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AN EXAMINATION OF AGE, SEX, AND CROSS-CULTURAL DIFFERENCES IN COOPERATION AND COMPETITION, AND THE RELATIONSHIP OF THE TWO VARIABLES TO SCHOOL ACHIEVEMENT

by

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ABSTRACT

AN EXAMINATION OF AGE, SEX, AND CROSS-CULTURAL DIFFERENCES IN COOPERATION AND COMPETITION, AND THE RELATIONSHIP OF THE TWO VARIABLES TO SCHOOL ACHIEVEMENT

ANTHONY D. BROWN

Cooperation and competition are two variables that have long been thought to play an important part in the academic achievement of Cherokee Indians. Although ethnographic studies have found evidence that Cherokee children favor cooperation and avoid competition, no evidence has been offered to substantiate the belief that the high cooperation of the children leads to their low academic achievement.

Cooperation and competition are also variables that have been of considerable theoretical interest. Numerous studies have attempted to determine age and sex differences in the two variables. In part because of the inadequate way the two variables have been defined and measured, no generally accepted conclusions have been reached about the nature of the two forms of behavior.

This study has attempted to provide information on cooperation and competition by answering the following questions: Do Cherokee children differ from Anglo-American children in

cooperative and competitive behavior? Is the cooperative behavior of Cherokee children negatively related to their school achievement? Does higher competitive behavior of both Cherokee and Anglo-American children lead to their increased academic achievement? In addition, it was hypothesized that: 1) cooperative behavior, unconfounded by competition, will increase with age for both ethnic groups; 2) cooperative behavior confounded by competition, and by other variables, will not increase with age for both ethnic groups; 3) competitive behavior among both ethnic groups will increase with age; 4) there will be no sex differences in cooperative and competitive behavior among younger Anglo-American children; 4) older Anglo-American males will be significantly more competitive than older females.

The subjects were 144 Cherokee and Anglo-American children in the 1st and 2nd, and the 4th and 5th grades. The two ethnic groups attended separate schools in two small towns in eastern Oklahoma. At the start of the experimental session a measure of psychomotor ability was taken so that initial differences between the two groups could be controlled. The subjects were blocked on sex, ethnic group, and age. Each pair then played on a modified version of the Madsen Cooperation Board for two trials in cooperation condition I, and three trials in cooperation condition II. In the competition condition the subjects operated the experimental apparatus by themselves for the single trial. The dependent measures in

all three conditions were the number of circles crossed. A higher number of circles indicated a higher level of cooperation in both cooperation conditions, and a higher level of competition in the competition condition.

The results in cooperation condition I (an unconfounded measure of cooperation), indicated that younger Cherokee children were marginally more cooperative than the younger Anglo-American children. No differences were found between the two groups of older children. In cooperation condition II (a confounded measure of cooperation), the younger Cherokee children were marginally more cooperative than younger Anglo-American children. Fourth and fifth grade Cherokee children were significantly more cooperative than fourth and fifth grade Anglo-American children in cooperation condition II. In the competition condition, Anglo-American children were significantly more competitive than 1st and 2nd grade Cherokee children; while at the 4th and 5th grade level they were only marginally more competitive.

The prediction that cooperative behavior in cooperation Condition I would increase with age was marginally accepted for Cherokee children and completely confirmed for Anglo-American children. As predicted, cooperative behavior in cooperation condition II failed to show an increase with age for both ethnic groups. Competitive behavior in the competition condition

was found to increase with age for both ethnic groups. The prediction that there would be no sex differences in cooperative behavior among the Anglo-American children was confirmed for both age groups. First and second grade Anglo-American males and females also did not differ in degree of competitive behavior. Finally, the prediction that 4th and 5th grade Anglo-American males would be more competitive than 4th and 5th grade females was not confirmed.

A significant negative relationship was found to exist between the cooperative behavior of Cherokee children and their school achievement. As predicted, no relationship between degree of cooperation and school achievement was found for the Anglo-American children. All correlations for both ethnic groups in the competition condition proved non-significant.

Ethnic differences were discussed in terms of the role that Cherokee culture plays in determining the way that cooperative and competitive behavior develops. The discussion of age and sex differences in cooperative and competitive behavior focused on the necessity of properly defining and measuring the two variables.

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Chapter I

INTRODUCTION

In the last few years, cooperative and competitive behaviors have become the center for a considerable amount of research interest. Most of this research has been concerned with sex and age differences, and with the possible variation in cooperative and competitive behavior to be found in different cultures and subcultures. The studies have so far produced the conclusion that cultural groups differ to a great extent in their willingness to exhibit cooperative or competitive behavior. This is not a surprising finding. Doob (1952) for instance, notes that "competing and cooperating are learned forms of behavior, and ---- a society may choose to emphasize one and deemphasize another (p. 214)."

Although there have been numerous cross-cultural studies on cooperation and competition among peoples around the world, no controlled studies using behavioral measures have been done in this country among Indians. The limited information provided so far from studies using the discursive, ethnographic approach has identified cooperative behavior and the avoidance of competition as being traditional behaviors among different tribes (Berry, 1968).

According to ethnographic studies, Cherokee Indians in eastern Oklahoma are an example of a tribe that emphasizes cooperation and deemphasizes competition (Garrison, 1970). These two variables are of special interest to Cherokees because of their concern that they play an important part in the low academic achievement of Cherokee school children. Sanders (1972), in her study on the effect of Cherokee culture on academic achievement, concluded that the noncompetitiveness of traditional Cherokee children, along with their concomitant high degree of cooperative behavior, were among the variables that contributed to the school achievement gap between traditional Cherokee children and their Anglo-American classmates.

The numerous studies on cooperative and competitive behavior have not yet produced firm conclusions about the nature of these two variables in terms of age trends or sex differences (Cook and Stingle, 1974). One of the reasons for contradictions in research conducted on cooperation and competition may be attributed to the way in which the two variables have been defined. Instead of treating cooperation and competition as independent behaviors, a number of researchers have considered the two variables as being at opposite ends of a single continuum. Examples of the problems created when the two variables are thus confounded will be detailed later.

This study is an attempt to provide answers to questions on age trends and sex differences in cooperative and competitive behavior by studying the development of these two variables among male and female Cherokee children and an

Anglo-American comparison group. In addition, an attempt is made to determine the relationship of cooperation and competition to school achievement.

Review of the Literature

Definitions

A review of the literature on cooperation and competition indicates that it has been common for many researchers to omit operational definitions of these two variables in their study. The definitions that are available come from several fields of study.

A definition from the field of anthropology is offered by Mead (1937). Mead defined cooperation "as the act of working together to one end, where the goal is shared; and it is the relationship to the goal which holds the cooperating individuals together. Competition is the act of seeking or endeavoring to gain what another is endeavoring to gain at the same time (p. 8)."

May and Doob (1937), in their early review of the literature, point out the social nature of cooperation and competition: "Competition or co-operation is directed toward the same social end by at least two individuals. In competition, moreover, the end sought can be achieved in equal amounts by some and not by all of the individuals thus behaving; whereas in co-operation it can be achieved by all or almost all of the individuals concerned (p. 6)."

In forming their definitions, behaviorists have

avoided references to consciousness and intention. Instead they focused upon observable responses, often the simple alternation of responses by two individuals. Keller and Schoenfeld (1950), for example described cooperative behavior as "the case in which the combined behavior of two or more organisms is in some way needed to procure positive or remove negative reinforcement (pp. 357-358)." The definition provided by Hake and Vukelich (1972), in their review of behavioristically oriented cooperation studies, also speaks in terms of responses and reinforcements. They write: "The essential aspects of any cooperation procedure are (1) that the reinforcers of both individuals are at least in part dependent upon the responses of the other individual, and (2) that the procedure allows such responses, designated as cooperative responses, to result in an equitable division of responses and reinforcers (p. 333)."

After looking over the definitions of cooperation and competition found in the literature, this writer developed the following definitions of the two variables to be used in this study.

Cooperation: behavior that is directed at sharing a reward or obtaining the reward for others.

Competition: behavior directed toward obtaining a reward at someone else's expense.

The two definitions were developed with the intention of avoiding the problems with defining cooperation and compet-

ition that are found in the literature. The first problem is that the two variables are frequently defined only in terms of the operations used to measure them. Such definitions are so narrow, and so specific to the particular task used, that generalizing the results becomes difficult. The second problem with the way cooperation and competition are usually defined is that the two variables are nearly always seen as being opposed against one another. Definitions with this problem define one variable as being present if the other variable is absent. Finally, definitions of cooperation and competition have sometimes violated the principle of mutual exculusiveness. That is, a behavior defined by one of the definitions cannot also be logically included at the same time in the category created by the other definition. An example are the definitions used in the study by Kagan and Madsen (1972): "competition - behavior intended to maximize own gains; rivalry - behavior intended to minimize other's gains (p. 214)." The problem is that in one of their experimental conditions a response that maximized one's own gain also minimized the other subject's gain.

Both Stingle (1973) and Cook and Stingle (1974) have written extensively about the problems created because many researchers rarely talk about one variable without an accompanying reference to the other variable. In their review of the literature Cook and Stingle (1974) ask: "Is cooperation merely one pole of a linear continuum with competition at the

opposite extreme; is it the absence of competition, a separate behavior independent of competition, or a complex synthesis of all these (p. 919)?" Although they don't offer their own definitions of the two variables, they do reach the conclusion that cooperation and competition cannot be looked upon as being at opposite poles along the same dimension.

In order to assist in the proper measurement of cooperation and competition, the following two conceptions of the variables have been developed. The first concept conceives of cooperation and competition as being on a unidimensional continuum, with cooperation at one extreme of the continuum, and competition at the other extreme. See diagram below:

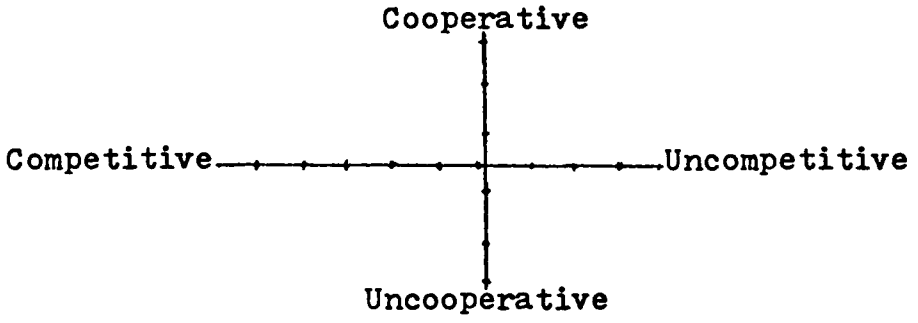
Cooperation ——————————— Competition

Studies by Stingle (1973), Richmond and Weiner (1973), and Madsen (1971) all have been based upon the unidimensional conception of cooperation and competition.

When cooperation and competition are classified on a unidimensional continuum all behavior that is not in one category of behavior is automatically put into the other category. As an example, in the study carried out by Stingle (1973) using a modified version of the Madsen Cooperation Board, subjects were timed in reaching a goal. Reaching a goal quickly was classified as cooperative behavior; more slowly was

classified as competitive. The problem is that any number of behaviors could slow the response of the subjects. Momentary inattention, boredom, excessive deliberation, and involvement in the play aspects of the experimental task, all can cause longer response times. Such behaviors are classified as competition, even when it is obvious that the listed behaviors are not forms of competition. The above behaviors would better be classified as non-cooperation.

The second conception of cooperation and competition places both variables on a bidimensional continuum. See diagram below:



The bidimensional concept of cooperation and competition has as its foundation the belief that the opposite of cooperative is not competitive, but uncooperative; that the opposite of competitive is uncompetitive. In addition, it is further contended that cooperation and competition are mutually exculusive behaviors, independent of each other. Recent research has supported this belief. Johnson and Ahlgren (1976) in their large-scale attitudinal study, found that a subject

could have high cooperative and high competitive motives, low cooperative and low competitive motives, or be high in one and low in the other. They further interpreted their findings to indicate that cooperation and competition were independent dimensions, and not opposite ends of a single dimension.

To a great extent, most tasks available to measure cooperation and competition have been constructed on the assumption that cooperation and competition are a unidimensional phenomenon. These tasks include the Prisoner's Dilemma game, the Circle Matrix Board, the Marble-Pull game, and the Madsen Cooperation Board. The Madsen Cooperation Board consists of a flat piece of wood, 18 inches on a side, upon which is a plastic pen holder that can be maneuvered around the board by means of four ropes held by the children. Because of its greater flexibility, it is the most suitable of the games which measure the two variables. In addition, the Madsen Board can be modified so that the two variables can be measured from a bidimensional perspective.

In summary, the definitions of cooperation and competittion that are available from several fields of study have proven to be inadequate. The two definitions given here are based on a bidimensional conception of cooperation and competition, and thus are an attempt to provide a clear, concise guide upon which to base research on the two variables.

Aiding behavior and altruism are not included among the studies in the review to follow. Both forms of behavior

are customarily treated by researchers as being areas of inquiry that are distinct and apart from research on cooperation. As an example, the reviews of the literature on aiding behavior by Midlarsky (1968) and on altruism (a subcategory of aiding behavior) by Bryan and London (1970) make the point that each form of behavior involves a sacrifice on the part of at least one individual. Cooperative behavior, on the other hand, involves no inherent sacrifice on the part of any individual.

