THE EFFECTS OF TRADITIONAL AND OPEN INSTRUCTIONAL PROGRAMS
ON COOPERATIVE/COMPETITIVE BEHAVIOR
AND LOCUS OF CONTROL

by

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This field study was designed to determine if differences in student competition and cooperation are associated with program differences along the open/traditional dimension. It was also designed to determine if these alternate types of programs differentially affect children's beliefs concerning the degree to which they have control over the consequences of their behavior in academic and in social situations. Fourth- and fifth-graders of one traditional and one open school (n=89) were randomly assigned pairwise to play a cooperative marble-pull game. The degree of cooperativeness was measured by the number of marbles won in the game. Beliefs about locus of control in achievement and in social situations were assessed by two questionnaires. Results showed that open school children were significantly more cooperative. They viewed themselves as being less responsible for their intellectual failures than did traditional school children. Children in the open setting showed no enhanced self-responsibility in social situations. Cooperative children in the traditional program showed significantly more internal control in social situations than did cooperative children in the open program.
CHAPTER 1

INTRODUCTION

Recent investigations have shown that American schoolchildren tend to be highly competitive (Madsen, 1967; Richmond and Weiner, 1973). In situations in which there is an opportunity to either compete or cooperate these children are more likely to pursue an individual goal than to work with others toward a common goal. Madsen (1967, 1971) has shown this to be the case even in situations in which cooperation is the only strategy by which a goal may be obtained by any of the players and he has called such behavior maladaptive competition.

Determinants of Cooperative/Competitive Behavior

A multitude of studies has been undertaken to investigate the aspects of cooperative and competitive behavior in young children. Comparison between children from different cultural backgrounds are especially instructive.

Cultural and Subcultural Factors

The degree to which children compete has been found to vary across different cultures and subcultures. Madsen (1971) showed that Anglo-American children were more competitive than Mexican children and he described the Anglo children as being irrationally competitive.
Mexican American children were found to compete less than American children but more than Mexican children.

Richmond and Weiner (1973) reported that white American children compete much more with one another than do black American children. When white and black children played against each other their competitiveness was found to be at a level between that of only white or black children.

Another subcultural variable which seems to influence children's competitive behavior is reported by Madsen (1967) who found that the degree of competitiveness relates to the rural or urban environment of children. In his study, rural Mexican children were less competitive than urban middle-class children. Madsen speculates that this difference in behavior may be associated with rural-urban differences in family structure. The rural family represents a unit of people who work together in order to earn their living. Moreover, particularly in non-technological rural areas, interfamily cooperation is necessary for the accomplishment of some tasks. Collaboration has a functional value in rural areas. On the other hand, in urban families the breadwinner has to compete individually for job and money. Here competitiveness is of functional value.

A confounding aspect in Madsen's study (1967) is that the rural and urban populations investigated by Madsen include a covarying difference of social class. That is, subjects from rural areas represented a lower socioeconomic level in terms of education and income of families than did subjects from urban areas. The effects of social class and
region on cooperative behavior are therefore confounded in this study. Madsen himself reports no difference between rural and urban poor children, but both groups differed significantly from urban middle-class children. From this result it appears that the variable of social class has a stronger influence on a child's cooperative/competitive behavior than does urban or rural environment. However, alternative explanations could account for differences in cooperative and competitive behavior among rural and urban poor children. The poor urban child might cooperate because he or she lacks enough self-esteem to compete, whereas the rural child might act in accordance with social norms which are incompatible with competitive behavior. This explanation is hypothetical, but it shows how important it is to analyze the determinants of cooperative behavior in detail.

Developmental Aspect

Irrespective of cultural and environmental influences, competitive behavior increases with age (Madsen, 1967, 1971; Richmond and Weiner, 1973). Developmental or maturation processes which have not yet been specified by empirical research are apparently involved in the development of competitive behavior. Research findings reveal that the increase in competitiveness is highest between age 6 to 10, with no systematic difference being found between males and females. However, the effect of developmental processes seem to play a relatively minor role compared to environmental factors.
Social Learning Viewpoint

An adequate explanation for different attitudes regarding cooperation may be sought by examining different social experiences of children. Some explanatory principles can be derived from Social Learning Theory. Albert Bandura (1971, p. 161) states the social learning view that "the combined use of modeling and reinforcement procedures is probably the most efficacious method of transmitting, eliciting, and maintaining social response patterns." He (1971, p. 160) further reports results from a study done by Chittenden suggesting that "of even greater interest is the finding that children who had observed the discriminative modeling displayed a significant decrease in domination and an increase in cooperativeness." The explanation that cooperative and competitive behaviors are performed in response to exposure to a cooperative or competitive model has further empirical support, provided by Braver and Barnett (1976). Results of their study show that observation of a competitive or cooperative model leads to a hypothesis in the observer about which behavior will be appropriate for further actions. This hypothesis then serves as a guide for the observer's behavior in similar situations.

Besides modeling, reinforcement and punishment contingencies also control the behavior of a child. When the child is reinforced for display of competitive behavior he or she will learn that competition is socially acceptable. The child who is punished for competing but rewarded for collaboration will develop cooperative attitudes. "One can,
of course, influence the degree of social interaction between persons even on an individualistic basis simply by rewarding cooperative responses" (Cohen and Lindsley cited in Bandura 1971, p. 280).

