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## Using participatory research to develop a playground-based prevention program

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### Abstract

Low level acts of aggression in school are associated with a host of emotional arousal, social problem-solving, peer relationship, and academic difficulties. School-wide interventions may decrease aggressive interactions and promote cooperative play and social skills among students. In the current study, the authors used a participatory-action research model to co-construct a playground-based recess program in a relatively large urban elementary school. The manuscript illustrates the partnership process and how data was used to inform intervention implementation procedures. The role of psychologists working at the whole-school level is highlighted.

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### Introduction

Peer harassment and victimization (teasing, hitting, pushing, and threatening) occur frequently in elementary schools across the nation: between 20% and 30% of elementary age youth are involved as a bully, victim, or both (Leff, Kupersmidt, Patterson, & Power, 1999; Nansel et al., 2001). Early aggressive behavior is associated with academic problems (Kazdin, 1994), difficulty regulating emotional arousal (e.g., Cummings,

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Iannotti, & Zahn-Waxler, 1985), social problem-solving deficits (e.g., Dodge, Petit, McClaskey, & Brown, 1986; Lochman & Dodge, 1994), and peer rejection (e.g., Kupersmidt, Coie, & Dodge, 1990). Similarly, peer victimization is related to adjustment difficulties, including depression and anxiety (Olweus, 1978), loneliness (Kochenderfer & Ladd, 1996), poor self-esteem (Olweus, 1978), and school avoidance (Kochenderfer & Ladd, 1996). Further, there is evidence that early forms of aggression (hitting, teasing, and annoying others) may lead to more serious aggression and violence as children get older (Loeber et al., 1993). School efforts to develop school-wide evidence-based strategies to address the milder forms of aggression may have both short and long-term benefits. The present study illustrates how a participatory action research paradigm (PAR) (Nastasi, Schensul et al., 1998; Nastasi, Vargas et al., 2000) can be used to design, implement, and evaluate an innovative playground-based prevention program. Participatory action research is a model in which sound scientific methods and responsiveness to community needs are integrated (see Nastasi, Vargas et al., 2000 for a review). This framework is well suited to glean relevant information from community-based prevention and intervention programs that cannot be examined by traditional experimental designs.

Although many school-based interventions have targeted aggressive behaviors occurring in classroom-based or small-group settings (see Leff, Power, Manz, Costigan, & Nabors, 2001), the majority of aggression at school occurs in unstructured settings, such as on the playground (Craig & Pepler, 1997; Craig, Pepler, & Atlas, 2000). As such, more attention needs to be directed to re-designing school playgrounds, empowering playground supervisors to better guide children's play behaviors, and helping educators implement age- and gender-appropriate activities for children during recess. Children from inner-city schools may be vulnerable to aggression and victimization on the playground, because these settings are often understaffed and under-resourced with respect to age- and gender-appropriate play equipment (Dowrick et al., 2001; Leff, Goldstein, Angelucci, Cardaciotto, & Grossman, in press; Leff, Power, Costigan, & Manz, 2003).

### *Determinants of aggression*

Aggressive behavior among children can be explained by at least two prevailing theoretical models: social learning theory (e.g., Bandura, 1973; Patterson & Capaldi, 1991) and developmental-ecological theory (e.g., Bronfenbrenner, 1986; Sameroff, 1993; Sameroff, Bartko, Baldwin, Baldwin, & Seifer, 1998). Social learning theory posits that children learn to behave aggressively by observing aggressive behavior and its effects on others and by receiving or expecting to receive positive reinforcement for exhibiting aggressive behaviors (e.g., Bandura, 1973; Dishion, Capaldi, & Spracklen, & Li, 1995; Patterson & Capaldi, 1991). In the case of the school playground, low levels of aggression occur frequently and are often associated with the perceived acquisition of reinforcement (e.g., Craig & Pepler, 1997). As a result, some children may perceive a benefit to aggressive behavior (e.g., gaining a desired play object, improving one's social standing at another's person's expense) without a huge cost (e.g., low level aggression is often ignored, undetected or viewed as part of normal development). Thus, this model suggests that interventions designed to reduce peer modeling of aggressive behavior and the

perceived benefits of aggression will be associated with decreased aggression and increased rates of prosocial behavior.

Developmental–ecological theory posits that behavioral patterns arise through an ongoing series of transactions that occur between the child and his or her environment (Bronfenbrenner, 1986). Child behavior is strongly influenced by contextual variables within systems (Sameroff, 1993; Sameroff et al., 1998). This model emphasizes the importance of altering contextual variables so that they promote child competence and reduce harmful behavior patterns (Bronfenbrenner, 1986; Sameroff, 1993). For instance, working with playground supervisors to provide structured activities and stronger supervision during recess may strengthen the context in which the child learns appropriate play behaviors and conflict negotiation skills.

### *Factors that affect behavior on the playground*

Children spend a considerable amount of each school day engaged in recess-related activities on the playground. Students typically view recess as an enjoyable and carefree time in their busy school day (Blatchford, 1996). Further, recess may provide an excellent opportunity for promoting social skill development (Pellegrini & Bjorklund, 1996; Pellegrini & Davis, 1993). Recess can also be an unstructured school context that promotes rough and aggressive behaviors (Craig & Pepler, 1997; McNeilly-Choque, Hart, Robinson, Nelson, & Olsen, 1996).

Many factors can determine whether a recess period will facilitate the development of social skills and friendship making skills or, in contrast, contribute to children's aggressive behaviors. In particular, at least two important areas to consider when designing and/or improving children's playground behaviors are organizing structured, cooperative activities on the playground (Bay-Hinitz, Peterson, & Quilitch, 1994; Murphy, Hutchison, & Bailey, 1983) and providing active monitoring of children's playground behaviors (Colvin, Sugai, Good, & Lee, 1997; Roderick, Pitchford, & Miller, 1997).

