16.41	17.23
	CONTROL	111	15.99	16.75	56	15.15	16.07	40	17.22	17.50

TABLE 4: ANALYSIS OF VARIANCE, GAINS IN ATTITUDES TOWARD SCHOOL AND ACHIEVEMENT

<u>Measure</u>	<u>Comparison</u>	<u>Old Mill</u> (N=542)	<u>Windmill/Bayview</u> (N=274)	<u>Southern</u> (N=215)
Liking of School	3 x 1	<1 (2,539)	<1 (2,271)	<1 (2,212)
	STILE vs. ILE	1.02 (1,423)	<1 (1,216)	<1 (1,173)
	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	<1 (1,346)	<1 (1,145)	<1 (1,127)
Perceived Probability of Success	3 x 1	<1 (2,539)	1.41 (2,271)	<1 (2,212)
	STILE vs. ILE	1.02 (1,423)	1.69 (1,216)	<1 (1,173)
	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	1.42 (1,346)	2.45 (1,145)	<1 (1,127)
Incentive Value of Success	3 x 1	3.42*(2,539)	1.36 (2,271)	<1 (2,212)
	STILE vs. ILE	5.57*(1,423)	2.74 (1,216)	<1 (1,173)
	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	3.93*(1,346)	<1 (1,145)	<1 (1,127)
Motivation	3 x 1	<1 (2,539)	1.28 (2,271)	<1 (2,212)
	STILE vs. ILE	<1 (1,423)	2.05 (1,216)	<1 (1,173)
	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	<1 (1,346)	1.81 (1,145)	<1 (1,127)
Anxiety	3 x 1	<1 (2,539)	<1 (2,271)	<1 (2,212)
	STILE vs. ILE	<1 (1,423)	<1 (1,216)	<1 (1,173)
	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	1.41 (1,124)
	ILE vs. CONTROL	<1 (1,346)	<1 (1,145)	<1 (1,127)

NOTE: Table entries are F's, followed by degrees of freedom
 * p < .05

V. ATTITUDE TOWARD SELF AND OTHERS

Scores for attitudes toward self and others were derived from the Classroom Perception Inventory measure and the adapted Piers-Harris Self-Concept Scale. Factors measured were numbers of friends named, liking of others, feeling of being liked and self-esteem. Data from these measures were compiled to assess mean gain scores for measures across all treatment conditions for the three schools. Then the data for these measures were subjected to an analysis of variance to determine differences.

Findings. The measure, number of friends named, presented an F on 3 x 1 comparison (STILE vs. ILE vs. CONTROL) of 3.14 at Old Mill significant at the $p < .05$ level, < 1 at Windmill/Bayview and 2.46 at Southern, which reflected no significant difference at $p < .05$.

The comparison of treatments STILE vs. ILE on this measure revealed at Old Mill an F of 5.67 significant at the $p < .05$ level. At Windmill/Bayview, this comparison had an F < 1 , but at Southern, the F for this treatment group was 4.96, significant at the $p < .05$ level.

The treatment conditions, STILE vs. CONTROL and ILE vs. CONTROL had F's of < 1 at all schools, with the exception of an F of 2.47 for STILE vs. CONTROL comparison at Old Mill which exhibited no significant difference at $p < .05$.

The liking of others had F's < 1 across all comparisons at all schools with the exception of an F of 1.45 on the 3 x 1 comparison at Southern. All of these F's for this measure revealed no significance at the $p < .05$ level.

The measure feeling of being liked on the 3 x 1 average comparisons had F's of 1.01 at Old Mill, 2.44 at Windmill/Bayview and <1 at Southern. These were not significant at the $p < .05$ level.

The comparisons of treatment conditions STILE vs. ILE had F's of <1 at Old Mill and Southern Middle Schools but an F of 4.90 at Windmill/Bayview, which was significant at the $p < .05$ level. The comparisons of treatments STILE vs. CONTROL had F's of <1 exhibiting no significance. The ILE vs. CONTROL comparisons had an F of 1.91 at Old Mill, 1.84 for Windmill/Bayview and <1 for Southern Middle School. These revealed no significance.

The self-esteem measure showed on the 3 x 1 comparison an F of 4.57 at Old Mill, significant at the $p < .05$ level, and an F of 1.41 at Windmill/Bayview and <1 at Southern, exhibiting no significance.

The comparison of STILE vs. ILE at Old Mill had an F of 7.39 significant at the $p < .01$ level. For Windmill/Bayview and Southern Schools, the F's were <1 , exhibiting no significance.

The comparison, STILE vs. CONTROL treatment, revealed an F of <1 at Old Mill and Windmill/Bayview, presenting no significance between treatments. The ILE vs. CONTROL comparison had an F of 5.06 at Old Mill, indicating significance at the $p < .05$ level. An F of 2.49 and 1.82 at Windmill/Bayview and Southern respectively, represented no significance on this comparison.

These findings are presented in the following tables: Table 5 presents mean scores for attitude toward self and others; and Table 6 presents analysis of variance, gains in attitudes toward self and others.

TABLE 5: MEAN ATTITUDES TOWARD SELF AND OTHERS

<u>Measure</u>	<u>Treatment</u>	<u>Old Mill</u> (N=542)			<u>Windmill/Bayview</u> (N=274)			<u>Southern</u> (N=215)		
		<u>N</u>	<u>PRE</u>	<u>POST</u>	<u>N</u>	<u>PRE</u>	<u>POST</u>	<u>N</u>	<u>PRE</u>	<u>POST</u>
Number	STILE	231	6.12	6.91	91	8.85	8.80	89	9.33	10.03
of Friends	ILE	191	5.98	6.13	127	8.40	8.73	86	9.18	8.78
Named	CONTROL	111	6.05	6.64	56	7.02	7.27	40	7.55	7.63
Liking	STILE	231	17.13	17.60	91	18.39	18.42	89	17.54	18.04
of	ILE	191	17.24	17.51	127	17.51	17.33	86	16.89	17.74
Others	CONTROL	111	17.10	17.59	56	16.67	17.22	40	17.95	17.84
Feeling	STILE	231	17.76	17.91	91	17.86	18.34	89	18.30	18.94
of Being	ILE	191	17.56	18.03	127	17.82	17.49	86	17.54	18.48
Liked	CONTROL	111	17.81	17.49	56	16.66	17.12	40	17.92	18.28
Self-	STILE	231	45.18	46.85	91	46.29	46.62	89	47.71	49.09
Esteem	ILE	191	47.94	48.31	127	45.07	44.60	86	46.12	48.51
	CONTROL	111	47.00	48.99	56	38.31	39.34	40	47.43	47.62

