THE EFFECTS OF REINFORCED COOPERATIVE EXPERIENCE ON THE FRIENDSHIP PATTERNS OF PRESCHOOL CHILDREN

by

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

The ability to experimentally manipulate cooperative behavior during middle childhood has been firmly established (Azrin and Lindsley, 1956; Mithaug and Burgess, 1968). The common strategy in this research has been to reinforce cooperation (i.e. matched responding) during Azrin and Lindsley's stylus-hole game. Attempts to use this experimental procedure, and modifications of it, to shape cooperative behavior in preschool children have been less successful (Brotsky and Thomas, 1967; Vogler, Masters, and Morrill, 1970). In each of these studies cooperative responses were obtained by less than 50% of the preschool subjects.

Sherif and Sherif (1964) stimulated a more naturalistic approach to the study of cooperation in their research of intergroup conflict and cooperation using fifth grade boys. Their study found specifically that the introduction of cooperation between groups served to reduce intergroup tensions and increase cross-group friendship preferences. The "common goals" approach used by Sherif and Sherif to stimulate cooperation has served as a basis for later naturalistic methods of producing cooperative response between individuals (Gottheil, 1955; Ballard, Gottleib, Corman and Kaufman, 1977; Oden and Asher, 1977). The "common goals" approach of eliciting cooperative behavior has not been applied to preschool populations.

Gottheil (1955) found increased social status rankings in adolescents after group work on essay assignments. Low-status children were paired with more preferred peers and given joint essay assignments.

Results showed that cooperative work on the essay increased the intra-group status of the low preference children. Haskett (1971) provided limited support of these findings in observing the individual peer preference differences before and after cooperation training in sixth graders. Haskett prompted cooperative play between both same-sex and opposite-sex pairs of children who had neutral preferences for playing with one another. The only significant difference for pre and post sociometric rankings was an increase in preference for the opposite-sex pairs. Cooperation in the study was elicited merely by a suggestion that the members of the pairs play jointly with a specific toy. Blau and Rafferty (1970) elicited cooperation in preschoolers and found sociometric ranking increases following the cooperation. It must be noted, however, that the sociometric posttesting occurred immediately following the reinforced cooperative experience. Research on social isolates (Oden and Asher, 1977; Ballard, Gottleib, Corman and Kaufman, 1977) found that the acceptance of isolates can be improved through coaching the skills necessary to engage or participate in group activities. Social isolates were enhanced in their friendship patterns by being exposed to methods of offering information about themselves, as well as drawing information from others in social situations.

The above findings suggest that offering mere proximity opportunities between children who do not choose each other sociometrically is not adequate for stimulating increased social preference between those children. The present study assumes that exposure to "common goals" (Sherif and Sherif, 1954), wherein each child must contribute near equal amounts of effort, will enhance the possibility

of increased interaction between dyad partners. Children of the same sex were paired on the basis of very low mutual interaction. These low interaction dyads were then exposed to reinforced cooperative experiences. It was expected that cooperative experience would increase the tendency toward mutual preference in naturalistic play and in sociometric choice. It was further hypothesized that this interaction increase would be minimal in a group of dyads experiencing mere proximity.

LITERATURE REVIEW

The literature pertaining to cooperation among children has dealt primarily with cooperative response acquisition as a dependent variable. Behavior modification techniques have been used almost exclusively in eliciting these cooperative responses (Azrin and Lindsley, 1956; Brotsky and Thomas, 1967; Mithaug and Burgess, 1968; Grieger, Kaufman and Grieger, 1976). The first section of this review reports the findings of these studies and the conclusions to be drawn about the relative strengths of methods used to produce cooperation.

Investigations of cooperation as an independent variable affecting other behaviors are not as extensive as those using cooperation as a dependent variable. There are, however, a variety of studies which observed social behavior as influenced by cooperation (Gottheil, 1955; Sherif and Sherif, 1961; Haskett,1971; Oden and Asher, 1977; Blau and Rafferty, 1970, Ballard, Gottlieb, Corman and Kaufman, 1977). These studies are reported in section two of the review and introduce the social behavior variables which have been researched in relation to varying levels of cooperative responding.

The third section of the review reports a series of studies which describe the traditional methods used in measuring social preference and social interaction (Parten, 1943; Dunnington, 1957; McCandless and Marshall, 1957; Marshall and McCandless, 1957; Moore and Updegraff, 1964; Gottman, Gonso and Rasmussen, 1975; Greenwood, Walker and Hops, 1977; Serbin, Tonic and Sternglanz, 1977). These studies deal with the application, validity and reliability of the methods of measuring the

two variables. The relative strengths of the two variables in assessing friendship patterns are also reported.

Modification of Cooperative Response Acquisition

The following studies are concerned with behavior modification methods of inducing cooperation between children. The studies deal with a range of issues affecting cooperative response acquisition, from reinforcement strategies and schedules in experimental settings to more natural contingencies within preschool classrooms.

Azrin and Lindsley (1956) developed a procedure to produce, maintain and eliminate cooperative responding in children through the use of simple reinforcement contingencies. These findings have formed a precedent for two decades of research in the area of cooperation. The majority of the research dealing with cooperation between and among children has been stimulated by the results and/or facilitated by the procedures of the Azrin and Lindsley study.

Azrin and Lindsley demonstrated that cooperation can be manipulated, without specific verbal command or instruction through the exclusive use of reinforcement and extinction. Twenty children ranging in age from seven to twelve years were arranged into ten dyads matched on age and sex. The dyads were then placed individually into a situation where cooperation between members yielded rewards in the form of jelly beans. The cooperation task involved the concurrent placing of styli by the two children into their respective holes in a table. The table was divided into two equal halves by a wire screen which prohibited the two children sitting on either end of the table from manipulating the other's stylus. Three small holes were in front of each child.

The children were told that the machine would periodcially give them candy for placing the styli into different holes. The candy was received in small cups. A red light on the apparatus flashed and one jelly bean was delivered contingent upon the placement of each child's stylus into opposing holes concurrently (within .04 seconds).

In an ABA reinforcement-extinction-reinforcement design, the candies were delivered as described for 15 minutes; followed by an extinction period of 15 minutes when candies were not given regardless of whether or not cooperative responding had occurred and; the reinforcement contingencies reinstated for a final 15 minute period. Each of the dyads acquired sustained cooperative responding within the first 10 minutes of the initial reinforcement period. According to the analysis, the median cooperative response rate per minute for the first three minutes of reinforcement was significantly lower than the rate during the final three minutes of that period ($p < .02$). The median cooperative response rate per minute during the final three minutes of the extinction period dropped significantly lower than the rate during the last three minutes of the initial reinforcement period ($p < .001$). The median number of cooperative responses per minute during the last three minutes of the extinction period was also significantly lower than the responses made during the last three minutes of the reinstated reinforcement period ($p < .001$). Azrin and Lindsley suggested that cooperation can be manipulated through operant conditioning techniques and found that reinforcement delivered to the dyad as a whole rather than both participants was sufficient in eliciting cooperation. The quick restoration of cooperative responding rates to their pre-extinction

level after the reintroduction of reinforcement illustrated the learning of the task requirements and the strength of the reinforcer in eliciting the cooperative response.

Mithaug and Burgess (1968) questioned the stability of the rates of cooperative responding when reinforcing the dyad as a whole rather than its individual members. The first of two studies conducted by Mithaug and Burgess attempted to reveal differences in rates of cooperative responding due to variations in group versus individual reinforcement, crossed with the presence or absence of individual feedback. The procedure involved a mechanical cooperation task similar to, but somewhat more advanced than, the Azrin and Lindsley apparatus. Increased complexity was in the form of 14 key choices to be punched by groupings of three children. Six triads of children, five to ten years of age participated. Group and individual feedback was provided in two forms by illuminating lights on a visible screen. Lights were also used to cue the appropriate key selection. Appropriate cooperative responding was described as the concurrent punching of the key corresponding to the illuminated light by all three children. Group feedback was delivered through a light on a wall screen and a counter of correct responses. Individual feedback was altered, according to conditions, through changes in activation of lights and counters on and beside the key apparatus. The reinforcements delivered varied across conditions in that triad members gained one cent for every 100 group responses when group reinforcement was being delivered and gained one cent for every 100 individual responses when individual reinforcement was in effect.

Three individual experimental manipulations of the feedback and reinforcement variables were conducted using separate ABA designs. The variable combinations used for the three independent experiments were; 1) Individual Reinforcement with Feedback versus Group and Individual Reinforcement with Feedback, 2) Group Reinforcement with Individual Feedback versus Group and Individual Reinforcement with Individual Feedback, 3) Group Reinforcement with Individual Feedback versus Individual Reinforcement with Feedback. The data was described in terms of mean differences with no reference to statistical analysis of these differences. In the first experiment cooperative responding increased with group response reinforcement and decreased when the group response reinforcement was removed. In the second experiment the absence of individual reinforcers strengthened group responding if individual feedback was available. The third experiment showed that group reinforcement with individual feedback strengthened cooperative responding over individual reinforcement with feedback. The study maintained that rates of cooperative responses were strongest when each group member received reinforcement contingent upon group responding and also received feedback on his individual performance.

Mithaug (1969) expanded his findings on the relative importance of group versus individual reinforcement in sustaining cooperative responses in a study very similar in design and apparatus to the above study. This study varied the relative reinforcement values for group versus individual reinforcement. Children five to ten years of age were divided into four groups of three and afforded the same task opportunity to earn points and pennies as in the original experiment. The alteration was

that periodic changes were made in the ratio of individual responses to group responses required for reinforcement. Both group and individual feedback were given continuously. Again, the analysis was purely descriptive. Children showed higher group responding than individual responding at all ratios descending down to the 3:1 point. At that point the child's attention was redirected to individual counters. Group rates of responding again increased as the ratio rose above the 3:1 mark. This finding suggests that in a mechanical task, cooperation gains must be substantially greater than individual gains in order to maintain cooperative responding.

In an attempt to establish cooperation between preschoolers, Brotsky and Thomas (1967) used an apparatus and procedure similar to that of Azrin and Lindsley. The device varied only in substitution of different colored levers to be pulled rather than holes to be filled with styli. Twenty-five dyads of children three to five years of age, chosen randomly, made up the sample.

Each child received an edible reward contingent upon the simultaneous pulling (within 15 seconds) of same color levers. Children were rated on cooperation scales by parents and teachers prior to the task situation and it was hypothesized that those dyads rated high in cooperativeness would emit more cooperative responses than those children rated lower in cooperation. The cooperative task session lasted 10 minutes with total cooperative and noncooperative responses calculated in two minute intervals. No significant differences in the amounts of cooperative responding occurred across the two minute intervals. No apparent cooperative response acquisition occurred and, due to increases

in total lever pressing and none in cooperative behavior, the authors suggested that lever pressing was learned rather than cooperation.

Vogler, Masters and Morrill (1970) experienced the same problems of Brotsky and Thomas in attempting to produce cooperative responding in preschool age children. Twenty preschool children, four and one-half to five and one-half years of age, were paired into dyads and exposed to a cooperative task (Azrin and Lindsley, 1956). The final goal was again to have the child place the styli into opposing holes of his partner's choice within a .5 second latency limitation. The study began with the requirement that the children place the styli into opposing holes with no latency restriction. Following consistent responding at this level a three second latency limitation was imposed and gradually lowered after consistent responding to the .5 lower limit. Sessions were terminated after 30 minutes.

Of the ten dyads, only five could be shaped to cooperate consistently. Only three of these five dyads reached the lower latency limit of .5 seconds. A t-test was conducted on the means of the ratios between individual and cooperative responses for the first 50 responses and the first 50 responses made after the latencies became contingent (for those five dyads achieving cooperation only). The difference between these two means was statistically significant ($p < .01$) and indicated that selective reinforcement control over cooperation was achieved for these dyads. The difficulties encountered here in shaping cooperative responding in preschool children support those experienced by Brotsky and Thomas and will be further observed in the findings of Altman (1971).

Altman (1971) also had difficulty in obtaining cooperative behavior in three to six and one-half year old children when he attempted to look at the transfer of learned cooperative responding from a laboratory setting to naturalistic play settings. Seven dyads of male children and three female dyads were selected for the task exposure. The apparatus used was simplified to include only two levers in front of each child instead of the three used by Brotsky and Thomas (1967). The contingency involved the simultaneous pulling of opposing levers. No latency limitations were imposed because of a double throw switch which allowed one child to hold his lever down until the dyad partner pulled the opposing lever. Children were given a chance to acquire 10 successive cooperative responses over a 20 minute session.

Forty, two-minute time-sampling observations were taken during free play sessions prior to the cooperation sessions and 20 additional observations were recorded during the hour following the sessions. The samples included four categories of interaction. They were; Association, Friendly Approach or Response, Conversation, or Hostile.

Cooperative responding was acquired by only seven of the ten dyads despite the increased simplicity of the task over previously mentioned methods (Brotsky and Thomas, 1967; and Vogler, Masters and Morrill, 1970). Tape recorded verbal comments indicated many competitive statements of the nature "I'm winning!" which suggested responses incompatible with cooperation.

With respect to the transfer to play settings, the children who achieved cooperative responses increased on post-observations significantly in associations and friendly interaction frequencies ($p < .01$). Those

failing to reach consistent levels of cooperative response showed no significant differences in the two observational areas. Hostility also decreased significantly for the cooperative children ($p < .01$) while no changes were noted in those nonlearners of cooperation. There were no differences in conversation observations for any of the children.