Providing cooperative, age-appropriate activities to children on the playground can have a beneficial effect on children's subsequent behaviors (see Nabors, Willoughby, Leff, & McMamen, 2001). For instance, Murphy et al. (1983) divided a playground for kindergarten to second grade students into three distinct sections, and then provided two cooperative games for children (jump-rope and relay racing) combined with a time-out procedure for inappropriate behaviors. Using a reversal (ABAB) design, the study demonstrated that there was a significant reduction in children's aggressive behavior in response to intervention. In another study, preschoolers demonstrated increases in cooperative actions and decreases in aggressive behaviors when involved in cooperative games (Bay-Hinitz et al., 1994). In contrast, the children demonstrated more aggression and less cooperative actions when involved in competitive games (Bay-Hinitz et al., 1994). Because organized games typically specify rules for relating to one another and discourage the use of aggressive behavior, the application of games on playgrounds may lead to a reduction in aggressive behavior and the promotion of cooperative forms of play.

Providing active supervision for children's playground behavior and encouraging children to play cooperatively is related to lower levels of aggressive behaviors (Colvin et al., 1997; Roderick et al., 1997). For example, in one study, playground supervisors

were trained to more actively monitor children's playground behaviors by encouraging playground assistants to reinforce children who exhibited positive behaviors with a raffle ticket (Roderick et al., 1997). This relatively simple strategy resulted in a 75% reduction in kicking and a 47% reduction in hitting on the playground. The presence of an adult who is actively monitoring playground behavior and encouraging cooperative play has the potential to be an effective method of shaping children's behavior on the playground.

### *Using a partnership-based framework to promote children's social skills*

Partnerships between educators, community members, and university-based researchers can be helpful in building schools' capacities to promote child development and prevent bullying and victimization (Dowrick et al., 2001). PAR enables the research team to integrate scientific methods with input from key community stakeholders to create and evaluate a potentially effective and acceptable intervention program. The PAR model posits that the partnership between researchers and school personnel drives the design and implementation of the program, as well as the planning of evaluation methods and the interpretation of data (Graham, 1998; Nastasi et al., 1998). The PAR model necessitates that researchers refrain from using "packaged interventions" but instead adapt evidence-based strategies to the particular needs of the school and community, as articulated by the school partners. By jointly developing procedures with school and community partners, an intervention is more likely to be culturally responsive, ecologically valid, and acceptable to the school and the community (Nastasi et al., 2000). In the current study, the research team collaborated with school administrators, teachers, and especially playground assistants (paraprofessionals who supervise children on the playground during recess) and community volunteers to design and implement a playground-based intervention, which has subsequently been termed the Playground, Lunchroom, and Youth Success (PLAYS) Program (see Dowrick et al., 2001; Nabors, Leff, & Power, in press).

In short, the purpose of the present study is to describe a partnership-based approach to the design and implementation of a playground-based intervention program, and to collect data to improve intervention implementation and student outcomes. The role of psychologists working at a whole-school level, and strengths and limitations in using a PAR model in school-based prevention programming are highlighted.

## **Methods**

### *Participants*

This project involved partnering with school staff (e.g., principal, teachers, and playground assistants), students, and community volunteers from an urban public elementary school serving students from a predominately low-income disadvantaged neighborhood. The school has approximately 750 children enrolled in kindergarten through 4th grade. Seventy percent of the students were African American, 20% were Asian American, and 10% were Caucasian. The majority of students come from low-income homes and receive free or reduced lunch (89.4%). Approximately 7% of students

are enrolled in special education and 11% are identified as Limited English Proficient (LEP) students.

In this article, the university-based researchers are referred to as “the research team”, the school staff (six individuals) and community volunteers (two individuals) who work in the playground setting to promote children’s behaviors are referred to as “the school partners,” and the collaborative efforts of the research team and the school partners are referred to as the “project team.”

### *Program design*

There are several steps in using a PAR paradigm. First, in the problem identification stage, the research team collaborates with the school partners to identify the initial problems. In the problem analysis stage, the research team shares their preliminary findings with school partners to ensure that their interpretation of the information gathered accurately reflects school partners’ perspective. Next, at the program implementation stage, researchers work hand-in-hand with school partners to develop a culturally sensitive and realistic intervention plan to address the areas of concern. Finally, in the evaluation stage, researchers and school partners agree upon an appropriate way in which to evaluate the success of the new intervention. Thus, the active input of school partners is essential in all stages of the research program.

### *Problem identification*

In the problem identification stage, the research team collaborated with school partners to identify their knowledge about and concerns for the children and families at the school, and to combine this information with the research team’s knowledge about research methodology and the empirical literature. This collaboration began approximately 1 year before the current project when several members of the research team provided educational consultation to the school and learned of serious concerns about children’s behavior during recess. The partnership to improve children’s playground behaviors began when the principal invited the research team to meet with key personnel who were concerned by children’s behavioral difficulties during recess (i.e., the school counselor, the physical education teacher, and the supervisor of the playground assistants). In this initial meeting, the research team learned more about the school ecology, the characteristics of the surrounding neighborhood, and some of the strengths and limitations of the existing recess program. The research team also agreed that they would be on site for 3 h/week, attend three lunch–recess periods on the same day, conduct brainstorming meetings with school partners every other week (a 1-hour meeting), and visit third and fourth grade classrooms to talk with students about their lunch-recess experience.

Over the next 3 months, the research team participated in all of the activities outlined above, and also administered a series of questionnaires to the school partners to better understand their perspective about the strengths and limitations of the existing recess program (Leff, Power, & Goldstein, in press; Leff, Power, et al., 2003; Nabors et al., in press). Further, the research team tried to better understand student beliefs by having several classrooms of students complete periodic playground diaries detailing where on the playground they typically played, what activities they participated in, and what types of

conflicts they encountered. Through these procedures the project team identified three primary concerns: (a) high levels of rough play that at times escalated into aggression, (b) relatively low levels of cooperative behaviors, and (c) low levels of communication and game-playing between children of different racial backgrounds (i.e., African American, Asian American, and White children).

### *Problem analysis*

Two of the biweekly brainstorming meetings with the school partners were used to describe the research team's initial analysis of their and student concerns. This allowed the research team to ensure that they adequately understood the school partners' perspective and that they were active partners in the process. The recursive nature of PAR is an integral part of the framework (Nastasi et al., 2000). Additionally, these conversations helped the research team to understand that school partners felt as if children's recess behavior problems occurred largely because students were bored during recess and because students had few opportunities to participate in developmentally appropriate games. Then, the research team discussed with the school partners that these ideas were extremely similar to prior research indicating that behavior problems are more frequent in the absence of structured activities that keep children positively engaged (e.g., Bay-Hinitz et al., 1994; Murphy et al., 1983). School partners summarized the strategies that they had previously tried to improve children's behavior on the playground and the research team discussed empirically supported playground interventions. School partners indicated that they wished to establish a "socialized recess" program with clear rules and expectations for children's behavior coupled with providing enjoyable activities for students to participate.