TABLE 6: ANALYSIS OF VARIANCE, GAINS IN ATTITUDES TOWARD SELF AND OTHERS

<u>Measure</u>	<u>Comparison</u>	<u>Old Mill</u> (N=542)	<u>Windmill/Bayview</u> (N=274)	<u>Southern</u> (N=215)
Number	3 x 1	3.14 *(2,539)	<1 *(2,271)	2.46 (2,212)
of Friends	STILE vs. ILE	5.67 *(1,423)	<1 *(1,216)	4.96*(1,173)
Named	STILE vs. CONTROL	2.47 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	<1 (1,346)	<1 (1,145)	<1 (1,127)
Liking	3 x 1	<1 (2,539)	<1 (2,271)	1.45 (2,212)
Of	STILE vs. ILE	<1 (1,423)	<1 (1,216)	<1 (1,173)
Others	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	<1 (1,346)	<1 (1,145)	<1 (1,127)
Feeling	3 x 1	1.01 (2,539)	2.44 (2,271)	<1 (2,212)
Of Being	STILE vs. ILE	<1 (1,423)	4.90 *(1,216)	<1 (1,173)
Liked	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	<1 (1,124)
	ILE vs. CONTROL	1.91 (1,346)	1.84 (1,145)	<1 (1,127)
Self-	3 x 1	4.57 *(2,539)	1.41 (2,271)	<1 (2,212)
Esteem	STILE vs. ILE	7.39**(1,423)	<1 (1,216)	<1 (1,173)
	STILE vs. CONTROL	<1 (1,309)	<1 (1,181)	1.20 (1,124)
	ILE vs. CONTROL	5.06 *(1,346)	2.49 (1,145)	1.82 (1,127)

NOTE: Table entries are F's, followed by degrees of freedom

*p <.05 - **p <.01

VI. BEHAVIORAL MEASURES

The Flexible Observation Instrument (Slavin, 1976) was used to measure off-task behavior and peer interaction. During the last five weeks of the study, behavioral observations of students were conducted in all classes. Observers at each school were trained to an interobserver reliability of .90. Observations required the observer to note if students were on/off task and if on task, working alone or with a peer; and if off task, alone or interacting with a peer. Observations were only during the periods when students were working with their worksheets. Observers monitored each student's behavior for five seconds, going through the entire class several times in an observation period. Dependent variables were percentage of time on task and percentage of time spent interacting with peers. A Chi Square contingency table was used to analyze and compare behaviors between treatment groups.

Findings. For off-task behaviors at Old Mill, ILE vs. CONTROL exhibited $\chi^2=2.72$ $p < .10$, in the direction ILE < CONTROL. Windmill/Bayview had $\chi^2=9.52$, $p < .01$ for a comparison of STILE vs. ILE vs. CONTROL, in the direction of CONTROL > STILE < ILE. STILE vs. ILE presented $\chi^2=5.13$, $p < .05$, in the direction of STILE < ILE, with STILE vs. CONTROL $\chi^2 < 1$ showing no significance. The comparison ILE vs. CONTROL had $\chi^2=6.15$, $p < .05$, showing the direction CONTROL < ILE. At Southern, the comparison of STILE vs. ILE vs. CONTROL had $\chi^2=16.39$, $p < .01$ revealing a direction of ILE < STILE < CONTROL, but STILE vs. ILE $\chi^2 < 1$. The comparison of STILE vs. CONTROL revealed $\chi^2=10.91$, $p < .01$, in the direction of STILE < CONTROL. The ILE vs. CONTROL comparison had $\chi^2=13.43$, $p < .01$ showing the direction of ILE < CONTROL.

Tables 7 and 8 summarize behavioral observations, Chi Square analysis and percent of time off-task, respectively.

TABLE 7: BEHAVIORAL OBSERVATIONS
CHI SQUARES-OFF-TASK

<u>School</u>	<u>Comparison</u>	χ^2	<u>P</u>	<u>Direction</u>
<u>Old Mill</u>				
3 x 1	STILE vs. ILE vs. CONTROL	2.97	N.S.	
	STILE vs. ILE	<1	N.S.	
	STILE vs. CONTROL	1.05	N.S.	
	ILE vs. CONTROL	2.72	.10	ILE < CONTROL
<u>Windmill/ Bayview</u>				
3 x 1	STILE vs. ILE vs. CONTROL	9.52	.01	CONTROL > STILE < ILE
	STILE vs. ILE	5.13	.05	STILE < ILE
	STILE vs. CONTROL	<1	N.S.	
	ILE vs. CONTROL	6.15	.05	CONTROL < ILE
<u>Southern</u>				
3 x 1	STILE vs. ILE vs. CONTROL	16.39	.01	ILE < STILE < CONTROL
	STILE vs. ILE	<1	N.S.	
	STILE vs. CONTROL	10.81	.01	STILE < CONTROL
	ILE vs. CONTROL	13.43	.01	ILE < CONTROL

TABLE 8: BEHAVIORAL OBSERVATIONS
PERCENT OF TIME OFF-TASK

<u>Comparison</u>	<u>Old Mill</u>	<u>Windmill/Bayview</u>	<u>Southern</u>
STILE	7.9	10.7	28.5
ILE	7.2	16.0	21.6
CONTROL	8.9	12.3	35.7

Table 9 summarizes the percent of time on peer task and shows the comparison of individual and peer task across three conditions at all schools.

TABLE 9: BEHAVIORAL OBSERVATIONS
PEER TASK - DURING ON-TASK

<u>TASK</u>	<u>Old Mill</u>			<u>Windmill/Bayview</u>			<u>Southern</u>		
	<u>STILE</u>	<u>ILE</u>	<u>CONTROL</u>	<u>STILE</u>	<u>ILE</u>	<u>CONTROL</u>	<u>STILE</u>	<u>ILE</u>	<u>CONTROL</u>
Individual	955	1510	1000	94	718	307	296	590	366
Peer	670	515	300	360	151	0	428	3	63
% Peer Task	41.2	25.4	23.1	79.3	17.4	0	59.1	0.5	14.7

Table 10 presents the results of the statistical analysis of χ^2 showing overall $p < .001$ in all treatment conditions at all schools with the exception of ILE vs. CONTROL at Old Mill.

TABLE 10: BEHAVIORAL OBSERVATIONS
PEER TASK - CHI SQUARES

<u>Analyses</u>	<u>χ^2</u>	<u>χ^2</u>	<u>χ^2</u>
3 x 2	147.39***	703.96***	603.87***
STILE vs. ILE	101.91***	479.68***	505.98***
STILE vs. CONTROL	106.57***	458.81***	215.68***
ILE vs. CONTROL	2.25	59.66***	80.52***

*p < .05

**p < .01

***p < .001

CHAPTER V

SUMMARY, DISCUSSION AND RECOMMENDATIONS

I. INTRODUCTION

This study was undertaken to compare the effects of cooperative, individual and competitive reward structures (team vs. individual vs. control) on cognitive achievement and positive attitudes toward self and others. The research employed techniques for cooperative learning and teams developed at the Center for Social Organization of Schools at Johns Hopkins University. The research was an effort to assess alternative reward structures using incentives and to determine their effectiveness for classroom instruction in terms of student achievement, mutuality and self-esteem.