Grieger, Kaufman and Grieger (1976) took a naturalistic approach in assessing the effects of reinforcement on training cooperative behaviors. Ninety kindergarten children were observed by trained observers within the classroom during free play sessions. The observations included records of both cooperative play and aggressive acts during separate 15 minute sessions on 23 consecutive school days. Cooperative play was scored as the percent of total students within the classroom that were engaged in cooperative play (this was taken in 60 second intervals). The total aggressive acts were tallied in a 10-second observe, five-second record time-sampling procedure.

The first eight observation days served as a baseline measure in which normal classroom activities were observed. The initial intervention procedure involved a "sharing time" following daily free play sessions. At this time children were asked in front of the entire class to name another classmate who had been friendly during freeplay. The named student received a "happy face" button to wear the remainder of the day. This eight day procedure was followed by a five day reversal in which unfriendly children during free play were reported along with a description of the unfriendly deed. Finally, the friendly report procedure was reinstated for four days without the button reinforcers.

The observational data collected throughout the interventions showed

that the median per cent of cooperative play rose from 42% to 55% from baseline to the end of the initial friendly report phase. This median of 55% dropped back to 42% during reversal but, increased to 60% in the final stage involving friendly reports only. The median number of aggressive acts per observation session fell during the initial friendly report period from 42 to nine. The aggressive acts rose during reversal to 40 per session and fell back to 6 during the friendly report only phase.

The authors note in conclusion that increases in cooperative responding were maintained in the preschoolers in a natural setting without specific instruction and that increases during the friendly report only condition suggest this maintenance need not be associated with a primary reinforcer. Conditioned reinforcers in the form of verbal recognition proved sufficient in raising cooperative response rates as well as lowering aggressive acts.

The studies cited in this section suggest that experimental situations may be structured in ways that enhance cooperative response acquisition in children. The studies also suggest, however, that with preschool children laboratory procedures do not have highly salient effects on cooperation. Naturalistic attempts to produce cooperation were more successful in altering cooperative response levels in preschoolers and suggest that the complex requirements of the laboratory procedures may be too advanced to elicit consistent cooperation in younger children.

Cooperative Behavior as an Independent Variable

The previous section established cooperation as a dependent variable

affected by the structure of situations (i.e. reinforcement contingencies based on cooperative response acquisition). The obvious question is; what effect does increased levels of cooperation have on other social behaviors of those cooperating. This section reviews studies which have addressed this question by manipulating cooperation as an independent variable affecting other social variables.

The classic study of intergroup conflict, "The Robber's Cave Experiment" (Sherif and Sherif, 1954) established cooperative experience as a variable affecting social interactions. Sherif and Sherif utilized a summer camp population of 22 middle class fifth grade boys in an attempt to manipulate intergroup conflict as well as cooperation. The study implemented a reversal design in treating the relationship between two groups.

On the first day of the three week study the children were randomly assigned to one of two groups. Each group occupied a separate area of the camp for a period of one week and had no relationship or contact with the other group. During this first stage, intragroup cooperation was emphasized and internal goals structured for the groups. The groups became structured and somewhat stratified during this stage as was evidenced in differential social status rankings and differential role taking of group status positions. A week long tournament, pitting the two groups against one another in common camping games, stimulated the proposed competitive atmosphere, (Stage II). Extensive observational data during Stage II and sociometric rankings taken after Stage II served as independent variables of intergroup versus intragroup structure and relations. Stage III was an intervention designed to reduce

intergroup conflict and friction, created in Stage II. It was first hypothesized that mere competitive free contact between the groups could reduce the existing frictions. This hypothesis was quickly proven false as friction persisted and increased with increased non-competitive contact between the groups. The second hypothesis stated that intergroup friction could be lessened through the presentation of superordinate goals. The two groups were forced into cooperative behavior in order to obtain necessary and desired reinforcers such as water, transportation, and entertainment over a one week period.

Again sociometric and observational data were used to assess inter-group and intragroup relations at the end of Stage III.

The comparison of sociometric scores following Stage II and Stage III offers highly significant support of the latter hypothesis. After Stage III, in-group sociometric choices were still significantly higher than out-group choices ($p < .001$) as they were after Stage II. This difference was, however, significantly less after Stage III than after Stage II. Sociometric in-group choices averaged 93% after Stage II while this figure dropped to 70% after Stage III. Observational data also support the hypothesis in that substantially fewer hostile and more positive remarks took place after the implementation of the forced cooperative experience.

Sherif and Sherif's study supports strongly the notion that forced cooperation between groups in the form of superordinate goals lessens intergroup conflict and friction. The study also offers evidence to refute the positive effect of simple proximity in reducing intergroup conflict between children.

Gottheil (1955) supported Sherif and Sherif's findings in his study dealing with within group acceptance and rejection in eighth grade boys. Sociometric rankings of classmates were taken prior to the experimental manipulations. Both "liked" and "disliked" choices were obtained through verbal questioning. The boys within two classes were used as subjects with one class serving as the experimental group and one the control. The experimental group was divided randomly into cooperation and competition conditions. Experimental manipulations began four months following the initial sociometric rankings.

The cooperation group was divided into subgroups of three boys and instructed to work together on an essay concerning school policy. These boys were told the essay would not be graded. In the competition group boys were told to work on the same essay topic individually and that their papers would be given a grade. The control group did not receive any essay instructions.

Following the experimental manipulations, a post-sociometric ranking of rejection and acceptance was obtained using the same procedure as the pre-sociometric ranking. Individual t-test comparisons of the proportion of acceptance to rejection scores for each condition on pre versus post testing showed that for the cooperation group there were significant increases in acceptance ranking and decreases in rejection rankings. The pre and post ranking differences in these proportions were not significant for the control class or the competition condition. Significance levels were not reported for any of the calculated results.

Ballard, Gottman, Corman, and Kaufman (1977) used cooperation elicited by the presentation of common goals in improving the social

status of mainstreamed mentally retarded third, fourth, and fifth graders. Thirty-seven mainstreamed mentally retarded children from different public school classrooms served as subjects. Of the 37 classrooms, 25 were randomly selected to be in the experimental condition while the remaining 12 served as a control. All members of each class were initially given a forced-choice sociometric test where both acceptance and rejection scores were obtained for all of the other children in the classroom. Experimental classrooms were divided into groups of four children and given multimedia projects to complete within a three week period. The groups met each school day for 40 minute work sessions on the project. Teachers were trained prior to the study in techniques of enhancing positive interaction and each was given a multimedia kit for each group in their class. Groups were reorganized (after a three week intercession following the first project session's completion) so that children were grouped with different peers and another project was assigned. Following this session, a post forced choice sociometric test was given identical to the pretest. Control classes were administered both sociometric tests but, carried on normal classroom activities between testings.

Two dependent variables were obtained for analysis from the sociometric testing. The choices themselves served as one of these variables and the other was taken as the percentage of total classroom students who either smiled (acceptance) or frowned (rejection) at the picture of the child when evaluating him. Analyses of variance were performed on both pre-post differences in experimental versus control means of rejection and acceptance as well as on the differences in rejection and acceptance

between classmates working on projects with children and those who did not. The results show that after the second stage of treatment group members as well as experimental class members not working with the child exhibited significantly more acceptance for children than did the control groups ($p < .05$). Rejection scores for total class members did not differ but, rejection was significantly less in those students participating in a group with the subjects ($p < .01$). These results are consistent with Sherif and Sherif's (1954) findings that the presentation of common or superordinate goals enhances friendship and inhibits conflict and rejection.

Oden and Asher (1977) took a more systematic approach in improving social status of 33 isolated third and fourth graders. They sought to coach social skills thought necessary for adequate friendship making. These skills included participation, cooperation, communication and validation support. All of these interaction skills would intuitively, seem present in the two previous studies dealing more naturalistically with the "common goals" method of improving friendship status.

Isolate selections as well as pretesting assessments were obtained by Oden and Asher through the combined scoring of sociometric rankings and a "best friend" peer nomination. The three lowest ranked children in each of the twelve classrooms served as subjects.

These 30 children were paired with a moderately popular classmate and placed into one of three conditions. The coaching condition involved; 1) a training session in which the experimenter introduced the concept of the social skills, 2) asked the subject specific examples of those skills, 3) rephrased the examples, 4) asked for examples of the opposite

types of behavior, 5) rephrased these examples. A play session with partner and a common game followed this training. Also within the coaching condition, a post-play review was given to the subjects which involved questioning about whether or not the previously discussed skill was implemented and, if so, was it useful in making the game more enjoyable. In the second condition a peer partner and isolate simply played the common game available during the session and in the third condition pairs went into the experimental room for the duration of the session without a specific common game to be played. In total, there were six sessions per condition and each lasted approximately 12 minutes.

During each session behavioral assessment data was collected in 72 ten second intervals. Two observational categories were coded for each subject. Task participation indicated whether or not the child was participating in the activity and social orientation suggested the amount of appropriate skills being demonstrated. Finally, posttest sociometric ranking and "best friend" nominations were taken. One year later a follow-up sociometric assessment was made using 22 of the original sample.

The positive change in sociometric rankings from pre to post testing for the coached group was significantly higher than the differences for the other two conditions. Differences in ranking isolates between partners and non partners were not significant. Although "best friend" nominations increased after training this increase was not significant. The only behavioral measure reaching significance was a main effect for participation over time, with both coached groups and peer-pairing groups having increased in participation over the sessions ($p < .01$). Follow-up sociometric data yielded continued increases in social

acceptance for the coached group which approached significance over posttest scores ($p < .06$). Other group increases in status were not significant.

The first study designed to improve the friendship status of preschool children was conducted by Blau and Rafferty (1970). This study placed 24 pairs of three to five year old preschoolers into an Azrin and Lindsley (1956) type cooperation task under one of three reinforcement schedules. It was hypothesized that sociometric ranking differences between pre and post cooperation testing would vary across the three reinforcement schedules.

The pairs were grouped according to mutual neutral rankings on the pre-sociometric testing. This procedure followed those described by McCandless and Marshall (1957). Each pair was given a 15 minute practice session using the cooperative responding device. During this time continuous reinforcement was delivered until stable responding occurred and then a variable schedule yielding 20 reinforcers for 382 responses was put into effect. Following the practice, the pairs were exposed to either fixed ratio 20, fixed ratio 40, continuous reinforcement or, no reinforcement until five minutes of stable responding was obtained. A second picture sociometric test was administered to subjects individually immediately following the cooperation testing.

A repeated measures analysis of variance was performed on the differences between dyad averages of pre and post rankings for each of the six pairs in the four conditions. The result was a significant increase in ranking from pre to post sociometric ranking ($p < .025$). The difference in ranking increases between cooperation conditions was

not significant although these differences did increase with higher levels of reinforcement. The mean ranking difference of combined reinforcement schedules was significantly greater than the ranking difference of the no reinforcement condition according to a t-test ($p < .10$). These results might, however, be the result of the immediate administration of the sociometrics following the reinforced cooperative session. A type of "recency" effect could cue the selection of peers experiencing the cooperation together.

Haskett (1971) also studied the effect of cooperation on friendship status, using first grade children. Haskett varied from Blau and Rafferty in that he manipulated sex differences across three experimental conditions (by pairing children into opposite-sex as well as same-sex dyads) and offered no reinforcement. The conditions were cooperation, spatial contiguity, and "normal classroom."

A picture sociometric pretest similar to McCandless and Marshall's (1957) procedure was given to 54 boys and 52 girls of six first grade classes. The test served as a basis for matching mutually neutral friendship pairs as well as part of the dependent variable to be combined with posttest measures. The children were matched so that one-half were same-sexed pairs and one-half opposite-sexed. These pairs were randomly assigned to one of the three experimental conditions to yield six groups.

Popsicle sticks and masking tape were used by the children in building shapes. In the cooperation condition, pairs were taken individually into an experimental room, seated side by side and instructed to work together and build something with the sticks and tape. The

spatial contiguity groups were also seated side by side but, were told to work on their structures individually. The "normal classroom" groups served as the control and worked in their regular classroom seats on their structures. Three of these 45 minute experimental sessions were conducted for all groups using the same materials. Following these sessions a post-sociometric test was administered identical to the pre-test.

In a descriptive analysis of the sex choice differences on the pre-test, 95% of the first friend choices were for same-sexed peers and 82% chose same-sexed peers in their first four best friend choices. Each pair of children was given a rank change score by calculating individual rank differences across the pair. In an analysis of covariance of these scores, no regression due to pretreatment ranking differences nor pairing effects were found. According to a set of orthogonal comparisons of the condition mean changes, the only meaningful finding was that rank changes increased significantly more in the opposite-sex cooperation condition than in the opposite sex control ($p < .01$). No other comparisons yielded significant results.

It was suggested by Haskett that the opportunity to increase interaction with opposite-sexed peers paired with the request for cooperation may have led to more knowledge about opposite-sexed partners thus increasing acceptance. It is worthy to note that in this study cooperation was suggested in the cooperation condition rather than required and no reinforcement was provided contingent upon cooperative response in any condition.