A somewhat related issue is described by Braver and Barnett (1976) who found that the nature of a task presented to children determines the attitudes that children develop toward the task. A cooperative task (defined by these investigators as a task in which the solution can either be found by all children involved or by none of them) leads sooner or later to collaboration among the children. Contrarily, a task which demands competition increases competitive behavior; defined by Henderson and Bergan (1976, p. 480) as "activity in which individual goals can be attained only at the expense of others involved in the activity." The solution of the task serves as a reinforcement for the displayed strategy. Richmond and Weiner further comment that "an individual is most likely to be cooperative when he perceives the realization of desired goals through collaborative rather than oppositional efforts with others" (Richmond and Weiner, 1973, p. 330).

**School as Socializing Agent**

Modeling and reinforcement are major techniques used by social agents to mold social norms within a child. The school is one important institution in which social learning takes place. The sudden increase of competitive behavior in American schoolchildren between the age of 6 and 10 can not be simply explained by maturation. School teachers in traditional schools foster the development of competitive achievement
motives by demanding individual performance and by evaluating student performance with norm referenced procedures. Vance and Richmond state that "children are taught that success means being better than someone else" (Vance and Richmond, 1975, p. 225).

Relevant Empirical Evidence

Although individual performance is still emphasized in traditional school programs, there is evidence to believe that cooperative interaction would be more efficient. A study by McClintock and Sanquist (1976) suggests that students who work in groups created by mutual interest were more likely to work overtime without supervision than were other students. Also they found that group performances of students were better than individual performances of the best student in the group.

Besides positive effects on a student's cognitive development, cooperative learning also has a beneficial influence on the social and emotional development of pupils. Seta, Paulus and Schkade (1976) found that competition produces a climate of anxiety and mistrust. The higher the level of arousal the less effective is learning. If other classmates are perceived as cooperators, the individual will feel supported which will reduce anxiety and enhance learning. Other emotional effects are reported by Johnson et al. (1976) in their investigation of 30 fifth-grade white working-class children studied under either individualized or cooperative conditions. The cooperators reported significantly more intrinsic motivation, as measured with a questionnaire, than
did the competitors. Competitors scored higher on extrinsic motivation. Eighty-one percent of the cooperators checked the item "I like studying this way," whereas only 57 percent of the competitive children agreed with this statement. Apart from that aspect, cooperators also developed different attitudes toward peers. They scored significantly higher on an altruism test (donating a token) and they recognized feelings of other children more correctly than did competitors. Apparently collaboration increases empathetic abilities of students.

Another study by Ames, Ames and Felker (1977, p. 6) reports that children who failed in competitive conditions rated themselves less capable and less deserving of reward and experienced greater negative effect than did those who failed in non-competitive settings. Competitive reward contingencies appear to accentuate the negativism of self-attributions and affective feelings.

In accordance with these results a study by Blaney et al. (1977) describes that fifth-grade students under cooperative learning conditions significantly increased their scores on a self-esteem questionnaire during a six week treatment procedure. Within the same time the scores of control subjects decreased slightly. Feelings of liking their peers also increased under cooperative learning conditions.

Open versus Traditional Curriculum

The open school ideology puts a strong emphasis on the development of social and emotional competencies of children. To reach this goal, open schools are structured in a way which allows the maximum amount of social interaction within the classroom for each child and in that regard they obviously differ from traditional settings. In many
open classrooms children are neither grouped by grade nor do they have fixed timetables. Pupils are often assigned a homeroom by broad age groupings, but they are rather free in making up their own schedule of course work. Classrooms are divided into interest areas which provide various learning materials. Several teachers and teaching aids often work at the same time within one classroom. Teaching is conducted on the basis of small groups and individual instruction. Students are neither graded nor assessed on a norm referenced basis. They are encouraged to study at their own pace. The open environment provides ample stimulation for art work and social activities. Children can talk to each other at any time of the day. Interaction with peers and teachers is considered to be part of the learning experience. Many learning and problem solving activities implicitly require cooperative or interdependent strategies.

Traditional organization differs from this pattern in many respects. Children are grouped on an age-graded basis. They are assigned a fixed position (usually a desk or location at a table) within a classroom. Goals and curriculum are specified by the teacher. He determines the academic standards. By testing and by grading individual performance, the pupils are evaluated by comparison with each other. There is a minimum of communication among students during instructional activities. The teacher determines the material to be learned and the approach to be followed, while the students have little control over the content of the curriculum.
It can be expected that curricula which are so differently structured as are open and traditional classrooms have different influences on a child's development. Johnson and his collaborators summarize the outcomes of their research as follows: "The way in which teachers structure classroom learning determines the way in which students interact with each other and with the teacher, which in turn affects the cognitive and affective outcomes of instruction" (Johnson et al., 1976, p. 446). In the open instructional program the child is rewarded for all kinds of social interaction. The child experiences a lot of personal control over his activities and relationships with other people. The tasks and instructions offered by teachers, peers, or the child himself imply collaboration of the people involved. Teachers and peers are cooperative models who create a climate of mutual support. In the traditional school setting rewards are given contingent upon competitive behaviors. The top students are distinguished from the average students. The rank of a child in the classroom implies an evaluative statement about the person as a whole. Thus it is important for the child to be better than others in order to feel accepted by teachers, parents and peers. The child is exposed to tasks which require the proof that he or she can individually perform better than others. The student has little control over the field in which he wants to excel since he has to compete against general standards in a number of required subject areas.
Locus of Control Phenomenon

The different experiences that a child has in various social settings influence the child's concept about the world as well as about himself (Wattenberg and Clifford, 1964). Reported studies suggest that the preference for either cooperative or competitive behavior is related to the self-concept of a child (Johnson et al., 1976; Seta et al., 1976; Blaney et al., 1977). One aspect of self-concept is the individual's perception of how much control he or she experiences in and over different situations. Individuals who attribute behavioral outcomes to their own actions are said to have an internal locus of control. Individuals who attribute behavioral outcomes mainly to external sources, such as luck or misfortune, are considered more externally controlled.