### *Program implementation*

Over the course of several additional meetings, the research team worked with school partners to develop straightforward and concrete implementation procedures. First, the playground was divided into five distinct sections with age- and gender-appropriate activities designed for use within each section. The activities chosen were easy to set up and implement, and did not require much financial resources (i.e., hot potato, hopscotch, relay races, and jump ropes). Second, the school partners, with the research team's input, decided not to limit children's activity choices in any way (i.e., children were able to move freely between different sections of the playground). Third, the research team discussed with the school partners the importance of actively monitoring the children playing in their section (e.g., Colvin et al., 1997; Roderick et al., 1997). The school partners then decided among themselves who would be best suited to supervise each activity, in part, matching the proposed activity to the interests of each school partner. Then, the research team assisted the school partners in developing a system for recruiting additional parent volunteers to help supervise the recess yard, especially when regular staff members were absent.

The procedures described above contributed to the social validity of the intervention, as school partners reported feeling motivated and empowered by choosing their own area of the playground and by determining the activity they wished to supervise as opposed to having an activity and section of the playground assigned to them. Further, the research

team worked closely with diverse school staff members (principal, counselor, and physical education teacher) and the school partners to help school personnel clarify and then post specific rules for children's lunchroom and playground behavior throughout the school.

Finally, the research team collaborated with the school partners to jointly plan and conduct a school-wide assembly with the principal and physical education teacher to explain and implement the new lunch/recess program to students and teachers. Part of this assembly was traditional (i.e., the principal and playground personnel discussed the rules and new games in an auditorium setting), whereas part of the assembly was interactive and context specific (i.e., the school partners worked with the physical education teacher to conduct a "hands-on" demonstration for children on the playground). For example, children watched demonstrations of each new activity on the playground, and then had the opportunity to "try out" each play activity with adult support.

### *Design of evaluation procedures*

In the Spring of the first consultation year (e.g., after providing several months of continuing consultation), the project team discussed ways in which the research team could determine whether intervention procedures were being implemented (i.e., clarifying and posting rules, providing structured activities in sections of the playground, actively monitoring students on the playground), and the association between program implementation and student behaviors. The research team proposed an observational study for the next school year, in which children's play behaviors would be observed in the context of the provision of activities on the playground and active monitoring by the school partners. This would allow the project team to determine under what conditions children were exhibiting rough play, aggressive behaviors, and cooperative actions, and under what conditions children of different ethnic backgrounds were playing together. Finally, the research team shared with school partners that the role of the research team would change somewhat during the following school year, as the research team would be concentrating on evaluation as opposed to consultation. The school partners were excited by this plan and readily agreed to it. However, they also requested that the research team meet with them periodically during the next year to address any ongoing or unforeseen problems.

### *Development of observation coding scheme*

The definitions for each behavior (e.g., cooperative play, rough and tumble play, overt aggression) were derived through a participatory action research process: that is, by combining prior research (e.g., Crick & Grotpeter, 1995; McNeilly-Choque et al., 1996; Pellegrini, 1989) with extensive feedback from school partners. The research team presented the school partners with definitions derived from prior empirical research literature and they were asked to decide whether the behaviors described sounded familiar, whether they occurred on the playground during recess, and whether they were defined appropriately. As such, the school partners helped the research team to modify each definition slightly in order to be sensitive to the urban school setting and to the playground context. Finally, the research team continued conversations with school partners on the playground so that the research team had concrete visual examples of how school partners

operationalized each different behavior. A codebook that had expanded definitions and examples of each construct, and decision rules to help coders differentiate between codes was derived through this process.

The following general classes of behaviors were observed and coded: (a) play behaviors, (b) aggressive behaviors, (c) intercultural interactions, and (d) contextual factors (i.e., presence of an organized activity, presence of an adult actively supervising children). The two primary play behaviors that were derived included cooperative play and rough and tumble play. *Cooperative play* was defined as a target child participating in a mutual play activity with peers in which the play is not overly active or rough. In addition, there is little chance for misinterpretation, aggression, or accidental injury to occur. Examples of cooperative play include jumprope, hopscotch, holding hands, and playing a circle or hand game. *Rough and tumble play* is defined as a mutual play activity that is active, vigorous, or rough, despite that the play is typically benign and continuous. Some studies have demonstrated that rough and tumble play helps many children learn to interact appropriately in a vigorous and enjoyable manner, thereby promoting social competence (e.g., Pellegrini, 1992); however, research has also shown that certain at-risk groups of children may use rough and tumble play as a means to harm others, or that they may misinterpret rough and tumble play as being aggressive, and therefore retaliate with anger and aggression (Pellegrini, 1989, 1990). Examples of rough and tumble play include play fighting, chase, wrestling, etc. Finally, an *intercultural interaction* was defined as a social interaction (either positive or neutral) between the target child and a child of another race. School partners worked collaboratively with the research team to help the research team define and then learn to identify these types of social interactions on the playground.

The construct of aggression was subdivided into three behavioral codes, *physical aggression*, *relational aggression*, and *verbal aggression*, based on past research demonstrating that children use multiple ways of expressing their anger towards their classmates (e.g., Crick & Grotpeter, 1995; Leff, Kupersmidt, & Power, 2003; Rys & Bear, 1997). As such, *physical aggression* was defined as a behavior enacted with the intent to dominate/harm another peer physically. Examples include pushing, shoving, hitting, kicking, or threatening others. *Relational aggression* was defined as a behavior enacted with the intent to harm/manipulate a social relationship. Examples of relational aggression include leaving a peer out of play activities, saying mean things about a peer, ignoring a peer on purpose, threatening to withdraw friendship from a peer, etc. Finally, *verbal aggression* was defined as a behavior enacted with the intent to dominate/harm another peer through name-calling, insulting, cursing, or making fun of a peer.