The above studies show that the manipulation of cooperative

experiences can alter certain aspects of social behavior. Specifically, the studies indicate that the development of "friendship" can be enhanced by the introduction of cooperative experiences. The studies do, however, fail to incorporate a single style of inducing cooperative responses and specific methods of measuring the effects of such responses. The following section will deal with the measurement of the effects of cooperative responses on social participation.

Measurement of Social Preference

Studies dealing with "friendship" as a dependent variable have typically used one of two measurement techniques: The application of these techniques, sociometric rankings and interaction scores will be reviewed in the following section.

The sociometric ranking method for obtaining peer preferences was devised by McCandless and Marshall (1957) and has contributed to further research in the prosocial area. In this study, a "picture sociometric technique" was devised to evaluate the stability of young children's friendship choices over time and to assess the correlation between those choices and teacher perceptions of friendship patterns within the classroom.

Twenty-four male and twenty-four female preschoolers attending one of two preschool classes were individually given three sociometric interviews at approximately 10 day intervals. Each interview required the child to select preferred playmates from photographs of all classmates.

Children were first presented a display board on which were mounted pictures of the children in the class. The child was then asked by the experimenter to find the picture of himself on the board. After this

picture had been removed the experimenter asked the child to identify the other children on the board. Then the child was asked to look at all of the pictures and point to the picture of the classmate with whom they preferred to play. This request was repeated until three preference selections had been made. Preference scores were weighted according to first, second, or third ratings. On concurrent days of the sociometric interviews teachers were asked to report their choices of the subjects' best friends. Sociometric scores for the three classes were correlated across the three sociometric interviews. The coefficients ranged from .45 to .71, suggesting moderate stability of choices.

In another study, Marshall and McCandless (1957) compared sociometric rankings with actual interaction data and teacher ratings of classroom friendship patterns. Thirty-eight three to five year old children were administered a series of sociometric picture tests. Three preferences were again recorded per child. A specific set of interaction categories was devised to measure actual levels of interaction. A minimum of one hundred minutes of interaction observations were taken on each child. These observations categorized interactions into one of four categories; associative play, friendly approach, conversation and hostile interaction. Each child obtained a best friend score based on high frequencies of associative play and friendly approach.

A correlation comparing interaction levels with sociometric rankings yielded 59 correlation coefficients, 52 of which were significant ($p < .05$). Hostile interaction scores were the only category scores failing to correlate with any of the other dimensions. Also, the addition or subtraction of the hostile to the other categories did not consistently

influence the categories to which they were combined. The results offer evidence as to the validity of sociometric rankings in portraying observed interaction patterns.

Moore and Updegraff (1964) looked specifically at sex and age relationships and sociometric rankings. The McCandless and Marshall (1957) picture sociometric technique was used to obtain both preferred and non-preferred choices. The subjects were 31 male and 31 female preschoolers. The sociometric test was administered twice with a one to two week interval separating testings.

Sociometric choices were given weighted scores according to order of occurrence. The sum of these weighted points served as the dependent variable with high scores indicating well liked children. Product-moment correlations between first and second test administrations were obtained.

In age analyses, children's scores were divided, by group, into those above and below the group median in popularity and those above and below the median age. Chi-square tests did support the hypothesis that children made positive choices toward same-sexed peers more often than toward opposite-sexed peers. Of the six sociometric tests given to the three classes, four indicated positive peer preferences being higher for same-sexed peers than for opposite-sexed peers and negative choices were found to go most often to opposite-sexed peers.

These studies using sociometric rankings to indicate levels of social preference suggest that children are somewhat consistent over short periods of time in the peers they voice as being friends. The question remains whether or not sociometric rankings reflect true

"friendship" patterns. The following studies review a different methodology used to portray these patterns.

Parten and Newhall (1943) devised a scale for measuring levels of interaction between children. They specifically were concerned with social participation and how it related to age and leadership. The categories developed for this social participation scale have been adopted in many subsequent studies which have observed children's interactions.

Parten assessed 42 two to five year old children to obtain data on I.Q., paternal occupation, social participation and leadership qualities. The social particpation data was obtained by observing the children in free play situations and recording their interactions into one of six categories. The categories and a brief description of each are as follows:

Unoccupied Behavior - The child is not playing at all but, rather watches anything that is of momentary interest.

Solitary Play - The child plays independently of other children with toys that are different from those being played with by other children.

Onlooker Behavior - Child spends time watching the other children play without attempting to join in that play.

Parallel Play - The child plays independently of other children but, the toys that he chooses to play with are similar to those of the children around him.

Associative Play - The child plays with other children, they borrow and share play materials.

Cooperative or Organized Supplementary Play - The children engage in formal games, organize to make a material product, or strive to attain a

competitive goal.

Interactions were observed in one minute samples on each of several days. The order of observation of individual children was randomized so that children's interactions were sampled over periods of time each day. During these observations, leadership qualities were recorded into a devised scale. The five scale categories of leadership reflected the child's role within the group as it related to degrees of following versus directing others.

Results, in the form of correlation coefficients, show that there is a positive relationship between age and level of social participation (coefficient of .61). The correlation between age and leadership in the highest leadership category was .53. A correlation coefficient of .97 was reported for the relationship between social participation and leadership. It should be noted, however, that age was not partialled out of the correlation.

Serbin, Tonic and Sternglanz (1977) used a concurrent ABA, AABA design to detect the increase and maintenance of cross-sex play. Subjects were attending one of two preschool classes and had a mean age of 4.5 years. Measures of play patterns were collected by eight trained observers during free play sessions. Play was characterized and recorded as either solitary, parallel or cooperative and the sex of those interacting was noted.

A baseline period of two weeks was recorded for Class I, followed by the experimental manipulation session of two weeks and a two week reversal. Running concurrent with this design was Class II in which six weeks of baseline was taken, followed by two weeks of manipulation and a two week

return to baseline. The experimental manipulation involved verbal praise of cross-sex play by the classroom teachers. Teachers were instructed to deliver to the entire class one positive remark per five minutes contingent upon instances of cross-sex play occurring within the classroom.

The dependent variable was a percentage score of time spent in the various levels of play with either same or opposite sexed peers. The results showed no significant sex or class differences for the various types of play. Baseline percentages for cooperative play were 28% with same-sex peers and 5-6% with opposite-sex playmates. During treatment procedures cross-sex cooperation increased significantly in Class I over baseline rates still being taken in Class II ($p < .025$). In the reversal stage, increased cooperative cross-sex play remained significant over that of Class II's baseline ($p < .05$), however, a substantial drop in Class II baseline measures was noted. Both classes showed significantly different rates of cooperative cross-sex play between baseline and treatment (Class I, $p < .05$; Class II, $p < .001$). Reversal session rates were also significantly lower than treatment rates (Class I, $p < .01$: Class II, $p < .005$).

The Moore and Updegraff (1964) findings along with those of Serbin, Tonic and Sternglanz (1977) indicated that same-sex peer preferences were predominant and relatively stable in preschool aged children. The return to baseline during the reversal or extinction phase of Serbin, Tonic and Sternglanz indicated stability of same-sex peer preferences.

The predominant use over the past two decades of sociometric ranking procedures has led to new investigations into the validity of the

technique in portraying actual interaction patterns. One such investigation was conducted by Dunnington (1977).

Dunnington used 15 nursery school children to test the general hypothesis that varying degrees of social status are correlated with behavioral differences between such status groups. Specifically, Dunnington administered sociometric tests to four and five year olds and compared this data to that collected by observation within a contrived play situation. Three specific behavior areas were hypothesized to differ, in proportion of occurrence, across three social status levels derived from the sociometric rankings. The observation sessions totaled 50 minutes per child and included data on aggression, imaginative use of materials, and verbal interaction with adults. These sessions were conducted in an experimental room containing a box of toys (novel to children), an experimenter and an observer. The experimenter interacted minimally with the children and only upon the child's request. The child was allowed to play with the toys throughout the session but was not prompted to use them in any particular manner.

Groupings of high, medium and low social status ranking were derived from the sociometric procedure and proportions of behavior in the above mentioned categories were compared across these three status levels. An analysis of the mean scores of the behavior observations yielded significant differences between high, medium, and low status groups for the variables of aggression and verbal interaction ($p < .05$). The imaginative use of materials variables showed no significant differences between the status level groups. Aggressive behavior means were clearly highest in the middle status group. Standard deviations of behavior scores were

markedly higher in all cases for the middle status group indicating higher variability in behavior within that group.

Dunnington offers evidence that there are specific differences in social interaction behavior at varying levels of social acceptance. It is suggested from this research that sociometric ranking procedures have some validity in reflecting observable interaction differences within the classroom.

Further support for the ability of sociometric procedures to predict behavioral and interaction differences was contributed by Gottman, Gonso and Rasmussen (1975). They looked at the covariation of social skills assessed through different task competencies and social behavior assessed in the classroom compared with sociometric friendship choices. Subjects consisted of all of the students within two third and two fourth grade classes.

Social skills were assessed through a series of six tasks. The tasks were designed to measure the following competencies: 1) the ability to label emotions from facial expressions, 2) referential communication accuracy, 3) perspective taking ability, 4) independent communication of directions, 5) friendship making skills in role play situations, 6) flexibility in altruistic behaviors. A list of 13 interaction categories served as a classroom behavior code and data was collected in 10 six second intervals with 90 such observations collected per child.

Two factorial multivariate analyses of variances were performed on the data sets [2 (social class) x 2 (grade) x 2 (friendship choice)]. In the social skill analysis, "high-friend" children scored higher on

referential communication abilities and the knowledge of how to make friends in role play than did "low-friend" children ($p < .02$). As for the classroom behavior analysis, "high-friends" were off task (daydreaming) less ($p < .007$) and distributed ($p < .092$) and received ($p < .029$) more positive reinforcement than did "low-friend" children. Again, this indicates a stratification of social skill competency and quality of interaction which is correlated with varying popularity assessed via sociometric choices.

In a theoretical interpretation of the literature dealing with friendship patterns and social isolates in particular, Greenwood, Walker and Hops (1977) addressed questions of reliability and validity within and between social interaction measures. The three most commonly used methods of assessing social interaction were compared and theoretical implications made concerning their usefulness, strengths and deficiencies.

The three methods commonly used to assess patterns of social interaction according to Greenwood, Walker and Hops are; 1) sociometric rankings, 2) teacher ratings, and 3) behavioral observations. The debate over which, if any, of these measures is most appropriate for measuring social interaction has been of considerable magnitude within the literature.

Greenwood, Walker and Hops contended that all three of these current measures lack reliability. They indicated that actual test-retests on behavioral observations and teacher ratings are rarely available in the literature and generally have been ignored. Explanation was offered that behavioral observations do not fall under traditional psychometrics thus, have mostly been plotted over periods as continuous data.

Teacher ratings have dealt with obtaining stability through internal consistency rather than test-retest comparisons. Sociometric measures have been exposed to test-retest reliability over recent years but mediocre reliability coefficients such as the .63, .52, and .78 found for the three groups of Moore and Updegraff (1964) have led the authors to conclude that reliability is less than adequate.

Greenwood, Walker and Hops turn to the usefulness of the three procedures by explaining that each is a measure of a different aspect of the total social pattern. In comparing the three measures they note that; 1) behavioral observations deal with specific interaction patterns, 2) teacher ratings lend information about specific behavioral "pinpoints" and 3) sociometric rankings offer peer perception data and popularity ratings.

The importance of the behavioral observation approach is described in relation to a bias on assessing social isolates. This article, however, supports Gottman, Gonso and Rasmussen (1975) in stating the importance of not relying solely on frequencies or duration measures extracted from behavioral observations. Greenwood, Walker and Hops strongly suggest future research looking at covariations within these three variables.

Sociometric and interaction scores are both necessary in explaining the process of social preferences. Though the two portray two different dimensions of the process, even more extensive and varied measures may be necessary to fully explain social preferences.

STATEMENT OF THE PROBLEM

Although Azrin and Lindsley (1956) were able to effectively elicit cooperative responding in middle childhood, less success had been made using the same techniques with preschool children (Brotsky and Thomas, 1967; Vogler, Masters and Morrill, 1970). Beyond the problems researchers have had in eliciting cooperative responding in preschoolers are the questions of the effect of cooperative experiences on other social variables, as well as the methods of measuring those effects.

Haskett (1970) used naturalistic means of eliciting cooperation to observe the effects of cooperation on the friendship patterns of those cooperating. The naturalistic means employed, however, merely allowed for cooperation between pairs of children rather than making the nature of the situation such that cooperation was mandatory. The full effects of cooperation may be more apparent when the structure of the task demands cooperative behavior for successful task completion.

Blau and Rafferty (1970) found cooperative responding to increase the sociometric rankings within pairs of cooperating preschoolers. This, however, can at most be interpreted as a short term effect because of the administration of the post sociometric ranking immediately following the reinforced cooperative sessions. The validity of the effect is also weakened by the nonoccurrence of reinforcement in the control condition as compared to the contingent reinforcement of the cooperative condition. The observed effect could easily be attributed to reinforced proximity rather than cooperation.

The present study will elicit cooperative responding in a

naturalistic setting by structuring the materials involved in such a way that their use requires near equivalent efforts by both members of a dyadic team. The study will measure the effects of cooperative experiences on friendship patterns in two ways; social interactions and sociometric rankings. These measures will reflect less immediate effects than those established in the Blau and Rafferty study due to the latency between cooperative training and posttesting. The application of reinforcement to control as well as experimental conditions will also improve upon previous efforts to study the effects of cooperation.

