

Preschool Peer Interactions and Readiness to Learn : Relationships Between Classroom Peer Play and Learning Behaviors and Conduct*

By: Kathleen Coolahan, John Fantuzzo, Julia Mendez, Paul McDermott

Coolahan, K.C., Fantuzzo, J., [Mendez, J.](#), & McDermott, P. (2000). Preschool peer interactions and readiness to learn: Relationships between classroom peer play and learning behaviors and conduct. *Journal of Educational Psychology*, 92, 458-465. DOI: 10.1037/0022-0663.92.3.458

Made available courtesy of American Psychological Association:

<http://www.apa.org/journals/edu/>

This article may not exactly replicate the final version published in the APA journal. It is not the copy of record.

*****Note: Figures may be missing from this format of the document**

Promoting young children's readiness to learn is a national priority. This mandate is clearly stated within the first of our National Education Goals, which reads that all American children will start school ready to learn by the year 2000 (U.S. Department of Education, 1992). Unfortunately, many young children in America are facing increasingly stressful and “socially toxic” environments that threaten the development of competencies necessary for early school success (Garbarino, 1995). Approximately one in five American children currently lives in poverty (Children's Defense Fund, 1998) and is exposed to multiple risk factors—including poor health care, lack of appropriate housing, family stress, and community violence—that severely threaten their development (Huston, McLoyd, & Garcia Coll, 1994).

Poor children are more likely than nonpoor children to have difficulties in school, ranging from behavioral and emotional difficulties to retention and poor school performance (Duncan, Brooks-Gunn, & Klebanov, 1994). These risks are especially pronounced for children living in densely populated urban areas. These children are exposed disproportionately to risk factors associated with less desirable educational outcomes, even when the effects of low income are taken into account (U.S. Department of Education, 1996).

In response to these risks, compensatory early childhood educational programs have been established to provide a buffer against the ill effects of poverty and urbanicity and to prepare children to succeed in school. The most prominent program is Head Start, established in 1965 by the federal government to promote successful school adaptation among low-income children by providing a comprehensive array of supportive services to children and families in need. To date, early intervention preschool programs for low-income children have demonstrated benefits such

* Acknowledgement: This research project was supported by a Head Start Research Scholars grant and a Head Start/University Partnerships grant from the U.S. Department of Health and Human Services. A special thank you goes to our collaborators at Prekindergarten Head Start in the School District of Philadelphia: Director Rosemary Mazzatenta and her Head Start staff.

as increased intellectual ability, achievement, and self-concept, as well as reduced grade retentions and special education placements (Schweinhart, Barnes, & Weikart, 1993; U.S. General Accounting Office, 1993). Despite the fact that only 35% of poor children receive preschool services (U.S. General Accounting Office, 1993), these programs represent the nation's most promising vehicle for setting young, low-income children on a positive educational trajectory.

Architects of early intervention programming are currently guided by developmental–ecological theory, which asserts the importance of supporting children's acquisition of age-appropriate competencies within relevant social contexts (Bredekamp & Copple, 1997). For preschool children, relating successfully with classmates is a critical, developmentally salient task that is considered to be a primary indicator of healthy adjustment (Cicchetti, 1990). The development of positive peer relationships during the preschool years has been associated with positive adjustment in kindergarten as well as academic success in the elementary grades and high school (Ladd, Price, & Hart, 1988). In contrast, longitudinal research has linked poor peer relations with detrimental consequences during later developmental periods, including emotional maladjustment, delinquent behavior, and school failure (Denham & Holt, 1993; De Rosier, Kupersmidt, & Patterson, 1994).

Peer play represents a primary context in which preschool children acquire and express peer social competencies (Gallagher, 1993). The repeated interpersonal interactions that occur in peer play, especially those involving prosocial behavior or aggressive encounters, are important experiences that impact children's social development (Fisher, 1992; Ladd, Price, & Hart, 1990). Exposure during play to the opinions, ideas, feelings, and feedback of peers enables children to move beyond egocentric thought to consider the point of view of others. This capacity serves as a foundation for developing conflict-resolution and cooperative-learning skills (Guralnick, 1993; Topping & Ehly, 1998).