Studies from a behavioristic tradition, such as those by Lindsley (1966) and by Waskik et al. (1969), are also not included in the literature review. The emphasis in these studies is on the acquisition and modification of cooperative behavior, and not on attribute variables such as sex, age, or ethnic identity.

Age Differences

Nearly all studies that attempted to study age differences in competition or cooperation have assumed that these two variables are a unidimensional psychological trait (Richmond and Weiner, 1973; Madsen, 1971; Stingle, 1973; Kagan and Madsen, 1971; McClintock and Nuttin, 1969). Thus it is not surprising that contradictory results have so far been obtained. The following review will be a brief outline of studies in cooperation and competition that were concerned with developmental changes.

Stingle (1973) modified the Madsen Cooperation Board to study developmental changes in cooperation and competition

among five, eight, and eleven year old children. Two dependent variables were used: the time to reach the goal; and, the total number of goals achieved. In terms of number of goals achieved, eight and eleven year old children were more cooperative than five year old children. When the time to achieve a goal was considered, the eight year children were more cooperative than either the eleven or five year old children.

Madsen (1971) studied the developmental and cross-cultural differences in cooperative and competitive behavior among Anglo-American and Mexican children by using a task in which subjects maneuvered a marble holder across a board to cups placed in front of them. Again, the task was one in which a developmental increase in one variable was invariably associated with a decrease in the other variable. Madsen found that the degree of cooperative behavior did not change over time with the Mexican sample, while cooperative behavior decreased among the Anglo-American children as they got older.

Richmond and Weiner (1973) used the Madsen Cooperation Board to study age differences in cooperative and competitive behavior among Black American and Anglo-American children in the first and second grade. They found that first graders were slightly less cooperative and more competitive in their group reward condition, and slightly more cooperative and less competitive under individual reward conditions than second graders.

Several researchers have emphasized competition more than cooperation in their experimental tasks. Kagan and

Madsen (1972) modified the Prisoner's Dilemma game to study rivalry and cooperation in two ages of Anglo-American and Mexican children. They found that rivalrous (competitive) behavior increased with age for both groups of children.

McClintock and Nuttin (1969) also modified the Prisoner's Dilemma game to study the development of competitive behavior among American and Belgium children. Although cooperative cues were present in their experimental task, McClintock and Nuttin preferred to speak in terms of competition. They reported that their results clearly indicated that older children were more competitive than younger children in both cultures.

In an early study on competitive behavior, McKee and Leader (1955) had preschool children play with a toy construction block game. They found that lower socioeconomic status children were more competitive than middle class children, and that four year old children were more competitive than three year old children.

In carrying out their search for age differences in cooperative behavior many researchers have based their hypotheses on the theoretical work of Piaget (1965), and Kohlberg (1963), who have posited that cooperation increases with age among children. Kohlberg (1963) sees the development of cooperative behavior as being influenced by the child's progression through a series of moral stages. At the first level the child's moral value is founded in the avoidance of punishment

and the naiive, selfish satisfaction of needs. A child at this level would likely not cooperate unless ordered to do so or unless the cooperation led directly to rewards. In Kohlberg's second level, the child's moral value is placed in obtaining approval and pleasing others. The child at this level is more likely to cooperate so that he may win the approval of others. At the third and final level, a child's moral value resides in shared standards, rights or duties. The child at the third level cooperates with another child as a matter of principle, regardless of whether or not the cooperative behavior leads to his own gain. For Kohlberg the child passes through the stages in a regular, predictable order. Thus the older child would tend to be more cooperative than the younger child.

Piaget (1965) also sees the development of cooperation as having its foundation in the child's development of moral behavior. Since for Piaget, morality consists of a system of rules, he has studied children's progression through four moral stages by examining the way they treat rules in games. Cooperative behavior develops in the child as he shifts from the second moral stage where his interaction with others is guided by immutable rules, to the third stage where behavior is guided by rules that are mutually shared. Piaget has called the second stage egocentrism, and the third stage cooperation. The age at which a child starts to shift from egocentrism to cooperation is placed at seven to eight years of age.

Piaget (1965) has also used the terms heteronomy and autonomy to describe the child's moral development. In heteronomous morality the child's behavior is guided by an adherance to rules and commands (usually from adults) that are objectively followed. At the autonomous stage the child is free to make choices based upon mutual respect and equality. Piaget believes that cooperative behavior starts to appear at the stage of autonomy because of the child's feelings of solidarity with other children, and because of the child's belief in reciprocity in relationships.

In summary, both theorists see the development of cooperative behavior as being influenced both by the increasing cognitive maturity of the child, and by the child's increasing ability to see the point of view of the other child. Piaget and Kohlberg are in agreement that cooperative behavior increases with age, although developmental studies on cooperation have not yet produced conclusive evidence in support of their theories.

More favorable findings for theories that predict developmental increases in cooperative behavior are provided by observational studies. Studies by Parten (1932), Barnes (1971), Zak (1968), and Hirota (1951) have all observed cooperative behavior increasing in frequency as children go from age three to age seven. But again in all four studies the researchers appeared to base their findings on the implicit assumption that cooperation and competition were on a unidimensional continuum.

In summary, research on cooperation and competition has failed to provide conclusive evidence on developmental changes in either variable. One of the reasons for the failure to find consistent results is that all the reviewed studies measured both variables as if they were on a unidimensional continuum. It is the contention of this writer that when cooperation and competition are conceived of and measured as bidimensional traits, both variables will show an increase with age. There are no studies available on age trends in cooperation and competition among Cherokee children, but it is believed that their behavior will also show developmental increases.

Sex Differences

A number of writers have pointed out that child rearing patterns encourage boys to be aggressive and competitive, and girls to be passive and dependent (Stingle, 1973; Barry, Bacon and Child, 1957; Sears, Maccoby, and Levin, 1957). Furthermore, as children grow up society holds different expectations for males and females regarding cooperative and competitive behavior (McClintock and Nuttin, 1969; Stingle, 1973; Richmond and Weiner, 1973). Yet in spite of the common belief that child rearing practices and societal expectations lead to higher competition and lower cooperation for males, experimentation on these two variables with children has provided few firm conclusions.

Several writers and researchers have identified males

as being more competitive and less cooperative than females (Stingle, 1973; Kagan and Madsen, 1972; Broverman, Clarkson, Rosenkrantz, and Vogel, 1970). On the other hand, other researchers have either found no differences between the sexes on these two variables, or found females to be less cooperative and more competitive (Richmond and Weiner, 1973; Kagan and Madsen, 1971; Nelson and Madsen, 1969; Lindskold, Cullen, Gahgan, and Tedeschi, 1970; Thomas, 1975).

Stingle (1973) surveyed the literature on sex differences in cooperative and competitive behavior and concluded that differences where found tended to occur among older elementary aged children. At the upper age levels boys were frequently found to be more competitive than females.

References to possible sex differences in cooperative and competitive behavior among Cherokee children are not found in the anthropological literature. It is not known if Cherokee culture holds different expectations for males and females on the two forms of behavior. Miller and Thomas (1972) found that male Blackfoot children were more cooperative than were female Blackfoot children, although the difference only approached statistical significance. In another cross-cultural study using the Madsen Cooperation Board, Madsen and Shapira (1970) found Mexican-American boys were less competitive than Mexican-American girls.

It is the belief of this writer that most of the contridictory findings in studies on sex differences are due to

three causes. The first cause for contradictory findings is the wide variation in subject ages among the studies. It was pointed out above that those studies finding sex differences usually had older children as subjects, thus suggesting an interaction between age and sex. The second cause for contradictions in findings lies in the varying culture and class background of the subjects. Several of the studies using ethnic minorities as subjects found a tendency for girls to be more competitive than boys ----- a finding just the opposite of the typical finding for middle-class Anglo-American children (Miller and Thomas, 1972; Madsen and Shapira, 1970). Finally, at least part of the contradictions in studies on sex differences can be explained by the fact that research on these two variables has usually been conducted on unidimensional tasks. When cooperation and competition are measured as bidimensional psychological traits, sex differences will become clearer. Neither sex is expected to differ in degree of cooperative behavior. However, Anglo-American males are predicted to be significantly more competitive than Anglo-American females.

Cross-Cultural Differences

Cooperation and competition among children have been studied across many cultures. The Madsen Cooperation Board, used in a number of these studies, was shown to be able to discriminate the varying amounts of preference for cooperative or competitive behavior found in the different national and

ethnic groups. Of particular interest to the present study was the study on the Cooperation Board carried out with Indian children in Canada. Miller and Thomas (1972) compared cooperative behavior among Canadian Blackfoot children with the behavior of Anglo-Canadian children. They used two conditions of reward in their study. The first condition of group reward required the joint efforts of all four children to cross four circles before they all could receive a reward. In the group reward condition there were no cues present for competitive behavior. The second condition of individual reward involved both cooperative and competitive behavior. They found under conditions of group reward that both groups were equally cooperative, but under the condition of individual reward the Blackfoot children developed strategies for cooperating so that they increased their rewards.

In a second study using the Cooperation Board, Miller (1973) examined cooperative behavior among all Indian, all Anglo-Canadian and mixed teams from the same integrated school near the reserve. No significant differences were found between the two ethnic groups. However, when comparing the results to the earlier study which used Blackfoot and Anglo-Canadian teams from segregated schools, Miller found that the behavior of both integrated groups was midway between that of Anglo and Blackfoot nonintegrated children. He discussed his results in terms of the acculturation that takes place when Indian children attend school in integrated settings.

While providing a useful background to this study, a number of problems exist in the methodology of the Miller and Thomas research that affects the generality of their results. The Indian children were rural-small community, whereas the Anglo-Canadian comparison group was from a more urbanized setting. In addition, the Indian sample was apparently drawn from the working-class, while the Anglo group was middle-class in origin. Cook and Stingle (1974), in their review of the literature on cooperative behavior, reported that children from urban and/or middle-class backgrounds tend to be more competitive than rural and/or working-class children. Because of the way the Cooperation Board is scored in the individual reward condition, an increase in competitive behavior automatically means a reduction in cooperative behavior. Thus area of residence and social class were confounded with ethnic group so that unambiguous conclusions could not be drawn from the Miller and Thomas study.

The method by which the rewards were dispensed during the experimental sessions also presents problems in interpreting the findings of the two studies on the Canadian Blackfoot. No attempt was made in either study to control for the varying motivational effect the single piece of candy reward might have on the two groups of children. Indian children, being more economically deprived than the middle-class Anglo group, might have placed more value on the candy rewards and thus actively cooperated in order to maximize their rewards.

Cherokee Culture and School Achievement

Cherokee children today have an educational tradition that is unique among American Indians. Wahrhaftig (1968) states that after Cherokees were removed to Oklahoma they began in 1841 to set up a national school system. So sucessful were their efforts that at its height it was reported to be the finest school system west of the Mississippi River (Fannin, 1969). Most of the schools were at the primary level, but for those graduating from the primary schools separate academies were set up. With the earlier invention of the Sequoyah syllabary in 1821, a large majority of the people had all ready become literate in the Cherokee language. In those schools attended largely by fullbloods, bilingual teachers taught from textbooks printed in the syllabary. Fuchs and Havighurst (1972) report that the Cherokee school system was so successful that Oklahoma Cherokees had a higher English literacy level than the surrounding white populations. But in spite of the many successes, the Cherokee school system was abolished when the Oklahoma territory became a state in 1906.

Since responsibility for the education of Cherokee children has been taken over by the State of Oklahoma and local school districts, Cherokee school achievement has fallen far short of what it was in the past. Several studies have looked at Cherokee educational attainment, with all of them finding similar results. Garrison (1970) found that Cherokee children lagged behind their Anglo peers in math, language,

and reading achievement. Although at the first grade level the Cherokee children equaled or exceeded the school achievement of their Anglo peers, as they continued on in school the Cherokee children fell further and further behind.

In the most recent research on Cherokee children, Sanders (1972) carried out a cross-sectional study on traditional and non-traditional Cherokee school achievement. At the beginning of her study Sanders developed a list of Cherokee aboriginal culture traits. Using this list, the subject's teachers divided the children into traditional and non-traditional groups. Sanders found at the end of the first year traditional pupils were .78 of a grade below the national norm on the Standford Achievement Test reading subtest; non-traditional pupils were .35 of a grade below the norm. At the end of the fourth year, traditional pupils were 2.58 grades below the norm; non-traditional pupils were 1.05 grades below the norm.

Hackbert and Naggy (1977) conducted an educational survey among Cherokees and twelve other Oklahoma Indian tribes. They found that 56.9 percent of Oklahoma Indians (sample was not broken down by tribe) are functionally illiterate. They also reported that over 51 percent of the Indian adults in Oklahoma have not completed high school, and over 22 percent have not gone beyond the 8th grade. Garrison (1970) also reports a high attrition rate for Cherokee students. He found a 49 percent dropout rate for Cherokee students between the 9th and 12th grades.

The causes for the low academic achievement of Cherokee children has been attributed to their disadvantaged home environment, to negative stereotyping by teachers, and to their different cultural background (Garrison, 1970). Sanders (1972) writes that "Numerous problems regarding discipline, motivation, attitudes toward authority, achievement, and so forth often arise because Indian (Cherokee) children hold a set of habits, attitudes, and values that are different from that of the school and its personnel (p. 76)."

