

*COOPERATIVE GAMES: A WAY TO MODIFY
AGGRESSIVE AND COOPERATIVE BEHAVIORS IN
YOUNG CHILDREN*

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We investigated the effects of competitive and cooperative games on aggressive and cooperative behaviors of 70 children (4 to 5 years old) from four classes in three preschools. The experimental design included both multiple baseline and reversal components. Behaviors were measured during game conditions and in subsequent free-play periods. Results showed that cooperative behavior increased and aggression decreased during cooperative games; conversely, competitive games were followed by increases in aggressive behavior and decreases in cooperative behavior. Similar effects were also found during free-play periods.

DESCRIPTORS: cooperative games, preschool children, aggressive behavior, competition, generalization

There is general agreement on the importance of children's development of strong positive social skills. The ability to interact in positive, nonaggressive, collaborative ways with others is one of the most fundamental goals of development and provides a basis for success in friendships, marriage, and careers. Much of the learning of these behaviors is done through play (Bruner, 1975). In effect, play is the child's workshop, a place where rules, behaviors, and consequences are explored, changed, and learned.

Games are a central aspect of children's play. Considerable research has focused on how games influence behavior. For example, Murphy, Hutchison, and Bailey (1983) found that the aggressive playground behaviors of elementary school children were reduced when free (unstructured) play was replaced by organized games (rope jumping and foot races) and a time-out procedure.

Games can be analyzed according to their social structure. A competitive game is one in which there are winners and losers (Kohn, 1992). Such games create strong individual motivation to succeed as well as an interest in seeing one's opponent fail. Cooperative games are structured differently; they require coordinated efforts of two or more individuals such that all the participants are involved in a successful outcome. Cooperative games create interest in encouraging and assisting others.

Cooperative games and activities have been associated with increases in peer acceptance and self-esteem (Ames, 1981; D. Johnson & Johnson, 1985; Madden & Slavin, 1983). Both cross-ethnic and cross-handicapped interactions have been affected (D. Johnson & Johnson, 1982; R. Johnson, Johnson, De Weerd, Lyons, & Zaidman, 1983). Although not all studies show consistent effects, academic performance appears to improve with cooperative activities (D. Johnson, Johnson, & Scott, 1978; D. Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Madden & Slavin, 1983; Slavin, 1990).

In contrast, a number of problem behaviors have been associated with competitive activities. Competitive endeavors have been associated with decreased academic performance and higher levels of aggression (Kohn, 1992). For example, Sherif, Harvey, White, Hood, and Sherif (1961) found general increases in aggression and hostility when

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11- and 12-year-old boys were divided into competitive baseball, football, and tug-of-war teams. The boys' aggressive behaviors continued after the conclusion of the games.

Nearly all studies in this area have focused on either cooperative or aggressive behavior. Murphy *et al.* (1983) limited their study to aggressive behavior and did not assess whether a particular type of game made a difference in the frequency of the behavior. In addition, the design of the study does not reveal whether the behavioral changes found were due to games, a time-out procedure, or both. Orlick (1981a) studied the effects of cooperative and traditional games on cooperative and noncooperative behavior. However, Orlick's definition of noncooperative behavior included both aggressive and nonaggressive responses. It is unclear whether only one or both types of behavior changed.

Previous studies have shown that cooperative games will increase cooperative behaviors, but it remains to be seen whether aggressive behaviors increase or decrease when such games are played. Although there is evidence that cooperative behaviors will generalize to free-play periods after lengthy exposure to these games (Jensen, 1979; Orlick, McNally, & O'Hara, 1978), the effects on aggressive behaviors are not known. Also, because most studies have used different (experimental vs. control) groups of children to examine the effects of games, it is not clear how a given group responds to both competitive and cooperative games. In order to answer these questions, we compared the effects of cooperative and competitive games on cooperative and aggressive behaviors of four groups of children during game times and free-play periods.

METHOD

Subjects and Setting

Subjects were 70 preschool children (4 to 5 years old). The children were enrolled in four classes in three different preschools. Daily class size varied depending on absences and fluctuations in enrollment. The average size of Group 1 was 11 children

(range, 4 to 15), Group 2 averaged 13 children (range, 5 to 18), Group 3 averaged 12 children (range, 4 to 16), and Group 4 averaged 17 children (range, 7 to 24).

Children in Groups 1 and 3 were from middle-income families and attended a university preschool facility. Groups 2 and 4 were drawn from two community preschools that catered to low- and middle-income families. All classroom settings included both indoor and outdoor play areas. Outdoor play areas contained playground equipment such as swings, jungle gyms, and slides. Indoor play areas contained large desks for group seating that were used for craft activities and lunch. Separate areas of the room were designated for various types of play (e.g., dolls, blocks, drawing, make-believe dress-up, and make-believe house). There was an open area for story telling. Six teachers were involved with the children; two each in Groups 1 and 2 and one each in Groups 3 and 4.