The specific questions upon which this research focused were:

1. What mode of learning, cooperative or individual, for classroom instruction brings about the greater achievement, higher percentage of time on task, higher percentage of time spent peer tutoring and most positive attitudes toward self and others?
2. Does use of a reward system that increases probability of success for students of all ability levels bring about greater academic achievement, higher percentage of time on task and more positive attitudes toward self and others?

Procedures employed. Forty-two classes of students from four schools in Anne Arundel County were randomly assigned to three treatment conditions: team learning (STILE), individual (ILE), and control group. Students within the team condition were assigned to a heterogeneous team in terms of achievement, sex and race as far as possible.

Students in team and individual conditions received an individual learning goal. Students in team conditions were rewarded in terms of team and individual performance, and in individual conditions in terms of their own performance, and control group received traditionally assigned grades. The curriculum for a ten-week period consisted of an English mechanics unit covering grammar punctuation and usage. In the analysis, differences were measured on four categories of dependent variables. Academic achievement was measured on two tests: the Hoyum-Sanders Junior High School English Test and a treatment specific test in terms of the curriculum material taught. Parallel forms of both tests were given as pre and post tests. A sociometric measure was given pre and post to assess number of friends named. Attitudes were measured on Classroom Perception Inventory. Measures were liking of school, perceived probability of success, incentive value of success, motivation, anxiety, liking of others and feeling of being liked. Differences were obtained between pre and post tests. Self-esteem was measured in terms of an adapted Piers-Harris Children's Self-Concept Scale. Differences were again measured between pre and post tests. Behavioral observations were measured in terms of Flexible Observation Instrument. This instrument measured off-task behavior and peer interactions through observations made in sequence through the class at five second intervals during a student work assigned period. An analysis of variance was used to compare mean gains in the measures except the observational ones in the three treatment conditions. Behavioral measures were analyzed through a Chi Square contingency table to compare observations of treatment groups. The reliability for each of these measures was reported in Chapter III.

Organization of the Study. This chapter contains an analysis of the research findings presented in Chapter IV. The first section presents an introduction, information relating to the problem being studied, and procedures employed in completing this study. The second section discusses the findings and implications related to student achievement, attitudes toward self and others, off-task behavior and peer interactions in terms of the treatment conditions. Recommendations for classroom instruction and for further research are presented in the final section.

II. ANALYSIS OF FINDINGS

In an effort to secure answers for the questions raised in this study, two hypotheses were tested using analyses of variance for achievement and attitude measures and χ^2 contingency tables for behavioral measures. The hypotheses indicated that students working and rewarded in terms of the team treatment conditions would obtain higher scores on all measures than those working in an individual learning experience. Similarly, students working and rewarded individually would obtain higher scores than students in the control group receiving traditionally assigned grades. Contrary to these expectations, the actual results were mixed and the hypotheses only partially supported.

As would be expected, there were differences in the team condition which supported the hypothesis on peer interactions at all schools on STILE vs. ILE, STILE vs. CONTROL and ILE vs. CONTROL with one exception, ILE vs. CONTROL at Old Mill. Differences in academic achievement, as

measured by the Hoyum-Sanders English Mechanics Test, were only evident at Southern. Statistical significances were revealed on 3 x 1 comparison (STILE vs. ILE vs. CONTROL) and STILE vs. ILE treatment conditions, and differences were exhibited at Old Mill in attitudes on the measures of incentive value of success and self-esteem across a 3 x 1 comparison, STILE vs. ILE and ILE vs. CONTROL. Percentage of time off task had mixed results which also indicated a spotty partial support of the hypothesis across the treatment conditions at all schools.

Hypothesis 1. This hypothesis stated:

Students who work in learning teams and whose quiz scores are formed into team scores will exhibit greater academic achievement, percentage of time on task, percentage of time spent peer tutoring, and more positive attitude toward school, self, and others, and will be more motivated and less anxious than will students who work individually and receive individual scores only.

Analysis of variance was applied to mean scores on the academic achievement tests, Hoyum-Sanders and curriculum specific, to test the hypothesis. The scores on these measures yielded F's < 1 predominantly across all measures. Statistically significant results were exhibited on the Hoyum-Sanders at Southern across the 3 x 1 comparison (STILE vs. ILE vs. CONTROL) as $F(2,212)=3.85, p < .05$ and STILE vs. ILE as $F(1,173)=6.99, p < .01$.

Chi Square was used to test the hypothesis for time on task and peer interaction. Differences in percentage of time on task were significant, showing $\chi^2=5.13 < .05$ in favor of the team condition at Windmill/Bayview. Non-significant differences ($\chi^2 = < 1$) were found at Old Mill and Southern.

Peer interactions were significant for the team conditions at the three schools: Old Mill, STILE vs. ILE, $\chi^2=101.91$, $p < .001$; Windmill/Bayview, $\chi^2=479.68$, $p < .001$; Southern, $\chi^2=505.98$, $p < .001$. Analyses of variance were employed to test the hypothesis concerning the attitudinal measures. Positive attitudes toward school were non-significant with $F < 1$ across four measures: liking of school, perceived probability of success, motivation and anxiety for the team comparison at all schools. The dimension of incentive value of success was significant for the team condition at Old Mill and supported the hypothesis on this one measure. The comparison STILE vs. ILE exhibited $F(1,423)=5.57$, $p < .05$.

The results of the analyses of variance on the measures for attitudes towards self and others partially supported the hypothesis on the number of friends named, feeling of being liked, and the self-esteem measure. The number of friends measure showed the comparison STILE vs. ILE had $F(1,423)=5.67$, $p < .05$ and $F(1,173)=4.96$, $p < .05$ at Old Mill and Southern respectively. The hypothesis was also supported in the team condition on the measure, Feeling of Being Liked. The comparison STILE vs. ILE showed $F(1,216)=4.90$, $p < .05$. Similarly, the self-esteem measure supported the hypothesis at Old Mill. The comparison STILE vs. ILE revealed $F(1,423)=7.39$, $p < .01$. The data only partially supported the research hypothesis that students who work in learning teams and receive team scores will have greater academic achievement, more positive attitudes toward school, self and others and will be more motivated and less anxious than students who work individually and receive individual scores. Students in teams supported the hypothesis in the

percentage of time on task and time spent peer tutoring.

Hypothesis 2. This hypothesis addressed the question of whether individual learning experience results in higher academic achievement and more positive attitudes. It stated:

Students who are rewarded based on the difference between their quiz scores and an individually prescribed expected score will show greater academic achievement, positive self concept, and motivation than will control students who receive traditional competitively assigned grades.