Of many possible forms of behavior, cooperation and competition are mentioned most frequently as being among those traditional Cherokee cultural variables that affect school achievement (Gulick, 1960; Garrison, 1970; Sanders, 1972). In order to understand how cooperation and competition affect school achievement it is necessary to examine how the two forms of behavior develop in Cherokee children.

Among the Cherokee, the term "Harmony Ethic" has been developed by Gulick (1960) to describe a general rule that guides the conduct of interpersonal behavior. Cherokees are taught as children to be concerned for a harmonious and peaceable relationship with others, and to be sensitive to their desires. Extending the work of Cherokee anthropologists Robert K. Thomas, Gulick (1960) has described the ethic this way:

> "In living from day to day according to the Harmony Ethic the Conservative Cherokee tries to avoid giving offense to others and is so doing, he must always 'wait and see what other's likes and dislikes are, and...perceive what demands are likely to me made of him.' Thomas character-

> izes this demeanor as being particularly sensitive to subliminal cues in overt behavior.....Whereas one actively maintains Harmony by giving of one's time and goods, one can passively maintain it by 'minding one's own business' (pp. 137, 139)."

Garrison (1970) speaks of how, as the Cherokee child matures, he develops an acute social sensitivity that emphasizes the importance of maintaining harmonious relations and avoiding conflictwith others. The avoiding of conflict can also include the avoiding of conflict that often accompanys competition. Maintaining harmony with others could require going along with the achievement norms of friends. For instance, in class when a child can't answer a question that several Cherokee children know the answer to, these children remain silent (Fuchs and Havighurst, 1972). The individual Cherokee child that seeks to out-do his peers is creating disharmony: he is not "going along" or cooperating with the aspirations and ability of his friends.

As a result of the way they are reared, Cherokee children are reluctant to exhibit ineptitude (Sanders, 1972). They will not ask questions since it might bother someone else, or reveal a lack of knowledge on their part. At the same time Cherokee children are frequently reluctant to be singled out for public praise by a teacher. Such praise in front of the other children, with its emphasis on individual rather than group effort, is as likely to produce embarrassment as it is pride because it disrupts group harmony.

As Cherokee children mature, they fall more and more under the influence of their peer group. A number of writers

have pointed out that peer group influence has an especially strong leveling effect on individual aspirations among Cherokees (Dumont and Wax, 1969; Sanders, 1972). That is, according to Cherokee peer group norms it is not appropriate for the individual to raise above or outperform his peer group. In the classroom setting, peer group influence would thus tend to discourage rivalry and competition with its emphasis on "winning" or coming out on top at the expense of other children. Garrison (1970) has the following to say about the group orientation of Cherokees: "Cherokee children work within an interdependent and cooperative framework which is nearly diametrically opposite to the individualistic and competitive atmosphere of middle-class white society. The Indian culture stresses togetherness; it is group oriented, group related, group dominated and emphasizes strong family communal ties (pp. 9-10)."

A continuation of Cherokee group orientation may be seen in their school-related behavior. They favor cooperation in classrooms that encourage achievement through individual competition. Fuchs and Havighurst (1972) report about Cherokees: "Observation in eastern Oklahoma classrooms also indicated that the children do not tolerate an individual show of superior knowledge (p. 249)."

In summary, Cherokee children are raised in a society that stresses cooperation and deemphasizes competition. Yet they are schooled in an atmosphere of individualism and competition. When assessed on unconfounded measures of coopera-

tion and competition, it is predicted that both groups of children will show age related increases in cooperative and competitive behavior, but Cherokee children will display less competition and more cooperation than will Anglo-American children.

In addition, it was posited that male and female children of both ethnic groups would not differ in degree of cooperative behavior at either age level. Anglo males, however, were predicted to be more competitive than females at the older age level. Contradictory findings in research on cooperation and competition were attributed to the failure of most researchers to consider the two variables from a bidimensional perspective.

Hypotheses

The nine hypotheses will be examined in three conditions. They are: cooperation condition I; cooperation condition II; and the competition condition. Cooperation condition I is a measure of cooperation in which there are no cues present for competition. Cooperation condition II is also a measure of cooperative behavior. But since in this condition competitive cues are present, the range of uncooperative behavior is larger than it is in condition I. The competition condition is a measure of competition, unconfounded by the presence of cooperation cues.

Hypothesis 1

Cherokee children in the grades 1&2, and 4&5 will be

significantly more cooperative than working-class Anglo-American children in the two cooperation conditions.

The first hypothesis is based on the ethnographic reports that describe Cherokee children as having a high degree of cooperative behavior (Garrison, 1970; Sanders, 1972).

Hypothesis 2

Cooperative behavior as measured in Cooperation condition I will increase with age for both the Cherokee and the Anglo-American children.

The second hypothesis is based on research studies and on observational data (eg. Parten, 1932; Barnes, 1971), that indicate that cooperative behavior increases with age. Although both forms of research used a unidimensional conception of cooperation, the results are expected to hold up when cooperation is measured according to bidimensional principles.

Hypothesis 3

Cooperative behavior as measured in cooperation condition II will show no increase with age in both groups from grades 1&2 to grades 4&5.

How cooperative behavior is measured becomes a crucial issue when an attempt is being made to determine age changes in cooperative behavior. As has been pointed out, much of the contradictory research findings on developmental changes in cooperative behavior can be explained by the fact that cooperative behavior was experimentally confounded with competitive

behavior. In these type of tasks, even if cooperation per se remains unchanged, increasing competitive behavior will lower cooperation scores. It is predicted here that the results in cooperation condition II will be similar to the many studies that mixed cooperation and competition and found that cooperation so measured did not increase with age.

Hypothesis 4

Cherokee children in grades 1&2 and 4&5 will be significantly less competitive than working-class Anglo-American children in the competition condition.

A number of researchers who have examined Cherokee culture have spoken of the reluctance of Cherokee children to engage in competitive behavior (Sanders, 1972; Garrison, 1970). On the other hand, Anglo-Americans are encouraged to be competitive (Berry, 1968). In addition, Anglo-American children appear to prefer competitive behavior the longer they are in school or the older they become (Kagan and Madsen, 1972; Madsen, 1971; Nelson and Kagan, 1972).

Hypothesis 5

Competitive behavior as measured in the competition condition will increase with age for both Cherokee children and the Anglo-American children in the comparison group.

As was previously pointed out, the culture of Anglo-American children encourages their development of competitive behavior. It is expected that continued association with Anglo-American classmates could lead to the development of at

least some degree of competitive behavior among the older Cherokee children. The competitive climate of the schoolrooms in eastern Oklahoma will also affect the development of competitive behavior among Cherokee children. Johnson and Johnson (1976), for instance, relate that "traditionally an interpersonal competitive goal structure in which students are expected to out-perform their peers has been used in American education (p. 217)." In spite of their increasing competitive behavior, Cherokee children are still not expected to demonstrate the same degree of competitive behavior as their Anglo-American peers.

Hypothesis 6

There will be no differences between Anglo-American males and females in cooperative behavior at both age groups in cooperation condition I.

As has been pointed out, studies that found differences in cooperative behavior between the sexes have generally opposed cooperation against competition, rather than measuring each variable as if it was a distinct behavior.

Hypothesis 7

First & Second grade Anglo-American males will be equally competitive with Anglo-American females in the competition condition; at the fourth & fifth grade level Anglo-American males will be significantly more competitive than Anglo-American females.

This seventh hypothesis is in line with the research

of Stingle (1973) and Kagan & Madsen (1972) who found that younger children do not differ in preference for competitive behavior, while among older children, males preferred competitive behavior significantly more than females.

Hypothesis 8

There will be a significant negative relationship between degree of cooperative behavior and school achievement in both cooperation conditions for the Cherokee children; there will be no relationship between degree of cooperative behavior and school achievement in both cooperation conditions for the Anglo-American children.

It is believed that those Cherokee children scoring high in cooperative behavior are more likely to conform to the Cherokee norm of equality of group achievement (Fuchs and Havighurst, 1972; Sanders, 1972). The result is a tendency for the achievement of the cooperating children to reduce down to that of the less able members. The cooperative Cherokee child is less likely to become an active learner in the individualistic schools of eastern Oklahoma. The comments made by Dumont (1972) after extensive observations of Cherokee children in classrooms in eastern Oklahoma are pertinent here. He reported that Cherokee children have a tendency to withdraw or become silent in the classroom of the typical well-meaning teacher, who expects them to be individualistic, competitive, and anxious to win the teacher's approval.

The Anglo-American child that is highly cooperative,

on the other hand, does not have the cultural tradition of equality of group achievement. Thus the cooperativeness of the Anglo-American child should not affect their school performance.

Hypothesis 9

There will be a significant positive relationship between degree of competitive behavior and school achievement for both groups of children.

A number of research studies have been found to agree with the common sense belief that competitive behavior increases achievement (Clayton, 1964; Clifford, 1971; Ryan and Lakie, 1965; Hammond and Morton, 1961).

Chapter II

METHOD

Subjects

The subjects were 72 Indian children attending a public elementary school in Salina, Oklahoma. The grades included in the study were the 1st & 2nd, and the 4th & 5th. Eighteen pairs of same sexed children were randomly selected for each group from the respective two grade levels.

Salina Elementary School has an enrollment of 340 children in grade 1 - 6. Indian children, nearly all of whom are Cherokee, constitute about 1/3 of the total student enrollment. Both Cherokee and Anglo-American children are from working-class families. The town of Salina, with a population of 1,044, is located in a picturesque setting on the bank of a large lake in the Ozark foothills of eastern Oklahoma. The town provides a bank and commerce center for the surrounding ranchers and farmers. There are no large cities nearby.

It was necessary to choose the Anglo-American comparison group from a different school since the second study by Miller (1973) with integrated Canadian Blackfoot children found that both Indians and their Anglo-Canadian peers became more similar to each other as a function of contact within a

school system. Cooperative and competitive behavior, like other forms of behavior, can be expected to be susceptible to bidirectionality of acculturative processes. This was well demonstrated by Miller's finding that integrated Blackfoot children were half as cooperative as Blackfoot children in segregated schools, while the integrated Canadian children were nearly twice as cooperative as segregated Anglo-Canadian children. Thus it is important that the Anglo comparison group have limited contact with Cherokee children.

The town of Porter, Oklahoma was chosen as the comparison town because it fit a number of criteria. Porter, with a population of 624, is similar in size to Salina. The town is located approximately 30 miles away from Salina in an adjoining county. There are only a few Indian children enrolled in the elementary school. Like Salina, Porter serves as a bank and commerce center for the surrounding rural working-class population. The experimental and sampling procedures used at Salina were duplicated at Porter.

A survey was conducted on the father's employment level to provide information on the socio-economic background of the two groups of children. As expected, both groups of children were from working-class families.

Because Indian children have been identified (Fuchs and Havighurst, 1972) both as having more siblings than Anglo children, and as being above the typical age for the school grade in which they are placed, information was gathered on these two variables. It was found that Cherokee and Anglo

children did not differ in age to any great extent (see appendix B). However, Cherokee children had an average of nearly one more sibling than the Anglo children (see appendix B).

Design

The study involved a 2 x 2 x 2 (culture x age x sex) design with three conditions (cooperation I, cooperation II, and competition). Each cell of the design contained nine randomly paired subjects who had been randomly selected from the respective school populations. The pair of subjects both came from the same class, and thus were well acquainted with each other. The experimental unit for the two cooperation conditions consisted of a dyad that was blocked on age, sex, and culture (see Figure 1).

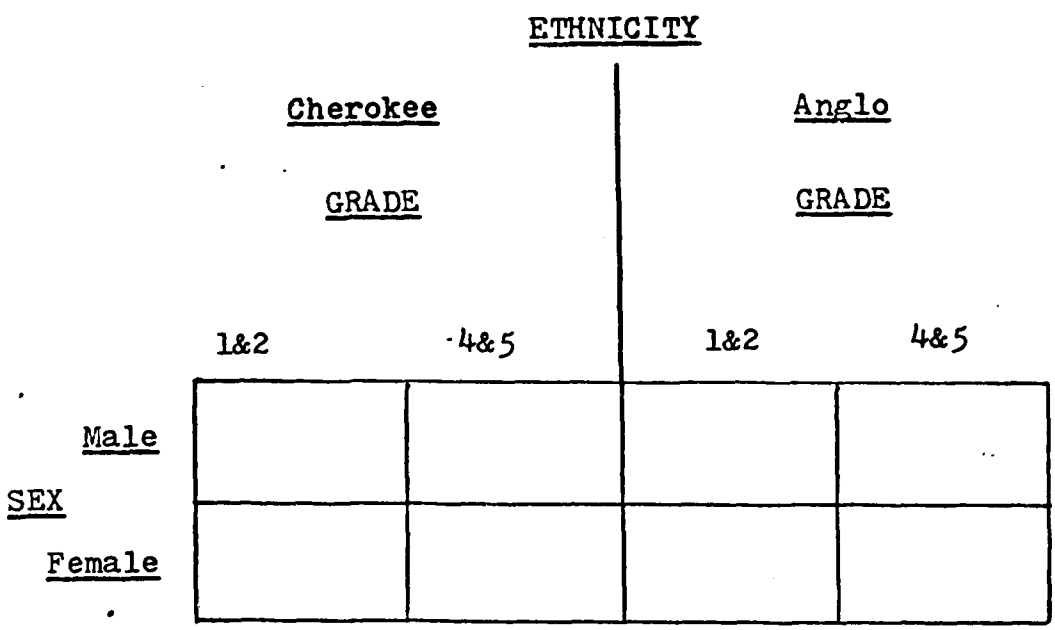
Materials

Cooperative behavior was measured through the use of an adaptation of the Madsen Cooperation Board (Madsen, 1969). The Board was chosen over other cooperation assessment instruments because it provides data on a continuous interaction over a period of time. Thus there are sufficient cooperative cues (or in the competition condition, competitive cues) so that subjects can exhibit behavior appropriate to their response histories.