Procedure

Teachers were informed of the general procedure of the study and were given a list of cooperative and competitive games. They were instructed how to play the games and how to explain the rules to the class. They were asked to teach and then lead both types of games for 30 min each day. Teachers were told to use only the games on the list during any given phase. Changes in treatment conditions were discussed a day prior to implementation.

One to three games were played per 30-min session. Initially, the teacher introduced the game, explained the rules, and asked who wished to play. The teacher then showed the children how to play the game. For example, the teacher demonstrated how to play musical chairs by walking around the row of chairs and finding a seat each time she stopped the music. If the game was competitive, she indicated that the child without a chair was to go to the sidelines; if the cooperative version was being played, then all the children were to pile on the remaining chairs. (Only a few games had both cooperative and competitive versions of the same game.) Once children were familiar with the game,

little instruction was needed. Children were not required to be involved in any particular game and were allowed to leave the games if they wished. They could rejoin at any time.

Baseline and free play. During these periods children were not given instruction in any particular games. They were allowed to play in whatever way they wished. However, cooperative and competitive board games were not available for use at these times. Typical activities included drawing, painting and crafts, doll play, and dress-up. The children also played with swings, slides, and the jungle gym. Occasionally the children gathered for stories or a movie. When games were scheduled in the morning, free-play observations were made during the afternoons. If free play was scheduled in the afternoon, games occurred the following morning.

Competitive games. Competitive games involved activities that pitted the children against each other to determine a winner. Competitive board games consisted of Candy Land[®], Chutes and Ladders[®], Aggravation[®], and Double Trouble[®]. Physical competitive games included musical chairs, Simon says, duck duck goose, bean bag balance, tug of war, and tag. (Tug of war, however, involved both cooperation and competition.) The children also played a question-and-answer team game (Children's Trivial Pursuit[®]) that involved questions about the alphabet or other factual material. In this case, the players competed with each other to be first with the answer as well as against the opposing team.

Cooperative games. Cooperative board games included Max[®], Harvest Time[®], Granny's House[®], and Sleeping Grump[®]. Cooperative physical activities included musical chairs, balance activities, freeze-defreeze tag, devine, half-a-heart, cooperative musical hugs, and bean bag freeze. Several of the games were variations of competitive games. For example, in cooperative musical chairs, children had to find an empty chair or share a chair with another child, so that everyone was seated. Chairs were progressively removed until all of the children were piled on the remaining chair. A description of the games may be found in Orlick (1982) and Sobel (1983). (Cooperative board

games and their descriptions are available from Animal Town Game Company, P.O. Box 485, Healdsburg, CA 95448.)

Experimental Design

The experimental design involved both multiple baseline and reversal designs. This combination of designs was used in order to include a variety of treatment sequences and to end the study on a cooperative note. Groups 1 and 2 followed an ACAB sequence, in which A was a baseline phase, C was a competitive games phase, and B was a cooperative games phase. Groups 3 and 4 followed an ABCB sequence. The onset of experimental conditions within each sequence was staggered to create a multiple baseline design. Treatment and baseline conditions were continued until a relatively stable rate of behavior was observed.

Target Behaviors

Prior to data collection, definitions for aggressive and cooperative behavior were read and discussed with all observers. *Aggressive behavior* was defined as any behavior that involved a destructive or hurtful action toward a person or object, and included both physical and verbal responses. Aggressive behaviors were scored when a child engaged in any of the following responses: (a) hitting, kicking, biting, scratching, pulling, grabbing, jumping on, bumping, tripping, throwing an object at another person, or attempts to do so; (b) throwing materials or equipment, kicking doors, walls or furniture, overturning furniture, knocking materials off shelves, breaking or destroying toys or equipment; or (c) threatening physical assault, verbally resisting instructions, stating dislike or other negative feelings about another person, name calling or other derogatory remarks, threatening physically destructive actions (e.g., to break a toy), or verbal attempts to exclude another child from an activity.

Cooperative behavior was defined as a behavior that was directed toward another child and that involved a shared, reciprocal, mutual or helpful quality. Cooperative behavior included: (a) sharing, assisting, or executing a task with another child, working together toward a common goal, sharing

material, or explicitly helping another child; (b) physically supporting another child (e.g., one child carries another child, or helps a child up off the ground or over a barrier) or engaging in physical contact of an affectionate nature (e.g., linking arms, holding hands, embracing, kissing, or patting a child on the back); or (c) verbal behavior such as giving a child instruction on how to do something, verbally offering to help or to share, or agreeing to a request made by another child.

