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## **Cooperative and Competitive Games in Constructivist Classrooms**

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### **Abstract**

*In this article, we report the results of three analyses of first graders' social behavior in constructivist classrooms during cooperative and competitive games. The first analysis involved time sampling of aggressive and cooperative behaviors; the second focused on enacted interpersonal understanding (negotiation strategies and shared experiences); and the third on turn taking and rule following. Results of these three analyses suggest that both types of games are of educational value in constructivist classrooms, but for different reasons. Suggestions for further research are discussed.*

In the *Moral Judgment of the Child* (1932/1965), Piaget analyzed children's play of group games to explore the development of moral reasoning, particularly in children's understanding of rules and their rule-following behavior. Almost 50 years later, in part due to Piaget's work, Constance Kamii and Rheta DeVries (1980) wrote their book, *Group Games in Early Education: Implications of Piaget's Theory*. They argue that group games provide excellent opportunities for young children to reason about moral issues and foster autonomous moral development as well as cognitive development. Since then, group games have become a staple of constructivist early education.

However, many teachers are concerned with the competitive nature of most group games. In particular, they ask whether promoting competition among children is sound, given the research on the negative effects of competition.

In his book, *No Contest: The Case Against Competition*, Alfie Kohn (1992) defines competition as "mutually exclusive goal attainment" (MEGA). According to Kohn, competitive games like chess and checkers involve mutually exclusive goal attainment because in order for one person to win, the other person must lose. The same is true for team sports such as football and basketball—in order for one team to win, the other must lose.

Based on an extensive review of the literature on the effects of cooperation and competition, Kohn argues that competition damages self-esteem, destroys relationships, and impedes the development of trust. He goes on to claim that it leads to envy, distrust, and aggression, and he concludes that all competition is harmful to children. Kohn's answer to competitive games is cooperative games. In cooperative games, children work together as a team to beat some element in the game, such as a black cat in *Max* or a time clock in *The Secret Door* (DeVries, Zan, & Hildebrandt, 2002; Hildebrandt & Zan, 2002). In response to these concerns, some teachers have turned to the use of cooperative games, some have abandoned competitive games, and some have adapted competitive games to make them cooperative.

We have not been entirely convinced of Kohn's argument. We recognize his perspective on destructive competition. We have seen it many times, and agree that it should be avoided. But we have also seen a great deal of positive game playing in early childhood classrooms, and have seen friendships flourish over games. We speculated (in a conversation with Kohn) that the results suggesting that

competitive games led to negative outcomes might only be true in contexts characterized by already high levels of competition. We suggested that in an otherwise cooperative atmosphere, such as is found in constructivist classrooms, where cooperation is the norm, children would exhibit cooperative behavior in the midst of competition.

We base this hypothesis on two assumptions. First, competition and aggression are not synonymous— if we define competition as “playing to win” and aggression as “treating other people in a rough, hurtful, or unfair fashion” then it is clear that one can play a competitive game without necessarily being aggressive. Second, cooperation is a prerequisite to competition—in other words, children need to cooperate in order to compete. In order to play a competitive game, children must agree to the rules, abide by the rules, and accept the consequences of the rules, all of which requires cooperation (Hildebrandt & Zan, 2002). If children don’t cooperate, the game will quickly fall apart. Therefore, we expected that children in constructivist classrooms would be better able exhibit cooperative behavior in the context of competitive games than children in other types of classrooms.

However, this is an empirical question. This disagreement with Kohn has inspired us to conduct our own research on these two types of games. Our position is that both types of games have value. In this article, we describe some of the research we have conducted over the past 5 years exploring this issue. In this research, we have concentrated on the social and moral aspects of group games, rather than the cognitive aspects. Other researchers, such as Constance Kamii, have shown that some group games are excellent vehicles for promoting intellectual reasoning, especially in the area of mathematics (Kamii, 1989, 1994, 2000). We have also seen interest in competitive games motivate children to devote time and energy to math problems that they might not consider in other contexts. However, we have not yet done systematic research comparing the cognitive aspects of competitive and cooperative games.

## **Comparison of First-Graders’ Play of Cooperative and Competitive Games**

Our interest in children’s social behavior during cooperative and competitive games was piqued by a study by Bay-Hinitz, Peterson, & Quilitch (1994) entitled “Cooperative games: A way to modify aggressive and cooperative behaviors in young children.” Using time-sampling to observe and record preschool children’s behaviors in the classroom during game time and free-play periods, Bay-Hinitz, et

al. found that exposure to competitive games led to an increase in aggressive behaviors, while exposure to cooperative games led to an increase in cooperative behaviors. However, they found this result in 3 of the 4 classrooms; in the fourth classroom, they found no differences. The authors provided no information about the educational programs in the four classrooms. When we saw the results we asked, "What is going on in this fourth classroom? Could it be different from the others?"