The Board was modified so that it could be used with two instead of four subjects. The adapted Board consisted of an 18-inch square piece of wood with eyelets in the corner of the board (see Diagrams 1 and 2 in Appendix A). A pen holder

Figure 1

Schematic of the Design



is held at the middle of the board by four cords that pass through each eyelet. The subjects sit facing each other across a table upon which the board is placed. When the subjects pull on the cords, lines are traced by the pen on a piece of paper covering the board. Circles are drawn at the center of each side of the paper, with the object of the game being to cause the pen to move across as many of the four circles as possible. Under the Madsen (1969) procedure of group reward, each child receives a small piece of candy every time all four circles are crossed during a one minute trial. The above procedure was used by Madsen and his associates in their series of experiments comparing cross-cultural cooperative behavior, and by Miller in his studies among the Canadian Blackfoot. In general these researchers found that there were no differences in amount of cooperative behavior among the vaious cultural groups under the group reward condition.

This is not a surprising finding. The efforts of all four children working together are required before any single child can receive a reward. A child that refuses to work along with the other children is in effect refusing to receive a reward for themselves. Since not many children in the cultures studied were willing to forego a reward for themselves at the the same time they denied the reward to others, cooperation differences between the cultures would be unlikely to occur under a group reward set of instructions.

There is not available a variety of tasks on which to measure competition as a variable by itself. Researchers have typically presented subjects with a mixed-motive task, and then inferred the presence of competition when scores were lower than expected. In order to measure competition, the Madsen Cooperation Board was further modified. It was necessary to have a procedure that would permit the subjects to operate independently so that there was no opportunity for them to cooperate. This was accomplished by using the marker that had been removed from the board (see diagram 3 in appendix A). The two ropes attached to each side of the marker were knotted at a point ten inches from the marker so as to form two handles. The children were thus able to hold the marker up-right and level on the paper by grasping the rope at each of the knots. In this way the subject was able to maneuver the marker around the board much like it was done during the other two conditions, except the child could now work alone, independent of the activities of the other child.

Procedure

Since the measurement of cooperative behavior, and competition, has time limitations, it was considered important to attempt to control for initial differences in pyschomotor ability. This is especially important in a study that is concerned with age changes in behavior. A child of six does not have the motor skill of a child of eleven. One could infer than an eleven year old is better able to operate the Board,

independent of the motivation to do so. The following procedure was used to determine initial differences in baseline motor ability for the cooperation task. After an initial familiarization session, in which the subjects were given experience in maneuvering the marker across the four circles, the subjects were told that they were now to reach each goal as quickly as possible. The experimentor then pointed to the first circle and told the subjects that when he said "go" they were to try and reach that circle as quickly as they could. When the first goal was reached, the subjects were quickly directed in a random order to the next goal, until thirty seconds were up. The entire procedure was repeated once.

The number of circles crossed in the two trials were summed and an average score of the two trials obtained. This average score represented an index of motor skill that was used in an analysis of covariance procedure to adjust for initial differences in psychomotor ability between the two groups of children.

Many studies on cooperation and competition have contained only one condition. In this one condition, six to twelve trials were frequently used. Because of the three separate conditions, and because of the number of pretest trials, this study could use only a minimum number of trials in each condition. In cooperation condition I there were two trials; in cooperation condition II there were three trials; and, in the competition condition there was one trial. For the pretests, there were two trials for the cooperation pretest, and

one trial for the competition pretest.

A modification of the Madsen group reward procedure was used for cooperation condition I (trials 1-2). The two children were first told that their names would be written on slips of paper and slips placed in a bag (see appendix A for instructions). The children were instructed that every time one of the circles was crossed in a thirty second time period the child whose name was drawn out of the bag would receive a poker chip that later could be traded for prizes. The two names at that time were written, placed in the bag, and then one of the names randomly drawn back out. The drawing out of the names was made to appear random, but in fact was manipulated by the experimentor so that each child received one trial. After being told whose name was drawn the children were instructed to commence playing the game. There were a number of advantages to the above procedures. In order to cross the circles the cooperation of the other child was crucial. The unrewarded child that aided the rewarded child to cross the circles was responding according to the definition of cooperation presented earlier---a behavior that is directed toward sharing a reward or obtaining the reward for others.

The unrewarded child can choose to not assist the rewarded child; that is, to be uncooperative. The unrewarded child cannot compete against the rewarded child since the possibility of competition was precluded. Thus a disposition toward competition should not have influenced the results in cooperation condition I.

Under cooperation condition II (trials 3-5), each of the two children were assigned their own circles. This was done by writing each child's name on the circle in front of them, and the circle to their right. Then when the pen crossed an individual child's circle, that child alone was rewarded. It was necessary for both of the children to cooperate in order for any single child's circle to be crossed. If instead the children competed as they tried to get the pen to cross their own circles, the number of circles crossed per trial went down. Cooperation condition II has been called the individual reward condition by such researchers as Miller (1973); Richmond and Weiner (1973); and Shapira and Madsen (1969). In the condition as used by these researchers, a lower score meant a preference for competition, a higher score meant a preference for cooperation. This writer however, used cooperation condition II to measure only cooperation. The instructions for cooperation condition II are given in appendix A.

In order to measure competition, the Madsen Cooperation Board was further modified. It was necessary to have a procedure that would permit the subjects to operate independently so that there was no opportunity for them to cooperate. Each child was first given a marker that had been removed from the board. The two ropes attached to each side of the marker were knotted at a point ten inches from the marker so as to form two handles. The child was thus able to hold the marker up-right and level on the paper by grasping the rope at each of the knots. In this way the subject was able to maneuver the mark-

er around the board much like it was done during the other two conditions, except the child could now work alone, independent of the activities of the other child.

At the beginning of the competition condition the children were placed in different areas of the same room so that they could be examined one at a time. After being given instructions and practice on operating the marker each subject was told to cross as many of the 30 circles on the paper as possible in 30 seconds (see appendix A for instructions given subjects). After time was up the circles were counted. As an example the number might be eight. The child was then told that another child in his class (unnamed) crossed 11 circles (in each case the number was 3 more circles than the subject crossed), and received 3 poker chips for his efforts. The subject was told that for every circle he crossed more than eight, one of the other child's poker chips would be taken away and given to him. Furthermore, if he reached 11 he could continue crossing circles for which he would receive a poker chip for each circle he crossed. After the child understood the instructions he was given forty seconds to cross as many circles as he could. Forty, instead of the thirty seconds of the first trial, were given to ensure that he could exceed his previous performance. The subject thus had the opportunity, if he was so motivated, to gain rewards at the expense of his classmates.

The advantage of the above procedure was that it allowed for an initial measure of the subject's motor skill on

the task so that an adjustment could be made for differences in initial skill through an analysis of covariance procedure.

A number of studies that contained more than one type of condition have failed to vary the order in which the subjects were to receive the conditions. Studies by Madsen (1967); Richmond and Weiner (1973); Miller (1973); and Miller and Thomas (1972) all contained a group-reward condition that preceded an individual reward condition for all subjects. The problem with the above fixed procedures is that an instructional set may develop among the subjects and alter the way they respond to subsequent conditions. In order to control for this possibility, the order in which the subjects in this study received the three conditions was randomly varied.

How to properly dispense rewards to the subjects is a potential problem, since it has been pointed out by Jones and Gerard (1967) that a child's interpretation of the attractiveness of a reward may affect their cooperative or competitive behavior. Most researchers on cooperation and competition have not heeded the warning of Jones and Gerard. Only one study was found in the literature that made a clear attempt to control for the incentive value of the reward.

In this study control of the incentive value of the reward was attempted by having the experimentor at the end of the final trial choose the rewards. Out of the view of the subjects the experimentor selected from boxes the rewards each child had earned. The rewards consisted of candy, balloons, trinkets, small cars, marbles, whistles, and other similarly

inexpensive items. The rewards were placed into paper bags, the child's name written on it, and the bags given to the subject's teacher. The children were instructed to obtain the bags after school and not to open them until they got home. They were also instructed not to talk about the rewards with other children.

Chapter III

RESULTS

The original purpose of the two separate pretests, or practice sessions, in the three conditions of the study was to control for initial differences in psychomotor ability between both ethnic groups and both age levels. In deciding whether to use the pretest to control for possible differences between any two groups, it was first necessary to determine if in fact the groups did significantly differ from one another on the pretest. The pretest results for the cooperation conditions are considered first.

The mean number of circles crossed per trial for the Cherokee group on the cooperation pretest was 2.86; for the Anglo-American group the mean was 2.14 (see Table 1). A two-tailed t-test on differences between the two means was found not significant ($t = 1.42$, $p > .05$). On the other hand, the means of the two age levels did significantly differ for both ethnic groups. Younger Cherokee children had a mean of 2.86 circles crossed on the pretest. The mean for the older Cherokee children was 4.36. The difference between the two means was significant ($t = 2.46$, $p < .02$). Similar significant findings were obtained for the Anglo-American children. The mean for the younger Anglo-American children was 2.14 on the

TABLE 1

COOPERATION PRETEST

Cherokee

Grade	Males	Females	
1&2	6.66	4.77	5.72
4&5	8.77	8.66	8.72
	7.72	6.72	7.22

Anglo-American

Grade	Males	Females	
1&2	3.88	4.66	4.27
4&5	7.11	9.33	8.22
	5.5	7.0	6.25

cooperation pretest. For the older children the mean was 4.11 ($t = 4.26$, $p < .001$).

A separate pretest was used in the competition condition to determine if initial differences in pyschomotor ability existed between both age levels and ethnic groups. The mean number of circles crossed by the Cherokee children was 8.79. The Anglo-American children had a mean of 9.38 on the competition pretest (see table 2). A two-tailed t-test on the difference between the two means was not significant ($t = -.87$, $p > .05$). The means of the two age levels did significantly differ for both ethnic groups. First and second grade Cherokee children had a mean of 6.33. Fourth and fifth grade children had a mean of 11.25. The difference between the two means was significant ($t = -5.02$, $p < .001$). The difference between the two age levels was also significant for the Anglo-American children. The mean for the 1st and 2nd grade on the competition condition pretest was 7.61. For the 4th and 5th grade children the mean was 11.17 ($t = -3.92$, $p < .001$).

In order to use an analysis of covariance to adjust for initial differences between groups it is necessary to assume that no covariate-by-factor interaction is present. To test this assumption a regression analysis was conducted for all three conditions (Nie, Hull, Jenkins, Steinbrenner, Bent, 1975). All tests proved non-significant except the test between the pretest and the ethnic group factor in cooperation condition II, which was significant at the .05 level.

TABLE 2

COMPETITION CONDITION PRETEST
MEANS

Cherokee

Grade	Males	Females	
1&2	8.22	4.44	6.33
4&5	12.00	10.50	11.25
	10.11	7.47	8.79

Anglo-American

Grade	Males	Females	
1&2	7.66	7.55	7.61
4&5	10.11	12.22	11.17
	8.88	15.99	9.39

On the basis of these findings it was decided for both cooperation conditions to use the pretest to adjust for initial differences between age levels, but to delete the pretest when considering differences between the two ethnic groups. Since there was no covariate-by-factor interaction present in the competition condition, it was decided to use means adjusted for the effect of the pretest in making all comparisons.

The dependent variable in cooperation conditions I and II was the number of circles crossed in each trial. The total number of circles crossed by a subject in each trial was summed across all trials and divided by the number of trials to obtain an average score for each condition. In accordance with previous research in this area (Cook and Stingle, 1974), a higher number of circles crossed indicated a higher level of cooperation.

The dependent variable in the competition condition was the number of circles crossed in the second trial. A larger number of circles crossed indicated a higher level of competition.

A number of studies (eg. Miller, 1973; Miller and Thomas, 1972) have incorrectly assumed that the individual subject rather than the dyad is the proper unit of measurement on the Madsen Cooperation Board. Such a misconception, since it directly affects the size of the error term, can lead to incorrect conclusions. In cooperation conditions I and II the subjects operate the experimental apparatus in pairs, thus the

unit of measurement for statistical analysis has to be the dyad. This was accomplished by randomly selecting a subject from within each pair, and assigning the total score achieved by the combined efforts of both subjects to the selected subject. The above procedure is in accordance with the principle of maintaining independence of observations----a necessary requirement in using inferential statistics (Hays, 1973).

Information on school achievement was obtained from two sources. Final classroom letter grades in math and reading for the Fall, 1976 semester were obtained for both groups of children. The letter grades were converted to a numerical form by the following system: A = 4; B = 3; C = 2; D = 1; F = 0.

The second source of information on school achievement was percentile scores obtained from reading and math subtests of standardized achievement tests. The two achievement tests were the Metropolitan Achievement Test and the Standford Research Associates Achievement Test. Twelve subjects for which no standardized tests were available were omitted, leaving 132 subjects.