Observation and Recording

Observers sat in the back of the classroom and conducted themselves unobtrusively, avoiding eye contact and social interactions with the children. Observers practiced recording in pairs until interobserver reliability reached 90% to 100% for 3 consecutive days. The type of game played was noted during each treatment session. Cooperative and aggressive behaviors were recorded twice daily, 5 days a week, in 30-s intervals. Observers scanned the entire group of children sequentially, beginning with those on the left side of the room. Instances of the two behaviors were recorded as they occurred; however, no more than one instance of cooperative or aggressive behavior was scored for a given child in any one 30-s interval. In order to obtain the most conservative measure of possible treatment effects, the behavior of children who were present but not participating in the games was also included. Observation periods ranged from 10 to 30 min. Variability in observation time resulted when the teacher deviated from either structured game-time or free-play periods. For example, free-play observations were shortened by events such as children leaving for lunch or gathering for a movie. Game-time observations were reduced when teachers did not continue the games for a full 30 min. In order to equalize comparisons across sessions, daily behavioral totals were divided by the number of minutes observed and the number of children present.

Observers were assigned to either game-time or free-play periods. To minimize knowledge about the type of game played during other times of the day, observers did not alternate between these settings. Game-time observers were provided with a

list and description of the games played. Observers noted whether a teacher engaged the children in the appropriate games during each phase. At the beginning of game time, observers obtained a count of total attendance and the number of children participating in the games. Dividing the number of children participating by the total number present and multiplying by 100% gave a percentage participation score.

Interobserver Agreement

Interobserver reliability was evaluated during 82 sessions. The formula of agreements divided by agreements plus disagreements was used for calculation. Agreement was defined as scoring the same number of each category of behavior in a given interval. Nonoccurrences of behavior (empty intervals) were not used in the calculations. Reliability on cooperative behavior ranged from 50% to 100% and averaged 95%. Reliability on aggressive behavior ranged from 0% to 100% and averaged 88%. Observer records showed that the teachers taught or requested that the children play the appropriate cooperative or competitive games during each treatment condition.

Social Validity

Teachers were interviewed at the end of study. They were asked for their opinions on the effects of the games on the children's behavior and the children's preferences or dislikes.

RESULTS

Scores were obtained by dividing the total number of behaviors observed in each session by the number of minutes observed and then by the number of children present (including those who did not participate). Because of the number of children to observe, observers were limited to scoring a maximum of one aggressive or cooperative behavior per child per 30-s interval. A ratio of cooperative to aggressive behavior was obtained by summing the number of aggressive and cooperative behaviors recorded during each session and dividing the num-