METHOD

Subjects

Twenty-five male and twenty-three female children from two preschool programs in the Manhattan, Kansas area were originally considered as subjects. Of these forty-eight children, those forty-two observed to have low interactions with at least one other child in the class were selected for further use in the study. Consequently, twenty-two males and twenty females were used as subjects. Ten boys and six girls were used from one program while twelve boys and fourteen girls were used from the other program. The children ranged in age from 39 months to 63 months with a mean of 53 months for one program and ranged from 41 to 62 months with a mean of 51 months in the other group. Socioeconomic status of the children was predominantly middle class. Subjects were paired in same-sex dyads based on low levels of observed mutual interaction in a naturalistic setting. This pairing procedure yielded eleven male and eleven female dyads. One female dyad was dropped, however, due to continued absence during the cooperative training phase of the study.

Setting

Interaction scores were derived from observing the subjects in a free play situation with materials natural to a preschool setting. The study was conducted at two different preschools but the nature of the materials present in the observation setting was highly similar. Each setting contained small motor manipulatives, dramatic play material, blocks, and books. The two preschools provided different physical conditions which required adaptation for the experiment.

In one setting the regular preschool classroom was divided by partitions into two sides with boys on one side and girls on the other side. One side of the room contained primarily blocks and large manipulatives while the other side contained books, small manipulatives and dramatic play materials. Interaction between children was observed by viewing males and females concurrently on their respective sides with one observer assigned to each side. After 10 minutes the groups changed sides and were again observed for 10 minutes. The experimental treatments and experimental sociometric testing, within this preschool, were administered in an 8' X 12' room located adjacent to the classroom.

The second preschool setting provided a separate classroom which contained the same type materials as were present in the first preschool setting. The room was 15' X 20' and had the play materials and blocks distributed around the periphery of the room. The children were taken to the room, in same sex groups for 20 minutes daily. Cooperative manipulation and sociometric testing were administered in the same room as the observations with the play materials removed.

In both preschool settings observers were located in observation booths. One booth was equipped with one-way glass and a sound system while the other had screens and no sound system.

Design

A simple two condition comparison design was utilized with two dependent variables recorded. Dyads were randomly assigned to one of the two conditions with sexes represented equally within each condition. The two dependent variables observed were an interaction score based on scaled interactions between dyad members and a peer preference score based

on sociometric rankings. For the purpose of anlaysis each of these variables was considered in two ways. The primary analysis focused on the dyads as the experimental units and scores from both variables represented the mean of the two dyad member's scores. Both of these scores were pre to post change scores. The secondary analysis treated all children in the experimental and control groups as individuals.

Interaction Observations

All of the same-sexed children in a given class were placed together in the experimental setting of their respective preschools. The experimenter explained to the children:

> "Here are some toys that may be used for a little while. You may use them and play with them in any way that you like. I will be sitting right here in the corner doing some work."

Observers focused on a particular child, observed for 15 seconds, and then took 10 seconds to code the most salient aspect of the child's behavior vis-a-vis other children during the 15 second interval. Thirty such observations were recorded over a period of two weeks. The sequence of the children observed was randomized within each same-sex group. The interaction coding encompassed two dimensions. The observers recorded interaction level (one of five categories) and the children with which the child being observed was interacting. A sample coding form may be found in Appendix A.

The five interaction categories used were a modified version of those devised by Parten (1932). The categories used and their operational definitions are as follows:

Unoccupied behavior: The child apparently is not playing, but occupies himself with watching anything that happens to be of momentary interest. When there is nothing exciting taking

place, he plays with his own body, gets on and off chairs, just stands around, follows the teacher, or sits in one spot glancing around the room.

Solitary independent play: The child plays alone and independently with toys that are different from those used by the children within speaking distance and makes no effort to get close to other children. He pursues his own activity without reference to what others are doing.

Onlooker: The child spends most of his time watching the other children play. He often talks to the children whom he is observing, asks questions, or gives suggestions, but does not overtly enter into the play himself. This type differs from the unoccupied in that the onlooker is definitely observing particular groups of children rather than anything that happens to be exciting. The child stands or sits within speaking distance of the group so that he can see and hear everything that takes place.

Parallel activity: The child plays independently, but the activity he chooses naturally brings him among other children. He plays with toys that are like those which the children around are using, but he plays with the toy as he sees fit, and does not try to influence or modify the activity of the children near him. He plays beside rather than with the other children. There is no attempt to control the coming or going of children in the group.

Cooperative-Associative play: The child plays with other children. The conversation concerns the common activity; there is a borrowing and loaning of play material; following one another with trains or wagons; mild attempts to control which children may or may not play in the group. All the members engage in similar if not identical activity.

The social participation categories were weighted with the following values:

Unoccupied behavior	(0)
Solitary independent play	(1)
Onlooker	(2)
Parallel activity	(3)
Cooperative Associative play	(4)

Negative interactions were defined as verbal or physical responses

which interfered with the ongoing activity of another child, or a direct attack on another child, or deliberate attempts at withdrawal from the approach of another child. Any such behavior occurring within an observation interval was noted and received a negative one ranking added to the interaction level score. Only one addition of the negative interaction code could be made per observation.

Average interaction scores were obtained for each child with regard to his social participation with each of the other children. This was the weighted sum of each contact for the child with a target child. These scores were based on thirty observations per child and indicate the subject's individual score toward his dyad partner when that partner is considered as the target child. Dyad scores were obtained by averaging the two dyad members scores in reference to one another. Thus, dyad scores were based on a total of sixty observations per dyad rather than thirty.

Reliability Check

Two ten minute observation periods during pre and post interaction observations served as an inter-rater reliability check for the interaction scaling. The two graduate student observers used in the study observed children simultaneously and a comparison of those observers' interaction ratings were obtained. The percent of reliability was taken as the total number of agreements in rating divided by the total number of observations. Ratings were considered agreements if the two observers used the same category rating for the observation and recorded the same children with which the subject was observed to be interacting. The two observers reached 90% agreement during pretesting

and 95% agreement during posttest observations.

Sociometric Assessment

Each subject was administered a picture sociometric ranking technique similar to that devised by McCandless and Marshall (1975). The technique was used in this study to assess the children's voiced preference of peers.

The sociometric technique employed a circular display board similar to that used by McCandless and Marshall (1975). The circular plywood board was two feet in diameter and supported by a stand affixed to the back at the approximate eye level of the children. The board had tacks arranged to provide for the circular display of photographs of all of the same-sex peers in the class of the child being tested and to provide for rotation of the display. There were at least as many tacks as there were same-sex children within the class being tested.

Two standard 35mm color photographs were taken of each child in the classroom and the photograph most representative of the child (as chosen by the teacher and the experimenter) was used in the sociometric procedure. A small hole was placed in the top center of the photo to facilitate hanging on the display board.

Each child was administered the picture sociometric ranking task the day before and after the two weeks of experimental manipulation. The procedure involved each child making two positive and two negative peer preference choices. Same-sex rankings, only, were used due to consistent findings that preschool age children choose same-sex peers as playmates significantly more often than opposite-sex peers (Haskett, 1971; and Moore and Updegraff, 1964). The picture display board contained

all of the pictures of the playmates within the classroom that were of the same sex as the child being tested. The pictures were arranged randomly in a circle around the perimeter of the display board. Children were escorted individually to the research room where the board was placed at the approximate eye level (when seated) in the chair facing the board and look at the pictures that were on the board. After allowing the children several seconds to study the pictures, the following instructions were given:

> "These are some pictures of the boys (girls) in your class. I would like for you to look at the pictures and point to the picture of a boy (girl) that you like to play with very much."

The experimenter then removed the chosen peer's picture from the board and revised the instructions:

> "I would like you now to point to one more picture of a boy (girl) that you like to play with."

The experimenter again removed the chosen photo and recorded the first preference choice of the subject as +2 and the second choice as +1. Non-preference choices were obtained using the following instructions:

> "You must listen very carefully now because I am going to ask you something different. Please, look at the pictures very carefully and point to the picture of a boy (girl) that you do not like to play with very much."

When the subject identified such a person, the experimenter removed that picture from the display board and continued:

> "Now, I would like for you to look at the pictures one more time and this time point to the picture of a boy (girl) that you do not like to play with very much."

The first picture chosen by the subject reflected the most negative peer preference for that child and received a ranking of -2. The second

choice was also considered as an indicator of strong negative preference but not quite as intense as the first choice and thus received a -1 ranking.

Formation of Dyads

Interaction scores were selected as the basis for constructing the dyads because it was expected that the measure of actual behavior would be more sensitive reflection of the training and more immediately detectable than changes in friendship preference.

The children were placed into dyads based on low interaction scores in regard to one another. Specifically, the scores of each group of same-sex children were evaluated to determine which children might be paired together, on the basis of low levels of interactions without losing any members of the group as subjects. In the case of uneven numbers of children in same-sex groups, the child without a low level of interaction with any other child was dropped from the study. The observations required that each of the same sex class members be present in every session. Attendance during the pre and post observations was virtually perfect with two days being missed during the two weeks of pretesting and three days being missed over the two weeks of posttesting.

No specific cut-off or criteria was involved in this selection other than the fact that the sum of two children's interaction scores in regard to each other were the lowest in regard to other pairs of scores possible. The lowest combined scale scores were selected as dyads as long as these selections did not inhibit the number of pairs to be drawn from the group. These combined scores were also recorded

as the initial level of the interaction variable. Actual interaction and sociometric data is available in Appendix B.

Treatment Groups

Dyads were randomly assigned to one of two experimental conditions by sex, age and preschool setting. Each dyad was exposed to its assigned experimental condition over a period of ten days, receiving one session per week day of a two week period. Each session was limited in length to eight minutes. During the first week of the study tasks were given one per day with the order randomized. Dyads within the same condition experienced the same task on a given day. The task order for the second week of the study was randomized independent of the order in the first week.

The experimental conditions were as follows:

1) Reinforced Cooperation - Children were verbally encouraged to cooperate and reinforced for the completion of the cooperative task. The cooperative task descriptions and illustrations can be found in Appendix C. Before giving the specific task instructions, the experimenter informed the dyad that if the task was completed before "time was up" they would each receive a prize (prizes varied from balloons to small toys and were visible throughout the session). The timing, however, was artificial and the reward was received after each trial noncontingent upon completion time. The experimenter expressed at least two positive verbal phrases (dealing with the ongoing cooperation) per minute of the session. Phrases were of the nature: "I like the way you are working so well together; I really like the way one covers the holes and the other fills." Upon completion of each session each child

received his reward. The reward was placed in an envelope that he was told he would receive at the end of the school day. The experimenter then returned the task materials to their original position and informed the dyad members that if they could do the task again just a little faster than the first time, they would receive another prize. The task was then repeated and the prize awarded again noncontingent upon completion time. Feedback was given along with the prize which suggested that there was a decrease in time from the first trial. The tasks were repeated in this fashion until the eight minute session limit was reached. Verbal reinforcement was delivered for cooperation in all of the task trials. Behaviors incompatible with cooperative responding were ignored. Specific task instructions can be found in Appendix D.

2) Proximity Control - The control dyads were required to remain in the research room with a table of manipulatives and the experimenter for the length of the eight minute session. Specific instructions were:

> "Here are some things that you may like to play with. I would like the two of you to remain in here with me for a few minutes and do whatever you like."

Control condition instructions were identical for all sessions with manipulatives changed each day. Verbalizations were made two per minute to the members of the dyads, but unlike the cooperation condition, these verbalizations did not relate to or encourage cooperative responding to the materials. The statements were direct and not interrogative. The control dyads received prizes noncontingent upon their behavior in the room. The control dyads were instructed upon entering the room that they would receive the prizes at the end of the session.

Observational and Sociometric Posttest

The day following the completion of the experimental sessions another two week observation period began which followed exactly the procedure of the initial observation period (see p. 37). As in the pretesting, this observation period yielded thirty observations per subject. Each child was also administered a picture sociometric ranking posttest in the exact same manner as the pretest sociometric ranking. A new experimenter administered the test and it was conducted in a room which was not the same as the area used in previous portions of the research. The experimenter was naive as to the dyad combinations and the conditions to which each dyad was assigned. Choices were scored on this posttest exactly as they were on the pretest.

RESULTS

Approach to Data Analysis

Two dependent variables were obtained in the study. The social participation data (Parten, 1943) reflected levels of interaction between specific children. Parten referred to social participation as the cumulative total of interactions of one child with all of the other children in the classroom. In the present study children's interactions with specific others in the classroom are of concern and thus, the results of the modified Parten scale are an index of specific social interactions (between members of particular dyads) rather than overall social participation.

Whereas the social interaction data yielded an index of the behavioral interaction between specific children, sociometric rankings reflected the voiced preference of playmates by each subject. These two variables, therefore, provide independent assessments of "friendship."

These two variables were analyzed using two different forms of the data. The data were considered once with each dyad contributing a single score for the social interaction scaling and a single score for the sociometric ranking. Then, in separate analyses each subject's individual score was considered. It can be argued that the individual scores based on a larger sample are more statistically valid but, conceptually there was a problem in dealing with the individual scores as totally independent. Statistically, the individual scores were taken from independent samples and violate no assumptions but,

conceptually it was more appropriate to consider the mean dyad score as more representative of changes in interaction levels and preference between dyad members. Both individual and combined dyad scores are therefore reported for both social interaction and sociometric analyses.