In the following nine hypotheses, no main effects were predicted. Instead, specific a-priori predictions were made regarding simple main effects. It is customary in such a case to omit the calculation of an F-test on the main effects, and instead proceed directly to the testing of all a-priori hypotheses by means of t-tests (Kerlinger, 1973; Kirk, 1968). However, in addition to the individual t-tests, both the ana-

lysis of variance tables and each separate main effects F-tests are presented so that the reader will have a better overall view of the analysis. Also, an overall breakdown of means for the three conditions, and the two pretests, are presented in the results section. The means for cooperation condition I are presented in table 3; the means for cooperation condition II are in table 4; the means for the competition condition are presented in table 5. For the two pretests, the cooperation pretest means are in table 1, and the competition pretest means are in table 2.

All correlations in hypotheses eight and nine were computed by means of the Pearson Product Moment method.

All t-tests, unless otherwise indicated, were one-tailed.

Hypotheses

Hypothesis 1

Cherokee children in the grades 1&2 and 4&5 will be significantly more cooperative than working-class Anglo-American children in the two cooperation conditions.

Cooperation condition I will be considered first.

In cooperation condition I a three way analysis of variance revealed no significant main effect for ethnicity ($F = 2.61$, $df = 1.64$, $p > .05$). See table 6, appendix B.

The mean number of circles crossed by the 1st and 2nd grade Cherokee children was 1.97. The mean for 1st and 2nd grade Anglo-American children was .78 (see table 3). A t-test

TABLE 3

COOPERATION CONDITION I
MEANS

Grade	Cherokee Males	Cherokee Females		Anglo-American Males	Anglo-American Females	
1&2	2.06	1.89	1.97	.67	.89	.78
4&5	4.17	3.50	3.83	3.17	3.39	3.28
	3.12	2.7	2.9	1.92	2.14	2.03

on the difference between the two groups of children was marginally significant ($t = 1.58$, $p > .05$). The mean number of circles crossed in cooperation condition I by the 4th and 5th grade Cherokee children was 3.83. For the 4th and 5th grade Anglo-American children the mean was 3.28. The difference between the two groups of children was not significant ($t = .74$, $p > .05$).

The results for cooperation condition II are as follows.

In cooperation condition II the three way analysis of variance revealed a significant main effect for ethnicity ($F = 5.81$, $df = 1,64$, $p < .01$). See table 7, appendix B.

The mean number of circles crossed by 1st and 2nd grade Cherokee children was 1.89. For 1st and 2nd grade Anglo-American children the mean was .72 (see table 4). A t-test on the difference between the means was marginally significant ($t = 1.32$, $p > .05$).

The mean number of circles crossed by 4th and 5th grade Cherokee children was 3.82. For 4th and 5th grade Anglo-American children the mean was 1.89. A t-test showed that the two means were significantly different ($t = 2.11$, $p < .02$).

The results for cooperation condition I indicated that hypothesis 1 was marginally accepted at the 1st and 2nd grade level, but rejected for the 4th and 5th grade children. In cooperation condition II, hypothesis 1 was marginally accepted at the 1st and 2nd grade level and completely confirmed at the 4th and 5th grade level.

TABLE 4

COOPERATION CONDITION II
MEANS

Cherokee

Grade	Males	Females	
1&2	2.44	1.33	1.88
4&5	3.40	4.22	3.81
	2.92	2.78	2.85

Anglo-American

Grade	Males	Females	
1&2	.59	.85	.72
4&5	2.11	1.77	1.94
	1.35	1.31	1.33

Hypothesis 2

Cooperative behavior as measured in cooperation condition I will increase with age for both the Cherokee and the Anglo-American children.

The three way analysis of covariance indicated a main effect for age ($F = 7.67$, $df = 1,64$, $p < .007$). See table 8, appendix B.

The mean number of circles crossed by the 1st and 2nd grade Cherokee children was 1.97. While the 4th and 5th grade Cherokee children had a mean of 3.83. After the scores were adjusted for the effect of the pretest through a procedure recommended in Weiner (1971), a t-test was conducted on the two means. The results indicated that the 4th and 5th grade mean was marginally different from the 1st and 2nd grade mean ($t = 1.40$, $p > .05$).

The 1st and 2nd grade Anglo-American children crossed an average of .78 circles in cooperation condition I. The 4th and 5th grade Anglo-American children had a mean of 3.28 circles crossed. A t-test on the adjusted means indicated that the two means were significantly different ($t = 1.92$, $p < .05$).

The results indicated that hypothesis 2 was marginally accepted for the Cherokee children, and completely confirmed for the Anglo-American children.

Hypothesis 3

Cooperative behavior as measured in cooperation condition II will show no increase with age in both groups from

grades 1&2 to grades 4&5.

The three way analysis of covariance indicated no main effect for age ($F = 2.12$, $df = 1,64$, $p > .05$). See table 9, appendix B.

The mean number of circles crossed by 1st and 2nd grade Cherokee children was 1.89. Fourth and fifth grade Cherokee children in cooperation condition II crossed an average of 3.81 circles. A t-test on the adjusted means indicated that there was no significant difference between the two groups ($t = 1.34$, $p > .05$).

Anglo-American 1st and 2nd grade children crossed an average of .72 circles in cooperation condition II. The 4th and 5th grade children crossed an average of 1.94 circles. A t-test indicated no significant difference between the two adjusted means ($t = .25$, $p > .05$).

The hypothesis was confirmed for both ethnic groups.

Hypothesis 4

Cherokee children in grades 1&2 and 4&5 will be significantly less competitive than working-class Anglo-American children in the competition condition.

A three way analysis of covariance indicated a significant main effect for ethnicity ($F = 11.72$, $df = 1,135$, $p < .001$). See table 10, appendix B.

The mean number of circles crossed by the 1st and 2nd grade Cherokee children in the competition condition was 10.44. For Anglo-American 1st and 2nd grade children the mean was 14.17 (see table 5). A t-test on the difference between the

TABLE 5

COMPETITION CONDITION
MEANS

Cherokee

Grade	Males	Females	
1&2	11.94	8.94	10.44
4&5	19.22	17.00	18.11
	15.58	12.97	14.28

Anglo-American

Grade	Males	Females	
1&2	15.11	13.22	14.17
4&5	18.83	19.94	19.39
	16.97	16.58	16.78

two adjusted means was significant ($t = 2.98$, $p < .005$).

Cherokee children in the 4th and 5th grade crossed an average of 18.11 circles in the competition condition. Anglo-American 4th and 5th grade children crossed an average of 19.39 circles. A t-test on the difference between the two adjusted means was marginally significant ($t = 1.61$, $p > .05$).

The results indicated that hypothesis 4 was confirmed for the younger children, and marginally accepted for the older children.

Hypothesis 5

Competitive behavior as measured in the competition condition will increase with age for both Cherokee children and the Anglo-American children in the comparison group.

A three way analysis of covariance indicated a significant main effect for age level ($F = 23.08$, $df = 1,135$, $p < .001$). See table 10, appendix B.

Cherokee children in the 1st and 2nd grade crossed an average of 10.44 circles in the competition condition. Cherokee children in the 4th and 5th grade crossed an average of 18.11 circles. A t-test indicated the difference between the two adjusted means was significant ($t = 3.57$, $P < .0005$).

Anglo-American children in the 1st and 2nd grades crossed an average of 14.17 circles in the competition condition. The average number of circles crossed by the 4th and 5th grade children was 19.39. A t-test on the difference between the two adjusted means indicated they were significantly

different ($t = 2.21$, $p < .025$).

Hypothesis 5 was confirmed for both ethnic groups.

Hypothesis 6

There will be no difference between Anglo-American males and females in cooperative behavior at both age groups in cooperation condition I.

A two way analysis of variance indicated no significant main effect for sex ($F = 1.56$, $df = 1,32$, $p > .05$). See table 10, appendix B).

The average number of circles crossed by 1st and 2nd grade Anglo-American males was .67. For Anglo-American females in the 1st and 2nd grade the average was .89 circles crossed. A two-tailed t-test indicated there was no significant difference between the two means ($t = .30$, $p > .05$).

At the 4th and 5th grade level Anglo-American males crossed an average of 3.17 circles in cooperation condition I. Fourth and fifth grade females crossed an average of 3.39 circles. A two-tailed t-test on the differences between the two means was not significant ($t = .30$, $p > .05$).

Hypothesis 6 was confirmed at both age levels.

Hypothesis 7

First and second grade Anglo-American males will be equally competitive with Anglo=American females in the competition condition; at the fourth and fifth grade level Anglo-American males will be significantly more competitive than Anglo-American females.

A two way analysis of covariance indicated no main effect for sex ($F = 2.25$, $df = 1,67$, $p > .05$). See table 12, appendix B.

Anglo-American males in the 1st and 2nd grade crossed an average of 15.11 circles in the competition condition. Anglo-American females in the 1st and 2nd grade crossed an average of 13.22 circles. A two-tailed t-test on the adjusted means was not significant ($t = 1.48$, $p > .05$).

The average number of circles crossed in the competition condition by Anglo-American males in the 4th and 5th grades was 18.33. The Anglo-American 4th and 5th grade females crossed an average of 19.94 circles. A t-test on the adjusted means indicated that there was no significant difference between the two groups ($t = .39$, $p > .05$).

Hypothesis 7 was confirmed for the 1st and 2nd grade children, and rejected for the 4th and 5th grade children.

Hypothesis 8

There will be a significant negative relationship between degree of cooperative behavior and school achievement in both cooperation conditions for the Cherokee children; there will be no relationship between degree of cooperative behavior and school achievement in both cooperation conditions for the Anglo-American children.

Cooperative behavior in cooperation condition I will be considered first.

The correlation between the final semester grade in reading for the Cherokee children and cooperative behavior in

cooperation condition I was -.30 ($p < .04$). The correlation between reading percentile score and cooperative behavior for Cherokee children was -.40 ($p < .008$).

For Anglo-American children the correlation between cooperative behavior and the final semester grade in reading was -.18 ($p > .05$). The correlation between reading percentile score and cooperative behavior for Anglo-American children was -.12 ($p > .05$).

The correlation between the final semester grade in math for the Cherokee children and cooperative behavior in cooperation condition I was -.16 ($p > .05$). The correlation betweeen Cherokee children's math percentile scores and cooperative behavior was -.39 ($p < .01$).

For Anglo-American children the correlation between cooperative behavior and the final semester grade in math was .03 ($p > .05$). The correlation between math percentile score and cooperative behavior for Anglo-American children was .16 ($p > .05$).

The results for cooperation condition II are as follows.

The correlation between the reading percentile score and cooperative behavior for Cherokee children in cooperation condition II was -.29 ($p < .04$). For Anglo-American children the correlation between cooperative behavior and reading percentile was .04 ($p > .05$).

The correlation between math percentile score and cooperative behavior for Cherokee children was -.27 ($p < .05$).

For Anglo-American children the correlation between math percentile score and cooperative behavior was .18 ($p > .05$).

The correlation between the final semester grade in reading for the Cherokee children and their cooperative behavior in cooperation condition II was -.27 ($p < .05$). For Anglo-American children the correlation between cooperative behavior and the final semester grade in reading was .10 ($p > .05$).

The correlation between the final semester grade in math for the Cherokee children and cooperative behavior in cooperation condition II was -.19 ($p > .05$). For Anglo-American children the correlation between cooperative behavior and the final semester grade in math was .28 ($p > .05$) at the two-tailed probability level.

The results indicated that hypothesis 8 was confirmed for both ethnic groups.

Hypothesis 9

There will be a significant positive relationship between degree of competitive behavior and school achievement for both groups of children.

The correlation between Cherokee children's competitive behavior and their final semester grade in reading was -.07 ($p > .05$). The correlation between reading percentile score and competitive behavior for Cherokee children was -.07 ($p > .05$).

For Anglo-American children the correlation between

their competitive behavior and their final semester grade in reading was -.09 ($p > .05$). The correlation between reading percentile score and the competitive behavior of Anglo-American children was -.15 ($p > .05$).

The correlation between Cherokee children's competitive behavior and their final semester grade in math was -.04 ($p > .05$). The correlation between math percentile score and the competitive behavior of Cherokee children was -.12 ($p > .05$).

For Anglo-American children the correlation between their final semester grade in math and their competitive behavior was .04 ($p > .05$). The correlation between math percentile score and the competitive behavior of Anglo-American children was -.04 ($p > .05$).

The results failed to confirm hypothesis 9 for both ethnic groups.

Supplementary Analysis

The following supplementary analyses were not conducted to provide specific answers to the hypotheses of this study. Instead, it was hoped that the correlations below would aid both in the overall interpretation of the results, and in the relating of those results to previous research in this area.

The correlation between the cooperation condition I scores of Cherokee children and their cooperation condition II scores was .54 ($p < .001$). For Anglo-American children the

correlation between their two cooperation scores was .55 ($p < .001$).

The correlation between the cooperation I scores of Cherokee children and their competition scores was -.13 ($p > .05$). For Anglo-American children the correlation between the two scores was -.11 ($p > .05$).

The correlation between the competition scores of Cherokee children and their cooperation II scores was .01 ($p > .05$). For Anglo-American children the correlation between the two scores was .18 ($p > .05$).

Chapter IV

DISCUSSION

Before proceeding to the discussion, a few words of caution need to be said about the interpretation of the findings. Because both the methodology and sample depart from the norm for research on cooperation and competition, the discussion of the present study is necessarily limited to the sample and procedures employed.