Two contextual codes were also derived: presence of an *organized game* and *active adult supervision*. Presence of an *organized game* was coded when there was a structured, organized activity occurring in a section of the playground. These activities had clear rules and children tended to take turns. *Active adult supervision* was coded when an adult was actively engaged in an interaction with a number of children within a section of the playground or in structuring or supporting an ongoing activity within a section of the playground. Examples of active adult supervision include an adult praising a child or children for appropriate behavior, an adult actively playing or participating in an activity, or an adult walking throughout a section of the playground and commenting upon or being attentive to student behaviors and activities. Further, the research team coded for the

presence of an *organized game* and/or *active adult supervision* if these behaviors were occurring in the target child's section of the playground, regardless of whether the target child himself or herself was involved in the game or in the interaction with the adult. The team chose to code these contextual behaviors in this manner, because the presence of a supportive adult and/or an organized game in the vicinity of the target child can change the environment in which the target child was interacting, and thereby influence his or her subsequent behavior. Finally, the child behavior codes (e.g., cooperative play, rough and tumble play, physical aggression, relational aggression, and verbal aggression) were mutually exclusive, whereas the playground contextual variables (presence of an organized game and active adult supervision) were able to co-occur.<sup>1</sup>

### *Training procedures*

Prior to beginning the evaluation, five individuals from the university-based research team were trained in the observational system using a series of steps including didactic readings, participation in brainstorming, studying the codebook, and practicing the coding scheme in the field. During this 4-week period, coders worked exclusively in pairs when in the field (rotating in a similar fashion as described below). During the first 2 weeks, coder pairs observed a target child for a 2-minute interval and then discussed their impressions with one another. On-site supervision was also provided during this time by the principal investigator. During the next 2 weeks, twice-weekly supervision meetings with the behavioral coders were held to discuss discrepancies in coding procedures, to clarify decision rules for coding, and to improve inter-rater accuracy. The weekly meetings continued with the principal investigators throughout the evaluation stage of the project in order to protect against observer drift (Kazdin, 1977; Repp, Nieminen, Olinger, & Brusca, 1988).

### *Observation procedures*

Observations were conducted in each of two recess periods on 14 separate days across approximately 6 weeks. A total of 377 separate 2-min observations were conducted, as the number of observations per day ranged from 22 to 32 with an average of 27 across the two recess periods. Given the rotating 10-second interval procedure employed, there were approximately 754 10-second intervals in which the presence/absence of each behavior was examined. Observers followed a systematic multi-step procedure for randomly selecting a section of the playground, and then randomly selecting a target child within the section to observe for each 2-minute observation period as described in Table 1. This

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<sup>1</sup> Child behaviors were observed in pairs, according to their functional similarity, in order to simplify the observation process. Rough and tumble play was observed during the same intervals as physical aggression, relational and verbal aggression were observed during the same intervals, and cooperative play was observed with another prosocial code that was not included in this study. Each child behavior was mutually exclusive (nonoverlapping), and only one behavior was coded at a time. However, within each 10-s interval, it was possible for one behavior to start and end (e.g., rough and tumble play), and for a second behavior to have started (e.g., physical aggression). Upon examining the data, this occurred extremely infrequently. For instance, rough and tumble play and physical aggression were both coded within the same interval in only 1% of the observation periods, and relational and verbal aggression were both coded within the same interval in only 1% of the observation intervals.

Table 1  
Coding procedure

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*Pre-observation period*

- (1) A number of randomized orders for observing the five playground sections across a recess period (approximately 20 min in length) were generated by the principal investigator.
- (2) Coder randomly selects a randomized order for one playground period.
- (3) Coder moves to the first randomly selected section of the playground.
- (4) Coder randomly selects a target boy (alternating with girl) within this section of the playground, based upon a randomly generated list of colors (i.e., the coder chooses to observe the first boy he/she sees who has on a blue/red/green article of clothing).

*Observation period (2-minute interval)*

For each sub-interval, the observer moves within close sight and hearing range of the selected student to code the presence and/or absence of each variable.

- (1) Contextual variables (0–30 seconds)
    - (a) Presence of an organized activity occurring within this section of the playground;
    - (b) Presence of an adult actively supervising children within this section of the playground.
  - (2) Behavioral variables I (31–40 seconds)
    - (a) Presence of rough and tumble play;
    - (b) Presence of physical aggression.
  - (3) Behavioral variables II (41–50 seconds)
    - (a) Presence of relational aggression;
    - (b) Presence of verbal aggression.
  - (4) Behavioral variables III (51–60 seconds)
    - (a) Presence of cooperative play;
  - (5) Behavioral variables I (61–70 seconds)
    - (a) Presence of rough and tumble play;
    - (b) Presence of physical aggression.
  - (6) Behavioral variables II (71–80 seconds)
    - (a) Presence of relational aggression;
    - (b) Presence of verbal aggression.
  - (7) Behavioral variables III (81–90 seconds)
    - (a) Presence of cooperative play;
  - (8) End of interval (91–120 seconds)
- Coder uses this time to note any additional information that is relevant about the observation period.

*Additional steps*

At any point throughout the observation period, an intercultural interaction is recorded when, and if, it occurs.

Also, if a child switches areas of the playground this is recorded as “OUT”. The child’s behavior is no longer coded unless he/she comes back into the section of the playground being observed.

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randomized procedure helped to ensure that the same child was not observed on two occasions within the same day. Observers were typically able to conduct six to eight 2-min observations during each recess period. Reliability checks were performed for 20% of the observations. In these instances, pairs of coders followed the exact same procedure as outlined in Table 1.

*Data analytic plan*

Based on past research indicating that consultees often have difficulty with the consistent implementation of intervention procedures (Moncher & Prinz, 1991; Noell, Duhon, Gatti, & Connell, 2002), the consistency with which intervention procedures were

applied and the relationship between intervention implementation and child behavior were investigated. Because it was not feasible to manipulate the use of organized games and adult supervision to study their effect upon children's play behaviors, a correlational design, that has been termed a continuous baseline probe design (Duvall, Ward, Delquadri, & Greenwood, 1997) was used. The team examined whether the intervention was being implemented as intended and with associated contextual variables. Subsequently, the team investigated the association between intervention implementation and student behavior.