This study captured the attention of one of Carolyn's graduate students, Taunjah Bell, and together we designed a study to replicate it in two constructivist classrooms. We hypothesized that in constructivist classrooms, where mutual respect is practiced between teachers and children and between children themselves, there would be no difference between the way children play cooperative and competitive games.

## **Time Sampling of Cooperative and Aggressive Behaviors**

The study included 37 first grade children (20 boys and 17 girls) from two classrooms in middle-income, rural communities in Iowa (Hildebrandt, Bell, Zan, & Stoeckel, 1999; Zan & Hildebrandt, 2003). Two first grade teachers who were actively striving to become more constructivist in their teaching practices agreed to set aside 30 minutes daily for games. These teachers had been working with constructivist educators at the nearby university to learn about constructivist practices. Both teachers were warm, caring, and respectful in their relations with children. They allowed peer interactions frequently throughout the day, encouraged and supported children in resolving their own conflicts, and to some extent encouraged children to be self-regulating in the classroom. Research assistants taught the children ten competitive games (e.g., Checkers, Guess Who? , Connect Four, Sorry, Mancala, and other commercial games), and ten cooperative games (e.g., Max, Round-Up, Secret Door, and other games from the Canadian company Family Pastimes). The children then played these games on a free-choice basis with five weeks of competitive games (as a baseline), five weeks of cooperative games, and another five weeks of competitive games.

Using a modified version of the Bay-Hinitz et al. time-sampling and coding procedures, two trained observers recorded children's aggressive, cooperative, and onlooking behaviors during game time in 15-second intervals (children were observed in randomized order). Examples of aggressive behavior included such behaviors as hitting, throwing the dice, insulting another player, yelling at another

player, grabbing game pieces away from another player, and refusing to take turns. Examples of cooperative behavior included such behaviors as taking turns, helping other players, handing the dice to the other, and offering advice. Two additional categories added to the Bay-Hinitz et al. coding procedures included “engaged onlooker” (for children who were actively engaged in watching other children playing a game), and “unengaged” for children who were not engaged in playing or watching a game. (Since these last two categories accounted for only a small fraction of the data, they were not used in the final analysis). Interrater reliability for this coding ranged from 90% to 100% across three consecutive sessions.

Approximately 33 observations of each child added up to a total of 1,174 observations. Children's behaviors in both game conditions were predominately cooperative. The average percentage of cooperative behaviors for all three game conditions was 97.36% in one classroom and 99.03% in the other. No differences were found between children's behavior during play of competitive and cooperative games (see Table 1).

Table 1  
Mean Percentage of Cooperative, Aggressive, and Onlooking Behaviors per Game Condition

Classroom	Behavior	Game Condition		
		Competitive I	Cooperative	Competitive II
Classroom 1	Cooperation	100%	96.4%	96.8%
(N = 17)	Aggression	--	2.2%	2.7%
	Onlooking	--	1.4%	.5%
Classroom 2	Cooperation	97.4%	98.1%	99.6%
(N = 19)	Aggression	1.3%	1.3%	.4%
	Onlooking	1.3%	.6%	--

## Enacted Interpersonal Understanding (Selman Coding)

Because of the limitations of time-sampling methods, we also collected videotaped data that could be examined more closely (Zan & Hildebrandt, 2003). After the cooperative game period and the second competitive game period, we invited children to come out of the classroom to play a game that we designed to be played either cooperatively or competitively. The same pairs of children played each version of the game together, first with an adult teaching them, and then without adult intervention. These sessions were videotaped, transcribed, and coded from the transcripts and tapes.

We were particularly interested in differences in the social perspective taking children expressed in their interactions in the two game conditions. We used Robert Selman's conceptualization of interpersonal understanding (Selman & Schultz, 1991) to examine the developmental levels of perspective coordination children used in their interactions during the game. In this model, all interactions can be characterized as either negotiation strategies or shared experiences. Negotiation strategies (NS) are interactions in which the interpersonal dynamic is in disequilibrium (for example, someone wants something that the other person has). Shared experiences (SE) are interactions in which the interpersonal dynamic is in equilibrium (that is, both are content and enjoying each other's company). Both NS and SE are coded for the level of social perspective coordination embedded in the interaction according to a coding manual developed by DeVries and colleagues (DeVries, Reese-Learned, & Morgan, 1991a).