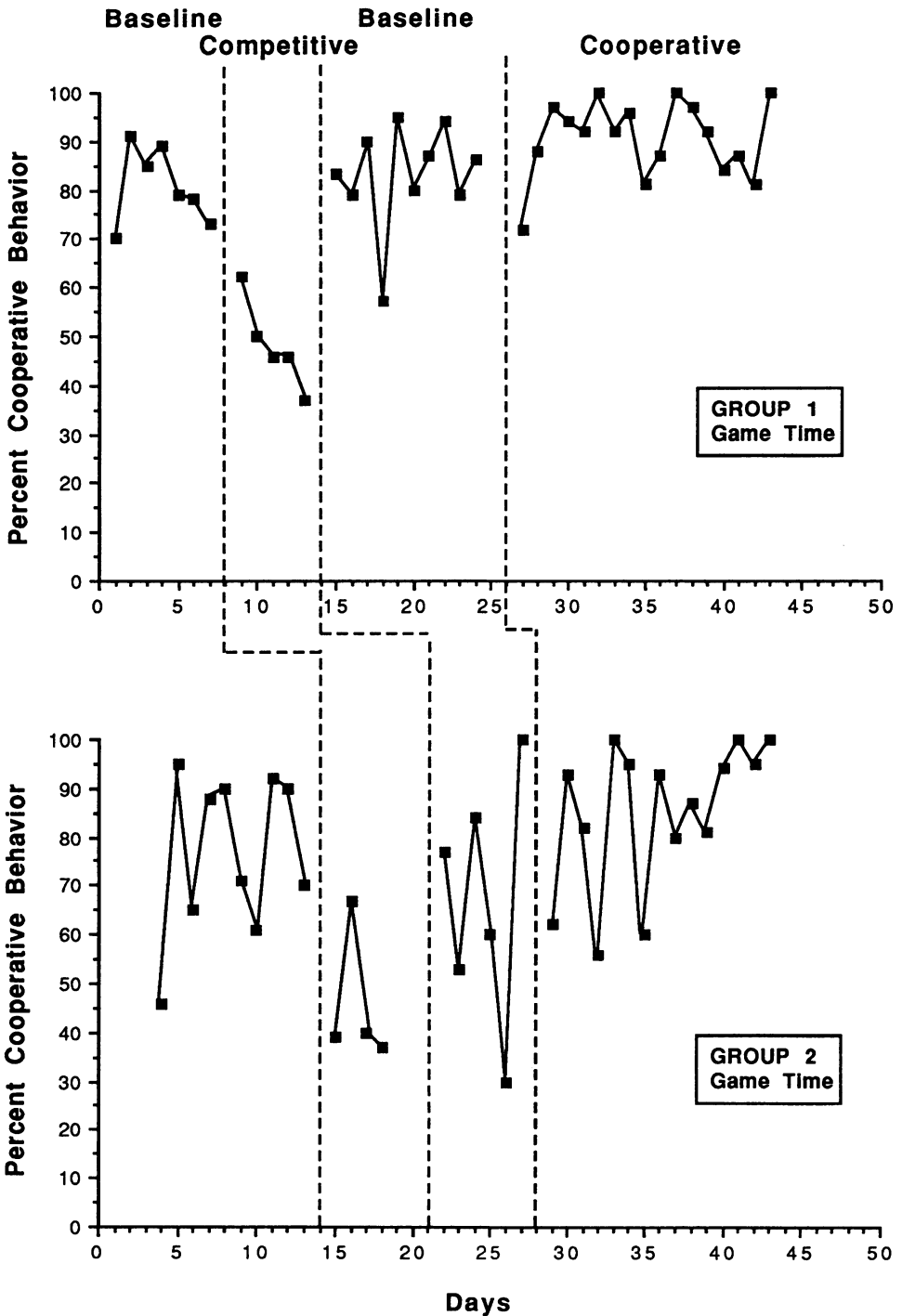


Figure 1. Percentage of cooperative behavior during game time for Groups 1 and 2.

ber of cooperative behaviors by the total. The ratio is expressed as the percentage of cooperative behavior observed (the percentage of aggressive behavior is the inverse).

Game-Time Behavior

The percentage of children participating in the games varied widely. For cooperative games, mean