Noting the protective potential of positive peer relationships in helping children avoid negative school-related outcomes, Raver and Zigler (1997) have called for research that examines the “cross-domain” influences of peer functioning in preschool children, particularly low-income children who are at higher-than-average risk for school difficulties. The present study responds to that call by exploring, with a sample of low-income, urban preschool children, potential multivariate links between preschool peer competencies and functioning in two important readiness-related domains: classroom conduct and early learning behaviors.

Learning is facilitated when children are able to meet expectations for appropriate classroom behavior such as following directions, cooperating with peers and adults, and containing frustration in the face of difficult tasks or unsatisfied desires. Problematic classroom behavior, however, has been associated with difficulties in early school adaptation (Stallard, 1993). Poor peer relations have been linked to psychosocial maladjustment and conduct problems (Kupersmidt, Burchinal, & Patterson, 1995; LaFreniere & Dumas, 1996). Specifically, the display of aggression in peer interactions is associated with externalizing behavior problems, and withdrawal from peer interaction is associated with internalizing behavior problems (Achenbach, Edelbrock, & Howell, 1987).

Children's individual pattern of learning behaviors—including task persistence, motivation, initiative, attentiveness, and openness to new challenges—are constructs that have been found to contribute uniquely to school achievement (Leigh, 1996; McDermott, 1984; Reynolds, 1991). Although several studies have confirmed the Vygotskian and Piagetian assertion that social interactions with peers enhance learning (Cannella, 1993, Piaget, 1962; Vygotsky, 1978), less is known about how preschool peer interactions relate to specific learning-related constructs. Studies with older children indicate that peer acceptance is associated with higher levels of student motivation and engagement in school, whereas peer rejection is linked to low levels of interest in school (Wentzel, 1999). Quality peer interactions also have been identified as an integral part of cooperative learning opportunities in the classroom (Topping & Ehly, 1998). Some research with low-income preschool children supported links between social skills and learning behaviors including motivation, task persistence, and positive attitudes toward learning (Leigh, 1996). However, more research is needed to elucidate the nature and extent of relationships between these constructs for diverse groups of low-income, preschool children. By focusing on a group of low-income, minority children residing in a large urban center, this investigation responds to recent calls for research by using a within-groups differences approach to expand researchers' knowledge of developmental processes for vulnerable groups of children (Garcia Coll et al., 1996). Such knowledge is critically needed to inform early intervention programming for young children who are most at risk for school difficulties.

The primary purpose of the present study is to examine how multiple dimensions of interactive peer play relate to the multivariate constructs of learning behaviors and problem behaviors in low-income, minority children. Relationships among these sets of constructs have not yet been explored using multivariate methods. We hypothesized that positive play interaction behaviors would correlate positively with learning behaviors, including competence motivation, persistence, and attitude, and negatively correlate with classroom behavior problems. In addition, disruptive and aggressive peer play interactions were expected to correlate positively with classroom behavior problems and negatively with the three learning behavior constructs. Finally, we hypothesized that withdrawn peer play behavior would correlate positively with inattentive–passive classroom behavior and negatively with the learning behaviors, particularly attention and persistence.

A secondary objective of this study is to extend researchers' understanding of the developmentally salient, multivariate construct of peer play interactions by examining age and gender variability in an urban sample of young, vulnerable children. Informed by theory (Piaget, 1962) and empirical evidence (Barnes, 1971; Parten, 1932; Smith, 1978) indicating that peer interactions become more social and prosocial through the preschool years as children's social–cognitive skills develop, we hypothesized that older children in our sample would demonstrate greater levels of positive peer interaction in play than younger children. Regarding gender differences, we postulated that boys would display higher levels of disruptive play than girls, and girls would be found to engage in higher levels of positive interaction in play. These hypotheses are based on literature suggesting that boys, due to biological and social influences, are more aggressive than girls in their interactions with peers (Maccoby and Jacklin, 1980; Parke and Slaby, 1983), whereas girls tend to be more prosocial than boys (Eisenberg & Mussen, 1989). With respect to African American children specifically, studies of gender differences in peer play interactions have found that girls engage in more sociodramatic and interactive play than boys

(McLoyd, 1985; Weinberger & Starkey, 1994). The findings of this study will add to researchers' knowledge of this issue.