An analysis of variance was used to test this hypothesis on achievement and attitudes and a Chi Square measure on behaviors. The data analyzed revealed that the hypothesis was not supported in the areas of achievement, with F's showing no significance. The attitudinal measures had similar results in all dimensions with the exception of incentive value of success measure which showed for the comparison ILE vs. CONTROL at the Old Mill School significant $F(1,346)=3.93, p < .05$ and $F(1,346)=5.06, p < .05$ on the self-esteem measure and supported the hypothesis in these two areas.

The data only partially supported the research hypothesis that students who are rewarded based on the difference between their quiz scores and an individually prescribed expected score will show greater academic achievement and more positive attitudes toward self and others.

III. DISCUSSION

The research findings provided only partial support for the hypotheses and revealed mixed results. Students in the team condition at all schools showed an increase in the sociometric measure number of friends named significant at $p < .05$. Students in no other treatment

conditions showed any increase in this measure. These findings were as predicted and were reflected in the results found by the research of DeVries and Slavin cited in Chapter II who have found strong support for the use of teams in increasing friendships and interpersonal effects. At the same time, however, there was no increase in attitudes of students for the measures liking of others and feeling of being liked with the exception of students at Windmill/Bayview also in the team classes significant at $p < .05$. No other attitudinal measures showed any increase.

Students in team and individual expectations at two schools supported the research expectations on two measures. Students' gains in the team condition in the measure of self esteem at Old Mill were significant at $p < .01$ and also $p < .05$ for students in the individual expectation treatment. These results were as predicted showing greater significance in the team condition than the individual one. Students at Southern Middle School showed improvement in achievement. This improvement was found for the Hoyum-Sanders Standardized Test only, and not on the Curriculum Specific Test. The improvement for the team condition over the individual was significant at $p < .01$ and for the individual condition at $p < .05$. These findings were in line with the prediction and supported the hypotheses in these two instances.

Despite the fact the hypotheses were not supported in every situation on all measures, the results obtained were significant and reflected that the increase of self esteem for the students at Old Mill were similar to the findings of Blaney et al. and Geffner, cited previously in Chapter II, who found increase in student self esteem in another form of cooperative learning, the jigsaw technique. Students in the team treatment showed

greater increase than students in the individual treatment, but both situations showed significance. This raises the question whether the increase was due to the team component or the individual expectation. Since the individual expectations were present in both conditions, one can only infer that the team technique enhanced the individual expectations since students in this treatment showed the greater gains.

Similarly, at this same school, students showed an increase in the measure incentive value of success in all conditions at $p < .05$. Any inference made in terms of this finding would be pure speculation, since the curriculum was the only consistent factor present between all conditions.

At the same time, the results students obtained at Southern showed an increase in achievement as predicted. These results were not achieved by students in any other school. An examination of the differences between the students at the schools might offer an explanation. Southern was the only school with a minority population of thirty-three percent black. The achievement level of the students at this school was also lower than the students at the other two schools. Research cited previously in Chapter II by Slavin, DeVries, Blaney et al. has found that team techniques have shown particular success in increasing the achievement of minority students and students working in the content area of basic skills. The findings at Southern would appear to be similar to that of the previous research. However, students within the individual condition also showed significant increase in achievement. These results appear to indicate that the components operating in the individual learning expectations of individual goal setting, earning points based upon

this goal had an effect on increased achievement, but the achievement was more increased by the team reward structure.

The findings for the behavioral measures of peer interaction and off task behavior revealed the same pattern of partial support for the hypotheses as the other measures. The greatest amount of peer interactions was found in the team condition at all schools as predicted. The measure of off task behavior, however, had mixed results.

The off task behavior of students in the Windmill/Bayview School was less in the team condition. Students at Southern and Old Mill, on the other hand, had less off task behavior in the individual learning treatment. In the team condition at Old Mill, the percent of difference was only marginal in comparison with the individual learning treatment showing 7.9% off task for STILE and 7.2% for ILE. While at Southern, off task behavior was 28.5% for STILE and 21.6% for ILE. The off task behavior for students at Southern was much higher in all treatment conditions than the other two schools. These findings might be attributed to the nature of classes at Southern in general which appeared to have more of a tendency to be distracted. Both the team condition and the individual learning condition in all cases at all schools had less off task behavior than the control condition, thus showing students spent greater percent of time on task in these conditions than control classes. Since the curriculum was the same in all three conditions, it would appear that students were more motivated to be on task in learning situations that had alternate reward structures than those used in traditional classrooms.

IV. CONCLUSION

The findings at each of the schools did not support the hypotheses in all instances. The data, however, provided partial support of predictions indicating positive benefits for students in the use of reward structures in relation to increased achievement and positive affective outcomes. An explanation for the partial support of the hypotheses could possibly be attributed to differences in student population among schools. Previous research already cited has shown team learning to be particularly effective in improvement of achievement for lower achieving students and minority students in the area of basic skills. These factors would seem to be a plausible explanation for the research findings of increased achievement at Southern which had the combined factors of minority population and lower achievement level than the other two schools. Thus the research findings at this school were consistent with previous findings. At the same time, there was no increase in achievement for the students at the Old Mill School. This failure to show an increase in achievement might be attributed to the ability level of the students and the curricular materials employed. The students at Old Mill were of a higher ability level than the students at the other two schools. As indicated by their pretests, the students already had acquired many skills involving English mechanics. Therefore, the English mechanics unit was of less interest to these students and offered less challenge for learning.

The findings for increased friendships and peer interaction were consistent for students at all schools. These findings also supported the research on team reward structures of DeVries and Slavin previously cited in Chapter II. An interesting fact connected with the findings of increased friendships of students at Old Mill and Windmill/Bayview is the fact that these two schools had an open space environment in which students were seated in small groups at tables as opposed to desks in a traditional classroom. The students, however, were usually instructed in a total group. It is interesting to note that students at these schools indicated an increase in number of friends named, demonstrating that just proximity by itself in an open space school does not necessarily provide the opportunity for mutuality and interpersonal interaction that is produced with team reward structures.

Both the team and individual reward structure showed beneficial effects for students on cognitive and affective measures. The significant increase of self esteem in both the team and individual treatments at Old Mill and the significant increase in achievement in both the team and individual treatments at Southern point to the fact that further research is needed to separate the processes and components operating in both of these treatment conditions.