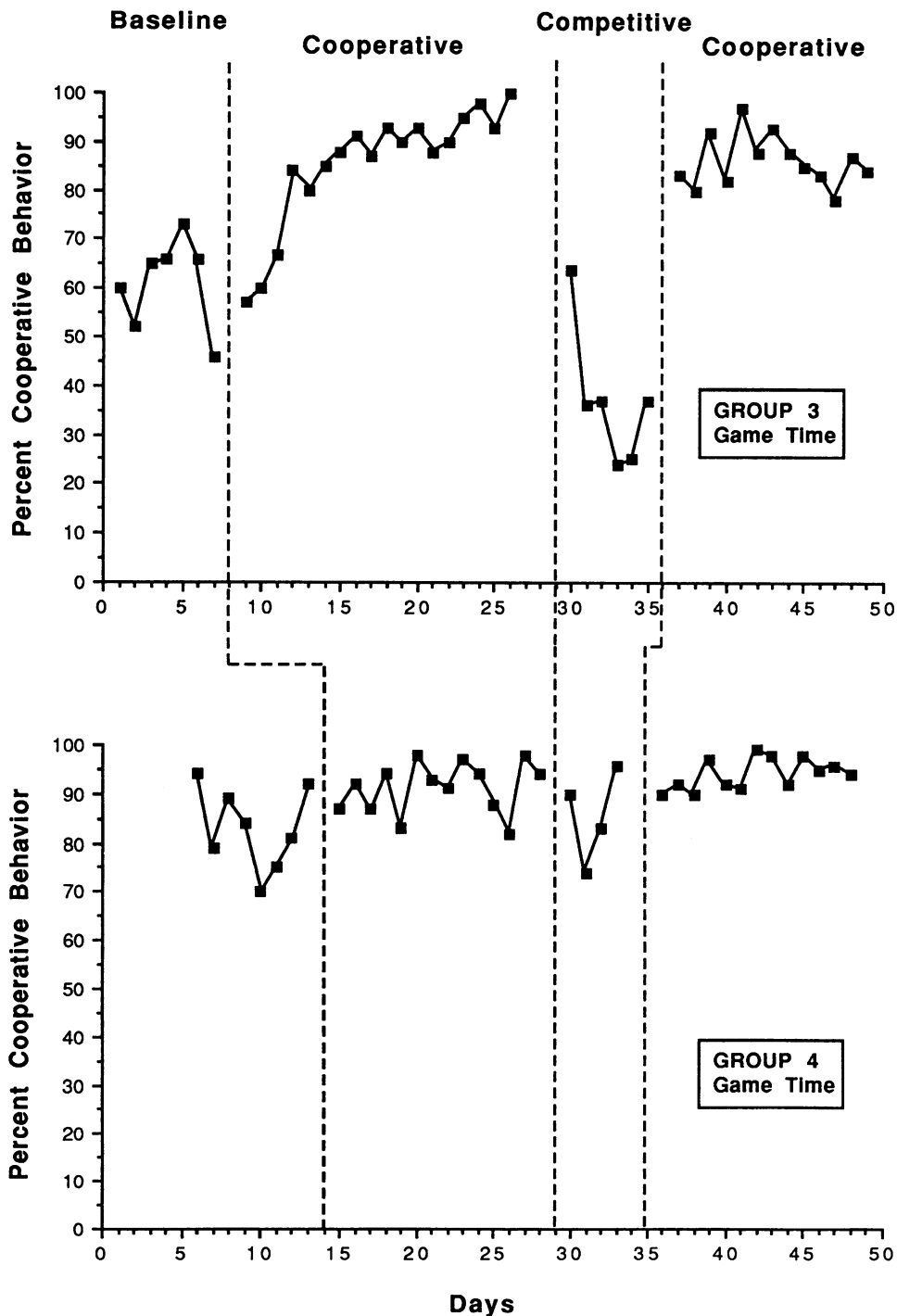


Figure 2. Percentage of cooperative behavior during game time for Groups 3 and 4.

percentages were, for Group 1, 40%; for Group 2, 90%; for Group 3, 43%; and for Group 4, 30%. The mean percentages of children participating in competitive games were, for Group 1,

36%; for Group 2, 83%; for Group 3, 38%; and for Group 4, 47%.

The effects of cooperative and competitive games on the behavior of Groups 1 and 2 are shown in

Figure 1. Cooperative behaviors for Group 1 averaged about 80% during baseline and fell to a mix of about 50% cooperative and 50% aggressive behavior when competitive games were introduced. Cooperation rose to baseline levels when competitive games were terminated. Involving the children in cooperative games raised the level of cooperative behaviors even further, and aggressive behaviors averaged less than 9%.

Following a baseline of 80% cooperative and 20% aggressive behaviors, Group 2's cooperative behavior declined to a mean of 46% during competitive games. When baseline was reintroduced, cooperative behavior increased but was lower ($M = 67\%$) and more variable than during the prior baseline. Variability progressively lessened after the introduction of cooperative games, and cooperation rose to a mean of 84%.

A multiple baseline and reversal designs were also used with Groups 3 and 4, but the treatment conditions were in a different order. The effects of cooperative and competitive games on the behavior of Groups 3 and 4 are shown in Figure 2. Group 3's cooperative behaviors averaged 61% during baseline. During cooperative games, cooperative behavior increased to a mean of 86%. The introduction of competitive games was followed by a sharp drop in cooperative behaviors to 37% and an increase in aggressive responses to 63%. When the cooperative condition was reinstated, cooperative behaviors rose to a mean of 86%.

Group 4 showed relatively minimal changes as a result of the treatment conditions. The proportion of cooperative behaviors remained high throughout the study. There was a small increase in cooperative responses from a baseline mean of 83% to 91% during cooperative games. The children's cooperative behavior dropped to 86% during competitive games and rose to a mean of 94% during the final cooperative phase.

Behavior During Free Play

The number of data points between game time and free play does not correspond on a one-to-one basis. Games were not played on some days when free-play observations were taken. Also, observer

absence occasionally prevented free-play recording on game days. Free-play data thus constitute a sample of behavior measured during particular treatment phases.

Figure 3 shows cooperative (and aggressive) behaviors during free play for Groups 1 and 2. Overall, the behavior of Group 1 during free play was very similar to that exhibited during game time. Following a high level of cooperative behavior during baseline ($M = 83\%$), there was a sharp drop after competitive games were introduced ($M = 53\%$). With the reintroduction of baseline, cooperative behavior rose to a mean of 89% and increased further in the cooperative game phase to 97%.