Our interest in children's interpersonal understanding reflects our recognition that in sociomoral development, learning how to take the perspective of another person is one of the primary accomplishments of the early childhood period. In early childhood, the majority of children's interactions are unilateral (level 1). Reciprocal (level 2) interactions occur much less frequently and reflect the "leading edge" of development (DeVries & Goncu, 1987; DeVries, Reese-Learned, & Morgan, 1991b; Zan, 1996). At the same time that children are developing reciprocal ways of interacting with others, they are also abandoning impulsive, physical (level 0) ways of interacting. Therefore, we were particularly interested in examining the differences in level 0 and level 2 interactions because of the effect these types of interactions have on children's peer relationships. That is, reciprocal interactions are generally more successful and lead to better peer relationships than impulsive ones, and children who do not abandon physical ways of interacting with others are at risk of being labeled as aggressive and eventually being rejected by their peers.

Coding was done primarily by a graduate assistant who was blind to the study design and hypotheses (it was impossible to be blind to the type of game), assisted by the first author, who coded approximately 17% of the data. Interrater reliability was 79% for dynamic and 81% for level.

Table 2 shows the breakdown of interactions by dynamic and level. As can be seen, most of the children's interactions, both NS and SE, were at level 1 (unilateral). However, in both types of games, children used some level 0 and some level 2 interactions.

Table 2

Percentage of Level 0, 1, and 2 Shared Experiences and Negotiation Strategies Within Each Game Condition

	Level of Interpersonal Understanding						
	Negotiation Strategies			Shared Experiences			Total
Game Condition	Level 0	Level 1	Level 2	Level 0	Level 1	Level 2	
Cooperative	3.25	45.60	9.29	3.06	32.68	6.11	100.00
Competitive	3.07	49.77	7.77	1.76	35.16	2.48	100.00

In order to test for statistically significant differences in children's interactions while playing cooperative and competitive games, we calculated difference scores for each child within each of the 6 types of interactions (3 levels of NS and 3 levels of SE). We used a Wilcoxon Signed Rank test to test for significance. Results were a mixture, but overall favored the cooperative game (see Table 3). Looking first at negotiation strategies, we found no differences between games in level 0 impulsive interactions. These are interactions such as hitting, pushing, yelling, jerking something out of the other person's hand, etc.—behaviors that others would probably call aggressive. At level 2, what we call the “leading edge of development” we found a significant difference in favor of the cooperative game. Children tended to use more level 2 (reciprocal) strategies in the cooperative game than they did in the competitive game.

Table 3

Mean Difference Scores (Cooperative Minus Competitive) for Three Levels of Shared Experiences and Negotiation Strategies

Level	Negotiation Strategies			
	<u>Mean</u>	<u>SD</u>	<u>S</u>	<u>p</u>
Level 0	-0.55	4.89	-8.5	.8820
Level 1	-5.49	8.21	-232	.0002
Level 2	1.99	6.24	147	.0244
Level	Shared Experiences			
	<u>Mean</u>	<u>SD</u>	<u>S</u>	<u>p</u>
Level 0	1.16	5.26	62	.0573
Level 1	-1.19	12.03	-54.5	.4184
Level 2	4.08	3.36	330.5	.0001

Note. Positive mean scores indicate greater percentage of interactions in the cooperative game condition, and negative mean difference scores indicate greater percentage of interactions in the competitive game condition (cooperative minus competitive).

Moving to shared experiences, we see that children tended to use more level 0 (impulsive) shared experiences (what we refer to as silliness) in the cooperative game, and that this difference approaches significance. These low-level interactions, while impulsive, are not harmful, and may have some social value in the development of intimacy. In fact, when children were engaging in these silly behaviors, they appeared to be having fun. However, teachers would probably call them “off-task” behaviors. At level 2, we see the same results as we saw in level 2 NS, only stronger. Children were much more likely to use level 2 (reciprocal) SE in cooperative games than in competitive games.

## Turn-taking and Rule-following

Finally, we conducted an analysis of turn-taking and rule-following behavior. This analysis was prompted by another, very small scale pilot study in which we examined 14 first graders’ turn-taking and other rule-following while playing two favorite classroom games, *Max* (cooperative) and *Rat-a-Tat-Cat* (competitive). The children in the pilot study were all enrolled at our constructivist laboratory school, the Freeburg Early Childhood Program, that serves primarily children from low-income families. We brought the children into the research room in pairs and invited them to play these two games in two separate sessions. Using the turn as the unit of analysis, we analyzed how many turns were characterized by turn violations (that is, someone played out of turn) and how many turns were characterized by rule violations (such as cheating) (see Table 5). We found that both turn violations and rule violations were more likely to occur in cooperative games than in competitive games.