The Anglo-American comparison group was rural working-class---a population infrequently included as subjects in studies on social behavior. American Indians are a diverse group with a wide variety of behavioral patterns (Berry, 1968). Little is known about what extent the different tribes share similar cultural norms. The Cherokee subjects used in this study are from a single tribe, in many ways unique. They also inhabit a rural environment at a time when nearly one-half of all Indians reside in urban areas (Wax, 1971).

This is not to say that the potential value of the study is severly limited. The sample of Cherokee children was purposely chosen as being most representative of the general population of Cherokees. Among the subjects were traditional fullbloods, non-traditional fullbloods, and mixed-bloods. No attempt was made to increase the likelihood of positive results

by selecting Cherokees from isolated traditional communities. One is thus encouraged to believe that the assumptions on cooperative and competitive behavior and school achievement that were upheld will generalize to a larger population of Cherokees. In addition, greater faith can be held in the belief that the results of this study will be duplicated in those tribal groups in which the encouragement of cooperation and the avoidance of competition are still held as cultural norms by traditionally oriented members of a tribe.

The following discussion is organized around the nine hypotheses, which have been regrouped into three sections of a similar focus in order to maintain continuity. The first section covers the differences between the two ethnic groups in cooperation and competition. The second part examines the findings on the relationship between cooperation and competition and school achievement. The final section discusses the findings on age changes and sex differences, both in terms of theoretical considerations and in terms of previous research.

Ethnic Differences

Ethnic differences were considered in terms of the prediction that Cherokee children were more cooperative and less competitive than Anglo-American children. To a large extent these two overall predictions proved to be true. Although differences in cooperative behavior will be considered first, references will also be made to differences in competitive behavior, and age and sex differences, in order to better inte-

grate findings.

Fourth and fifth grade Cherokee children were found to be significantly more cooperative in cooperation condition II than fourth and fifth grade Anglo-American children. First and second grade Cherokee children in both cooperation conditions crossed nearly three times as many circles as first and second grade Anglo-American children, although the comparisons proved to be only marginally significant. The overall results thus fit in well with ethnographic studies that have found Cherokee children to be highly cooperative (Garrison, 1970).

In addition to being more cooperative than Anglo-American children, Cherokee children were found to be less competitive than Anglo-American children. First and second grade Cherokee children were significantly less competitive than first and second grade Anglo-American children. In a difference that reached marginal significance, 4th and 5th grade Cherokee children were less competitive than 4th and 5th grade Anglo-American children. The results thus supported the ethnographic studies that have found that Cherokee children avoid competition (Dumont and Wax, 1968).

The continued high level of cooperative behavior by Cherokee children, as well as their avoidance of competition, can best be understood by examining the lifestyle of the children. Although the Cherokees attend an integrated school system, most of the children spend a good part of their time exclusively with other Cherokee children (Wahrhaftig and Thomas, 1968). The children usually attend segregated churches and

Sunday Schools; or if non-Christian, attend traditional Cherokee dances. These activities are well integrated into the Cherokee community, and frequently involve an entire weekend. In addition, since the extended family is an important focal point for the Cherokee child, a great deal of their time is spent with the children of relatives. Wahrhaftig (1968) and Garrison (1970) both point out that in all of the above day-to-day situations the Cherokee child is made to be aware that in his interactions with other Cherokees he is to be cooperative and to avoid divisive competition. The results of this study indicates that in spite of continued and prolonged contact with Anglo-American children in the classroom, the Cherokee children hold fast to the norms that they have picked up from their many experiences within Cherokee society.

Relationship of Cooperation and Competition to School Achievement

Perhaps the most important finding of this study was the confirmation of the prediction that a negative relationship existed between the cooperative behavior of Cherokee children and their school achievement. Also confirmed was the prediction that there was no relationship between the cooperative behavior of Anglo-American children and their school achievement.

The explanation of the affect of cooperative behavior on school achievement is found in Cherokee culture, and in the way that culture operates in the classroom. Several writers have pointed out how Cherokee children maintain their

cultural norm of cooperation, even though they are under pressure from their teachers to compete with other members of their class (Dumont, 1972; Dumont and Wax, 1968). In their classroom observations, Dumont and Wax noted how the Cherokee children develop their own closed society within the larger classroom system. The two researchers have called their concept the Cherokee School Society. The classroom society of the Cherokee children closely follows such traditional norms as the previously mentioned Harmony Ethic. But the most important norm is the one that requires the children to hold fast to group standards of achievement that all of the children are capaple of meeting. Rather than risk violating the norms of the Cherokee classroom society, Cherokee children of high ability purposely keep from displaying their academic competence. The cumulative result of Cherokee children cooperating with group performance norms is lowered achievement for many members of the classroom society---hence the negative correlation of cooperative behavior with school achievement.

In examining the correlation between cooperative behavior and school achievement, no predictions were made about possible age effects. A supplementary analysis on this factor indicated that the largest negative correlations were found among the younger Cherokee children. This finding would seem to indicate that the peer group interaction that apparently encourages a withdrawal from active participation in classroom learning occurs most prominently during the earlier school years.

The fact that no relationship was found between the cooperative behavior of Anglo-American children and their school achievement lends support to the explanation given above. Since Anglo-American children do not share a cultural norm that calls for them to maintain equaiity of group achievement, their cooperative behavior cannot lead them to act in a way that reduces their academic achievement.

The Cherokee School Society has a counterpart among the Sioux, according to Wax, Wax, and Dumont (1964). Among the Sioux, the three researchers report that peer group influence is the most important element in the school social environment affecting achievement. Hess (1974) also reports that a number of researchers have commented on the importance of the peer group in controlling Indian academic achievement. The influence of the Cherokee peer group in affecting school achievement can thus be seen as similar to the pattern that occurs among a number of tribes.

Cooperative and competitive behaviors can be adaptive or mal-adaptive, depending upon the social context in which the behavior takes place. The cooperative behavior of Cherokee children has its roots in the Pre-Colombian culture of the Cherokee people (Gulick 1961). In this early period Cherokee ecology was based upon hunting and horticulture. Cooperative behavior was probably an adaptive trait, since it helped increase group solidarity and cohesiveness, and help bring equality to the distribution of food during periods of want. But in an environment of competitiveness and individualism, such as

the eastern Oklahoma school system, the cooperative behavior of the Cherokee school children has proven mal-adaptive.

Since it is highly unlikely that the majority of Cherokee children will soon give up their cooperative behavior, the schools that they attend will need to adjust to the children. The competitive, individualistic environment of eastern Oklahoma classrooms need to be restructured so that the emphasis in motivation is placedon cooperation.

In a cooperative environment the children would be encouraged to work together to accomplish assignments. The emphasis would be on group accomplishment and group evaluation. In this new classroom enviroment the children would be able to freely tutor their peers, since the stress on individual accomplishment would be removed. Johnson, Johnson, Johnson, and Anderson (1976) have reported that classrooms organized along the lines suggested above are equally effective with those organized along a more traditional, competitive structure.

The rationale for the above restructuring of the classroom has its foundation the belief that an attempt should be made both to accommodate to the unique cultural traits that Cherokee children bring to class, and to utilize the strengths that are evident in their culture.

John (1971), in her review of Indian classroom learning, discussed styles of learning that are peculiar to Indians. Although no efforts have apparently been made to restructure classrooms in accordance with Indian culture, John provides

evidence that Indians do possess learning strengths that can be utilized to improve their learning.

In speaking of the Sioux, Wax, Wax, and Dumont (1964) have coined the term "Vacuum Ideology" to describe the attitudes of many educators toward Indian culture. "Vacuum Ideology" is the belief that the Indian child comes from a house that is empty and meager, and from a culture that has nothing worth building upon. Garrison (1970) and Dumont and Wax (1969) provide evidence that the "Vacuum Ideology" also exists among educators of Cherokee children. A restructuring of the eastern Oklahoma classrooms that Cherokee children attend, so that motivation is attained through cooperation rather than competition, may well prove the educators wrong.

Unlike the situation with cooperative behavior, the predicted positive relationship between the competitive behavior of both ethnic groups and their school achievement was not significant.

In order to understand the failure of competitive behavior to relate to school achievement, it is necessary to look at the literature on competition and school achievement. A number of studies have shown that competition increases performance on mechanical or skill-oriented tasks, but has no effect on performance on complex tasks (Clifford, 1971; Clifford, Cleary, and Walster, 1971; Shaw, 1958). Math and reading achievement, with which competition scores were correlated, are complex tasks. Thus the results in this study are in line with previous research on competition and achievement.

If the subject's competition scores had been correlated with such school tasks as writing speed, a positive relationship might have been found. Yet such tasks play only a limited part in final term grades in core adademic subjects. Clifford (1972) writes "Assuming that most formal education is concerned with improving performance in complex problem-solving tasks rather than motor-skill activity, the value of using competitive motivation in the classroom appears questionable (p.124)."

A supplementary analysis on the achievement scores of both groups revealed a somewhat surprising finding. There was a tendency for 1st and 2nd grade Cherokee children to exceed the school achievement of the 1st and 2nd grade Anglo-American children in the comparison group (see tables 15-18). The superiority of the 1st and 2nd grade Cherokee children was evident both in classroom grades and in percentile scores in the standardized tests. At the 4th and 5th grade level the situation was almost reversed, with Anglo-American children scoring considerably higher on the standardized achievement tests.

The results from this study can be compared to the school achievement results previously given for the studies by Sanders (1972) and Garrison (1970). In Sanders' study Cherokee children in the first grade scored only slightly below the national norms on a standardized achievement test; while at the upper grades they were considerably below the norms. Garrison found that 1st grade Cherokee children in his sample equaled or exceeded the achievement of the Anglo-American comparison

group, but fell behind in achievement at the upper grade levels.

The term "cross-over effect" has been developed to describe the situation where young Indian children achieve at the same or higher level than an Anglo-American comparison group, only to fall behind them in achievement at the upper grades (Bryde, 1965). Fuchs and Havighurst (1972) have criticized studies reporting a "cross-over effect", pointing out that in many cases Indian children are retained in the early grades and thus are exposed to primary grade work for a longer than normal period of time. A comparison of the ages of both groups indicates that the two groups are nearly identical in age (see table 14). The results from this study then, supports the existence of a "cross-over effect" for Cherokee children.

Age and Sex Differences

It was predicted that the cooperative behavior of both groups of children would increase with age in cooperation conditon II.

The cooperative behavior of both groups of children increased with age in cooperation condition I, although the increase for the Cherokee children reached only marginal significance. As predicted, in cooperation condition II the cooperative behavior of both groups of children failed to show an increase with age.

By measuring cooperation and competition in separate, unconfounded conditions, and in a condition in which the two variables were mixed, comparisons could be made among a groups

response in several situations. In this way the results in any single condition could be further clarified.

The results from cooperation condition II in this study would have been interpreted by such researchers as Madsen (1971) and Kagan and Madsen (1971) to indicate that cooperative behavior does not increase with age; or, by Stingle (1973) to indicate that the increasing competitive behavior of the subjects affected their cooperative behavior. An examination of the results in all three conditions indicates that the three researchers are probably wrong in their interpretations. The results in all three conditions indicates that cooperative behavior does increase with age. On the other hand, when cooperative behavior is confounded with competition, and when the range of uncooperative behavior is fairly large (as is the case in condition II), cooperative behavior will not increase with age. Although it is tempting to follow the lead of Stingle (1973) and attribute the reduced cooperation condition II scores of the 4th and 5th grade Anglo-American children to their increasing competitive behavior, results in the other conditions cast doubt on this interpretation. Male Anglo-American children proved to be both more cooperative in condition II (males $\bar{x}$ = 2.1; females $\bar{x}$ = 1.7) and more competitive (males adjusted $\bar{x}$ = 19.37; females adjusted $\bar{x}$ = 18.90) than females at the 4th and 5th grade level. If competitive behavior alone reduced cooperation scores in cooperation condition II, then in that condition the Anglo-American females should have had higher cooperation scores than the more competitive males.

In addition, even though the competitive behavior of the Cherokee children showed a highly significant increase with age, the scores of the 4th and 5th grade children were nearly identical in the two cooperation conditions (condition I = 3.83; condition II = 3.81). It is obvious that the increasing competitive behavior of the 4th and 5th grade Cherokee children did not reduce their cooperative behavior in condition II.

The supplementary analysis provides some additional clarification of this issue. The correlation between the cooperation I scores and cooperation condition II scores was nearly identical for both groups of children. This finding indicates that the two conditions were measuring essentially the same variables, and that both ethnic groups had a similar pattern of response to the two cooperation conditions. In addition, if the competitive behavior of either group of children tended to lower their cooperation scores in condition II, then there should be a negative relationship between these two variables. The supplementary analysis indicated that the relationship between the cooperation II scores and the competition scores for both ethnic groups was not negative, nor was this relationship significant.

Although the possibility that competition was a factor in the results in condition II cannot completely be ruled out, it is unlikely that the high level of competitive behavior of 4th and 5th grade Anglo-American children was <u>entirely</u> responsible for their failure to increase their cooperative behavior

with age in cooperation condition II. If competition is seen as only one of a variety of uncooperative behaviors available to respondents, then the problem of explaining the failure of cooperative behavior to increase with age in condition II becomes one of merely setting up appropriate bidimensional categories of behavior.