The behaviors of Group 2 showed more variability during free play and did not reflect changes in treatment conditions as strongly as did those of Group 1. The first baseline showed a mix of 70% cooperative and 30% aggressive behaviors, with little change from this level during competitive games. With the return to baseline, cooperative behavior averaged 76%. There was a small increase in cooperative responses in the cooperative game phase, when cooperation averaged 83% and aggression averaged 17%. Despite the relatively small changes in behavior, it should be noted that aggressive responses during this final phase were 57% of the level observed during the first baseline period.

As shown in Figure 4, Groups 3 and 4 displayed high levels of cooperative behavior during free play. Group 3 showed few changes in behavior from baseline to the cooperative games. However, cooperative behaviors dropped from a mean of 89% during the first cooperative game phase to a mean of 73% during competitive games. Cooperation increased to 94% in the final cooperative game phase. (Free-play data were not available for the first nine sessions of the final cooperative phase, because the children's teacher engaged them in structured activities that precluded free play.)

Group 4 displayed high levels of cooperation and low levels of aggression throughout free play. The mean percentage of cooperative behavior was 97% during the first cooperative games phase, fell to 83% during competitive games, and then rose to 95% in the final cooperative phase.

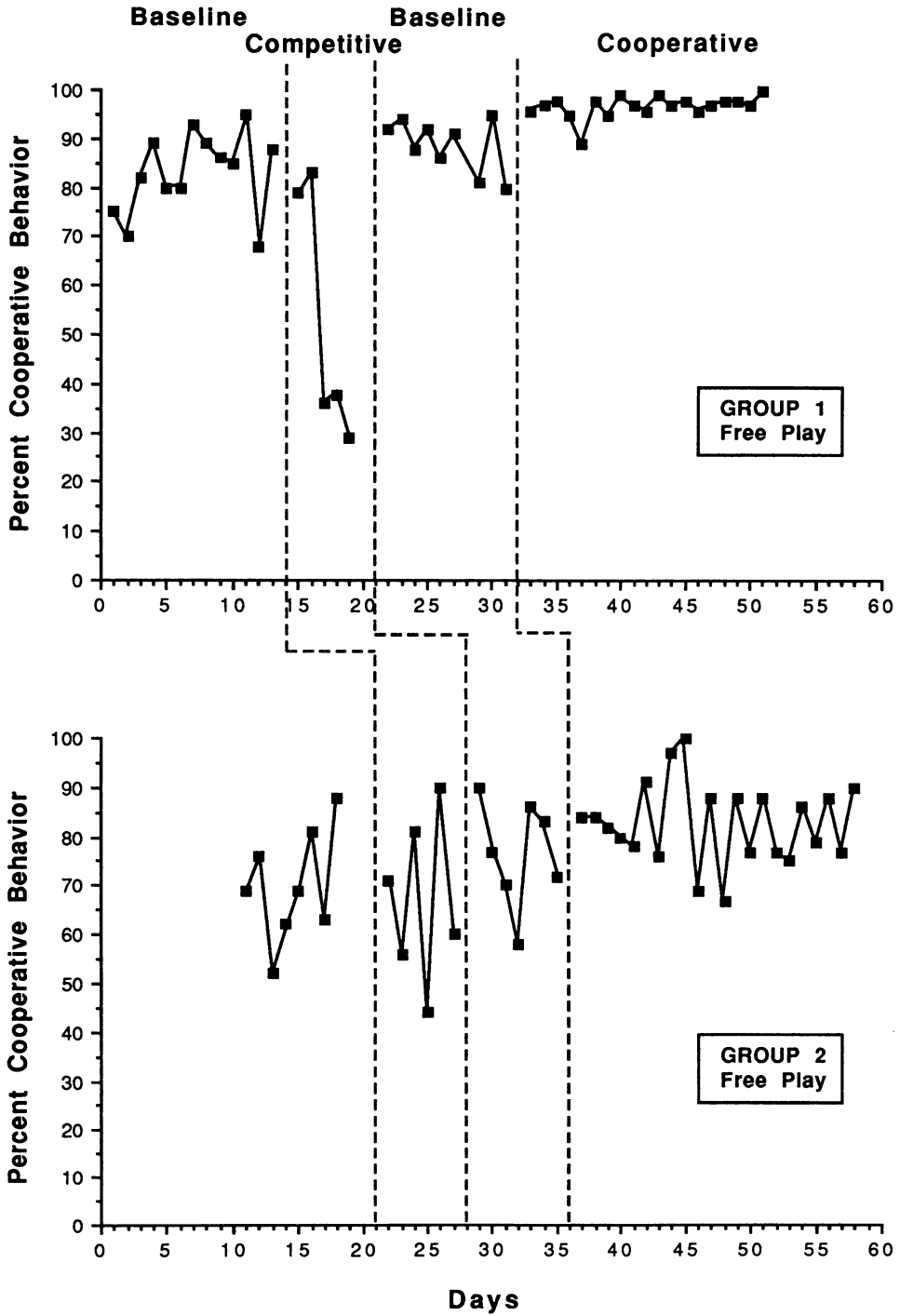


Figure 3. Percentage of cooperative behavior during free play for Groups 1 and 2.