As pointed out earlier, the degree of control over the environment given to a child is a crucial factor of contrast between open and traditional education settings. In an open setting the child himself is supposed to control his behavior. In a traditional school the child is declared responsible for his own performance, but does not have much control over such aspects of the school situation as goals and methods. It seems likely that this situational difference may influence children in open and traditional educational settings to develop different beliefs about why certain things happen to them.

Empirical Evidence

Crandall, Katkovsky and Crandall (1965) investigated beliefs of children about the locus of control in academic achievement
situations. They used the Intellectual Achievement Responsibility (IAR) Questionnaire, a scale consisting of 37 items measuring attitudes in academic success and failure situations. Results of the study revealed a low correlation between items measuring children's attributions of success and items measuring attributions of failures. Crandall et al. (1965, p. 101) point out that "... assuming responsibility for successful intellectual-academic experiences may be different from assuming responsibility for failure experiences." They further state (p. 100) that "children's assumptions of responsibility causing their academic-intellectual failures is a somewhat more stable belief than that for causing their success." Crandall and her colleagues administered the scale to 923 elementary- and high-school students, representative of students in diverse kinds of communities. Scores on the IAR scale were analyzed for all grade levels separately. Also subscales measuring success attribution and failure attribution were separately considered. As an overall evaluation of their data the authors express their view that "common observation would indicate that parents and teachers attempt to promote and encourage a belief in personal responsibility for intellectual-academic success very early in the child's training" (Crandall et al., 1965, p. 99).

Rationale for Present Research

The intentions of a teacher in an open classroom are quite different from those stated in the above quotation. Instead of fostering self-responsibility for intellectual achievement, open education
emphasizes each individual's social responsibility for himself as well as for others. A distinction between purely academic situations and situations dealing with social relationships on a non-academic basis seems useful and necessary.

Robinson (1974, p. 17) states that "open education seems more a set of attitudes and assumptions about children and how they learn than a specific method or approach." He further points out that (p. 22) "... little research has been carried out to justify the claims of the open education proponents." The purpose of this field study was to assess the effects of an open school program compared to a traditional program upon the degree of cooperativeness demonstrated by its pupils. In addition, beliefs of open and traditional school children about the locus of control in academic and social (non-academic) situations were measured. The study was designed to answer three questions: (1) Does the open instructional program affect children's attitudes toward cooperative problem solving; i.e., are open school children more cooperative than children from a traditional school? (2) Do open school children and traditional school children differ in their beliefs about the locus of control in achievement and other social situations? (3) Is locus of control in achievement situations correlated with locus of control in social situations?

It was hypothesized that open school children would be more cooperative than traditional school children. The educational principles of open programs led us to the hypothesis that open school children might perceive more internal control in social situations. Results of
the study of Crandall and colleagues (1965) suggest that children from traditional schools would be more internally controlled in achievement situations. Furthermore it was expected that locus of control assumed in achievement situations is a quite different phenomenon than locus of control perceived in social situations.
CHAPTER 2

METHOD

Subjects

The subjects in this study were 89 fourth- and fifth-graders of two elementary schools in the Tucson, Arizona School District Number One. Forty-five of the children attended a traditional elementary school; forty-four of the children attended an open exploratory learning center. The two schools were suggested by administrators in the central administration of the school district as representing contrasting approaches to instructional organization while serving populations of comparable socio-economic background and similar ethnic composition. However, in the traditional school about 60% of the children were of background other than Anglo American. The majority of these children was Mexican American. The open school had only 20% of the children being of other background than Anglo American. This discrepancy apparently resulted from the fact that many Mexican American parents in the open program attendance area elected to send their children to more traditional schools. Although the difference in ethnic composition between the schools is considerable it does not constitute a threat to the external validity of the study. Since Madsen (1967) found Mexican American children to be less competitive than Anglo American children, the bias would be expected to affect the data in a direction opposite
to the hypothesis which stated that traditional school children would be more competitive than open school children.

The pupils were chosen from each school according to their grade level. In the traditional school one fourth-grade and one fifth-grade classroom were selected in which the teachers were willing to participate in the study. The total number of children in these two classrooms was 46. All of them were selected to participate in the study. The population from the open education program consisted of all fourth- and fifth-graders who had been in the program long enough to adjust to it. Because of cross-age grouping practices in the open school, the fourth- and fifth-graders in this environment came from a variety of different homerooms. From a list of all fourth- and fifth-graders in the school, teachers identified those who had not attended the open school long enough to become adapted to it and who therefore were not representative of open education students. These students were eliminated from the population. The remainder equaled a number of 44 children who were all included in the study. During the course of the investigation one subject in the traditional school could not be tested because he was absent from school.