A number of uncooperative behaviors could have reduced the cooperation of 5th and 6th grade Anglo-American children in condition II. The older children could have looked upon the task as a puzzle which they were to solve. The hesitation that took place as the children sought to find a solution to the puzzle would reduce their cooperation score. The Anglo-American children could have also been intrigued by the play aspects of the Madsen Board. Involvement in the experimental task as if it was a game would tend to lower cooperative responses. In addition, differences between the two ethnic groups in turn taking behavior could have affected the results such that the older Anglo-American scores were reduced. The Anglo-American children might have exhibited greater indecision in deciding whose circle would be crossed first, thus delaying the beginning of their cooperative efforts. Finally, any increased competitive behavior of the 4th and 5th grade Anglo-American children would have the effect of lowering their scores.

The differential cultural experiences that the two groups of children bring to class would account for Anglo-American children exhibiting the above uncooperative behavior

to a greater degree than Cherokee children.

In summary, the results in this study help provide some clarification of the confusion that exists in the literature on age changes in cooperative behavior (Cook and Stingle, 1974). When the experimental task contains cues for a number of uncooperative responses (as in cooperation condition II), then the experimenter is likely to find that cooperative behavior fails to increase with age. But when the experimental task hold only a limited possibility of uncooperative behavior (as in cooperation condition I), then cooperative behavior will be found to increase with age.

Age changes were also considered in the competition condition. The prediction that competitive behavior would increase with age was upheld for both ethnic groups.

The fact that competitive behavior increased with age among the subjects can be explained in terms of the stress that society places on achieving success in the classroom through competition (Berry, 1968). As the children from both ethnic groups continue on in school they are constantly exposed to the classroom ethic that calls for them to wring success from someone elses' failure (Henry, 1963). The result for both groups of children is increasing competitive behavior with increasing age.

In considering sex differences, it was predicted that Anglo-American males and females would not differ in cooperation condition I behavior, or, in competitive behavior at the the 1st and 2nd grade level. Fourth and fifth grade Anglo-

American males however, were expected to be more competitive than females.

As predicted, the Anglo-American males and females did not significantly differ in cooperative behavior. Nor did they differ in competitive behavior at the 1st and 2nd grade level. However, the 4th and 5th grade males and females also did not differ in competitive behavior.

An extensive review of the literature revealed no evidence that society holds different expectations regarding cooperative behavior for males and females. Thus it is not surprising that research has sometimes found a difference in cooperative behavior in favor of males, a difference in favor of females, or as is more frequently the case, no difference in favor of either sex. The findings in this study then, lend support to the weight of research that indicates no sex differences for cooperative behavior.

It was thought that competitive behavior of older males would play a role in explaining contradictions in research on sex differences in cooperative and competitive behavior. If an experimental task that measures cooperation also contained competitive cues, the assumed greater competitiveness of males was presumed to lower their cooperation below that of females. While there was a slight difference in competitive behavior in favor of males in both ethnic groups, the apparent failure of this difference to significantly affect cooperative behavior in condition II serves to cast doubt on this theory.

The failure to find sex differences in competitive behavior among the 4th and 5th grade Anglo-American children may be due in part to the type of experimental procedures used in this condition. As a matter of control, the subjects in the competition condition were not told the sex of the child they were in competition with. However, experimental evidence indicates that the competition of a subject varies depending upon the sex of the subject they are in contention with. Allen and Boivin (1976), and Horner (1968) found evidence that women become more competitive with women than when competing with men. Stingle (1973) found a tendency for boys to become more competitive when their dyad partner was a girl. Since each opponent in the present study was not present, opportunities for a dominate-submissive relationship to develop were not present. Thus in a competitive task with ambiguous opponents, neither dominate-submissive relationships nor societal expectations can combine to produce sex differences in competitive behavior.

Results from the supplementary analysis provides support for the bidimensional conception of cooperation and competition that was formulated in this study. The correlations between both group's cooperation condition I scores and their competition scores were very low, with neither correlation being significant. Cooperation condition II scores also failed to significantly correlate with the competition condition scores. The results in this study are in agreement with the findings from the previously described study by Johnson and

Ahlgren (1976). They concluded from their study that cooperation and competition were unrelated variables.

Suggestions for Future Research

Very few studies have been done on the cooperative and competitive behavior of pre-school children. Since the Madsen Board and several of the other experimental games appear suitable for use with children as young as four years, studies should be undertaken to determine more knowledge about how the two variables develop in very young children.

It would be easy to alter the experimental instructions in the competition condition so that information might be gained on sex differences in competition. One group of subjects could be told that their unseen opponent is the same sex as they are; the other group would be told that their opponent was a different sex. Such a procedure should prove effective since in this study the subjects in both ethnic groups appeared quite curious about the identity of their unseen opponent.

Because high rates of cooperative behavior and an avoidance of competition are thought to be part of the cultural norms of a number of tribes, this study should be replicated with different samples of Indians so that a greater knowledge can be obtained of the impact of Indian culture on school achievement.

Research needs to be carried out among Cherokee children to determine more information on the nature of the relationships between cooperative behavior and school achievement.

Classroom observations should be made to determine the specific behaviors that constitute the Cherokee School Society. Possible behaviors to look at are peer prompting during recitation, unsolicited recitation, student response to teacher's question, and covert student interaction.

The correlational methods used in this study have provided only limited information on the nature of the relationship between cooperative behavior and school achievement. Controlled studies using behavioral measures would provide additional information, and help identify ways classroom environments might be modified so that use can be made of the high cooperative behavior of Cherokee children.

An attempt should be made to determine the effect of cognitive factors on the development of cooperation and competition. As of yet no studies on these two variable have considered this factor.

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Appendix A

Instructions and Diagrams 1-3

APPENDIX A

Instructions for Cooperation Condition I

I am going to write your names on two slips of paper and put them in this paper bag (Experimenter writes names, puts them in a bag and shakes it up.). Now I am going to draw one name out. Every time the marker crosses a circle the person whose name was drawn out will receive a poker chip that can later be traded for prizes. I will draw out names twice so that each of you will have a chance to have your name selected. (Experimenter draws out name.) The first name is _____. Both of you take hold of the knots. You will have 30 seconds Any questions? Begin. (At the end of 30 seconds the children are stopped.) Now I am going to draw a name again. (Experimenter draws out name.) This time it is _____. Both of you take hold of the knots. You will again have 30 seconds. Any questions? Begin.

APPENDIX A

Instructic. for Cooperation Condition II

Now we are going to do something different. Both of you get your own two circles. These are David's circles (Experimenter writes name on circles in front and to the right of David.). These are Ron's circles (Experimenter writes name on circles in front and to the right of Ron.). Now, when the pen draws a line across one of the circles, the child whose name is in the circle gets a poker chip. When it crosses one of David's circles, David gets a poker chip. When it crosses one of Ron's circles, Ron gets a poker chip, and so on. You will have 30 seconds to play before I stop you. Are there any questions? Begin.

APPENDIX A

Instructions for Competition Condition

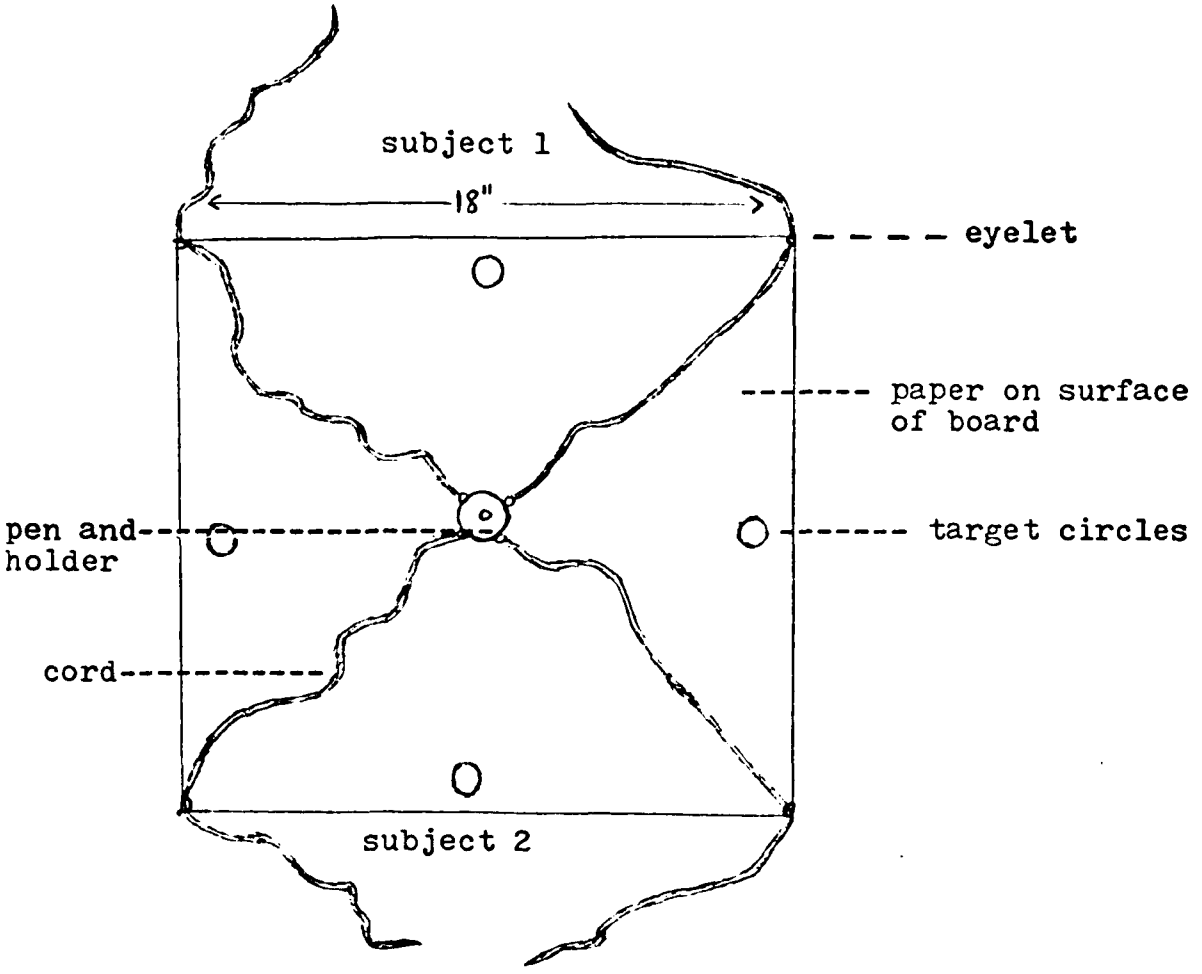
Practice task

Do you see the little circles? I want you to draw a line through the circles as quickly as you can as many as you can. Be sure and hold the ropes at the two knots. Are there any questions? Ready? Begin. (At the end of thrity seconds the subjects are stopped and the circles crossed are counted.)

Experimental task

Another child in your class crossed_____circles (subject's score plus 3). For crossing that many circles I gave that person 3 poker chips. If you cross_____circles (suject's score plus 3) I will take away the other child's poker chips and give them to you. If you cross_____ (subject's score plus 1) I will give you one poker chip. If you cross_____ (subject's score plus 2) I will give you two poker chips. If you cross _____ (subject's score plus 3) I will give you all of the other child's poker chips. When you reach_____ (subject's score plus 3) you can keep on crossing circles. I will give you a poker chip for each circle you cross beyond_____ (subject's score plus 3). Are there any questions? Ready? Begin. (At the end of forty seconds the subject is stopped.)