Method

Description of the Sample and Data Collection Procedures

The participants for this study were 556 preschool children enrolled in a large Head Start program in a northeastern U.S. city. Participating children ranged in age from 44.8 to 71.8 months ($M = 59.4$, $SD = 5.9$), and the ethnic makeup of the sample was 87% African American, 9% European American, 3% Hispanic, and 1% Asian and other groups. Gender was evenly distributed (51% boys, 49% girls). Sixty-four percent of the children resided in single-parent-headed households, whereas 25% resided in two-parent households. In addition, there was an average of 3.0 ($SD = 1.5$) children per household.

Participants were recruited from 14 Head Start centers throughout the city that had previously participated in a pilot teacher and parent training program. The research objectives were reviewed and approved by Head Start parent leaders and staff. All parents were invited to participate, and informed consent was obtained prior to the collection of data. Seventy-five percent of the parents granted permission for their child to participate and completed a brief demographic questionnaire. Subsequently, 43 teachers from the 14 centers completed measures on those children for whom parental permission had been granted. Teachers were asked to complete the Penn Interactive Peer Play Scale (PIPPS; Fantuzzo et al., 1995) and either the Preschool Learning Behaviors Scale (PLBS; McDermott, Green, Francis, & Stott, 1996) or the Conners Teacher Rating Scale—28 (CTRS—28; Conners, 1990) on each participating child. In all, 556 PIPPS, 229 PLBS, and 136 CTRS—28 rating forms were collected. Teachers completed the measures concurrently during a month late in the school year. Classrooms received \$5 worth of classroom materials for each child for whom data was obtained.

Measures

PIPPS (Fantuzzo et al., 1995)

The PIPPS is a 32-item teacher rating scale of preschool children's interactive peer play. In completing the scale, teachers are asked to indicate how frequently they have observed various peer interactive behaviors in a child during free play periods. Investigations of the reliability and validity of the teacher version (Fantuzzo, Coolahan, Mendez, McDermott, & Sutton-Smith, 1998) revealed three reliable dimensions: play interaction, play disruption, and play disconnection (Cronbach's $\alpha = .90$, $.91$, and $.87$, respectively). The play interaction dimension consists of items describing prosocial behaviors such as comforting and helping other children, showing creativity in play, encouraging others to join play, and helping settle peer conflicts. In contrast, the play disruption dimension includes items describing behaviors such as starting fights and arguments, not taking turns, demanding to be in charge, destroying others' things, and disrupting the play of others. Items on the play disconnection dimension describe such behaviors as hovering outside the play group, wandering aimlessly during play times, and refusing to play when invited. Concurrent validity for the teacher version was established using conceptually related indicators of social competence and school adaptation, including the Social Skills Rating System (SSRS; Gresham & Elliot, 1990; Fantuzzo, Manz, & McDermott, 1998), peer sociometrics, and direct play observation data (Fantuzzo, Coolahan, et al., 1998). Children who exhibited high interactive play ratings received high social skill ratings from teachers, were well

liked by peers, and engaged during play sessions. Children whom teachers rated as disruptive in play received ratings of low self-control and were more likely to be engaged in solitary play. Finally, children whom teachers rated as disconnected in play were not well accepted by peers and were not engaged during play sessions.

PLBS (McDermott et al., 1996)

The PLBS is a 29-item teacher report measure of preschool children's learning behaviors. It was designed as a tool for identifying successful and faulty learning patterns in young children. Three reliable learning behavior dimensions are reported for the scale: competence motivation, attention/persistence, and attitude ($r_s = .85, .83, \text{ and } .75$, respectively). PLBS items describe specific, observable behaviors (not behavioral generalizations) that occur during classroom learning activities and that do not require teachers to make causal inferences about behaviors. The Competence Motivation Scale reflects children's interest in and approach to learning-related activities and includes items such as "Is reluctant to tackle a new activity," "Shows little determination to complete an activity," and "Says task is too hard without making much effort to attempt it." The attention/persistence dimension characterizes a child's skill in focusing and maintaining attention and includes items such as "Acts without taking sufficient time to look at the problem or work out a solution," "Tries hard, but concentration soon fades and performance deteriorates," and "Pays attention to what you say." Lastly, the attitude dimension focuses on such concepts as children's propensity to cooperate, accept help, and express hostility when frustrated. Sample items on this dimension include "Shows little desire to please you," "Doesn't achieve anything constructive when in a mopey or sulky mood," and "Gets aggressive or hostile when frustrated."