Table 4

Turn Violations and Rule Violations in Max (Cooperative) and Rat-a-Tat-Cat (Competitive) Game Sessions (Pilot Study)

	Max (N = 7)	Rat-a-Tat-Cat (N = 7)	Total
Total number of turns	217	121	338
Number of Turn Violations	17	1	18
Percent of Turn Violations	7.8%	.8%	5.3%
Number of Rule Violations	59	24	83
Percent of Rule Violations	27.2%	19.8%	24.6%



Table 5

Frequency and Percent of Turn Violations and Rule Violations in Competitive and Cooperative Game Sessions

	Cooperative (N = 17)	Competitive (N = 17)	Total
Total number of turns	450	420	870
Number of Turn Violations	19	16	35
Percent of Turn Violations	4.2%	3.8%	4.0%
Number of Rule Violations	84	86	170
Percent of Rule Violations	18.7%	20.5%	19.5%

As a result of this pilot study, we expected to find the same results with our larger, rural sample of first graders. We analyzed the videotapes from the larger study in the same way, looking for turn violations and other rule violations. The transcripts were coded primarily by a graduate student, assisted by the first author, who coded approximately 10% of the data. Interrater reliability was 100%.

As shown in Table 6, we found no differences in the number of turn-taking and rule-following violations between the cooperative and competitive games. While it appears that children might have had slightly more turn violations and rule violations in the cooperative game than in the competitive game, this difference is not statistically significant.

Table 6

Mean Number and Percent of Turn Violations and Rule Violations per Game Session, by Type of Game

	Cooperative		Competitive	
	Number	%	Number	%
Mean Turn Violations	1.1	5.2%	.94	3.4%
Mean Rule Violations	4.9	22.2%	5.1	20.5%

## Discussion

We draw two broad conclusions from the results of these analyses. First, we find no evidence to suggest that competitive games are harmful to children in otherwise

cooperative classroom atmospheres, such as those in constructivist classrooms. Competitive games do not appear to elicit more aggression than competitive games in these settings. We found this in two different analyses—the time-sampling of behaviors and the Selman coding of social interactions. We also found that children’s play of cooperative games and competitive games appears to be equally cooperative—that is, they are no more likely to cheat or to play out of turn in competitive games than in cooperative games. These results are in contrast to those of Bay-Hinitz et al. (1994) and Finlinson, Austin, & Pfister (2000), who also observed more positive behaviors during cooperative games, and more negative behaviors during competitive games, at least during the first week of play.

The findings of the current study challenge Kohn’s claim that when people play games competitively, their desire to win leads them to distance themselves from their opponent, even so far as to dehumanize the other, so that they can beat their opponent without feeling guilty. We saw no evidence of this type of behavior, nor did we see any increase in distrust or aggression during competitive games.

Second, the results of the Selman coding lead us to conclude that cooperative games provide an advantage in the area of sociomoral development. They appear to elicit more advanced perspective taking than competitive games. However, it is not clear from this study whether the advantage in interpersonal understanding is due to the structure of the game (competitive or cooperative), or if it is due to the team nature of the play. When playing a cooperative game, children are in essence on the same team, playing against the game. The question is, how would they interact if they played competitive games in teams, and how would these interactions compare to playing a cooperative game? This is one of the many directions we hope to take our future research.

This research raises several other questions for us. We remain puzzled by the difference between the results of our pilot study (where children cheated and played out of turn more in the cooperative games), and the larger study which showed no differences in cheating and turn taking. The results of the pilot study made sense to us, given the experiences we had had playing cooperative games with these children. That is, when children break the rules or cheat in a cooperative game, generally no one protests because the cheating benefits everyone. It is like cheating in solitaire, only done in collusion with another player. We expected to see the same pattern in the larger study. However, there are many differences between the two studies. They sampled different populations of children (predominately low-income, inner-city children in the pilot study, and predominately middle-income, rural children in the larger study). In addition, the

pilot study contained a much smaller sample (7 pairs compared to 17 pairs). So perhaps the finding of differences was simply random variation. Finally, in the larger study, the children had experienced 5 weeks of strictly cooperative games prior to the videotaped game session, while in the pilot study, the children had access to both types of games throughout the year. So perhaps the difference in results is due to different amounts of experience playing *cooperative* games.

Another finding that we puzzle over is the difference in out-of-control silly behavior in the cooperative games. Perhaps the silliness is a sign of disintegration of the game; that is, the children lose interest in cooperative games over time, and so engage in silly behaviors to increase interest. Speaking strictly anecdotally, we have found in our own play of cooperative and competitive games in early childhood classrooms that children tend to have more friendly conversations about topics other than the game during cooperative games. Perhaps this is because most of the cooperative games with which we are familiar tend to be less cognitively challenging than most competitive games, so that children are more inclined to carry on conversations while they play.

## Conclusions

Based on these findings, we conclude that both cooperative and competitive games have value in constructivist classrooms. In classrooms characterized by high levels of cooperation, children's interactions are cooperative, regardless of the type of game. The significant differences in children's reciprocal negotiation strategies and shared experience suggest that developmentally appropriate early childhood teachers take a closer look at cooperative games, and consider adding them to their collection of group games, but that they do not discard their competitive games.

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