The correlation between social interaction scores and sociometric rankings was analyzed for both individual measures and mean dyad measures. This was done for pretest as well as posttest scores.

Sex and age variables were not considered in the analysis of the data due to the balanced nature of the design and the limited sample size. The sexes were represented nearly equally across the conditions with five male-five female dyads in the experimental condition and six male-five female dyads in the control condition. Age differences across the conditions were not significant according to t-tests, nor were there significant differences across the conditions in the age differences between dyad partners.

The design of the study suggested a repeated measures analysis of pretest to posttest data as it was affected by the different experimental conditions. This analysis was to be done separately for each of the dependent variables (social interaction and sociometric ranking). The correlation between these two variables was then to be evaluated. The method of dyad selection, however, imposed limitations on the distribution of the pretest data which invalidated a repeated measures analysis of the pretest to posttest data. More specifically, the methodology of the study created dyads based on extremely low levels of interaction with one another with these low levels serving as the pretest data. Consequently, artificial range and variance restrictions

were imposed on the pretest data. The low values obtained from the interaction scaling of the dyads made increases in that value mandatory due to chance since the range of possible decreases in values was severely restricted. The variance of the pretest data was restricted by the dyad selection procedure also in that scale scores were purposely selected with values being very close to zero. This restricted variance of the pretest data was not homogeneous with the possible variance of the posttest data.

Sociometric scores were also affected by this selection procedure even though the procedure was not based on sociometric scores. Many of the dyads' sociometric scores were at the range limitations of the scale used and suffered the same problems as the social interaction data.

These difficulties led to the use of change scores from pretest to posttest as measures of the effects of forced cooperative experience. Separate t-tests were done on the change scores for the social interaction data and the sociometric data.

Social Interaction Data

Mean Dyad Scores. The pretest to posttest change score means and standard deviations for the social interaction data are graphed in Figure 1 and presented in Table 1. The t-test analysis of mean dyad interaction data found a significant condition effect for pretest to posttest change scores. Children in the cooperation condition showed increases in interaction levels following the experimental manipulation which were significantly greater than those observed in subjects in the control condition ($t=2.27$, $df=19$; $p < .03$).

Individual Scores. The t-test condition comparisons using individual interaction scores found results similar to those found in the dyad score analysis. Changes in interaction levels were again significantly greater in the cooperation condition than they were in the control group ($t=3.03$, $df=40$; $p < .005$).

Insert Figure 1 and Table 1

Sociometric Data

The sociometric data means and standard deviations for pre and posttest are graphed in Figure 2 and presented in Table 2. The t-tests of mean dyad scores and individual scores for the sociometric data showed no differences in pretest to posttest change scores due to condition. Changes from pretest to posttest rankings were extremely low in both conditions with both means well under zero (cooperation mean change = -.22 and control mean change = -.14).

Insert Figure 2 and Table 2

Correlations

Correlations of sociometric rankings and social interaction scores using pretest, posttest and change scores yielded very low and nonsignificant coefficients when scores were in individual form (.02, .05, and .11 respectively) and in mean dyad form (-.02, -.12 and -.21 respectively).

FIGURE 1

Pretest to posttest social interaction change.

THIS BOOK CONTAINS NUMEROUS PAGES WITH DIAGRAMS THAT ARE CROOKED COMPARED TO THE REST OF THE INFORMATION ON THE PAGE.

THIS IS AS RECEIVED FROM CUSTOMER.

COOPERATIVE EXPERIENCE = 0

CONTROL = ●

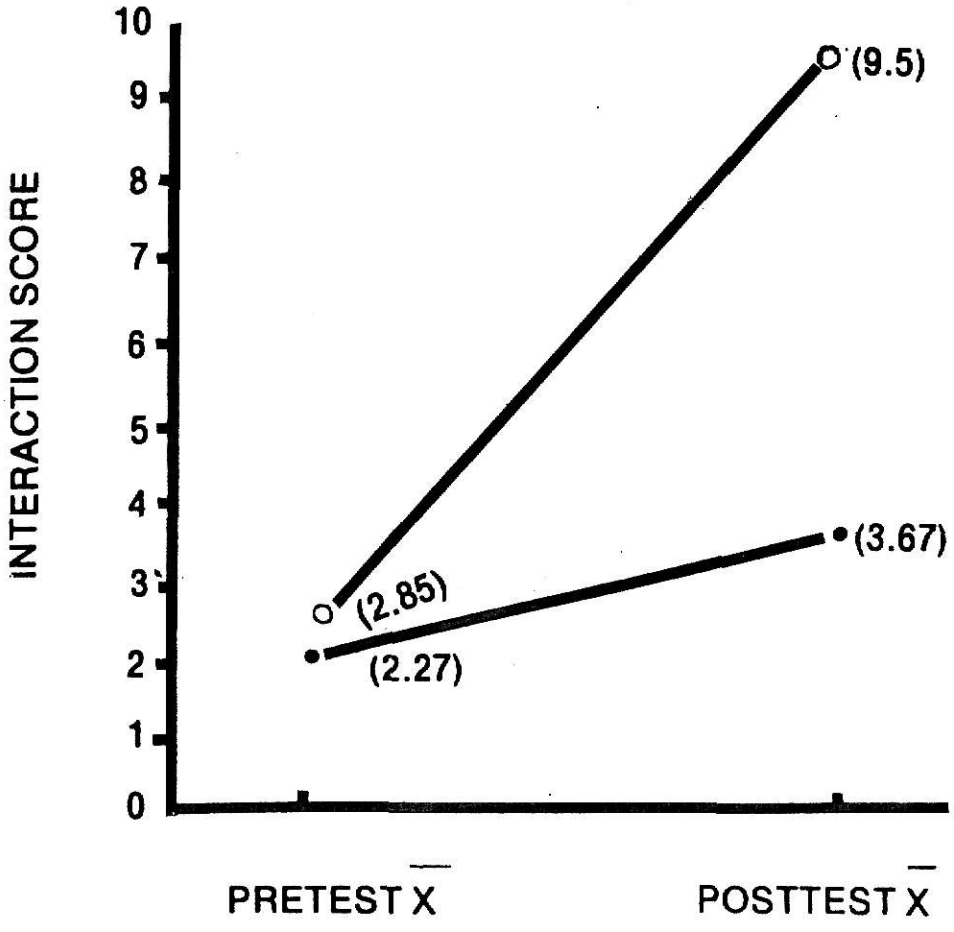


TABLE 1

Social interaction data change score means and standard deviations.

	CONTROL		COOPERATIVE	
	$\bar{X}$	SD	$\bar{X}$	SD
INDIVIDUAL	0.14	1.21	0.10	1.45
MEAN DYAD	0.27	1.79	0.22	1.86

FIGURE 2

Pretest to posttest sociometric change.

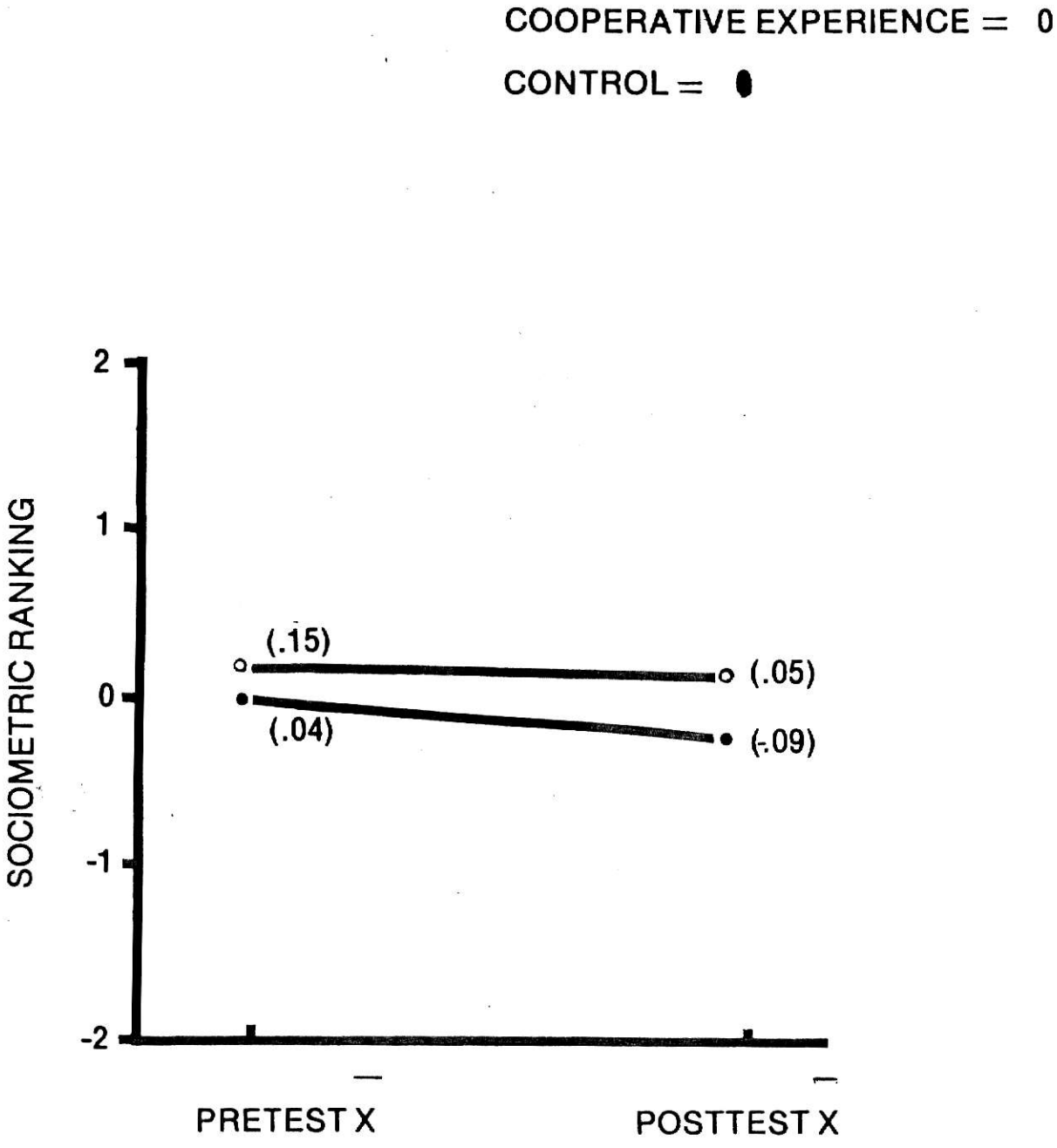

COOPERATIVE EXPERIENCE = 0
CONTROL = ●
SOCIOMETRIC RANKING
2
1
0
-1
-2
(.15)
(.05)
(.04)
(-.09)
PRETEST X
POSTTEST X

TABLE 2

Sociometric data change score means and standard deviations.

	CONTROL		COOPERATIVE	
	$\bar{X}$	SD	$\bar{X}$	SD
INDIVIDUAL	1.41	4.89	6.65	6.28
MEAN DYAD	2.27	8.12	13.30	10.10

DISCUSSION

Reinforced cooperation as manipulated in the study clearly affected increases in the amount of time that dyad members spent interacting with one another during free play situations. Considering that the setting and structure used during these free play observations were very similar to those experienced in every day preschool play, it is reasonable to assume that these increased interaction levels between dyad members would generalize to other preschool situations. In more general terms, those children who experienced reinforced cooperation began "playing" together more than those children in dyads who were merely exposed to one another for the same period of time.

These findings parallel in a dyadic situation those larger group findings of Sherif and Sherif (1954) in "The Robber's Cave Experiment." The introduction of common goals, by Sherif and Sherif in a naturalistic setting elicited cooperation which reduced conflict and increased intergroup sociometric choice between opposing groups. This reduction was not attainable by mere proximity of the two groups. The results also shed light on the findings of Blau and Rafferty (1970) and Haskett (1971). Blau and Rafferty's short term sociometric increases and Haskett's cross-sex sociometric increases following cooperative sessions are supported by the present results and strengthened by the structure and control of this methodology.

Despite the fact that reinforced cooperation enhanced freeplay interactions, this study does not increase our understanding of why this

phenomena occurs. Haskett (1971) suggested that this phenomena (in cross-sex pairs) was caused by the reinforced cooperative experience requiring the demonstration of specific abilities needed to obtain reinforcement. He speculated that this forced demonstration of competency stimulated increased acceptance among the participants.

Conceptually, the notion is the same as that used in the recent research on social isolates (Oden and Asher, 1977; Ballard, Gottleib, Corman and Kaufman, 1977). These studies taught social isolates to demonstrate skills in social situations which improved their social status. The present results are congruent with this work in that the cooperative task in itself forced the demonstration of skills or qualities which were necessary to complete the task. The result was increased interaction levels for those cooperating. It is possible, however, that simply pointing out competencies of children to other children would have had the same effect on friendship patterns among those children. The demonstration of such qualities could be induced in many ways other than cooperation.