V. RECOMMENDATIONS

The use of team reward structures has much implication for educational practice and research. Thus, within the limitations cited in Chapter I, the following recommendations are offered:

Recommendations for Educational Practice

1. The use of team reward structures fosters greater interactions of students and promotes increased friendships, positive interpersonal relations and attitudes of mutuality. Educators should employ these reward structures with students to offer them learning experiences which promote positive social development.
2. The teaching of basic skills is facilitated through variation in the reward structures and the structuring of tasks employed in the classroom. The use of team reward structures has been shown with relative consistency to enhance learning with low ability students and minority students.
3. The use of team techniques can be used with any curricular materials. It is essentially an approach for learning and offers teachers the opportunity for alternative reward structures than those presently operating in the classroom.
4. The interaction of students through team contact enhances learning and fosters helping relationships which promote academic achievement as a student goal as well as peer norms for academic achievement. Educators need to recognize that students do not need to learn materials in isolation from one another to be successful.

Recommendations for Further Research

1. The relationship of the variables operating in individual learning expectations and student teams individual learning

expectations to increased achievement and more positive attitudes needs further research. Are the components of the individual learning expectations (individual goal setting and points earned based upon this goal) or the team learning expectations (peer tutoring and individual scores summed to form a team score) responsible for increased achievement and more positive attitudes?

2. Examination of the processes operating between and among students in the team situation that facilitate learning and peer tutoring is needed.
3. Further research is needed to identify the relationship between the structuring of tasks and rewards (employing the same variables as the treatment conditions of STILE and ILE) and the increase in student's self esteem.
4. Further research is recommended in the use of team and individual reward structures in additional curricular areas with students of all ability levels. Further investigation is necessary to discover if the use of team and individual reward structures increases achievement in all curricular areas and with all ability levels of students.

APPENDIX A
CURRICULUM MATERIALS

List of Units

Sample Worksheet

Quiz (Skill Drill)

Skill Drill Score Sheet

Curriculum Units for Intermediate
Language Mechanics Program

<u>Unit</u>	<u>Titles</u>
A	Sentences vs. Non-sentences
B	Fragments and Run-ons
C	Kinds of Sentences
D	Commas 1
E	Commas 2
F	Capitalizing Proper Nouns
G	Alphabetization
H	Past Tenses of Verbs
I	Verb Usage
J	Subject-verb Agreement 1
K	Subject-verb Agreement 2
L	Adjectives vs. Adverbs
M	Forms of Comparison: Adjectives and Adverbs
N	Apostrophes
O	Usage 1
P	Usage 2
Q	Usage 3
R	Usage 4
S	Review

Worksheet A

Sentences/Non-Sentences

Objective: To tell the difference between groups of words that are sentences and groups of words that are not sentences.

Instructions: Read the items on the sheet and decide whether or not they are complete sentences.

The puppy chewed my shoe. A-1	Our television is broken. A-4	Watching the football game. A-7
The snow falling during the night. A-2	Just then we heard a loud bark. A-5	Two jet planes zoomed across the sky. A-8
Tin cans falling on the floor. A-3	The boy with red hair. A-6	Near the tall pine tree. A-9
He needs his boots today. A-10	He was hurt by a rock. A-17	Going to the store after school. A-24
Reading an exciting book. A-11	Because it went away. A-18	It's my turn. A-25
We are leaving tomorrow. A-12	Behind the door he hid. A-19	Are you going? A-26

Worksheet A - Sentences/Non-Sentences

When it stops raining. A-13	Look at the rainbow! A-20	Because the show was over. A-27
They are baking a cake now. A-14	Let's play ball. A-21	Watching television is fun sometimes. A-28
It was a black cloud. A-15	It's a chilly day. A-22	On the top shelf he put his books. A-29
Fell into the water with shoes on. A-16	Picking of some pretty flowers. A-23	Washing her hands with soap and water. A-30

Worksheet A
Sentences/Non-Sentences

Answers

A-1	Yes	A-11	No	A-21	Yes
A-2	No	A-12	Yes	A-22	Yes
A-3	No	A-13	No	A-23	No
A-4	Yes	A-14	Yes	A-24	No
A-5	Yes	A-15	Yes	A-25	Yes
A-6	No	A-16	No	A-26	Yes
A-7	No	A-17	Yes	A-27	No
A-8	Yes	A-18	No	A-28	Yes
A-9	No	A-19	Yes	A-29	Yes
A-10	Yes	A-20	Yes	A-30	No

Name _____

Number Correct _____

Class _____

Skilldrill A: Sentences/Non-Sentences

Instructions: Read the items on the sheet and decide whether or not they are complete sentences. If they are complete, write "YES" in the space; if not, write "NO."

- _____ 1. Tin cans falling on the floor.
- _____ 2. Just then we heard a loud bark.
- _____ 3. The boy with red hair.
- _____ 4. We are leaving tomorrow.
- _____ 5. When it stops raining.
- _____ 6. Fell into the water with shoes on.
- _____ 7. Behind the door he hid.
- _____ 8. Look at the rainbow.
- _____ 9. It's my turn.
- _____ 10. Are you going?
- _____ 11. Because the show was over.
- _____ 12. Watching television is fun sometimes.
- _____ 13. Washing her hands with soap and water.
- _____ 14. Few people like making a bed.
- _____ 15. Riding in a car with the windows down.
- _____ 16. Smoke from cigarettes stinks.
- _____ 17. Buttons can fall off and get lost.
- _____ 18. Knocking on the door in the rain.
- _____ 19. If you go where the snowflakes fall.
- _____ 20. Mars is a faraway planet.
- _____ 21. This old coat of mine.
- _____ 22. Steel wheels get stolen.

Skilldrill A: Sentences/Non-Sentences

- _____ 23. Mowing the lawn is dangerous.
- _____ 24. Happiness is helping.
- _____ 25. Missing the bus in the morning.

APPENDIX B
CURRICULUM SPECIFIC TEST -
LANGUAGE ARTS

Name _____

Date _____

Teacher _____

School _____

CURRICULUM SPECIFIC TEST - LANGUAGE ARTS

I. Sentences/Fragments/Run-on Sentences

Instructions: Read the items below and decide if they are sentence fragments, complete sentences, or run-on sentences. If they are sentence fragments, put a "1" in the space to the left of the number. If they are complete sentences, put a "2" in the space. If they are run-on sentences, put a "3" in the space.

-
-
- 1 - sentence fragments
 - 2 - complete sentences
 - 3 - run-on sentences

- _____ 1. The sky is so clear today the clouds are very beautiful too.
- _____ 2. The loud barking of the angry dog.
- _____ 3. Everyone knows that February has only 28 or 29 days.
- _____ 4. The right way to do it.
- _____ 5. I wrote a letter to Jerry I hope that he gets it soon.
- _____ 6. Anne caught the ball and made a point for her team.
- _____ 7. There are many trees in the park we saw one that was very old.
- _____ 8. The king and queen were married they ruled the country and they were very kind.
- _____ 9. Together with my friend who likes to ride his bicycle.
- _____ 10. Judy helped Tim cook breakfast.
- _____ 11. Singing the song that Bill sang.
- _____ 12. The answers to the questions are easy and they are very short and so I got them right.