Norms for the PLBS were developed with a national standardization sample of 100 children ranging in age from 3.6 to 5.5 years. Percentage distributions for the sample match those for the U.S. population. Thirty-three percent of the children in the sample were non-White, and 48% of sampled parents reported 12 or fewer years of education. In addition, 79% of the children in the sample lived in a metropolitan area, and 24% were from the northeast United States. Internal consistency estimates based on Cronbach's alpha indicate good reliability for the PLBS ($r = .88$), and reliability estimates are similar for both White and non-White portions of the sample. Convergent and divergent validity for the scale have been established by correlating the PLBS dimensions with the cognitive ability scales of the Differential Ability Scales (DAS; Elliott, 1990) and the SSRS (Leigh, 1996). In the first case, correlations between PLBS and DAS factors were analyzed for participants in the norm sample and an additional 150 participants from a national supplementary validation sample that was demographically similar to the norm sample. Significant correlations were found between each of the PLBS factors and the DAS's verbal and nonverbal ability factors and general conceptual ability. Correlations between PLBS and SSRS factors were analyzed for participants in a local sample of 52 children who were randomly selected from 26 Head Start classrooms in a northeastern U.S. city. Significant correlations in the expected directions were reported between each of the PLBS and SSRS factors. Each of the PLBS factors correlated positively with the social skills factors of the SSRS (self-control, interpersonal skill, and verbal assertion) and negatively with the problem behaviors factors (externalizing and internalizing).

CTRS-28 (Conners, 1990)

The CTRS–28 is a short-form (28-item) version of the CTRS–39 and includes three subscales used to characterize patterns of troublesome child behavior during classroom activities: Conduct Problems, Hyperactivity, and Inattentive–Passive. Teachers are asked to rate how frequently children exhibit the problematic behaviors. The Conduct Problems subscale consists of items such as “Temper outbursts and unpredictable behavior,” “Acts ‘smart’ (impudent or sassy),” “Pouts and sulks,” and “Overly sensitive to criticism.” Items on the Hyperactivity subscale include “Restless in the ‘squirmy’ sense,” “Restless, always up and on the go,” and “Excitable/impulsive.” Items on the third subscale, Inattentive–Passive, assess distractibility (“Distractibility or attention span a problem”), passivity (“Submissive attitude toward authority”), and difficulty in finishing tasks and learning (“Fails to finish things that s/he starts”). Each item is rated on a 4-point scale. This measure was chosen over other behavior problem measures because its subscales yield richer, more useful information than scales that dichotomously characterize problem behaviors as either “externalizing” or “internalizing.” Standardized scores were derived from a factor analysis conducted with data from a sample of 340 urban Head Start children. This analysis supported the measure's original factor structure (see Footnote 1). The overall scale demonstrated good reliability when used with the Head Start sample, as demonstrated by Cronbach's alpha ($r = .95$); alphas for the Conduct Problems, Hyperactivity, and Inattentive–Passive factors were .95, .92, and .70, respectively. Validity studies of the original structure manifest evidence of predictive, discriminant, and concurrent validity.

Data Analyses

To test the significance, magnitude, and nature of the respective relationships of peer play behaviors to learning behaviors and behavior problems, canonical variance and redundancy analyses were conducted. Although inspection and interpretation of the bivariate correlations between each of the PIPPS factors and the learning behaviors and behavior problems factors was possible, such analysis is prone to error and bias related to the experimenter's presentiments. With canonical techniques, the complex relations between multivariate domains are simultaneously assessed such that (a) the divergent and convergent relationships between the one set and the other emerge, and (b) the picture is not confounded by inattention to the redundant relationships among the variables within either of the sets (Weiss, 1972).

Two separate canonical variance and redundancy analyses were performed to investigate the overlap between the PIPPS factors and the factors of the PLBS and CTRS–28. These analyses yielded a canonical structure exhibiting the dimensions in which the intersection between measures occurred and redundancy estimates (i.e., the amount of variance in each set that was predictable from the other). Adequate sample sizes ($n > 146$) were used to ensure adequate statistical power. In addition, a multiple analysis of variance (MANOVA) was computed to determine whether there were any age and gender differences across the three PIPPS factors. For the purpose of these analyses, we formed two age groups by splitting the sample at the median age of 59.5 months. Cell sizes for the two-way MANOVA were more than adequate to ensure statistical power ($n > 120$).