DIAGRAM 1



MADSEN COOPERATION BOARD
(Top View)

DIAGRAM 2

Madsen Cooperation Board
(Side View)

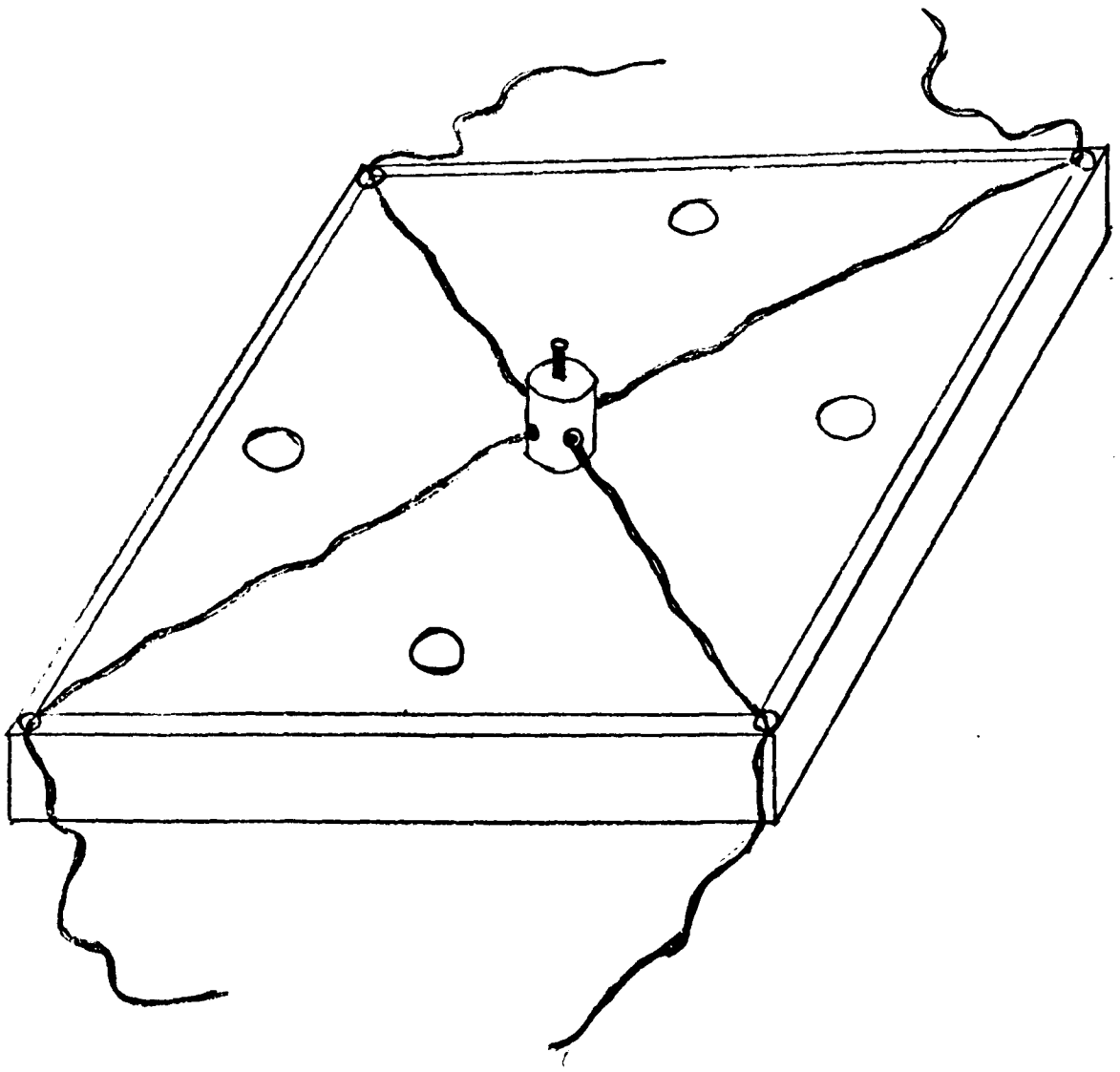
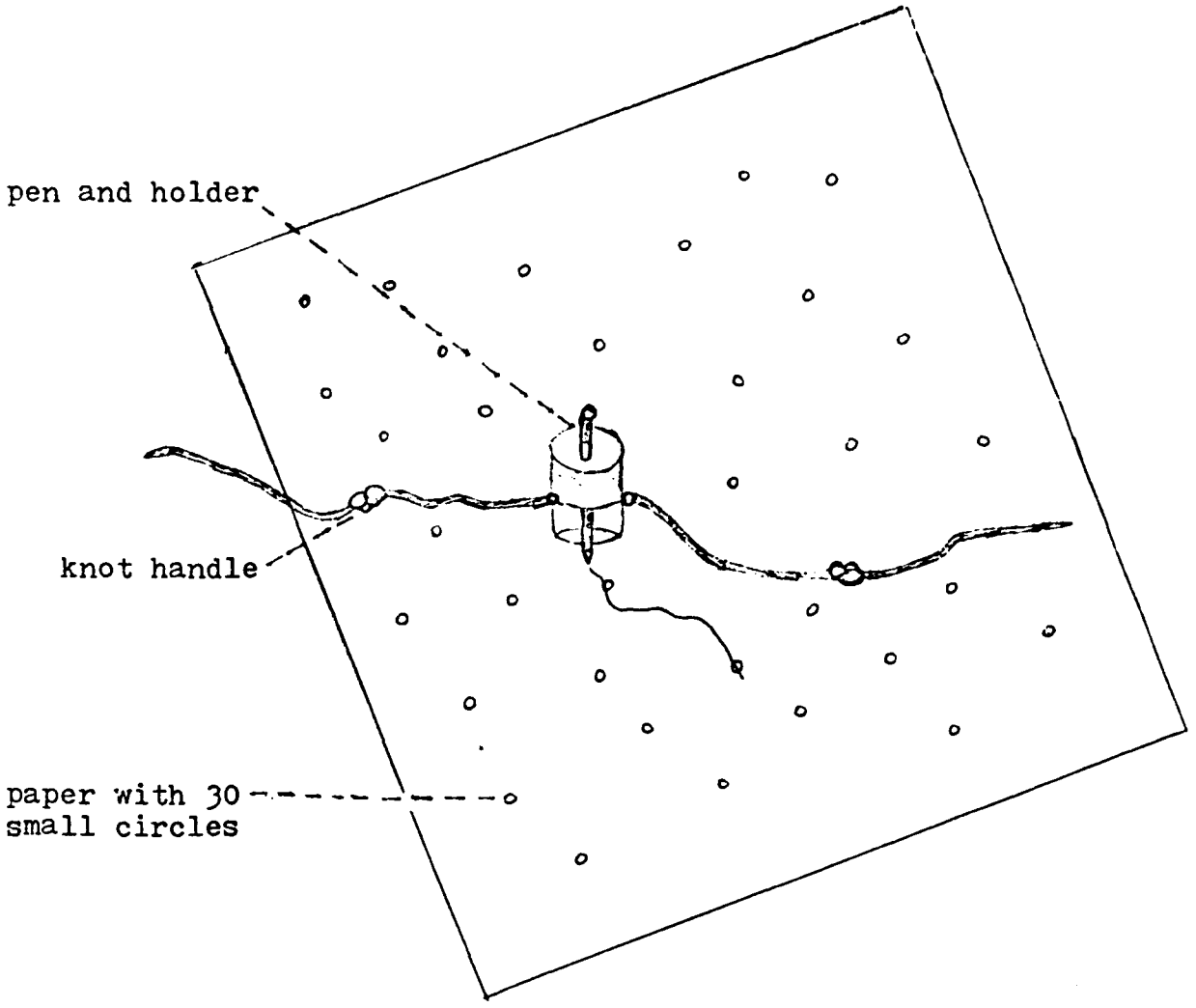


DIAGRAM 3

Competition Task



Appendix B

Statistical Analysis and Table Means

TABLE 6

THREE WAY ANALYSIS OF VARIANCE
COOPERATION CONDITION I

Source of variation	DF	Mean Square	F	Significance of F
Main effects	3	33.384	6.531	.001
Sex	1	0.125	0.024	.999
Ethnic	1	13.347	2.611	.107
Age	1	86.681	16.957	.001
2-Way interactions	3	1.236	0.242	.999
Sex Ethnic	1	1.681	0.329	.999
Sex Age	1	0.347	0.068	.999
Ethnic Age	1	1.681	0.329	.999
3-Way interactions	1	0.347	0.068	.999
Sex Ethnic Age	1	0.347	0.068	.999
Explained	7	14.887	2.912	.010
Residual	64	5.112		
Total	71	6.076		

TABLE 7

THREE WAY ANALYSIS OF VARIANCE
COOPERATION CONDITION II

Source of variation	DF	Mean Square	F	Significance of F
Main effects	3	28.751	4.078	.010
Sex	1	0.125	0.018	.999
Ethnic	1	41.001	5.816	.018
Age	1	45.125	6.401	.013
2-Way interactions	3	1.425	0.202	.999
Sex Ethnic	1	0.039	0.005	.999
Sex Age	1	1.890	0.268	.999
Ethnic Age	1	2.347	0.333	.999
3-Way interactions	1	6.927	0.983	.999
Sex Ethnic Age	1	6.927	0.983	.999
Explained	7	13.922	1.975	.072
Residual	64	7.050		
Total	71	7.728		

TABLE 8

THREE WAY ANALYSIS OF COVARIANCE
COOPERATION CONDITION I

Source of variation	DF	Mean Square	F	Significance of F
Covariates	1	75.305	15.458	.001
Pretest	1	75.305	15.458	.001
Main effects	3	14.693	3.016	.036
Sex	1	0.278	0.057	.999
Ethnic	1	8.675	1.781	.184
Age	1	37.490	7.696	.007
2-Way interactions	3	0.814	0.167	.999
Sex Ethnic	1	0.185	0.038	.999
Sex Age	1	1.276	0.262	.999
Ethnic Age	1	0.941	0.193	.999
3-Way interactions	1	0.416	0.085	.999
Sex Ethnic Age	1	0.416	0.085	.999
Explained	8	15.280	3.137	.005
Residual	63	4.872		
Total	71	6.044		

TABLE 9

THREE WAY ANALYSIS OF COVARIANCE
COOPERATION CONDITION II

Source of variation	DF	Mean Square	F	Significance of F
Covariates	1	63.442	9.311	.003
Pretest	1	63.442	9.311	.003
Main effects	3	14.490	2.127	.104
Sex	1	0.260	0.038	.999
Ethnic	1	31.644	4.644	.033
Age	1	14.460	2.122	.146
2-Way interactions	3	1.569	0.230	.999
Sex Ethnic	1	0.533	0.078	.999
Sex Age	1	0.565	0.083	.999
Ethnic Age	1	3.589	0.527	.999
3-Way interactions	1	6.500	0.954	.999
Sex Ethnic Age	1	6.500	0.954	.999
Explained	8	14.765	2.167	.042
Residual	63	6.814		
Total	71	7.710		

TABLE 10

THREE WAY ANALYSIS OF COVARIANCE
COMPETITION CONDITION

Source of variation	DF	Mean Square	F	Significance of F
Covariates	1	2659.641	207.266	.001
Pretest	1	2659.641	207.266	.001
Main effects	3	150.491	11.728	.001
Sex	1	27.676	2.157	.140
Ethnic	1	150.326	11.715	.001
Age	1	296.218	23.084	.001
2-Way interactions	3	6.961	0.542	.999
Sex Ethnic	1	2.285	0.178	.999
Sex Age	1	0.334	0.026	.999
Ethnic Age	1	17.994	1.402	.237
3-Way interactions	1	11.533	0.899	.999
Sex Ethnic Age	1	11.533	0.899	.999
Explained	8	392.941	30.622	.001
Residual	135	12.832		
Total	143	34.097		

TABLE 11

TWO WAY ANALYSIS OF VARIANCE
COOPERATION CONDITION I
(ANGLO-AMERICAN CHILDREN ONLY)

Source of variation	DF	Mean Square	F	Significance of F
Main effects	2	21.368	9.083	.001
Sex	1	3.674	1.562	.218
Age	1	39.062	16.605	.001
2-Way interactions	1	1.563	0.664	.999
Sex Age	1	1.563	0.664	.999
Explained	3	14.766	6.277	.002
Residual	32	2.352		
Total	35	3.416		

TABLE 12

TWO WAY ANALYSIS OF COVARIANCE
COMPETITION CONDITION
(ANGLO-AMERICAN CHILDREN ONLY)

Source of variation	DF	Mean Square	F	Significance of F
Covariates	1	1231.527	93.709	.001
Pretest	1	1231.527	93.709	.001
Main effects	2	46.938	3.572	.033
Sex	1	29.571	2.250	.134
Age	1	59.286	4.511	.035
2-Way interactions	1	4.517	0.344	.999
Sex Age	1	4.516	0.344	.999
Explained	4	332.480	25.299	.001
Residual	67	13.142		
Total	71	31.133		

TABLE 13

NUMBER OF SIBLINGS AT HOME

MEAN

Cherokee

Grade	Males	Females	
1&2	2.1	2.3	2.3
4&5	2.9	3.0	2.9
	2.5	2.6	2.6

Anglo-American

Grade	Males	Females	
1&2	1.7	1.9	1.8
4&5	3.0	1.6	2.3
	2.3	1.7	2.0

TABLE 14

AGE OF SUBJECTS IN YEARS

Cherokee

Grade	Males	Females	
1&2	7.2	7.2	7.2
4&5	10.6	10.6	10.6
	8.9	8.9	8.9

Anglo-American

Grade	Males	Females	
1&2	7.4	7.1	7.3
4&5	10.6	10.4	10.5
	9	8.7	8.9

TABLE 15

CLASSROOM GRADE IN MATH
MEAN

Cherokee

Grade	Males	Females	
1&2	3.56	3.00	3.28
4&5	3.00	2.56	2.78
	3.28	2.78	3.03

Anglo-American

Grade	Males	Females	
1&2	3.00	3.00	3.0
4&5	2.44	3.00	2.72
	2.72	3.00	2.86

TABLE 16

CLASSROOM GRADE IN READING
Mean

Cherokee

Grade	Males	Females	
1&2	2.89	3.11	3.0
4&5	2.33	2.67	2.5
	2.6	2.89	2.75

Anglo-American

Grade	Males	Females	
1&2	2.89	3.00	2.9
4&5	2.11	2.11	2.11
	2.5	2.56	2.53

TABLE 17

READING ACHIEVEMENT IN PERCENTILE SCORE

Cherokee

	Males	Females	
1&2	69.5	57.1	63.3
4&5	29.8	29.5	29.6
	49.6	43.3	46.5

Anglo-American

	Males	Females	
1&2	55.7	62.9	59.3
4&5	34.4	44.3	39.4
	45.1	53.6	49.3

TABLE 18

MATH ACHIEVEMENT IN PERCENTILE SCORE

Cherokee

Grade	Males	Females	
1&2	61.0	41.7	51.4
4&5	19.5	26.4	23.0
	40.3	34.1	37.1

Anglo-American

Grade	Males	Females	
1&2	54.9	51.9	53.4
4&5	33.3	51.3	42.3
	44.1	51.6	47.9