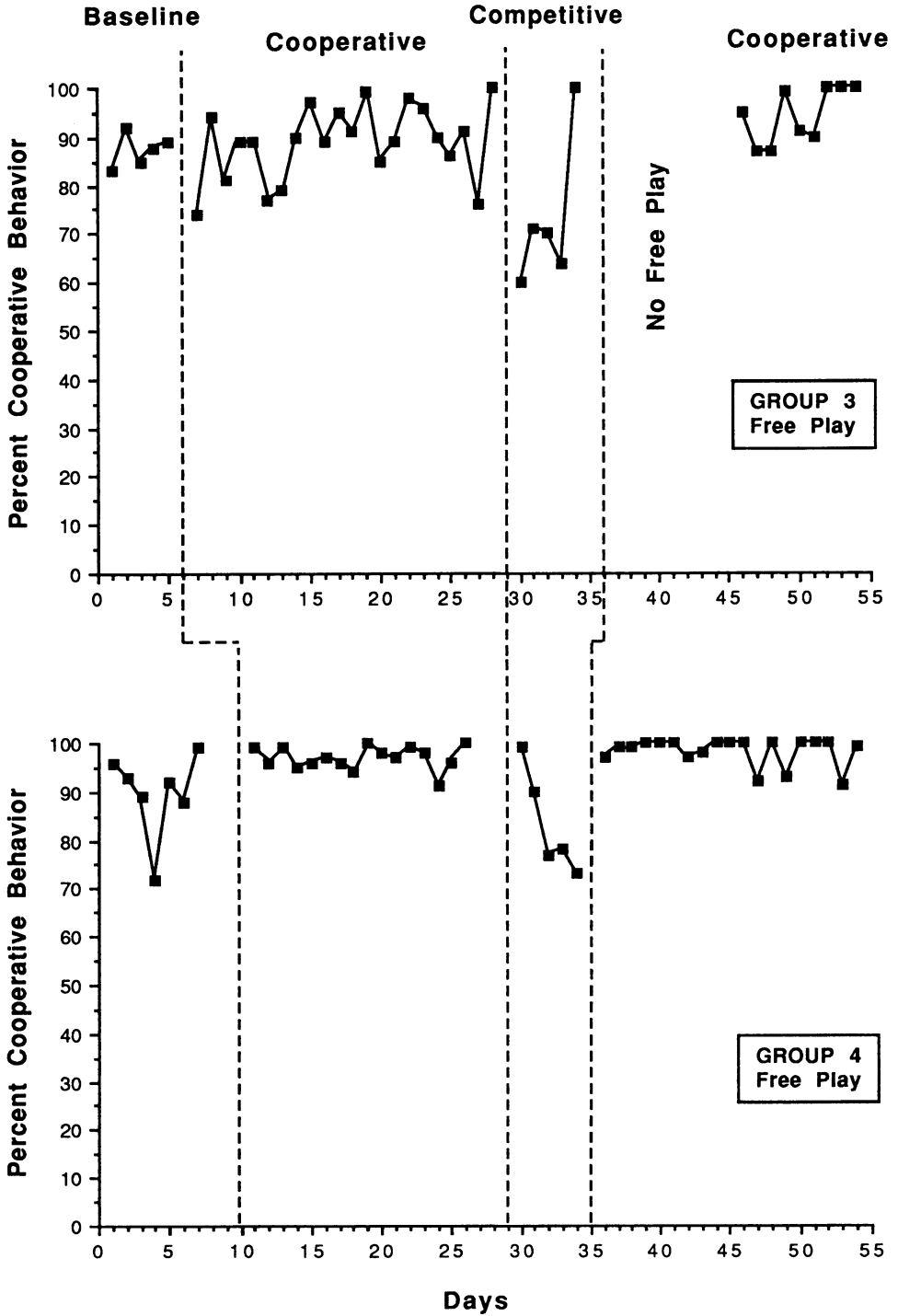


Figure 4. Percentage of cooperative behavior during free play for Groups 3 and 4.