**Instruments and Tasks**

The three instruments used in the study were:

1) A questionnaire to measure beliefs about locus of control in achievement situations.
2) A questionnaire to measure beliefs about locus of control in social situations.

3) A game to assess cooperative/competitive game strategies.

The questionnaire which measured locus of control in achievement situations was adapted from the Intellectual Achievement Responsibility (IAR) Questionnaire developed by Crandall et al. (1965). From the IAR questionnaire only the 17 items which assess responsibility for intellectual-academic failures were selected. The items chosen from the total questionnaire were more consistent over time and quite uncorrelated to the rest of the instrument (Crandall et al., 1965). The questionnaire used in the present study is referred to as the Modified Intellectual Achievement (MIAR) Questionnaire.

Parallel to the MIAR questionnaire, a Social Responsibility (SR) Questionnaire was constructed consisting of 14 items of similar structure and length to the items of the MIAR scale. Draft items for the scale were discussed with a teacher and modified as necessary to make the language understandable for fourth- and fifth-graders. Neither questionnaire had been pilot tested.

To measure cooperativeness a marble-pull game devised by Millard Madsen (1971) for that purpose was used. Henderson and Bergan describe the game as follows:

The marble-pull game consists of a rectangular plank to which short table legs may be attached. The game board stands at a comfortable height for children who play while seated on small chairs. Positioned at the midpoint of the board at each end is an eyelet through which a string may be passed. Just in
front of the eyelet is a hole in the game board, with a cup attached beneath it to hold any marbles which fall into the hole. The game is played by two children at a time. A plexiglass marble holder is placed in the middle of the board and a string attached to each end is threaded through the eyelet at the ends of the board. When a marble is placed in the marble holder, it is possible for the players to pull it toward the hole at their own ends of the board. If the marble holder passes over one of the holes in the game board, the marble will fall from the opening in the bottom of the holder into the cup of whichever child has pulled the holder to his or her own end of the board. The interesting feature about this apparatus is that the two halves of the marble holder are held together with magnetic inserts. Therefore, whenever the children pull against each other with much force, in an attempt to get the marble to their marble cup, the marble holder breaks at the midpoint and the prize rolls into a groove at either side of the game board. The players must therefore choose between competition and cooperation. This feature makes it impossible for either child to win any marble through competition because neither child wins the marble when the holder comes apart. Competition is therefore maladaptive—that is, it is impossible to win by competing with the other player (Henderson and Bergan, 1976, p. 293).

The total number of marbles won in the game was the operationalized measure of cooperativeness.

The independent variable in the present study was traditional versus open instructional programs. The variable has not been measurably defined beforehand. The contrasting schools in which the study was carried out were not empirically identified as representative open and traditional schools, but there was ample descriptive evidence to indicate that the two settings differed substantially from each other along a traditional-open instructional continuum. A limitation of the design was that the independent variable is directly related to a particular school. A distinction between the effects of school program and other school-specific variables (e.g., neighborhood) which might
influence the data cannot be made. This limits the interpretation of the findings somewhat since outcomes cannot be unambiguously attributed to open or traditional curricula in general.

The three dependent variables employed in the study were: 1) scores on the MIAR questionnaire; 2) scores on the SR questionnaire; and 3) number of marbles won in the marble-pull game.

Procedure

The questionnaires were administered first to groups of approximately ten pupils at a time. This was done to ensure better control over the group during administration of the scales. The Instructions to both questionnaires were read aloud to make sure that every child understood what he or she was supposed to do. The instructions for each of the two questionnaires were as follows:

Students have different beliefs why certain things happen to them. We know that these beliefs differ from one individual to another, and now we are interested in finding out whether these beliefs differ among students of different elementary schools. It would be very helpful if you would take a few minutes to complete this questionnaire. We are interested in the average responses in this class as a group, and there will be no attempt to associate your name with your answer to the questions. The results will be summarized in group form, and when the study is completed we will come back and let you know what we learned. You are not required to complete this questionnaire, but, of course, we do hope you will participate. It will take less than ten minutes to complete the questionnaire. If you decide not to complete the form after you begin, you are free to withdraw at any time. We shall assume that if you complete this questionnaire you are giving your consent to participate.

Subsequent to the instructions every item was read aloud while each child had a form of the questionnaire in front of him. Each item was read aloud to compensate for any differences in reading ability.
Administration of each scale took 10 to 15 minutes. Each of the administration groups in each school filled out both scales within 20 to 30 minutes during class hours in a classroom separate from their own.

The second task to be administered was the marble-pull game. Within each sample children were randomly assigned to pairs to play the game. This procedure was carried out twice, giving each child the opportunity to play the game, with a different partner each time. This was done to account for extraneous situational influences such as friendship or enmity of partners, or game constellations. A cooperative child would have little chance to show his cooperativeness when paired with a competitor, while on the other hand a child might cooperate because his partner told him to but still not have the concept of cooperation himself. Double random pairing was expected to disclose each child's attitude toward the game more precisely and to make up for loss of information due to situational bias.