There are two possible explanations for social interaction scores not paralleling the sociometric findings: 1) the sensitivity of the sociometric scale used may have not been adequate in detecting the expected result; 2) sociometric and interactional data may tap two dimensions of "friendship" that are not as similar as might be expected.

The sensitivity of the sociometric scale used was severly limited by the possible range of selections. Two positive preference choices and two negative choices were elicited for groups with an average size

of eight subjects. No inference could be made about the position or change of position of those subjects within the unchosen range. The full range of preference patterns could only be obtained if each child ranked every other child as to their preference as a playmate. This procedure would have been overly tedious for the preschool children and of low reliability.

The effect of the restricted range of the sociometric scale on pretest to posttest change scores can be demonstrated by the significant negative correlation between sociometric pretest levels and change scores of posttesting. This negative correlation can be interpreted in the following way. As sociometric pretest scores neared the upper ranges of the sociometric scale, there was a progressively increasing limitation in the amount of potential change in sociometric scores from pretest to posttest (i.e. a child who scores +2 on the pretest could not increase on the posttest). The sociometric hypothesis generated for the present study was directional and anticipated increases in scores due to the condition effect. With directionality in mind, it is obvious that scores near the high end of the scale range could not increase with the same magnitude as the scores near the lower end of the scale range. Sociometric data may therefore be of limited value in experimental studies of this type.

Another explanation for the discrepancey between interactional data and sociometric data is the possibility that each variable measures a different dimension of "friendship." The question to be considered is whether or not children actually play with those children whom they say they like, and avoid those children whom they say they

dislike. The low pretest correlation of social participation data and sociometric data would suggest that children do not necessarily interact extensively with those they say they like.

Since the subjects in the present study were together in their respective groups for five months prior to the investigation, it is reasonable to assume that "friendships" were firmly established. It could be expected that even though the cooperative experience did not affect the stated preference patterns of the children (sociometric choice), it did affect increased interest and awareness which provoked increased interaction levels.

An organization of play preferences had been evolving in subjects as a result of their classroom experiences over a period of five months. This organization may be strengthened by the fact that once preference patterns are established they are maintained by the continual contact with and exploration of those preferred playmates. The introduction of the cooperative condition to pairs of subjects who have, to an extent, left one another out of their pattern of playmates forces the subjects to both actively explore and actively demonstrate certain properties and qualities of themselves to one another. This forced exploration was not mandatory in the control condition. The observed increases in interaction levels between those dyad partners experienceing the cooperation condition indicate that they are at least continuing their exploration of one another and beginning to include one another in their organization of playmate preferences. The process of altering this organization completely would not be a rapid one considering its creation occurred over a five

month period. Once the initial explorative contact, stimulated by cooperation, is implemented, sustained interaction would be needed to complete the transformation of play preferences. There might be little conscious awareness of the transformation of the organization at play patterns until this process is complete. Thus, a voiced preference in the form of sociometric rankings would not be expected immediately following the cooperative experience.

Follow-up observations were not possible due to the length of the preschool program but, such data could have substantiated or refuted the above speculative interpretation. Follow-up data would have allowed an evaluation of the strength of the effect on interaction levels and whether or not sociometric rankings show delayed increase for the cooperative experience group. This is assuming that the sociometric scaling problems discussed earlier do not severely hamper this analysis.

Research Implications

It is important that future research differentiate between pure cooperation and reinforced cooperation. This can be accomplished by simply obtaining a large enough sample to implement a pure cooperation condition into the design of the present study. Future research should also address other systematic attempts to allow children to demonstrate as well as perceive the qualities and competencies of other children. A study in which children were simply told the competencies of other children rather than these competencies being demonstrated would lend valuable evidence to the issue. Observing the effects of cooperation on other prosocial variables such as

empathy, sharing, etc. could further clarify the particular aspects of cooperation experiences which affect social development.

The more practical and clinical implications of the study are numerous. The application of reinforced cooperation within preschool settings could conceivably reduce intergroup conflict and the application of cooperative experiences could prove useful in the treatment of social isolates. Evaluations of such treatments in the form of case studies could contribute additional knowledge of the effect. It can be predicted that such treatment would parallel closely the results of training specific social skills and methods of demonstrating these skills explained by Oden and Asher (1977).

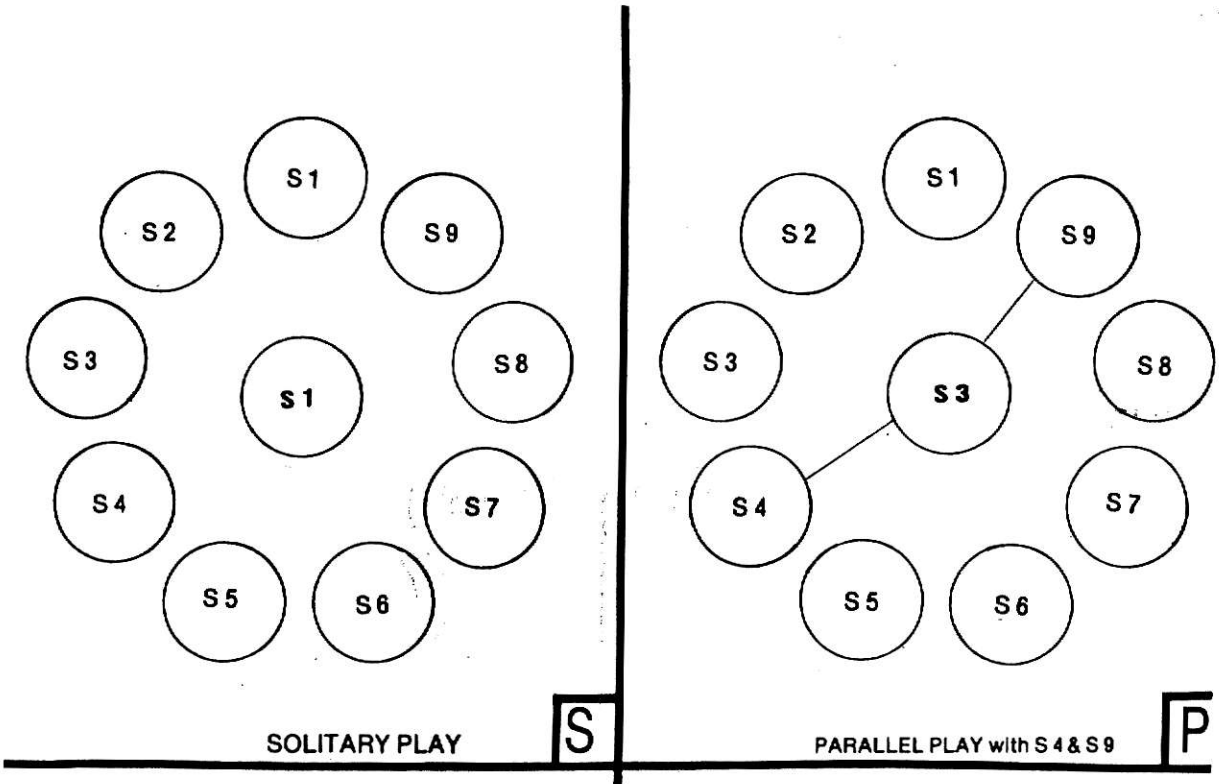
This study shows that the introduction of reinforced cooperative experiences can increase previously low levels of interaction between pairs of preschoolers. This, if adopted as a technique for preschool teachers and clinicians, offers unprecedented control over children's social interactions and introduces certain ethical considerations. The ability to manipulate the naturally evolving social patterns at any age level is not adequate justification for these manipulations. The cooperative techniques suggested in this study and the social patterns which they may affect, could be very beneficial in the treatment of severe social isolates. The ethical issue, however, is whether or not these benefits are worth the alteration of the overall social patterns of the group. Fut re research investigating the relative strength of the cooperative experience in altering these patterns and some of the secondary consequences of these experiences should help to resolve these ethical considerations. The paradox of

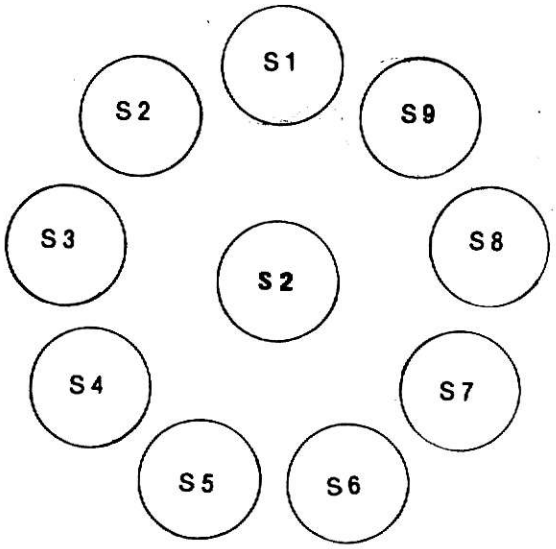
course is that research efforts must also consider the same ethical issues.

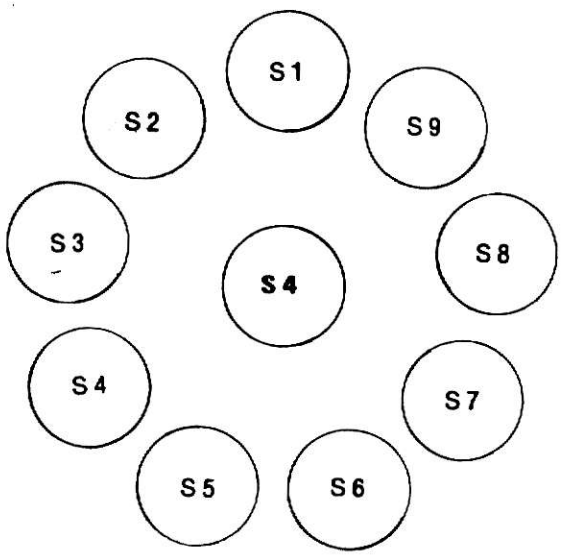
APPENDIX A

The following is an example of the data sheets used to record ongoing social interactions. Each child within a same-sex group is designated by a number in one of the peripheral circles. The child being observed in a particular interval is designated by the number in the center circle.

DATE _____ CLASS _____


S1
S2
S9
S3
S1
S8
S4
S7
S5
S6
SOLITARY PLAY
S
S1
S2
S9
S3
S3
S8
S4
S7
S5
S6
PARALLEL PLAY with S 4 & S 9
P


S1
S2
S9
S3
S2
S8
S4
S7
S5
S6


S1
S2
S9
S3
S4
S8
S4
S7
S5
S6

APPENDIX B

The following tables contain the actual interaction levels and sociometric rankings obtained for each child. The first table contains these scores for the experimental group and the second table contains the control group scores. Both of the tables have the dyad members listed individually yet grouped together in sequence.

COOPERATIVE

DYAD MEMBER	Interaction Pretest	Interaction Posttest	Interaction Change		Sociometric Pretest	Sociometric Posttest	Sociometric Change
1A	2	0	- 2		0	0	0
1B	0	0	0		0	0	0
2A	3	0	- 3		0	0	0
2B	0	0	0		0	0	0
3A	3	0	- 3		0	0	0
3B	3	0	- 3		0	0	0
4A	2	11	9		0	1	1
4B	0	0	0		0	1	1
5A	0	6	6		- 1	0	1
5B	4	6	8		- 2	- 1	1
6A	8	6	- 2		1	- 2	- 3
6B	7	7	0		2	1	- 1
7A	3	0	- 3		- 2	- 1	1
7B	0	2	2		1	0	- 1
8A	0	0	0		0	0	0
8B	0	2	2		2	0	- 2
9A	2	4	2		- 1	0	1
9B	2	12	10		- 1	- 2	- 1
10A	5	17	12		0	0	0
10B	0	5	5		0	- 2	- 2
11A	4	0	- 4		- 1	- 2	- 1
11B	5	0	- 5		0	2	2

CONTROL

DYAD MEMBER	Interaction Pretest	Interaction Posttest	Interaction Change		Sociometric Pretest	Sociometric Posttest	Sociometric Change
12A	0	6	6		0	0	0
12B	0	12	12		2	- 2	- 4
13A	3	6	3		- 1	0	1
13B	0	6	6		0	- 1	- 1
14A	0	6	6		0	0	0
14B	0	16	16		2	0	- 2
15A	10	25	15		1	0	- 1
15B	7	9	2		0	2	2
16A	0	9	9		- 1	- 2	- 1
16B	10	14	4		1	- 1	2
17A	0	3	3		0	0	0
17B	2	2	0		1	2	1
18A	3	14	11		0	0	0
18B	15	12	- 3		- 1	0	1
19A	0	9	9		0	0	0
19B	0	4	4		0	2	2
20A	3	0	- 3		- 1	- 2	- 1
20B	0	0	0		0	- 1	- 1
21A	4	20	16		0	0	0
21B	0	17	17		0	0	0

APPENDIX C

Experimental Tasks

Five game type cooperative tasks were devised to facilitate cooperation between dyad members. The tasks were designed to preclude successful completion without a complementary effort by the members of each dyad. The tasks were constructed using materials natural to or similar to those used in everyday preschool programming. The nature of the five tasks were as follows:

1) Tube Fill - A three inch in diameter by seven inch long plastic tube was mounted perpendicular to a 5"x5"x2" wooden base. The tube was constructed with two rectangular 1 1/2"x1" holes placed two inches from the base on opposing sides of the tube. Enough dried peas to completely fill the tube were provided. The task required that either one child cover both tube holes with his hands while the other dyad member attempted to fill the tube with peas or, both children had to cover one of the holes and they could simultaneously fill the tube.