Results

Relationship of Peer Play Behavior to Learning Behaviors and Behavior Problems

Canonical analyses were used to elucidate relationships between the three PIPPS factors and the factors of the PLBS and CTRS–28. The nature and extent of these relationships was investigated through the use of canonical redundancy analyses. With respect to the PIPPS and PLBS, two significant canonical correlations (canonical $R = .68$ and $.53$) yielded the canonical variates positively engaged and nonengaged, respectively. Table 1 displays loadings based on the variate pairs for the two significant canonical relationships. The greatest overlap in the positively engaged variate was found between the Play Disruption factor of the PIPPS and the Attitude factor of the PLBS (with Play Disruption correlating negatively with the significant variate). For the nonengaged variate, the greatest amount of overlap was detected between the Play Disconnection factor of the PIPPS and the Competence Motivation factor of the PLBS (with Competence Motivation correlating negatively with the variate). Squared canonical correlations showed that the positively engaged variate accounted for the greatest amount of variance (47%) of the overlap between these two measures. Redundancy analyses demonstrated that the PLBS factors account for 34% of the variance in the PIPPS factors. Alternatively, the PIPPS factors account for 40% of the variance in the PLBS (Wilks's $\lambda = .38$), $F(9, 543) = 29.1$, $p < .0001$.

Table 1
Canonical Structure of the Penn Interactive Peer Play Scale (PIPPS) With the Preschool Learning Behaviors Scale (PLBS)

Variable	Canonical variate set	
	Positively engaged	Nonengaged
PIPPS dimensions		
Play disruption	-.76	-.63
Play disconnection	-.70	.64
Play interaction	.68	-.51
PLBS dimensions		
Competence motivation	.74	-.67
Attention/persistence	.92	-.03
Attitude	.93	.20

Note. $N = 229$.

The nature of overlap between the factors of the PIPPS and the CTRS–28 is evident in the pattern of canonical loadings on the disruptive and disconnected–passive variates associated with the two significant canonical correlations (canonical $R_s = .78$ and $.47$, respectively). These loadings are reported in Table 2. The greatest overlap in the disruptive variate occurred between the Play Disruption factor of the PIPPS and the Conduct Problems factor of the CTRS–28. With respect to the disconnected–passive variate, the greatest overlap was found between the Play Disconnection factor of the PIPPS and the Inattentive–Passive factor of the CTRS–28. The disruptive variate accounted for the greatest amount of variance (60%) of the overlap between these two measures. Finally, the CTRS–28 factors accounted for 38% of the variance in the PIPPS factors, whereas the PIPPS factors accounted for 42% of the CTRS–28 factors (Wilks's $\lambda = .31$), $F(9, 317) = 21.7$, $p < .0001$.

Table 2
Canonical Structure of the Penn Interactive Peer Play Scale (PIPPS) With the Conners Teacher Rating Scale—28 (CTRS-28)

Variable	Canonical variate set	
	Disruptive	Disconnected-passive
PIPPS dimensions		
Play disruption	.90	-.43
Play disconnection	.61	.71
Play interaction	-.37	-.77
CTRS-28 dimensions		
Conduct problems	.99	.00
Hyperactivity	.85	-.11
Inattentive-passive	.22	.94

Note. $N = 136$.

Age and Gender Differences in Peer Play Behavior

Having examined canonical relationships between peer play behavior and learning and problem behaviors, we next explored whether age and gender differences existed in children's peer play behavior. With Wilks's lambda test of significance, a 2 (age groups) \times 2 (gender) MANOVA for PIPPS play factors yielded a significant main effect for gender, $F(3, 550) = 7.5, p < .001$, and age group, $F(3, 550) = 9.7, p < .001$. In addition, there was a significant gender by age group interaction, $F(3, 550) = 3.24, p < .05$. In univariate analyses, we found that boys displayed significantly higher levels of disruptive, $F(1, 552) = 11.6, p \leq .01$, and disconnected, $F(1, 552) = 5.1, p \leq .05$, play than did girls. Girls showed significantly higher levels of play interaction, $F(1, 552) = 14.0, p \leq .001$. Younger children displayed significantly higher levels of play disconnection, $F(1, 552) = 9.1, p \leq .005$, and lower levels of play interaction, $F(1, 552) = 25.7, p \leq .001$, than did older children. With respect to the Age Group \times Gender interaction, there was a significant interaction for the play interaction factor of the PIPPS, $F(1, 552) = 6.5, p \leq .05$. Tukey post hoc comparisons showed that older girls displayed significantly higher levels of interactive peer play than did all other groups.