The instructions for the marble-pull game were standardized. The experimenter first explained the purpose of the game saying: "This is a game with which you can win marbles. I put the marble here into the marble holder." The experimenter then moved to one side of the board, stood beside one child and said: "If you pull the marble holder to your side and the marble drops into your hole, you win the marble." While talking, the experimenter demonstrates the game. Then she moved to the other end of the board, stood beside the other child and explained while pulling the string to the other side: "If you pull the marble holder to your side and the marble drops into your hole, then you
win the marble." During the demonstration care was taken that the marble holder did not break in the middle. After this demonstration the device was put back to the center of the board and the children were told to start with the game. If they pulled at the same time so that the marble holder broke apart, the experimenter removed the marble from the board, simply informing the players that this marble was lost. No further explanation about the game was given. Every session took about 5 minutes. Each pair of children had 10 trials per game. The game session took place in a separate room. No observers other than the experimenter were present during the game.
CHAPTER 3

RESULTS

A One Factor Analysis of Variance was performed (open school versus traditional school) on the cooperation dependent measure. Also, a 2x2 Repeated Measures ANOVA (groups by trials) was carried out with the same set of data. Pearson Correlation Coefficients across all dependent measures were obtained as well as means and standard deviations of all dependent measures. A reliability analysis for the MIAR and the SR questionnaire was conducted.

Findings on the Cooperation Measure

In each analysis of variance, a significance main effect was found for groups \( F = 68.29, \text{df} 1, 87, p < .000 \) as can be seen in Table 1. The two way groups by trials ANOVA discloses a significant main effect for trials \( F = 17.90, \text{df} 1, 87, p < .0002 \) and a significant groups by trials interaction \( F = 7.11, \text{df} 1, 87, p < .009 \). Figure 1 illustrates the significant group effect. In both trials open school children were significantly better at winning marbles than were children from the traditional group. Table 2 describes the significant trial effect. The children were in general more cooperative on the second trial than on the first trial. Table 2 also portrays the significant interaction. Both groups of children responded differently to the two
Table 1. Summary of Analysis of Variance for Cooperation Task

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<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Treatment</td>
<td>1</td>
<td>465.39</td>
<td>68.29</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>87</td>
<td>6.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Comparison of Number of Marbles Won During First and Second Trial by Open and Traditional School Children.
Table 2. Summary of Repeated Measures Analysis of Variance for Cooperation Task.

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>1</td>
<td>232.69</td>
<td>68.29</td>
<td>.000</td>
</tr>
<tr>
<td>Error</td>
<td>87</td>
<td>3.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trials</td>
<td>1</td>
<td>39.64</td>
<td>17.90</td>
<td>.000</td>
</tr>
<tr>
<td>Groups x Trials</td>
<td>1</td>
<td>15.75</td>
<td>7.11</td>
<td>.009</td>
</tr>
<tr>
<td>Error</td>
<td>87</td>
<td>2.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

trials of the game. The increase in number of marbles during the second trial was much higher for open school children than for traditional school children (see Figure 2).

Open school children won 94 marbles on the first trial and 155 marbles on the second trial. Traditional school children won 20 marbles on the first and 36 marbles on the second trial. The mean number of marbles won on the first trial by open school children was 2.14 (see Table 3) compared to a mean of .44 for the traditional sample. The difference between these means was significant ($t = 4.83, p < .000$).

Means on the second trial were 3.68 for open school and .80 for traditional school children. This difference is also highly significant ($t = 7.91, p < .000$). Consequently, data for both trials considered together show a significant difference between the means of open school children (5.82) and the mean of traditional school children (1.24) on the cooperation variable ($t = 8.22, p < .000$).
Figure 2. Comparison of Number of Marbles Won by Open and Traditional School Children on the First and on the Second Trial of the Cooperation Game.
Table 3. **Summary of Mean, Standard Deviation, and T-Test of Group Means for Cooperation Scores.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>T-Value</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trial 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open S.</td>
<td>44</td>
<td>2.136</td>
<td>2.06</td>
<td>4.83</td>
<td>.000</td>
</tr>
<tr>
<td>Trad. S.</td>
<td>45</td>
<td>.444</td>
<td>1.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Trial 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open S.</td>
<td>44</td>
<td>3.681</td>
<td>1.97</td>
<td>7.91</td>
<td>.000</td>
</tr>
<tr>
<td>Trad. S.</td>
<td>45</td>
<td>.800</td>
<td>1.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Coop.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open S.</td>
<td>44</td>
<td>5.818</td>
<td>3.23</td>
<td>8.22</td>
<td>.000</td>
</tr>
<tr>
<td>Trad. S.</td>
<td>45</td>
<td>1.244</td>
<td>1.81</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Open S. = Open School Sample;  
**Trad. S. = Traditional School Sample.*

Within the open school sample, 22 out of 44 children displayed cooperativeness during the first trial. Two of them became competitors during the second trial of the game while the total number of cooperators within the sample from the open setting increased to 34. Within the sample from the traditional school only 4 children out of 45 employed a cooperative strategy during the first trial. Three of them switched to competition during the second trial. A total of 8 children from the traditional setting cooperated during the second trial.
Findings on the Locus of Control Measures

Children from the traditional school scored significantly higher on the MIAR questionnaire than did open school children (see Table 4). The mean score for the former was 13.11 while the mean score for open school children on the MIAR scale was 9.55. The T-test showed that this difference was significant ($t = -7.00, p < .000$). The mean score on the SR questionnaire for traditional school children was 8.67; the mean score for open school children on the same scale was 8.00. This difference was statistically nonsignificant.