II. Kinds of sentences

Instructions: Read the sentences below and decide if they are declarative (telling), interrogative (asking), imperative (commanding), or exclamatory (exclaiming). Then put "1" for declarative, "2" for interrogative, "3" for imperative or "4" for exclamatory in the space to the left of the number.

-
-
- 1 - declarative (telling)
 - 2 - interrogative (asking)
 - 3 - imperative (commanding)
 - 4 - exclamatory (exclaiming)

- _____ 1. The basket is on fire!
- _____ 2. Please answer the phone.
- _____ 3. How do you like daylight savings time?
- _____ 4. We went to Shoppingtown to buy a gerbil.
- _____ 5. Run to the backdoor quickly.
- _____ 6. Judy, you're too close to the edge!

III. Commas

Instructions: Commas are needed in these dates, addresses, parts of letters, and sentences. Put the commas in where they are needed.

-
-
- 1. "Yes" said Ms. Brown "You may go."
 - 2. Mr. Driscoll my new history teacher went home early.
 - 3. Excuse me Janet I'm busy.
 - 4. No it did not fall from the wall.
 - 5. Afterward they went out for dinner.
 - 6. It was a dreary rainy day.
 - 7. 986 Cloud Street
Honolulu Hawaii 80374
April 14 1974

8. Bill would however like to take a chance.
9. "Please sharpen your pencil Judy" said Miss Wilber.
10. I finished reading the book but I didn't understand it.
11. Yellow red and blue are primary colors.
12. Dear Janet

We hope you will be coming back to school soon.

Your friends

Judy and Sharon

IV. Capitals

Instructions: Underline the words that should begin with a capital letter.

-
1. did your grandparents visit their german friends?
 2. our friends, the smiths, have a dog named snoopy.
 3. have you seen the statue of liberty in new york?
 4. did you ever read the book tom sawyer?
 5. two famous americans have february birthdays.
 6. a favorite holiday in the summer is the fourth of july.

V. Apostrophes

Instructions: For each sentence, fill in the blank with the correct word.

-
- | | |
|---------------------------------|--------------------------------|
| 1. _____ better get going soon. | 2. _____ we doing a great job? |
| a) we'd | a) Arent |
| b) we'd | b) Are'nt |
| c) we'll | c) Aren't |

3. Maybe it _____ matter to you.
- a) doesnt
b) don't
c) doesn't
4. _____ mother is a scientist.
- a) Billy's
b) Billys
c) Billies
5. They _____ done their work.
- a) haven't
b) have'nt
c) havent
6. _____ a good boy.
- a) He'is
b) He's
c) Hes'

VI. Usage

Instructions: For each sentence fill in the blank with the correct word.

-
1. Yesterday I _____ a mouse
- a) seen
b) saw
2. The game has already _____.
- a) begin
b) began
c) begun
3. The astronauts have _____ into outer space.
- a) gone
b) went
4. We have _____ lunch outdoors twice.
- a) ate
b) eaten
5. Last week everyone _____ their books to school.
- a) brang
b) bring
c) brought
6. I don't _____ it with me.
- a) have
b) got
7. Suddenly, Richard _____ with a thump.
- a) sit
b) sat
c) set
8. You may _____ Jack go to lunch early.
- a) leave
b) let
9. Grandmother _____ me stay over-night.
- a) let
b) left
10. Paul _____ the class his magic trick.
- a) teached
b) taught
c) learned

11. He doesn't feel very _____ today.
a) well
b) good
12. How _____ it is to be done.
a) well
b) good
13. _____ time to go right now.
a) Its
b) It's
14. The steam shovel kept _____ power year after year.
a) its
b) it's
15. _____ we go to the art room?
a) Can
b) May
16. The book belongs to _____.
a) I
b) me
17. _____ are two pictures on the wall.
a) Their
b) There
c) They're
18. It belongs to _____ family.
a) there
b) their
c) they're
19. Steven is going _____ the store.
a) too
b) to
c) two
20. May _____ and _____ go to the Art room?
a) me & Patrick
b) Patrick & me
c) Patrick & I
21. The books are _____ heavy for one person.
a) to
b) two
c) too
22. Carol should _____ that answer
a) know c) knowing
b) knew d) known
23. Who is _____ the ball against the wall?
a) throw c) throwing
b) threw d) thrown
24. Ivy has _____ all over the wall of the building.
a) grow c) growing
b) grew d) grown
25. If we win, we will have _____ our strongest opponent.
a) beat
b) beating
c) beaten

VII. Subject-Verb Agreement

Instructions: For each sentence, fill in the blank with the correct word.

-
1. This box of staples _____ more than that one.
(costs, cost)
 2. The staples in the box _____ more than that one.
(costs, cost)
 3. Neither of the boxes of staples _____ expensive.
(is, are)
 4. Several of the boxes of staples _____ expensive.
(is, are)
 5. All of the boxes of staples _____ expensive.
(is, are)
 6. No one with four dogs _____ to live in an apartment.
(wants, want)
 7. Either the students or the teacher _____ the answer.
(knows, know)
 8. The class _____ its own president.
(has, have)
 9. _____ either angelfood cake or blueberry muffins baked this morning.
(was, were)
 10. The singer and dancer _____ broken his leg.
(has, have)
 11. The singer and the dancer _____ both broken their legs.
(has, have)
 12. The club _____ both boys and girls.
(includes, include)

APPENDIX C

THE PIERS-HARRIS CHILDREN'S

SELF CONCEPT SCALE

Circle the yes if the statement is generally like you, or circle the no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

- | | | |
|---|-----|----|
| 1. My classmates make fun of me. | yes | no |
| 2. I am a happy person. | yes | no |
| 3. It is hard for me to make friends. | yes | no |
| 4. I am often sad. | yes | no |
| 5. I am smart. | yes | no |
| 6. I am shy. | yes | no |
| 7. I get nervous when the teacher calls on me. | yes | no |
| 8. My looks bother me. | yes | no |
| 9. When I grow up, I will be an important person. | yes | no |
| 10. I get worried when we have tests in school. | yes | no |
| 11. I am unpopular. | yes | no |
| 12. I am well behaved in school. | yes | no |
| 13. It is usually my fault when something goes wrong. | yes | no |
| 14. I am strong. | yes | no |
| 15. I have good ideas. | yes | no |
| 16. I usually want my own way. | yes | no |
| 17. I am good at making things with my hands. | yes | no |
| 18. I give up easily. | yes | no |
| 19. I am good in my school work. | yes | no |
| 20. I do many bad things. | yes | no |
| 21. I can draw well. | yes | no |
| 22. I am good in music. | yes | no |