Discussion

Findings from this study inform researchers' understanding of how multivariate constructs of children's interactive peer play relate to other key multivariate domains of preschool classroom functioning. Overall, interactive peer play behavior was found to correspond to children's learning behaviors and classroom behavior problems in the hypothesized ways. Three general patterns of relationships emerged from the findings. First, children who demonstrated positive interactive play behaviors were also actively engaged in classroom learning activities. They displayed higher levels of competence motivation, attention, persistence, and a positive attitude toward learning than did children who were less engaged in peer play. Children who received high ratings for disconnected peer play (e.g., hovering around the play activity and refusing invitations to play) were also viewed as inattentive and passive by their teachers and exhibited low levels of motivation. Finally, children who received high ratings of disruptive peer play were also rated as displaying high levels of conduct problems and hyperactivity across classroom activities.

Prior research examining relationships between interactive peer play and other indices of classroom social functioning supports and complements these findings. Fantuzzo, Coolahan, et al. (1998) examined relationships between the same PIPPS peer play constructs and teacher-reported social skills, direct observations of play, and sociometric ratings of peer acceptability. Fantuzzo et al. revealed that children who were rated by teachers as interacting positively with peers in play, being disruptive in peer play, or being disconnected from others during peer play exhibited differential patterns of social skills, observed play behaviors, and peer acceptance. Children whom teachers rated as interacting positively with peers in play also received high teacher ratings for more general social skills, including self-control, interpersonal skills, and verbal assertiveness. These children were also well liked by their peers and engaged in high levels of collaborative peer play. As in the present study, positive peer play interaction was part of an overarching pattern of positive engagement in the classroom.

In contrast, teachers viewed preschool children who displayed disruptive peer play interactions as lacking self-control. These children were also not well accepted by peers and, perhaps not surprisingly, were frequently observed in solitary play. The findings of the present study extend these results by linking disruptive play interactions to both conduct problems and a general lack of attention and task persistence within the broader classroom arena. Childhood conduct problems, especially aggressive behavior, have been extensively examined and highlighted within the literature as a contributing factor to poor peer relationships (see Campbell, 1995, for a comprehensive review). In the present study, peer interaction difficulties are also associated with poor learning behaviors, including an unwillingness to accept help from the teacher and lack of effort when faced with new educational challenges. Among young adolescents, a similar problematic academic profile emerges for children characterized as aggressive–rejected by their peers. Teachers perceived these students as less interested in school and more impulsive and disruptive in the classroom (Wentzel & Asher, 1995).

Finally, teachers who rated children as highly disconnected from peers during peer play periods reported these children to be nonengaged and passive within the broader classroom learning context. Previous researchers have described withdrawn children as going unnoticed in the classroom (Coplan, Rubin, Fox, & Caulkins, 1994), and Fantuzzo, Coolahan, et al. (1998) reported that disconnected children were the least likely group to be nominated by peers in sociometric assessments. However, studies with older children found that submissive–rejected children reported higher levels of academic motivation, and teachers reported that these students were more self-regulated and compliant. Teachers also reported liking these students better than students in other sociometric status groups (Wentzel & Asher, 1995). Although our data regarding the play difficulties of preschool children in the areas of disruption and disconnection are suggestive of a coexistence of problems within the larger classroom arena that impede school readiness, this pattern becomes more differentiated for older children.

Taken together, these findings point to the need for longitudinal data to shed further light on the ways in which peer relationships relate to motivation to learn and school functioning during different developmental periods. The present findings are consistent with those of a number of studies linking the quality of peer relationships to future school functioning (De Rosier et al., 1994; Guay, Boivin, & Hodges, 1999; Kochenderfer & Coleman, 1996; Ladd, 1990). In these studies, problematic peer relationships were found to predict lowered academic performance,

negative perceptions of school, avoidance of school, and school dropout. In addition, Hampton (1999) found that teachers' ratings of kindergarten children's interactive peer play behaviors (as assessed with the PIPPS) predicted first-grade academic performance, as measured by report card grades. Positive peer play interactions in kindergarten related positively to first-grade achievement in the subjects of language, social studies, art, music, health, and gym, whereas disruptive and disconnected peer play behaviors related negatively to achievement in these subjects. These findings are supportive of models that propose that positive interactions with peers foster a sense of belonging in children and promote the development of achievement motivation, which facilitates school success (Birch & Ladd, 1996; Wentzel, 1999). This perspective—that students' social functioning in the classroom is related to central aspects of academic motivation and success (Goleman, 1995; Wentzel, 1999)—is supported by and helps to frame our findings on children's engagement in preschool.