Pupils in the open setting answered 56% of the items of the MIAR questionnaire with responses indicating internal control (see Table 5). Pupils in the traditional school gave internality replies to 77% of the achievement items. Open school students answered an average of 57% of the items on the SR questionnaire in a direction indicating internal locus of control while traditional school children responded internally to 61% of the items.

Figures 3 and 4 illustrate the difference in responsiveness to the two questionnaires by the two groups. The difference is largest for the MIAR questionnaire and relatively small for the SR questionnaire. Open school children respond at about equivalent levels to both scales whereas traditional school children react significantly more internally to the MIAR scale than to the SR scale.
Table 4. Summary of Mean, Standard Deviation, and T-Test of Group Means for Locus of Control Scores.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>T-Value</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIAR-Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open S.</td>
<td>44</td>
<td>9.546</td>
<td>2.85</td>
<td>-7.00</td>
<td>.000</td>
</tr>
<tr>
<td>Trad. S.</td>
<td>45</td>
<td>13.111</td>
<td>1.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR-Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open S.</td>
<td>44</td>
<td>8.000</td>
<td>2.37</td>
<td>-1.34</td>
<td>.182</td>
</tr>
<tr>
<td>Trad. S.</td>
<td>45</td>
<td>8.667</td>
<td>2.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( ^a \) Open S. = Open School Sample;  
\( ^b \) Trad. S. = Traditional School Sample.

Table 5. Percentage of Items of Each Questionnaire Answered in Terms of Internal Control by Open and Traditional School Children.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Open School</th>
<th>Traditional School</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of internal responses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>on MIAR scale</td>
<td>56</td>
<td>77</td>
</tr>
<tr>
<td>% of internal responses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>on SR scale</td>
<td>57</td>
<td>61</td>
</tr>
</tbody>
</table>
Figure 3. Comparison of Percentages of Internal Responses of Open and Traditional School Children on the MIAR and SR Questionnaires.

Figure 4. Comparison of Differences between Samples from Open and Traditional School with Respect to Percentage of Internal Responses to MIAR and SR Questionnaires.
Correlational Findings across All Dependent Measures

The Pearson Product Moment Correlation among all dependent measures was obtained separately for each school's subsample as well as for the total sample. For the traditional school children no correlation could be found between MIAR scores and SR scores ($r = -.061$) as shown in Table 6. SR scores correlated moderately with trial 2 on the cooperation game ($r = .287$, $p < .10$) and with the total cooperation scores ($r = .298$, $p < .10$). For the open school children the correlation between MIAR score and SR score is positive ($r = .372$, $p < .02$). For these children the SR scores were uncorrelated with both cooperative trials as well as with the total measure of cooperativeness ($r = -.097$) as can be seen in Table 7.

The overall correlation analysis for the pooled sub-samples shows a negative correlation between MIAR scores and first ($r = -.280$, $p < .01$) and second trial ($r = -.427$, $p < .01$). Scores on the MIAR questionnaire were negatively correlated with cooperativeness ($r = -.423$, $p < .01$) as shown in Table 8.

Comparison of the SR scores of only the cooperative children in each subsample was conducted. Cooperators were defined by the number of marbles won by taking turns; there was no mediocre cooperativeness, either children won nearly all marbles of a game session or almost none. Thus, cooperative children could be easily identified. The comparison showed the following results: the mean score for cooperators in the open school on the SR questionnaire was 7.77. The group mean was 8.00,
Table 6. Pearson Correlation Coefficients of All Dependent Measures for Traditional School Subsample. (n=45)

<table>
<thead>
<tr>
<th></th>
<th>MIAR Score</th>
<th>SR Score</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Total Coop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIAR Score</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR Score</td>
<td>-0.061</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial 1</td>
<td>0.146</td>
<td>0.125</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial 2</td>
<td>-0.149</td>
<td>0.287*</td>
<td>0.045</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Total Coop.</td>
<td>-0.029</td>
<td>0.298*</td>
<td>0.630***</td>
<td>0.804***</td>
<td>1.000</td>
</tr>
</tbody>
</table>

*Total Coop. = Total Cooperativeness on both trials.
*Significant at the .10 level.
***Significant at the .01 level.

Table 7. Pearson Correlation Coefficients of All Dependent Measures for Open School Subsample. (n = 44)

<table>
<thead>
<tr>
<th></th>
<th>MIAR Score</th>
<th>SR Score</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Total Coop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIAR Score</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR Score</td>
<td>0.372**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial 1</td>
<td>-0.053</td>
<td>-0.109</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial 2</td>
<td>-0.018</td>
<td>-0.048</td>
<td>0.279*</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Total Coop.</td>
<td>-0.045</td>
<td>-0.097</td>
<td>0.810***</td>
<td>0.790***</td>
<td>1.000</td>
</tr>
</tbody>
</table>

*Significant at the .10 level.
**Significant at the .05 level.
***Significant at the .01 level.
Table 8. Pearson Correlation Coefficients of All Dependent Measures for the Total Sample. (n=89)