Interviews with Teachers

Four of the six teachers were available for interviews at the end of the study. Two of the four indicated that the children preferred cooperative games; two others did not see one type of game preferred over another. One teacher stated that aggressive children and older children preferred competitive games over cooperative games. All four teachers reported increased aggressive behaviors during competitive games. ("Winners wanted to play more. Losers didn't want to play again.") Because of the disruptive behaviors displayed, one teacher had requested that the competitive games phase be terminated as soon as possible. Three of the four teachers reported increased negative verbal comments (e.g., "I hate you, I don't want to play with you") during competitive games. Three of the four teachers said they preferred cooperative games, citing greater creativity on the part of the children, ease of administration, increased participation of shy children, and overall better behavior. The fourth teacher found competitive games to be more "colorful," and indicated that cooperative board games needed to be made more appealing. Teachers reported that after playing cooperative games, children began devising their own games and often used cooperative rules. Sometimes they changed competitive board games into cooperative games.

DISCUSSION

The four groups of children varied in their responsiveness to cooperative and competitive games. This was true during game time and in later free-play periods. Groups 1, 2, and 3 displayed fewer cooperative behaviors and more aggressive behaviors when playing competitive games. Group 4 showed similar changes but to a more modest degree. Groups 1, 3, and 4 also showed that the type of game played can affect behavior during subsequent free play, even when free play was measured the next day (Groups 3 and 4) or later.

Quilitch and Risley (1973) evaluated the effects of particular toys and play materials on changes in

social or isolated play. In contrast, the effects of specific cooperative or competitive games were not evaluated in this study. Teachers chose a variety of competitive and cooperative games during the treatment phases. The results of the present study suggest that it is not a particular game per se that affects behavior, but whether the game is organized cooperatively or competitively. Nevertheless, some games may be more attractive to children and may have greater effects on behavior than others.

Three groups showed a tendency to prefer cooperative over competitive games. Nevertheless, participation was moderate, ranging from 30% to 43%. Even at these levels of involvement, the games influenced the children's responses. Further evaluation of the effects of specific games could allow teachers to choose games that attract more children and more strongly influence the behavior of the group.

Several studies have demonstrated that cooperative behavior can be increased using contingent teacher attention (Buell, Stoddard, Harris, & Baer, 1968; Cole, 1986; Hart, Reynolds, Baer, Brawley, & Harris, 1968; Poresky & Hooper, 1984; Wolfe, Boyd, & Wolfe, 1983). Given these findings, it might be argued that the results of the present study were due to changes in reinforcement from teachers rather than the type of game per se. We believe that both factors play a role. Rapid changes in responding (such as those seen during treatment reversals in Groups 1, 2, and 3) suggest that games act as setting events that make cooperation more probable. Subsequent attention from teachers, however, may function to maintain the behavior. More gradual changes (such as those shown by Group 3 in the initial cooperative games phase) could have been due to changes in teacher attention and peer reinforcement rather than to the setting effect of games per se.

Orlick (1981a) found that teachers dispensed more attention during traditional games than during cooperative games. Given that traditional (largely competitive) games produce increases in aggressive behaviors, it seems probable that increased teacher attention is the result of such be-

havior. Although attention may raise the level of aggression once it occurs, the setting effect of games appears to be responsible for the initial occurrence of the behavior. The treatment conditions also produced changes in the children's behavior during free play, a time when the children received less teacher attention than during organized games. These changes in behavior were more likely to be a result of changes in the interaction between the children than between teacher and child.

Studies suggest that cooperative games can increase sharing (Orlick, 1981b) and encourage stronger peer relationships (Acton & Zarbatany, 1988; Rogers, Miller, & Hennigan, 1981). Given that poor peer relationships in childhood are a predictor of maladjustment in adolescence and adulthood (Puttala & Dunn, 1990), frequent use of cooperative games in the preschool could play an important preventive role. Furthermore, there is a practical advantage to modifying behavior with antecedent conditions such as games. Instructing children in the use of particular games is a simple strategy, particularly when compared to training a teacher to carry out a specific treatment plan using contingent reinforcement for certain responses. It should also be noted that the behavior of children can affect the job satisfaction of teachers. Happy, cooperative, nonaggressive children are more likely to make the preschool environment an attractive work setting.

Aggressive behavior in children and adolescents has become an increasingly serious social problem (Peterson, in press). Aggressive behaviors that are apparent by middle childhood, even those of a mild nature, are predictive of future antisocial behavior (Farrington, 1985; Huesmann, Eron, Lefkowitz, & Walder, 1984; Magnusson, Stattin, & Duner, 1983). To the degree that the roots of aggression lie in the failure to learn and practice positive social behaviors in early childhood, preschool environments that promote the widespread use of cooperative games (coupled with limitations on competitive games) may reduce tendencies to respond aggressively and may positively affect future social behavior.

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