## Results

### *Reliability analyses*

Two observers coded the behaviors of the same target child in 20% of the observation periods in order to assess for inter-rater reliability. Table 2 provides base rates and inter-rater reliability estimates for all behaviors of interest. Although percent agreement was relatively high for all observed behaviors (75% or greater), Cohen's  $\kappa$  statistics ranged considerably across the behavioral codes. Observations of cooperative play, rough and tumble play, organized activities, and intercultural interactions demonstrated adequate reliability ( $\kappa=0.60$ – $0.68$ ), whereas the code of active adult supervision demonstrated borderline acceptable reliability ( $\kappa=0.50$ ). The  $\kappa$  statistics for coders related to aggressive behavior were relatively low ( $\kappa=0.23$ – $0.29$ ), which was related, in part, to the low base rate for these behaviors.

### *Consistency of program implementation*

To investigate the consistency of program implementation, the research team examined the variability of organized activities and active adult supervision across observation day (holding the playground quadrant constant), and across quadrants (holding the observation day constant). Rates of organized activities varied considerably across days, ranging from

Table 2  
Base rates and inter-rater reliability

Variables	Base rate	Percent agreement	$\kappa$
<i>Child behaviors</i>			
Cooperative play	56.9%	84.4%	0.68
Rough and tumble play	17.5%	88.9%	0.64
Intercultural interactions	47.7%	80%	0.60
Physical aggression	6.7%	91%	0.29
Relational aggression	10.5%	88.9%	0.23
Verbal aggression	4.6%	95.6%	<sup>a</sup>
<i>Contextual variables</i>			
Organized activities	58.9%	83.8%	0.67
Active adult supervision	39.7%	75%	0.50

<sup>a</sup>  $\kappa$  statistic could not be calculated due to empty cells.

a low of 29% of the observation periods to a high of 76% of the observation periods (mean = 59% of the observations). Rates of active adult supervision ranged from a low of 23% of the observations to a high of 56% of the observations (mean = 39% of the observations). Second, rates of organized activities varied considerably by quadrant (across observation days), ranging from a low of 42% of the observations to a high of 73% of the observations (mean = 58% of the observations). Rates of active adult supervision also varied considerably, as rates ranged from a low of 21% of the observations to a high of 57% of the observations (mean = 40% of the observations).

#### *Association between contextual variables*

The correlation between the two contextual variables, organized activities and active adult supervision, was found to be low,  $r = 0.15$ . In addition, the overlap of these behaviors was relatively low, as these codes co-occurred in only 29% of the observation intervals. In contrast, organized games occurred in the absence of active adult supervision in 32% of the intervals, and active adult supervision occurred in the absence of organized activities in 13% of the intervals. Because these two contextual variables were relatively independent, they were analyzed separately in the following analyses.

#### *Association between contextual variables and student behavior*

To test the association between contextual variables (organized games and active adult supervisors) and student behavior (rough play, cooperative play, and intercultural interactions), which were both categorical variables, chi-squares tests were performed. Given that multiple chi-squares were computed, a  $p$ -level of .01 was utilized. Organized games were associated with cooperative play,  $\chi^2 = 100.89$ ,  $p < .0001$ . Specifically, organized activities was associated with a three times higher rate of cooperative play; that is, when there was no organized game present, cooperative play occurred in only 25.8% of the observation intervals, but when organized games were used, cooperative play occurred during 77.9% of the intervals. The presence of organized games was also associated with lower rates of rough and tumble play,  $\chi^2 = 10.75$ ,  $p < .001$ . Rough and tumble play occurred during 25.8% of the observations when organized games were not present and during 12.6% of the time when organized games were present. Organized games were also associated with intercultural interactions,  $\chi^2 = 12.73$ ,  $p < .0001$ . Intercultural interactions occurred in 40% of the observations when organized games were not present and during 52.9% of the observations when organized games were present. Finally, active adult supervision was associated with intercultural interactions,  $\chi^2 = 12.78$ ,  $p < .001$ , but was not associated with rates of rough and tumble or cooperative play. For example, intercultural interactions occurred in 40.2% of the observations when active adult supervision was not present and during 59.2% of the observations when active adult supervision was present.

Because cooperative play is considered one of the best indicators of children's prosocial behavior (see Richard et al., 2001), a series of analyses were conducted to better understand how playground contextual variables related to cooperative play. First, an omnibus chi-square was computed to determine whether there was an association between the contextual variables and cooperative play. Subsequently, five targeted 2 by 2 chi-

square tests were conducted. The four levels of playground organization investigated were (a) both organized games and active adult supervision were present (i.e., combined condition); (b) organized games were present in the absence of active adult supervision (i.e., organized games condition); (c) active adult supervision was present in the absence of organized games (i.e., active adult condition); and (d) neither organized games nor active adult supervision were present (neither condition). The results demonstrated that there was an association between the contextual variables and cooperative play,  $\chi^2 = 99.53$ ,  $p < .0001$ . Cooperative play occurred in 25% of the intervals in the neither condition, 27.2% in the active adult condition, 78.2% in the organized games condition, and 78% of the combined condition (see Table 3). Finally, a series of targeted pairwise tests were conducted in order to contrast organized games and adult supervision. These analyses indicated that the association between cooperative play and organized games was much stronger than the association between cooperative play and adult supervision.

#### Data interpretation

Once program evaluation data were collected and analyzed, the physical education teacher and the school partners helped the research team understand the meaning of the findings. The school partners thought that providing organized games on the playground not only affected the quantity of cooperative play and rough and tumble play, but that it made a noticeable difference in the quality of children's friendships on the playground and their play behaviors. For instance, they reported that children seemed to relate more effectively when there were organized activities and strong adult supervision provided for them.