<table>
<thead>
<tr>
<th></th>
<th>MIAR Score</th>
<th>SR Score</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Total Coop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIAR Score</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR Score</td>
<td>.243**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial 1</td>
<td>-.280***</td>
<td>-.090</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trial 2</td>
<td>-.427***</td>
<td>-.023</td>
<td>.443***</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Total Coop.</td>
<td>- .423***</td>
<td>-.068</td>
<td>.816***</td>
<td>.880***</td>
<td>1.000</td>
</tr>
</tbody>
</table>

a Total Coop. = Total Cooperativeness on both trials.
** Significant at the .05 level.
*** Significant at the .01 level.

as reported earlier in Table 4. The difference between these means was not significant. For the cooperative children in the traditional setting the mean score on the SR questionnaire was 10.1. The group mean for the traditional subsample was 8.66 (see Table 4). This difference was statistically nonsignificant. However, the mean scores of the open school cooperators and the traditional school cooperators are significantly different. The difference between 7.77 and 10.1 is significant at the p < .05 level (t = 2.45, df 28).
CHAPTER 4

DISCUSSION

From the reported results several conclusions appear feasible. Students enrolled in the open school adapted much faster to the cooperative structure of the game presented. The difference between the two subsamples, expressed by the number of marbles won in the game, is impressive. The results seem to support the hypothesis that open school children behave more cooperatively than do traditional school children.

The second hypothesis which stated that cooperative children would score higher on the SR questionnaire whereas competitive children would reveal higher scores on the MIAR questionnaire could only be partly supported by the present data. The results showed that the significantly more competitive children of the traditional school also scored significantly higher on the Modified Intellectual Achievement Responsibility Questionnaire. Open school children scored amazingly low on this scale. Compared to the means that Crandall et al. (1965) found by applying the scale to 202 fourth- and fifth-graders of various schools, the traditional sample had slightly higher scores (their score was 12.0 as compared to the score of 13.11 obtained in this study). Since Crandall et al. included different schools from diverse communities in their study, for example country, village, and city schools, the slightly higher score for a sample from a city school in the present study
seems understandable. With respect to the mean scores found by Crandall et al., the low mean score of open education children (9.55) appears to be even more striking. These 44 children of the open school seem to differ in their attitudes toward achievement situations from the broader sample of Crandall et al. Open school children in this present study perceive themselves as being less responsible for their own academic failures than do children from a traditional school. The latter part of the second hypothesis, which anticipated that open school children would score higher on the Social Responsibility Questionnaire could not be affirmed. Open school children did not perceive more internal control over social failure situations than did the traditional comparison group.

The third hypothesis that internal responsibility in achievement and social situations are uncorrelated phenomena within a person could only find support within the traditional subsample. Responses to the two questionnaires were independent of each other for children from the traditional school but they were correlated with each other for open education children. The data provide support for the explanation that the differentiation between achievement and other social experiences is a culturally fostered one. Depending on what kind of experiences a child has, he or she perceives both achievement and social aspects of his life as either intertwined or separated. Data from this study disclosed that children in the traditional setting tend to differentiate the intellectual-academic aspects of their lives from other interpersonal social situations, school being the domain of academics. On the
other hand, open school children did not appear to distinguish these aspects of their lives. In that regard they represent a personalization of a school system in which any kind of social experience is considered essential to learning.

An interesting result emerged by comparing the scores of only the cooperative children of each school with each other. The degree of social responsibility of cooperators in the traditional school was much higher than the degree of social responsibility of open school cooperators. It seems we can not generalize to all cooperators with one interpretation. The kind of relationship between cooperativeness and self-responsibility in social situations seems to depend on the setting in which the cooperation takes place and the kind of educational experiences children have had. A cooperative child in a competitive setting might have to accept much greater responsibility in order to succeed with his cooperative strategy than would a cooperative child in a cooperative setting. In concrete terms, cooperation for a traditional school child in this study would mean giving the marble away, letting the partner win first, or taking the responsibility of making the other child aware of the "right" way of playing the game. On the other hand, a cooperative child in a cooperative setting would not have to carry the responsibility alone. He or she may hold an expectation for the game partner to do something to the benefit of both of them as well. In the last analysis, a cooperative situation involves mutual dependence of the partners involved. The cooperative input of a traditional school child would have to be much higher because he or she can not necessarily
expect collaboration from the partner. This might explain the relatively high mean score of cooperative children in the traditional setting on the Social Responsibility Questionnaire.

Besides interpretations which are directly drawn from the obtained data, some explanation might be hypothesized by taking results of other studies into consideration. One question is: why did so few children from the traditional school become aware of the cooperative strategy required to succeed in the game? It might be a matter of increased tension found to be characteristic for competitive situations. The increased level of arousal in turn reduces flexibility in thinking and problem solving. In fact, it was obvious to the experimenter in this study that children in the traditional school rather tried to win by increasing their competitiveness by pulling the string much harder and faster. They did not try out other approaches to the problem. Additionally, during the game session they talked much less to each other than did open school children. This behavior reflected differential social norms in the contrasting educational environments and certainly decreased the probability of finding the solution of the task.

Another issue mentioned earlier (Ames et al., 1977) suggested that students' altruistic behavior increases during cooperative learning sessions. Applied to the present study, it could be interpreted that the act of donating a marble to another child might have been much easier for an open school child than for a child from the traditional
setting. Again, the personal impression of the experimenter was that children in the traditional setting had more emotional reluctance to give a marble away to another child without getting one themselves. Some children pulled the string away right before the marble could drop in the hole of the other player. It is very likely that these emotional rather than intellectual factors caused some of the rigidity of the competitive children.