2) Block Stack - The task involved a prerolled piece of plastic 12"x12" which remained in a coiled position unless pressed out manually. The plastic was placed on a table where the width of the plastic required full extension of the child's arms to establish and maintain the open position. Fourteen 1"x1" wooden blocks were provided. The plastic had two marks on the extreme left and right edges which were centered vertically. Either one child had to hold the plastic pressed flat on a table while the other dyad member stacked two equal

sized towers of blocks on the two marks or both children had to hold an end of the plastic flat and build a tower with their other hand.

3) Balloon Carry - A 7'x7' piece of plastic was used along with enough small balloons to nearly cover the surface of the plastic (i.e. just enough balloons to make the plastic begin to overflow and lose balloons if not kept on a level plan and/or if moved too quickly or abruptly in any direction). The task required the placing of the balloons on the plastic and then picking the plastic up from the floor and carrying it across the room and placing it on a table without dropping any of the balloons. Any balloons that dropped from the plastic had to be immediately replaced before the dyad could continue moving the plastic in the direction of the table. The dyad had to work cooperatively to carry the plastic and insure not losing any of the balloons.

4) Marble Roll - A 12"x12" board was mounted in the center of a 7'x6" board such that the connection of the boards on their front edge formed a 45 degree angle. The square board was therefore at an incline to a table top when placed down upon it. The square board had two 1/2 inch slits running parallel 3 inches apart the length of the incline. A V-shaped piece of wood 5 inches long was located at the base of the incline and centered on the board. The piece was mobile in that it could be slid from the base of the incline to the top of the incline by pulling two strings attached to either end of the piece. The strings which were connected to the piece extended up the incline and were guided by small loops out to the ends of the 7 foot board to which the incline was attached. The ends of the two

strings were attached to two small handles. The length of the 7 foot board was such that one child could not reach the ends of both strings. The task required that a marble be placed in the center of the V-shaped piece and the piece be placed at the base of the board. A spring attached to the base of the V-shaped piece kept the piece in the base position unless the strings were pulled. The two had to pull on the two strings simultaneously at the same rate in order to avoid the marble sliding into one of the slits running parallel up the incline. The object of the task was to keep the V-shaped piece level enough to avoid the slits and bring the marble to the top of the incline.

5) Elastic Stretch - A five foot in diameter board contained four pegs secured uniformly around the edges of the board. Each peg was 3 inches in height. A 3"x3" platform located at the top of the board had a height of one-half inch. A piece of elastic 4 feet long was placed freely in the center of the board. The length of the elastic and the height of the platform was such that in order for the dyad to successfully stretch the elastic around the long pegs and bring the two ends of the elastic together at the platform they had to cooperate. Either one of the children had to hold one end of the elastic at the platform while the other child stretched the elastic around the pegs and joined it again at the platform or both children had to stretch one end of the elastic around the larger pegs and bring the ends together at the platform. The length of the elastic when stretched out was just adequate enough to fit around the pegs in a circular manner. It is worthy to note that the purpose of the

platform was to provide a reference point for bringing together the two ends of the elastic and to inhibit one child from completing the task solitarily by tying one end of the elastic to a starting post while stretching the remaining end around the pegs.

The remainder of Appendix C is a display of the tasks used to elicit cooperation between dyad members. The illustrations and the tasks they depict are as follows:

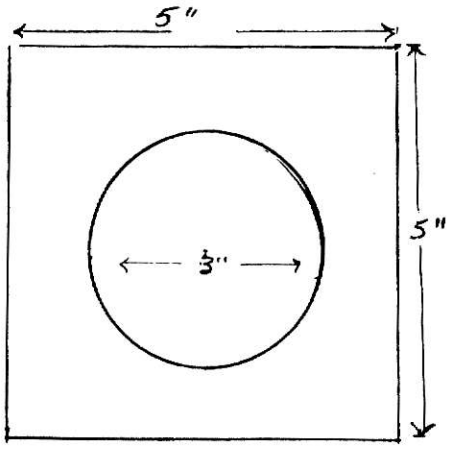
Illustration #1 ..... Tube Fill

Illustration #2 ..... Block Stack

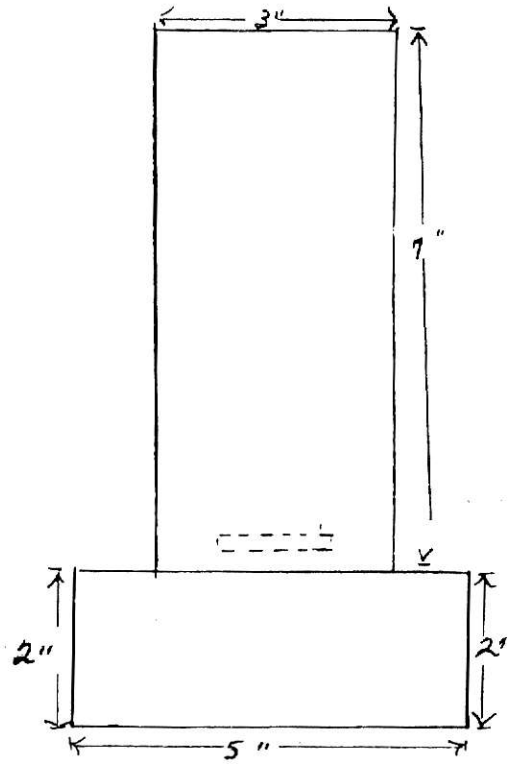
Illustration #3 ..... Balloon Carry

Illustration #4 ..... Marble Roll

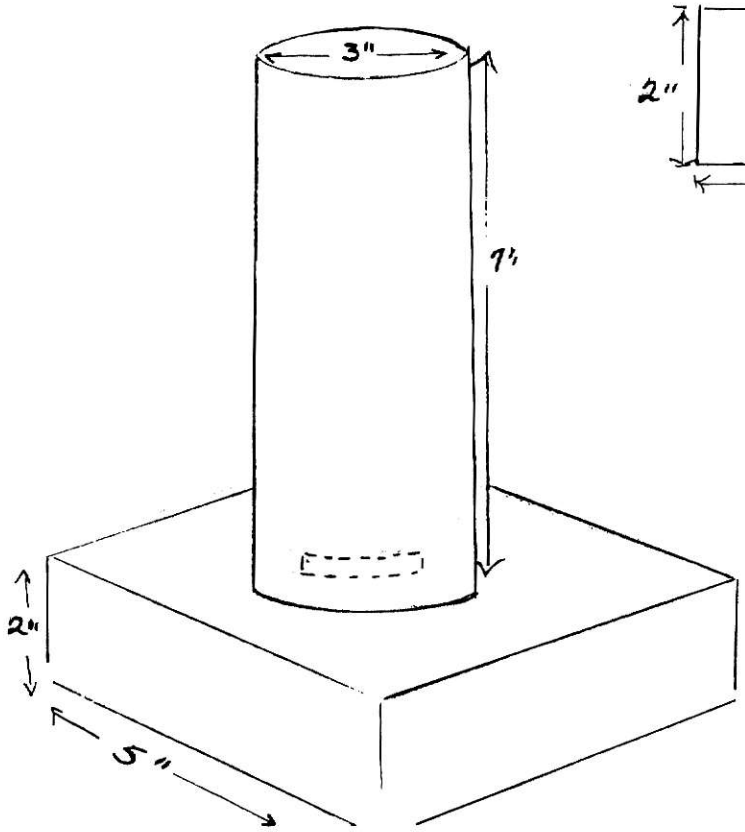
Illustration #5 ..... Elastic Stretch



TOP VIEW

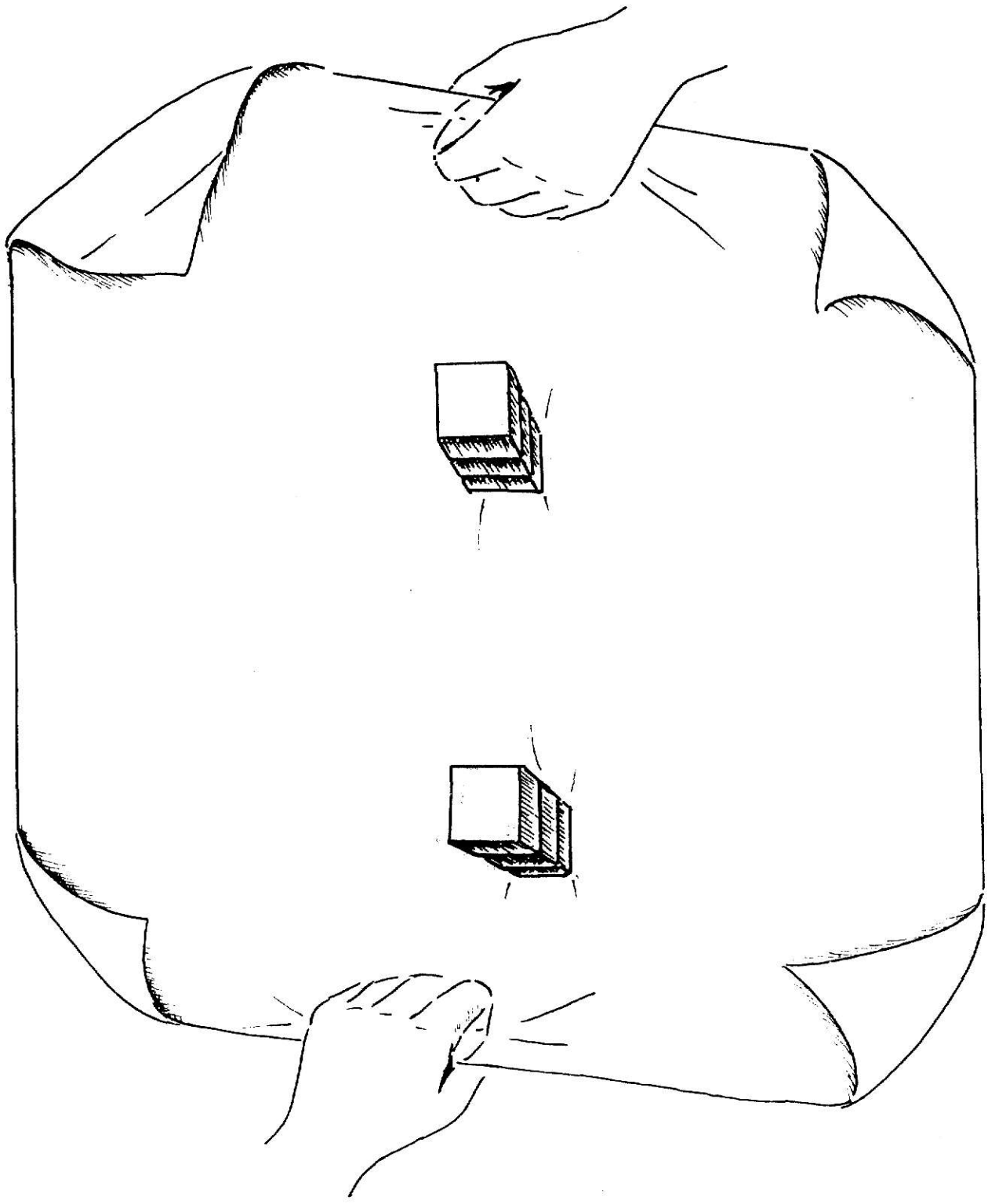


FRONT VIEW



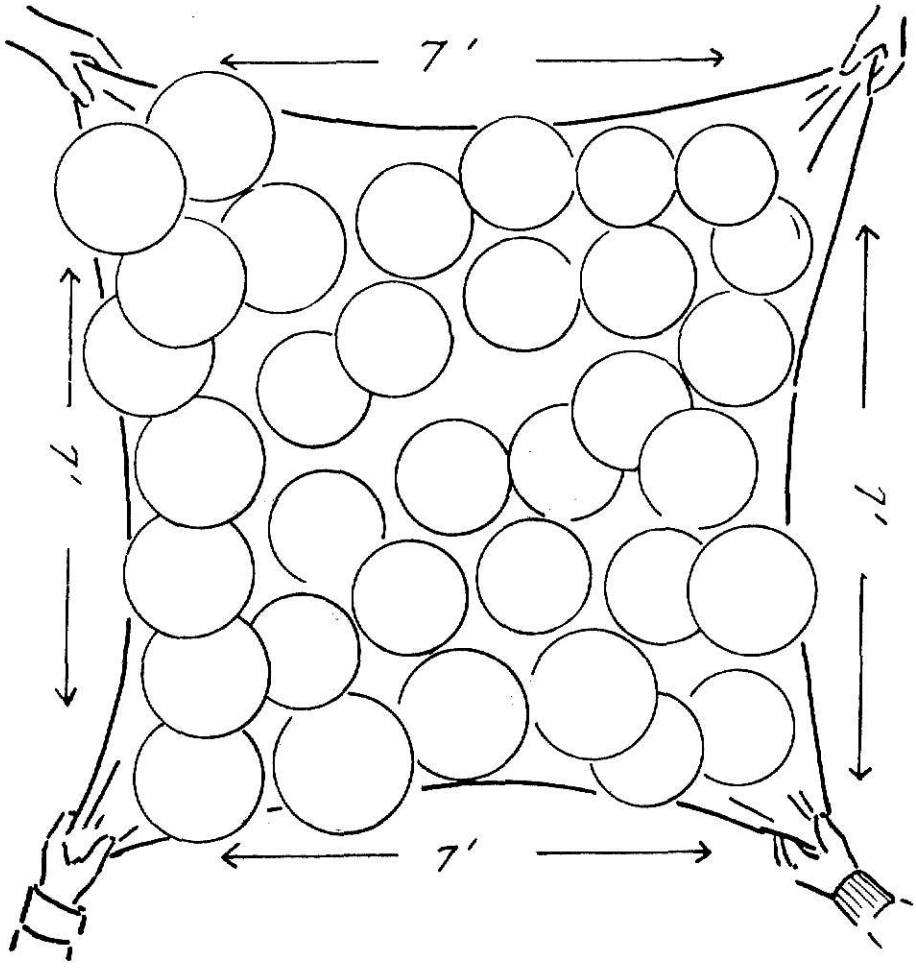
MATERIALS:
2''x5'' Block of wood
3'' Diameter tube