23. I am slow in finishing my school work.	yes	no
24. I am an important member of my class.	yes	no
25. I am nervous.	yes	no
26. I can give a good report in front of the class.	yes	no
27. In school I am a dreamer.	yes	no
28. My friends like my ideas.	yes	no
29. I often get into trouble.	yes	no
30. I am lucky.	yes	no
31. I worry a lot.	yes	no
32. I like being the way I am.	yes	no
33. I feel left out of things.	yes	no
34. I often volunteer in school.	yes	no
35. I wish I were different.	yes	no
36. I sleep well at night.	yes	no
37. I hate school.	yes	no
38. I am among the last to be chosen for games.	yes	no
39. I am sick a lot.	yes	no
40. I am often mean to other people.	yes	no
41. My classmates in school think I have good ideas.	yes	no
42. I am unhappy.	yes	no
43. I have many friends.	yes	no
44. I am cheerful.	yes	no
45. I am dumb about most things.	yes	no
46. I am good looking.	yes	no
47. I have lots of pep.	yes	no

48. I get into a lot of fights.	yes	no
49. I am popular with boys.	yes	no
50. People pick on me.	yes	no
51. When I try to make something, everything seems to go wrong.	yes	no
52. I am a leader in games and sports.	yes	no
53. I am clumsy.	yes	no
54. In games and sports, I watch instead of play.	yes	no
55. I forget what I learn.	yes	no
56. I am easy to get along with.	yes	no
57. I lose my temper easily.	yes	no
58. I am popular with girls.	yes	no
59. I am a good reader.	yes	no
60. I would rather work alone than with a group.	yes	no
61. I am often afraid.	yes	no
62. I am always dropping or breaking things.	yes	no
63. I can be trusted.	yes	no
64. I am different from other people.	yes	no
65. I think bad thoughts.	yes	no
66. I cry easily.	yes	no
67. I am a good person.	yes	no

APPENDIX D

CLASSROOM PERCEPTION INVENTORY

Name _____
Date _____
Teacher _____
School _____

Sex: Boy _____
Girl _____

Classroom Perception Inventory

We would like to know about your class. Please tell us how you honestly feel. This is not a test, and no one in your school will know what you write down.

DIRECTIONS:

1. Read each statement carefully.
2. Think about how well the statement describes the class you are in now.
3. Circle one (and only one) of the four letters across from the statement.

Circle T if you think the statement is definitely true for you.
 Circle t if you think the statement is mostly true for you.
 Circle f if you think the statement is mostly false for you.
 Circle F if you think the statement is definitely false for you.

Examples:

	Definitely true	Mostly true	Mostly false	Definitely false
A. I like spinach.	<u>T</u>	t	f	F

Circle the letter that tells how you feel about spinach. If you like it very much, circle T, for definitely true. If you dislike it just a little, circle f, for mostly false.

B. I do <u>not</u> like to roller skate.	T	t	f	F
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Circle the letter that tells how you feel about roller skating. If you do like to roller skate very much, you would circle F, because the statement is definitely false for you.

You are not required to respond; however, your cooperation is needed to make the results of this survey comprehensive, accurate, and timely. (21 USC 1221 (E)(3), P.L. 92-318)

	<u>Definitely true</u>	<u>Mostly true</u>	<u>Mostly false</u>	<u>Definite false</u>
1. I enjoy this class very much.	T	t	f	F
2. A few of the students in this class do <u>not</u> like me.	T	t	f	F
3. I like almost all of the other students in this class.	T	t	f	F
4. It is hard to do well in this class.	T	t	f	F
5. Doing well in this class is very important to me.	T	t	f	F
6. Other students do <u>not</u> care whether I work hard or not in this class.	T	t	f	F
7. I worry a lot in this class.	T	t	f	F
8. I like to do the work in this class.	T	t	f	F
9. This class is always a lot of fun.	T	t	f	F
10. Almost all the students in this class are friendly toward me.	T	t	f	F
11. I do <u>not</u> like some of the students in this class.	T	t	f	F
12. If I work hard, I can do really well in this class.	T	t	f	F
13. Sometimes I do <u>not</u> care very much if I do well or poorly in this class.	T	t	f	F
14. Other students want me to work hard in this class.	T	t	f	F
15. Taking tests in this class doesn't bother me at all.	T	t	f	F
16. I often give up too easily in this class when the work gets hard.	T	t	f	F
17. Sometimes I do <u>not</u> like this class.	T	t	f	F
18. Most of the students in this class like me.	T	t	f	F
19. Several of the students in this class are my best friends.	T	t	f	F

	<u>Definitely true</u>	<u>Mostly true</u>	<u>Mostly false</u>	<u>Definitely false</u>
20. It seems that I cannot do really well in this class no matter what I do.	T	t	f	F
21. Doing well in this class always makes me very happy.	T	t	f	F
22. Other students care whether I do well or not in this class.	T	t	f	F
23. I sometimes think everyone will laugh at me when I say something in this class.	T	t	f	F
24. I try not to do more work than I need to get by in this class.	T	t	f	F
25. This class is one of the best I have ever had.	T	t	f	F
26. I feel left out of things in this class.	T	t	f	F
27. Some of the students in this class are <u>not</u> very friendly.	T	t	f	F
28. It is easy to do well in this class.	T	t	f	F
29. Doing well in this class is sometimes <u>not</u> very important to me.	T	t	f	F
30. Other students do <u>not</u> care how much I study in this class.	T	t	f	F
31. I like it when the teacher calls on me in this class.	T	t	f	F
32. I like chances to show how much I can do in this class.	T	t	f	F
33. I almost always like the work in this class.	T	t	f	F
34. I get along very well with the other students in this class.	T	t	f	F
35. The other students in this class are fun to be with.	T	t	f	F
36. Sometimes I think it's no use trying in this class.	T	t	f	F

	<u>Definitely true</u>	<u>Mostly true</u>	<u>Mostly false</u>	<u>Definitely false</u>
37. I would feel very bad if I did not do well in this class.	T	t	f	F
38. Students in this class want me to come to class every day.	T	t	f	F
39. I sometimes feel nervous or uneasy in this class.	T	t	f	F
40. This class makes me want to work as hard as I can.	T	t	f	F
41. I often do <u>not</u> look forward to this class.	T	t	f	F
42. I am <u>not</u> very popular in this class.	T	t	f	F
43. The other students in this class are a good group.	T	t	f	F
44. Anyone in this class can do well if he tries.	T	t	f	F
45. I really don't care that much how I do in this class.	T	t	f	F
46. If I don't do my work very well, other students in this class are disappointed.	T	t	f	F
47. I feel comfortable and secure in this class.	T	t	f	F
48. If there were no grades in this class, I might work just as hard.	T	t	f	F

APPENDIX E

SOCIOMETRIC MEASURE

APPENDIX F

BEHAVIORAL OBSERVATION

PROCEDURES AND INSTRUMENT

1. On the first page to be used, fill in teacher's name, period, date, and starting time in the spaces provided. Wait until the class settles down to begin the period, and figure out what they are doing. Write under "activity," one of the following:
 - A. Quiz (students working on quizzes). The quizzes are called "skilldrills," and are marked "Skilldrill A," "Skilldrill B," etc.
 - B. Worksheets (students working on worksheets). Also say whether students are working individually (worksheet-individual) or in teams (worksheet-teams).
 - C. Other desk work (students working on other desk work, not related to language arts).
 - D. Teacher-led discussion (teacher lecture of discussion).
 - E. Other (specify).