The school partners also helped the project team understand why it was difficult to consistently implement intervention procedures. First, they indicated that they often became discouraged when team members were unexpectedly absent from work, and thus more responsibility was placed upon them without adequate back-up from school administration. Second, they reported that some of the playground equipment was quite heavy and difficult to transport (i.e., portable basketball hoop and soccer goals), especially on days when inclement weather threatened to end the lunch/recess early (i.e., then they would need to quickly escort students inside the building while also bringing in various play equipment). Third, they indicated that they were occasionally re-assigned for the day to cover other "trouble spots" at the school, effectively lessening their available workforce. Finally, they reported that school administrators sometimes made changes to the lunch/recess program without communicating first with them, which undermined their

Table 3  
Examining the relation between level of playground organization and children's cooperative play

Cooperative play	Level of playground organization			Combined
	Neither	Active adult only	Organized activity only	
No	78 75.0%	34 72.3%	26 21.8%	22 22.0%
Yes	26 25.0%	13 27.7%	93 78.2%	78 78.0%

$\chi^2 = 99.53$ ,  $p < .0001$ .

enthusiasm and motivation to complete their usual playground duties. Following this meeting, the research team met with school administrators to help them understand the findings and to assist them in providing more support for the school partners. As such, the research team was able to facilitate communication between school administrators and the playground partners, and thereby translate the research data into a useful action that influenced subsequent school procedures. For example, school administrators began meeting more regularly with and asking for more input from playground and lunchroom personnel over the following few months.

## **Discussion**

This project illustrates how PAR can be used to co-construct a whole-school intervention through collaboration between university-based research staff and a diverse group of school staff and community volunteers. The research team initially focused upon partnering and better understanding the perspective of key stakeholders at the school. As the partnership unfolded, the project team integrated scientific methods with community input to tailor-make a playground program that was potentially effective, realistic, practical, and responsive to the needs of the school and community (see [Ho, 2002](#); [Nastasi et al., 2000](#)). School and community partners were actively involved in the implementation, data collection, and data interpretation process. Finally, subsequent to the collection of evaluation data, research and school staff collaborated to translate project findings into practice recommendations.

Results from the evaluation portion of the study found that program implementation varied markedly across sections of the playground and across days. The provision of organized games on the playground was associated with substantially higher rates of cooperative play, lower rates of rough physical play, and higher levels of interactions between children of different ethnic backgrounds. These findings replicate several prior studies (e.g., [Bay-Hinitz et al., 1994](#); [Murphy et al., 1983](#)) as children who had the opportunity to participate in an organized activity in an area of the playground were considerably more likely to be involved in socially competent behaviors than children who were not afforded this opportunity. Further, active adult supervision was associated with higher levels of interactions between children of different ethnic backgrounds, which was one of the major concerns of the school partners.

A further examination of the separate and combined effects of organized games and active adult supervision on students' cooperative play behaviors indicated that the presence of organized games, even in the absence of adult support, was related to much higher rates of cooperative play than adult supervision in the absence of organized activities. These findings, although correlational in nature, suggest that the impact of the playground supervisors may be greater when they are implementing structured activities for children, as opposed to monitoring play in the absence of structured activities. This hypothesis needs to be investigated in future studies using an experimental or quasi-experimental design.

The results of the study have several implications for psychologists and other mental health professionals who work collaboratively with administrators, teachers, and play-

ground supervisors in schools. First, psychologists can collaborate with school personnel to demonstrate how to integrate scientific practice with participatory management to address critical concerns that arise within the school (e.g., Ho, 2002). Too often, programs that have been designated as “best practice” are implemented as a fixed or set program and are not adapted to meet the needs of students, staff, parents, and community members at a particular school. This approach may decrease the social validity and meaningfulness of the program, leading to poor implementation and ineffectiveness. Further, many of these “best practice” programs that are highly appealing to schools may not have an empirical basis to support wide-scale implementation (see Leff et al., 2001).

The project team made two decisions during the project that may have had an impact on the findings. First, the team chose to use a continuous baseline probe design (Duvall et al., 1997), which is a correlational design that is suitable when it is not feasible to manipulate environmental variables. Correlational designs often have a relatively high level of ecological validity, but they make it impossible to infer causal connections between variables. Because no baseline data were collected prior to the intervention, one must be careful not to imply that the association between playground contextual variables and student behaviors changed due to the playground-based intervention. Second, rough and tumble play was selected as a target for intervention. Given research demonstrating that rough and tumble play at times may facilitate the development of social and social-cognitive competence (e.g., Pellegrini, 1992), one may question the selection of this target behavior. However, the purpose of the intervention was to increase cooperative interactions and to decrease the frequency of rough and tumble play to more acceptable levels, but not to eliminate it entirely. Thus, the research team chose to target this behavior because school partners felt strongly that rough and tumble play occurred *too* frequently and was often leading to aggressive interactions. In addition, despite a number of benefits of rough and tumble play, prior research has also demonstrated that certain at-risk subgroups of children are much more likely to become involved in aggressive incidents or misinterpretations stemming from rough and tumble play (Pellegrini, 1989, 1990). Base rates from the current study confirmed that rough and tumble play during recess was occurring at a relatively high rate (i.e., 17.5% across all observation intervals and in 26% of observation intervals during which an organized game was not present) as compared to the typical 10–11% of recess interactions that are often characterized as rough and tumble play (e.g., Humphreys & Smith, 1984; Pellegrini, 1989).

A limitation of the current study was that the observational system was unable to adequately determine associations between playground contextual variables and rates of aggression. Because of the relatively low base rates of the different types of aggression and because a rotating partial interval recording system was used, it was difficult to obtain enough instances of each type of aggressive behavior to accurately assess for rates of interobserver agreement. Future observational studies of children’s recess behaviors could collapse across aggression categories, code all children’s behaviors simultaneously across a longer interval of time (15–20 s), utilize remote video and audio techniques in order to obtain more of an insiders’ perspective on children’s social relationships (e.g., Pepler & Craig, 1995), or focus upon other categories of behavior that occur more frequently and that may be related to aggression (i.e., adults intervening due to a negative behavior exhibited by a child). Alternatively, interobserver agreement for low base rate behaviors

may also be improved by using video training and testing tapes. Another limitation to the current study was that the percent agreement and  $\kappa$  statistics for adult supervision were marginal. As such, findings related to adult supervision should be interpreted with caution and should be viewed as provisional until replicated.