Illustration #1



12'' sq. Clear Plastic
2 Sets of 3 1''x1''
Blocks

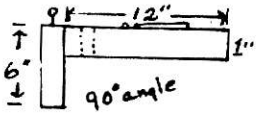
Illustration #2



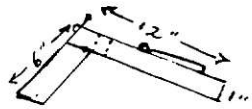
Thin Plastic-like Tablecloth Supporting Balloons

Illustration #3

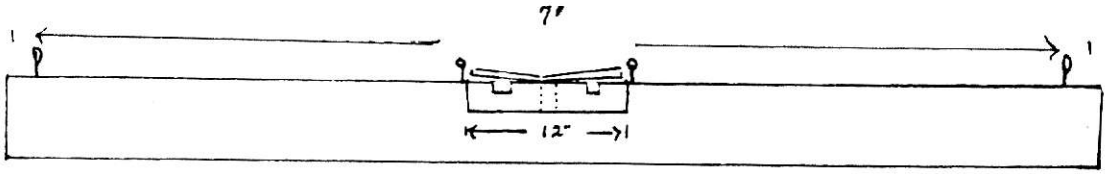
UPRIGHT
SIDE VIEW

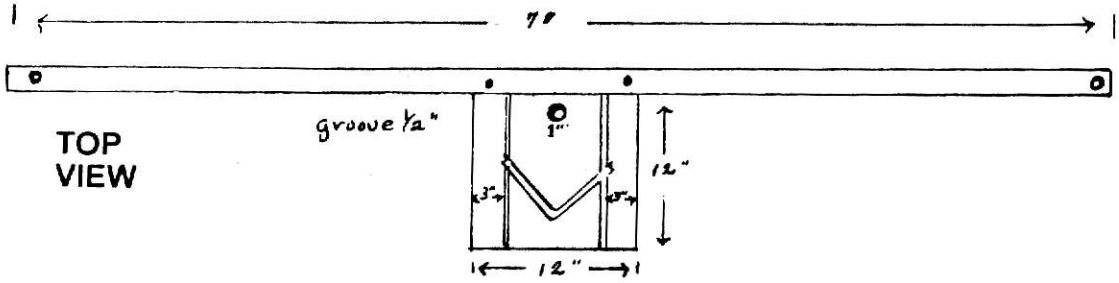


PLAYING POSITION
SIDE VIEW

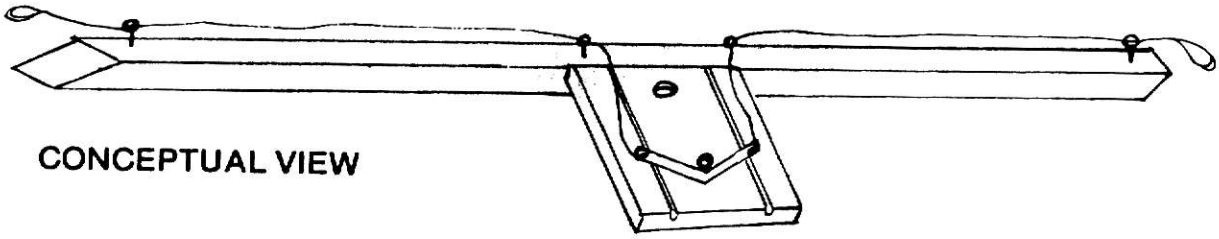


FRONT VIEW





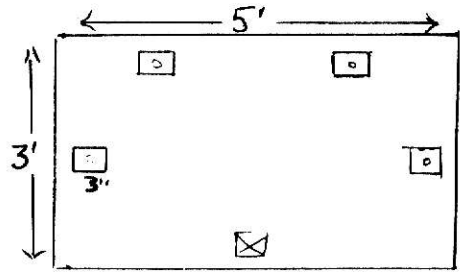
TOP
VIEW



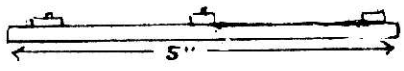
CONCEPTUAL VIEW

MATERIALS:
7' - 1x6'' Board
12'' Square Board
6 Eye Hooks
String
Marble

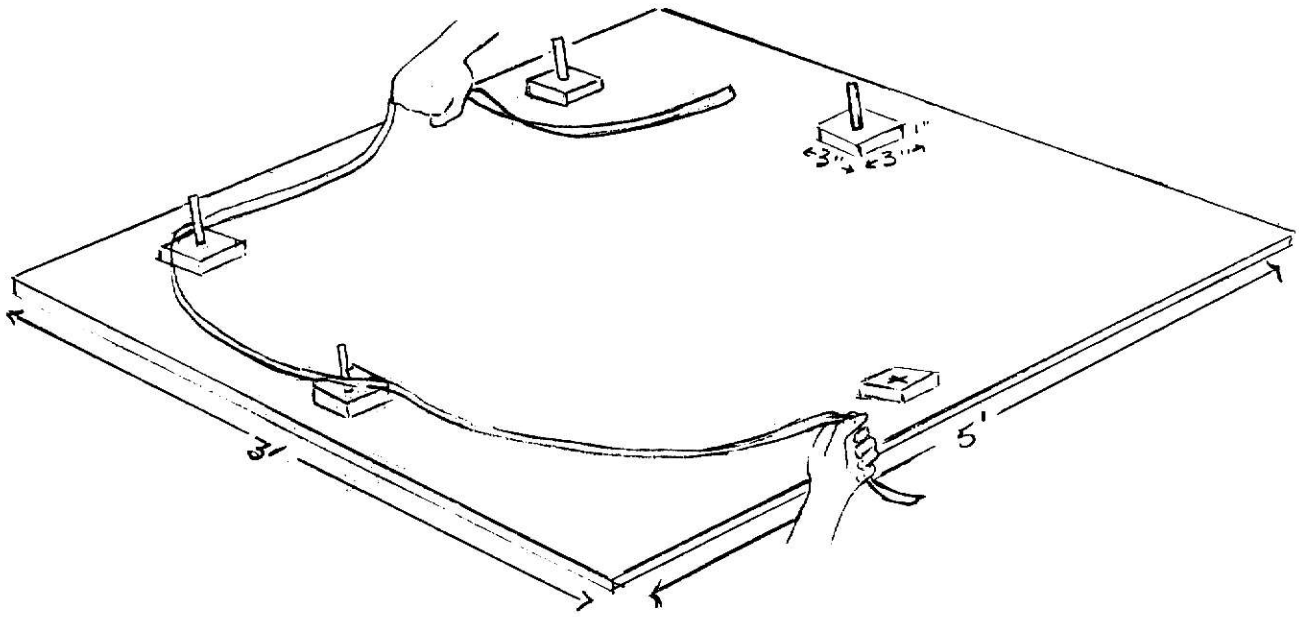
Illustration #4



TOP VIEW



SIDE VIEW



MATERIALS:
plywood board 3'x5'
5 ' 3''x1'' blocks
4 - short dowel pieces
Elastic

Illustration #5

APPENDIX D

Appendix D details the specific task instructions delivered during the cooperative experience sessions of the study. The instructions vary with the task involved but, are standard in respect to reinforcement and session length.

1-A Cooperative Tube Fill - E directed the Ss of a given dyad to chairs in front of a table and asked them to be seated. The table contained the tube described in the Apparatus Section and also and open container filled with peas. E instructed the dyad;

> "I would like to see how fast the two of you can work together and fill this tube to the top with these peas. You must use all of the peas and be really careful not to spill them because it takes a very long time to pick them up. You may begin when I say GO."

E then clicked on a stop watch and exclaimed "GO!" E allowed the Ss one minute to figure out the cooperative requirements of the task before intervening if necessary to explain. E recorded whether or not explanation was required in order for the dyad to complete the task. If explanation was required E continued after the two minute period with;

> "There is a problem, one of you needs to hold his (her) hands over these holes on the side of the tube so the peas will not spill out while the other person is filling the tube. You decide which of you will do which. Ready GO."

When the tube had been filled the E emptied the peas back into the open container while continuing;

> "That took ____seconds, let us try again and see if you do it any faster. Ready GO."

After each trial a very slight decrease in time was reported to the dyads in order to maintain motivation. This procedure was repeated until the eight minute session limit was reached. Ss were then thanked for helping and returned to their classroom.

1-B Cooperative Block Stack - Ss were directed to the room and seated side by side as in condition 1-A. E then instructed the dyad;

"I would like to see how fast the two of you can work together and take these blocks and build two towers of the same size. It is important that you build the two towers on this piece of plastic. One should be on this mark and one should be on this one (show the two marks on the plastic described in the Apparatus Section)."

Again the dyad was given one minute to decide the nature and requirements of the task and begin completing it. At the end of this one minute E continued;

"One of you must hold the plastic flat while the other stacks the blocks or each of you must hold one side flat and make your own tower."

Upon task completion the artificial time feedback was given as in 1-A, the blocks returned to an unstacked position and instructions given to try again at a faster speed. This was repeated until the eight minute session limit was reached.

1-C Cooperative Balloon Carry - Ss were directed to the center of the balloon filled research room and their attention directed to the piece of plastic in a corner of the room. E said;

"I would like to see how fast the two of you can gather these balloons and put them on the plastic. Then, you must carry the plastic across the room and put it on the table (opposite corner)."

One minute was again given the dyad to devise a method of completing the task at the end of which E continued;

"To keep the balloons on the plastic, one of you must get on either end of the plastic and pick it up very slowly. If any of the balloons fall off the plastic you must stop right there and replace the balloons on the plastic."

The successful moving of the plastic covered with balloons again yielded the artificial time feedback, redispersement of the balloons, and the urging to try again with increased speed. This procedure is

again repeated until the session time limit terminates the session.

1-D Cooperative Marble Roll - Ss were taken to the center of the experimental room and their attention directed to the Marble Roll apparatus. E instructed the Ss;

> "Here is a game that I would like for you to play. I would like to see how fast the two of you can work together and pull the marble up to the top of this board. You must pull the strings using the handles."

Again after allowing one minute for the dyad to experiment with methods of pulling the strings, E continued:

> "Each of you will have to pull your string very slowly and at the same time to get the marble to the top. You must try to keep the marble at the bottom of the piece of wood (E pointing to V-shaped piece)."

Upon completion of the task, artificial time feedback was given, the strings released so that the V-shaped piece returned to the base of the incline, and the Ss were urged to try again with decreased time. This procedure was repeated until the twenty minute sessions length was reached.

1-E Elastic Stretch - Ss were directed to the center of the room where they were shown the wooden board and elastic strip. The experimenter said;

> "I would like to see how fast the two of you can take this piece of elastic and stretch it into a circle around these pegs (demonstrate). I would like for you to put both ends of the elastic together at this block."

The Ss were given the one minute to figure out a method of completing the task before E interrupted with;

> "One of you needs to hold each end of the elastic and stretch it together around the large pegs toward the block."

Trial completion brought the artificial time feedback, the return of the elastic to the center of the board and the urging to try to decrease the completion time. This procedure was repeated until the eight minute session limit was reached.

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THE EFFECTS OF REINFORCED COOPERATIVE EXPERIENCE ON THE FRIENDSHIP PATTERNS OF PRESCHOOL CHILDREN

by

DAVID W. ANDREWS

B. S., Auburn University, 1977

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submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Family and Child Development

KANSAS STATE UNIVERSITY
Manhattan, Kansas
1980

ABSTRACT

Twenty-two same sexed dyads of preschool children, paired on the basis of observed low levels of social interaction in freeplay, were randomly assigned to experimental and control conditions. A sociometric pretest was given. The experimental group dyads were exposed over a two week period to five game-type tasks which were devised to elicit cooperative responding between dyad partners. The control group dyads experienced less structured contact over the same time period. All children were then observed in a posttest of social interaction and were retested on the sociometric procedure. A t-test comparison of pretest to posttest change scores indicated an increase in interaction levels in the cooperative condition significantly greater than those found within the control condition ($p < .02$). The sociometric data failed to yield this condition effect. The correlation between interaction levels and sociometric rankings was low and nonsignificant. Results were discussed with respect to future research implications as well as practical and clinical applications.