If the class activity changes during an observation period, draw a heavy black line under the last observation in the old activity, and record the new one next to the old one under "activity" (e.g., quiz/teacher-led discussion).

2. In the left-hand column, make a list of the students you will observe by sex and race, and make a note of the student's clothing, so that you can keep the same order of observation. Record sex and race as follows:

FB - female, black
MB - male, black
FW - female, white
MW - male, white
FO - female, oriental
MO - male, oriental

For example, you might have a list as follows: FW (blue skirt), FW (brown jacket), MB (grey jacket), etc. If all students are white, you need not record student race.

In addition to race, sex, and other identifying information, use a specific order to be sure that you observe each student an equal number of times. If students are seated at tables, begin with the table nearest the teacher's desk, and observe first the student nearest the teacher's desk, next the student on his left, and so on. Then go to the table behind the first table and observe each student. Continue this way until you reach the back of the class, and then start on the next row of tables in front until all students have been observed. Put a bracket around the sex-race identifiers for students at the same table or same row so that if a student leaves, you will know that someone is missing. If students are seated in rows, start at the front left-hand side of the class and go back, then start in the second-to-left row, etc., or you may use your own system as long as it results in a consistent order of observation.

3. When your list is made, you are ready to start. Observe the first student for approximately five seconds, and check the box that indicates the first thing you saw him or her doing. Then start counting seconds again for the next student, and check the box for the first thing you saw that student doing, and so on. The five-second observation time includes observing and writing. The six categories are described in detail in a separate section. Briefly, they are:

- IT - Individual Task (student is working by himself)
- PT - Peer Task (student is working with another student)
- INT - Individual Not on Task (student is not on task during a task period and is not interacting with other students)
- PNT - Peer Not on Task (student is not on task during a task period but is interacting with another student)
- NTO - No Task Opportunity (student is not expected to be on task)

If it is unclear what the student is doing, you may wait a few seconds to find out. However, if in doubt, always give students the benefit of the doubt - score IT or PT unless the student is clearly off task. For example, if a student has a worksheet in his hand and looks at the ceiling and then the worksheet and back at the ceiling, count him on task (IT).

Proceed from student to student observing and recording behavior. You will need to walk around the edges of the classroom to see what students are doing. If a student is out of class when you get to him, count him as "NTO." When you have made a sweep of the entire class, start again in the same order in the next column on the observation form. You need not write the student sex-race identifiers again until you start on a new page.

4. Continue observing until the end of the task period (that is, when no one in the class is expected to be on task). That is, you may stop observing if the whole class has started to watch a movie, do individual reading, or to just wait for the end of the period. Record the ending time on your last page.

While you are observing, try to be as inconspicuous as possible. Try not to interact with students any more than you have to, and get only as close to students as you must to see whether they are on or off task. *If students try to talk with you, be friendly but explain that you are supposed to be observing, not talking.* If they have questions about what you are doing, tell them that you are there to observe the way of learning they are using, and that you are not recording student names.

Definitions of Observation Categories

A. IT(Individual Task)

IT can only be recorded during a task period. A task period is a time when students are expected to be working or participating in class discussion. Free or unstructured time, movies, etc. are not considered task periods.

A student is rated as IT during worksheet or quiz periods if he appears to be working on the assigned task, but is not interacting with any other student. A student is scored IT if he is writing on or studying the assigned worksheet or quiz. He is not on task if he is drawing, daydreaming, playing, etc. In general, students who are on task will have their worksheets on quizzes in plain view, and will obviously be using them. A student is counted as IT during a class discussion if he is paying attention. That is, the student should be facing the teacher and not doing something (such as writing or drawing) that would indicate that he is not listening. If a student is working on something other than the

main class task, but has been specifically allowed to do so by his teacher (perhaps because he has finished *his work*), score him NTO. If he is working on something else without specific teacher permission, score him INT (Not on Task).

B. PT (Peer Task)

PT may also only be recorded during a task period. Requirements for PT are the same as for IT, except that the student must be interacting with another student or students on task-related work to be scored PT. A student may be scored PT even if he is only listening to another student who is talking about the task. In general, students who should be scored PT are clearly referring to a worksheet while they are interacting. If you are not sure whether students are interacting or not, assume that they are. In most cases you will not be able to hear what students are saying to tell whether they are on or off task. Try to use visual clues (such as the worksheets) to make this decision.

C. INT (Individual Not on Task)

INT is used when the student being observed is clearly not performing a task related to the assigned school work, but is not interacting with any peers. Doing nothing, looking at materials other than assigned materials without permission, etc., may be scored INT. INT may only be used during task periods. However, do not rate a student INT if he is merely pausing from being on task. If you are not sure whether a student is just pausing or is actually not on task, count three seconds. If the student is still not on task, score him or her INT; if he or she returns to task, score him or her IT.

D. PNT (Peer Not on Task)

PNT is the same as INT, except that the student must be interacting with a peer and off task at the same time. If a student is off task, but interacts with a peer for only a few seconds, count the interval as PNT. Most behaviors that would be scored PNT would include talking with other students about non-task related matters. You can usually tell that this is the case when students are talking, but are not making any reference to their worksheets.

E. S (Staff)

Any time a student talks to or otherwise interacts with a staff member, score his behavior S, regardless of whether the student is on or off task, or whether he is also interacting with a peer, or if it is not a task period. If a staff member is interacting with as many as six students, all students are scored S. If there are many more than six students listening, treat the situation as you would teacher-led discussion (see IT). The main question is whether the staff member is interacting with individual students or a small group of students, or with the class as a whole.

F. NTO (No Task Opportunity)

NTO is used to record observation intervals during which students are not expected to be on task, such as waiting time, movies, free time, etc. NTO should be used primarily when only individual students are not expected to be on task for

one reason or another. The most frequent kind of behavior marked NTO is when students have been told that when they finish a quiz they may use the time as they wish. If the whole class is not expected to be on task you may stop observing. If this happens, be sure to draw a line where you stop observing. If it is unclear whether individual students are supposed to be on task, make a note and ask the teacher when he or she is free.

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