The continuous baseline design used in the current study enabled the researchers to identify the natural variations in treatment integrity that occur in school-based intervention work. A recent study by Noell et al. (2002) found that consultees in schools (teachers) have difficulty consistently implementing behavior management procedures in the classroom. In the current project, in which paraprofessionals served as consultees and the intervention was implemented in a less structured environment than a classroom, it was expected that treatment integrity would also be inconsistent. An examination of the variation in program implementation in the current study across sections of the playground and across observation days confirmed that it was difficult for school partners to maintain consistently high levels of treatment integrity. Thus, research focusing upon methods for improving treatment integrity in partnership-based research studies is an important area for future research (Blom-Hoffman, Kelleher, Power, & Leff, *in press*).

There are several challenges to using a PAR model. First, it can be quite time-consuming to build meaningful and trusting relationships with key stakeholders within the schools. Second, and somewhat related, school personnel initially may be reluctant to partner with university-based researchers, in part, because of past negative experiences they have had with researchers (see Fantuzzo, Coolahan, & Weiss, 1997). Third, some researchers may find it difficult to use a partnership model as opposed to taking the “expert role” in a more traditional, medical model approach. Nonetheless, school and community settings provide an ample context for further developing participatory action research models of prevention (see Leff, Goldstein et al., *in press*; Nastasi et al., 2000).

The current study replicates prior research that has found that allowing children to participate in organized activities is associated with higher rates of prosocial behaviors (e.g., Bay-Hinitz et al., 1994; Murphy et al., 1983) and that individuals on the playground can serve as social skills agents as opposed to merely disciplinarians (e.g., Dowrick et al., 2001; Leff, Power, et al., 2003). This is especially important amidst reports of widespread bullying (e.g., Nansel et al., 2001) on elementary school playgrounds (e.g., Craig & Pepler, 1997; Craig et al., 2000). This study illustrates the process of developing and implementing a program based upon a partnership among researchers, school professionals, and community residents, and how this process can be used to improve future school practice in a community-responsive and collaborative fashion.

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## References

- Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Bay-Hinitz, A. K., Peterson, R. F., & Quilitch, H. R. (1994). Cooperative games: A way to modify aggressive and cooperative behaviors in young children. *Journal of Applied Behavior Analysis, 27*, 435–446.
- Blatchford, P. (1996). “We did more then”: Changes in pupils’ perceptions of break time (recess) from 7 to 16 years. *Journal of Research in Childhood Education, 11*, 14–24.
- Blom-Hoffman, J., Kelleher, C., Power, T. J., & Leff, S. S. (in press). Promoting Healthy food consumption among young children: Evaluation of a multi-component nutrition education program. *Journal of School Psychology*.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology, 22*, 723–742.
- Colvin, G., Sugai, G., Good, R. H., & Lee, Y. (1997). Using active supervision and precorrection to improve transition behaviors in an elementary school. *School Psychology Quarterly, 12*, 344–363.
- Craig, W. M., & Pepler, D. J. (1997). Observations of bullying and victimization in the schoolyard. *Canadian Journal of School Psychology, 13*, 41–59.
- Craig, W. M., Pepler, D. J., & Atlas, R. (2000). Observations of bullying in the playground and in the classroom. *School Psychology International, 21*, 22–36.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social–psychological adjustment. *Child Development, 66*, 710–722.
- Cummings, E. M., Iannotti, R. V., & Zahn-Waxler, C. (1985). Influence of conflict between adults on the emotions and aggression of young children. *Developmental Psychology, 21*, 495–507.
- Dishion, T. J., Capaldi, D., Spracklen, K. M., & Li, F. Z. (1995). Peer ecology of male-adolescent drug use. *Development and Psychopathology, 7*, 803–824.
- Dodge, K. A., Pettit, G. S., McClaskey, C. L., & Brown, M. M. (1986). Social competence in children. *Monographs of the Society for Research in Child Development, 51* (2, Serial No. 213).
- Dowrick, P. W., Power, T. J., Manz, P. H., Ginsburg-Block, M., Leff, S. S., & Kim-Rupnow, S. (2001). Community responsiveness: Examples from under-resourced urban schools. *Journal of Prevention and Intervention in the Community, 21*, 71–90.
- DuVall, S. F., Ward, D. L., Delquadri, J. D., & Greenwood, C. R. (1997). An exploratory study of home instructional environments and their effects on the basic skills of students with learning disabilities. *Education and Treatment of Children, 20*, 150–172.
- Fantuzzo, J. W., Coolahan, K., & Weiss, A. (1997). Resiliency partnership-directed research: Enhancing the social competencies of preschool victims of physical abuse by developing peer resources and community strengths. In D. Cicchetti, & S. Toth (Eds.), *Developmental perspective on trauma: Theory, research and intervention*. Rochester, NY: University of Rochester Press.
- Graham, D. S. (1998). Consultation effectiveness and treatment acceptability. An examination of consultee requests and consultant responses. *School Psychology Quarterly, 13*, 155–168.
- Ho, B. S. (2002). Application of participatory action research to family-school interactions. *School Psychology Review, 31*, 106–121.
- Humphreys, A., & Smith, P. (1984). Rough-and-tumble in preschool and playground. In P. Smith (Ed.), *Play in animals and humans* (pp. 251–270). London: Blackwell.
- Kazdin, A. E. (1977). Artifact, bias, and complexity of assessment: The ABC’s of reliability. *Journal of Applied Behavior Analysis, 10*, 141–150.
- Kazdin, A. E. (1994). Interventions for aggressive and antisocial children. In L. D. Eron, J. H. Gentry, & P. Schlegel (Eds.), *Reason to hope: A psychosocial perspective on violence and youth*. Washington, DC: American Psychological Association.
- Kochenderfer, B. J., & Ladd, G. W. (1996). Peer victimization: Cause or consequence of school maladjustment. *Child Development, 67*(4), 1305–1317.
- Kupersmidt, J. B., Coie, J. D., & Dodge, K. A. (1990). The role of poor peer relationships in the development of disorder. In S. R. Asher, & J. D. Coie (Eds.), *Peer rejection in childhood*. Cambridge, MA: Cambridge Univ. Press.
- Leff, S. S., Goldstein, A. B., Angelucci, J., Cardaciotto, L., & Grossman, M. (in press). Using a participatory