Open educational programs seem to affect a child's attitude toward social interaction in that an emphasis is placed on cooperation. In this respect open school children may differ from children enrolled in traditional programs. The present limited study suggests that open school organization seems to succeed in their attempt to connect intellectual and social experiences. Traditional school programs seem to succeed in developing self-responsibility attitudes for intellectual achievement in children. It is obvious that school life has an important influence on the social development of children. Simplistic expectations concerning the outcomes of alternative forms of instructional practice seem clearly unwarranted.
APPENDIX A

MIAR AND SR QUESTIONNAIRES

Intellectual Achievement Responsibility (IAR) Questionnaire

1. When you have trouble understanding something in school, is it usually
   a) because your teacher didn't explain it clearly, or
   b) because you didn't listen carefully?

2. Suppose a person doesn't think you are very bright and clever
   a) can you make him change his mind if you try to, or
   b) are there some people who will not think you are very bright no matter what you do?

3. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
   a) because you didn't work hard enough, or
   b) because you needed some help, and other people didn't give it to you?

4. When you find it hard to work arithmetic or math problems at school, is it
   a) because you didn't study well enough before you tried them, or
   b) because your teacher gave problems that were too hard?

5. When you forget something you learned in class, is it
   a) because your teacher didn't explain it very well, or
   b) because you didn't try very hard to remember?

6. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
   a) because of something you did, or
   b) because they happen to be feeling cranky?

7. When you don't do well on a test at school, is it
   a) because the test was especially hard, or
   b) because you didn't study for it?

8. Suppose you don't do as well as usual in a subject at school. Would this probably happen
   a) because you weren't as careful as usual, or
   b) because somebody bothered you and kept you from working?
9. If you can't work a puzzle, is it more likely to happen
   a) because you are not especially good at working puzzles, or
   b) because the instruction wasn't written clearly enough?

10. If a teacher says to you, "Try to do better," would it be
    a) because this is something she might say to get pupils to try
       harder, or
    b) because your work wasn't as good as usual?

11. When you read a story and can't remember much of it, is it usually
    a) because the story wasn't well written, or
    b) because you weren't interested in the story?

12. When you lose at a game of cards or checkers, does it usually
    happen
    a) because the other player is good at the game, or
    b) because you don't play well?

13. If a boy or girl tells you that you are dumb, is it more likely
    that they say that
    a) because they are made at you, or
    b) because what you did really wasn't very bright?

14. If a teacher didn't pass you to the next grade, would it probably
    be
    a) because she "had it in for you", or
    b) because your schoolwork wasn't good enough?

15. Suppose your parents say you aren't doing well in your schoolwork.
    Is this likely to happen more
    a) because your work isn't very good, or
    b) because they are feeling cranky?

16. Suppose you are showing a friend how to play a game and he has
    trouble with it. Would that happen
    a) because he wasn't able to understand how to play, or
    b) because you couldn't explain it well?

17. Suppose you're not sure about the answer to a question your
    teacher asks you and the answer you give turns out to be wrong.
    Is it likely to happen
    a) because she was more particular than usual, or
    b) because you answered too quickly?
Social Responsibility Questionnaire

1. Suppose your teacher does not pay attention to you in class. Would this happen
   a) because you are not very active this day in class, or
   b) because he is always more interested in other children?

2. Suppose you are quarreling with a class-mate, is it usually
   a) because he or she attacked you, or
   b) because you provoked the argument?

3. Imagine all children in your neighborhood are playing without you. Would that be
   a) because they don't like you, or
   b) because you didn't want to?

4. If your parents are upset with you, is it
   a) because you don't act right, or
   b) because they don't understand you?

5. When you drop the ball in a game is it mostly
   a) because you just need work on your catching, or
   b) because the others didn't throw right?

6. Suppose your parent would not help you in a very difficult situation. Would this happen
   a) because he knows you can do it alone, or
   b) because he has no time for you?

7. If your teacher blames you, would this probably happen
   a) because it's your fault, or
   b) because he doesn't like you?

8. If a boy or girl tells you that you are dumb, is it more likely to happen
   a) because you did something to them first, or
   b) do they try to tease you, no matter what you do?

9. Suppose you have a game you want your group to play and nobody wants to play. Is it
   a) because nobody cares what you have to say anyway, or
   b) because that particular game doesn't interest them?

10. Imagine you hit somebody. Would that happen
    a) because he or she made you do it, or
    b) because you felt like doing it?
11. Suppose you dislike somebody very much, is that likely to happen
   a) because that person is not very nice to you, or
   b) because you don't accept the way that person behaves?

12. Imagine your family moves to another town and you have a hard
time making friends. Would it probably happen
   a) because the others don't like strangers, or
   b) because you don't try to make friends?

13. Suppose your parents were much nicer with your brothers and
    sisters than with you. Would that be
   a) because of something you did, or
   b) because they just like your brothers and sisters better?

14. Imagine you feel very alone and sad. Would this be
    a) because you are just being moody, or
    b) because somebody made you feel this way?

Please answer the following questions:

1. Did you enjoy filling out the questionnaires?
   Why?

2. Have you ever thought much before about the kinds of questions you
   were asked?
LIST OF REFERENCES