An additional goal of this study was to extend research on interactive peer play by examining age and gender variability. Our results indicate that older children demonstrate greater levels of social interaction with peers during play, whereas younger children are more disconnected and withdrawn from peers during play. This finding is consistent with prior research supporting the developmental nature of certain social behaviors, with older children demonstrating greater skill in peer relationships (Howes, 1987, 1992). In addition, a main effect for gender revealed that boys clearly evidenced lower levels of positive play interaction and higher levels of disruptive and disconnected play interaction than did girls. This finding comports with those of prior studies indicating that boys from various racial, ethnic, and socioeconomic groups show more serious difficulties with peer relations during childhood (Coie, Dodge, & Coppotelli, 1982; Hartup, 1983; Patterson, Kupersmidt, & Vaden, 1990). Specifically, the relationship between aggression and peer rejection is stronger for boys than girls (Coie, Dodge, Terry, & Wright, 1991).

The age and gender interaction effect found within this study further contributes to the literature on young children's peer play interaction. Our results indicate that the subgroup of older girls demonstrated the most advanced levels of social competence within the Head Start classroom context. Although prior work in this area is somewhat limited with respect to low-income children, previous literature has shown that girls are more prosocial (Eisenberg & Mussen, 1989). Previous observational studies of young children's play documented that African American girls engaged in more sociodramatic and interactive play than did boys (McLoyd, 1985; Weinberger & Starkey, 1994). The present study extends this work by highlighting the interesting variability associated with the combination of age and gender characteristics. Exploring these relationships through intragroup study allows for important variations to emerge, which clearly adds to the peer interaction literature for low-income, minority children (Fantuzzo, Coolahan, et al., 1998; Garcia Coll et al., 1996).

The findings of this study are qualified by its reliance on a single source of report on child classroom functioning. Our exclusive use of teacher report measures of children's classroom functioning may have contributed to shared-method variance. However, the use of teacher report measures must be seen within the larger context of the preschool assessment literature, which is characterized by a lack of psychometrically sound options for assessing culturally and linguistically diverse preschool children (Rogers, 1998). The present study was designed to serve

as a preliminary, large-scale investigation of interactive peer play, conduct, and learning behaviors in urban, low-income preschool children. Teacher rating scales, particularly the ones used in this study, are the only available measures of these classroom-based constructs for this population that can be practically administered on a relatively large scale. No complete set of valid behavior rating instruments was available for other sources of reports on these constructs, such as parents or peers. Moreover, teachers are relatively accurate, reliable, and unobtrusive observers of classroom phenomena (Schuck, Oehler-Stinnett, & Stinnett, 1995; Wentzel, 1991). Because of their familiarity with many different children over time, they are natural and valuable informants for classroom behaviors (Baumgartner & Jackson, 1991; McDermott, 1986).

Furthermore, the measures that were used in this study called for teachers to rate different types of behaviors in different classroom contexts (e.g., in free play and learning activities, or in free play and general classroom activities). This increases the likelihood that the observed overlap in teachers' responses on the three measures is attributable to consistencies in child behavior across contexts rather than to teachers rating the same behaviors on different measures or basing their responses across measures on a single observation or impression of the child. Future research with more intensive, microlevel observational methods could further clarify this issue and shed additional light on the relationships between the readiness-related constructs examined in this study.

Sample characteristics also qualify the findings of this study. The central city Head Start sample in this study was predominantly African American, with a very small percentage of low-income European American, Hispanic, and Asian children represented. Further research with samples from other ethnic groups is needed to determine the applicability of the current findings to other groups.