- action research model to create a school-based intervention program for relationally aggressive girls: The Friend to Friend Program. In J. Zins, M. Elias, & C. Maher, (Eds.), *Handbook of prevention and intervention in peer harassment, victimization, and bullying*. New York: Haworth Press.
- Leff, S. S., Kupersmidt, J. B., Patterson, C., & Power, T. J. (1999). Factors influencing teacher predictions of peer bullying and victimization. *School Psychology Review, 28*, 505–517.
- Leff, S. S., Kupersmidt, J. B., & Power, T. J. (2003). An initial examination of girls' cognitions of their relationally aggressive peers as a function of their own social standing. *Merrill Palmer Quarterly, 49*, 28–53.
- Leff, S. S., Power, T. J., Costigan, T. E., & Manz, P. H. (2003). Assessing the climate of the playground and lunchroom: Implications for bullying prevention programming. *School Psychology Review, 32*, 418–430.
- Leff, S. S., Power, T. J., & Goldstein, A. (in press). Community-responsive outcome measures to assess for the impact of bullying prevention programs in the schools. In D. L. Espelage, & S. S. Swearer, (Eds.), *A Social-ecological perspective on bullying prevention and intervention in American schools*. Lawrence Erlbaum Associates.
- Leff, S. S., Power, T. J., Manz, P. H., Costigan, T. E., & Nabors, L. A. (2001). School-based aggression prevention programs for young children: Current status and implications for violence prevention. *School Psychology Review, 30*, 343–360.
- Lochman, J. E., & Dodge, K. A. (1994). Social-cognitive processes of severely violent, moderately aggressive, and nonaggressive boys. *Journal of Consulting and Clinical Psychology, 62*, 366–374.
- Loeber, R., Wung, P., Keenan, K., Giroux, B., Stouthamer-Loeber, M., Van Kammen, W. B., & Maughan, B. (1993). Developmental pathways in disruptive child behavior. *Development and Psychopathology, 5*, 101–132.
- McNeilly-Choque, M. K., Hart, C. H., Robinson, C. C., Nelson, L. J., & Olsen, S. F. (1996). Overt and relational aggression on the playground: Correspondence among different informants. *Journal of Research in Childhood Education, 11*(1), 47–67.
- Moncher, F. J., & Prinz, R. J. (1991). Treatment fidelity in outcome studies. *Clinical Psychology Review, 11*, 247–266.
- Murphy, H. A., Hutchison, J. M., & Bailey, J. S. (1983). Behavioral school psychology goes outdoors: The effect of organized games on playground aggression. *Journal of Applied Behavioral Analysis, 16*, 29–35.
- Nabors, L., Willoughby, J., Leff, S. S., & McMenamin, S. (2001). Promoting inclusion for young children with special needs on playgrounds. *Journal of Developmental and Physical Disabilities, 13*, 179–190.
- Nabors, L. A., Leff, S. S., & Power, T. J. (in press). Quality improvement activities and expanded school mental health services. *Behavior Modification*.
- Nansel, T. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., & Scheidt, P. (2001). Bullying behaviors among US youth: Prevalence and association with psychological adjustment. *Journal of the American Medical Association, 285*, 2094–2100.
- Nastasi, B. K., Schensul, J. J., De Silva, M. W. A., Varjas, K., Silva, K. T., Priyani, R., & Schensul, S. (1998). Community-based sexual risk prevention program for Sri Lankan youth: Influencing sexual-risk decision-making. *International Quarterly of Community Health Education, 18*, 139–155.
- Nastasi, B. K., Varjas, K., Schensul, S. L., Silva, K. T., Schensul, J. J., & Ratnayake, P. (2000). The participatory intervention model: A framework for conceptualizing and promoting intervention acceptability. *School Psychology Quarterly, 15*, 207–232.
- Noell, G. H., Duhon, G. J., Gatti, S. L., & Connell, J. E. (2002). Consultation, follow-up, and implementation of behavior management interventions in general education. *School Psychology Review, 31*, 217–234.
- Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. Washington, DC: Hemisphere (Wiley).
- Patterson, G. R., & Capaldi, D. M. (1991). Antisocial children: Unskilled and vulnerable. In P. A. Cowan, & E. M. Hetherington (Eds.), *Family transitions. Advances in family research series* (pp. 195–218). Hillsdale, NJ: Erlbaum Associates.
- Pellegrini, A. D. (1989). Elementary school children's rough-and-tumble play. *Early Childhood Research Quarterly, 4*, 245–260.
- Pellegrini, A. D. (1990). Elementary school children's playground behavior: Implications for children's social-cognitive development. *Children's Environments Quarterly, 7*(2), 8–16.
- Pellegrini, A. D. (1992). Rough-and-tumble play and social problem solving flexibility. *Creativity Research Journal, 5*, 13–26.

- Pellegrini, A. D., & Bjorklund, D. F. (1996). The place of recess in school: Issues in the role of recess in children's education and development. *Journal of Research in Childhood Education*, *11*, 5–13.
- Pellegrini, A. D., & Davis, P. D. (1993). Relations between children's playground and classroom behavior. *British Journal of Educational Psychology*, *63*, 88–95.
- Pepler, D. J., & Craig, W. M. (1995). A peek behind the fence: Naturalistic observations of aggressive children with remote audiovisual recording. *Developmental Psychology*, *31*, 548–553.
- Repp, A. C., Nieminen, G. S., Olinger, E., & Brusca, R. (1988). Direct observation: Factors affecting the accuracy of observers. *Exceptional Children*, *55*, 29–36.
- Richard, J. F., Fonzi, A., Tani, F., Fulvio, T., Tomado, G., & Schneider, B. H. (2001). Cooperation and competition. In P. K. Smith, & C. H. Hart (Eds.), *Childhood social development*. Malden, MA: Blackwell.
- Roderick, C., Pitchford, M., & Miller, A. (1997). Reducing aggressive playground behavior by means of a school-wide raffle. *Educational Psychology in Practice*, *13*, 57–63.
- Rys, G. S., & Bear, G. G. (1997). Relational aggression and peer relations: Gender and developmental issues. *Merrill Palmer Quarterly*, *43*, 87–106.
- Sameroff, A. J. (1993). Models of development and developmental risk. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 3–13). New York: Guilford Press.
- Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Seifer, R. (1998). Family and social influences on the development of child competence. In M. Lewis, & C. Feiring (Eds.), *Families, risk, and competence* (pp. 161–185). Mahwah, NJ: Erlbaum.