Taken together, the patterns of classroom engagement and social competence that were found suggest important directions for future classroom-based research examining the learning readiness of low-income children. First, our understanding of readiness demands careful attention to other multivariate domains that impact children's early school success. For example, a comprehensive examination of the relative contribution of cognitive, emotional, and communicative capacities that are foundational to socially competent behavior is lacking (Raver & Zigler, 1997). Instead, models of social competence have typically focused on singular child outcomes such as aggression or delinquency, without reflecting the multiple indicators of child competence (Hart, Olsen, Robinson, & Mandlco, 1997). Continued use of a developmental framework will help researchers examine the relationships between the multiple emerging capacities of preschool children and classroom expectations for social and learning behavior (Guralnick, 1993; Raver & Zigler, 1997). This knowledge will contribute greatly to educators' ability to help low-income children be ready for school and to the ability of school personnel to maximize learning opportunities for these children.

This study's direction is consistent with recent emphasis on the study of children's natural socialization contexts to appreciate or surface cultural variations in peer interaction behaviors (Farver & Howes, 1993; Gaskins, 1994). Yet, a limitation of this cross-sectional work is the omission of both proximal and distal factors of the child's environment that may promote or hinder the development of capacities for social interaction over time (Hart et al., 1997). Our

decisions regarding appropriate intervention for children and families struggling to adapt to socially toxic environments (Garbarino, 1995) must be based on high quality, longitudinal research addressing risk and protective factors that impact school adjustment. For example, Fantuzzo and Mohr (in press) have highlighted the need for greater understanding of how traumatic events, such as domestic violence and community violence, uniquely disrupt the course of healthy development for child victims.

The findings of this study have implications for educational psychologists and practitioners. Specifically, they indicate that young children's success at relating with peers in play is associated with the quality and level of their engagement in the wider classroom context, and suggest that opportunities for successful peer play interaction may serve to enhance young children's adjustment to early educational settings. Currently, early childhood organizations advocate the importance of play and peer relationships for facilitating the learning process (National Association for the Education of Young Children, 1991; U.S. Department of Health and Human Services, 1996). Yet, recent study has shown that kindergarten and first-grade curricula are characterized by a significant reduction in the time children spend in play and their opportunities for learning through social interaction with peers (Fantuzzo, Childs, & Pugh, 1998). Furthermore, national data reveal that less than 12% of kindergarten curricula are based on preschool educational practices (U.S. Department of Education, 1992). Because children who engage in positive peer play interactions also demonstrate positive learning behaviors, school psychologists should encourage elementary school teachers to use activities that provide opportunities for positive peer interactions as an instructional strategy.

Educational and school psychologists should also attend to the assessment of peer interaction difficulties as a marker for early school difficulties in general (Ladd et al., 1988). Fostering peer interaction between children with varied levels of interactive play competence is a successful intervention for children who display inappropriate classroom behavior (Fantuzzo et al., 1996). The relationship between interactive peer play and competence motivation affirms that social connection is highly rewarding for young children, and longitudinal research with adolescents has documented that success in high school is directly associated with students' level of engagement and competence motivation (Steinberg, 1996). The foundation for such academic motivation to learn can be nurtured during the early elementary years through recognition of classroom play as an important curricular—and not extracurricular—activity.

In sum, our study revealed important relationships between multiple dimensions of interactive peer play and constructs of learning behaviors and classroom behavior problems with urban, low-income children. These findings have implications for future research and school-based intervention with this group of children at risk for poor school adjustment. Through continued attention to and study of the developmental capacities of young children, educators can more effectively build their instruction on the qualities that children bring with them from home and preschool experiences. By nurturing children's natural motivation for connecting with others through classroom peer play, elementary schools can become more successful at cultivating principles of lifelong learning for vulnerable children.

Footnotes

1 To obtain a copy of the PIPPS and a scoring manual, or for the factor structure of the CTRS–28, please write to John Fantuzzo, Graduate School of Education, University of Pennsylvania, 3700 Walnut Street, Philadelphia, Pennsylvania 19104–6216.

References

- Achenbach, T. M., Edelbrock, C., & Howell, C. T. (1987). Empirically based assessment of the behavioral/emotional problems of 2- and 3-year-old children. *Journal of Abnormal Child Psychology*, 15, 629–650.
- Barnes, K. E. (1971). Preschool play norms: A replication. *Developmental Psychology*, 5, 99–103.
- Baumgartner, T. A., & Jackson, A. S. (1991). *Measurement for evaluation*. Dubuque, IA: Brown.
- Birch, S. H., & Ladd, G. W. (1996). Interpersonal relationships in the school environment and children's early school adjustment: A motivational analysis. In J. Juvonen & K. Wentzel (Eds.), *Social motivation: Understanding children's school adjustment* (pp. 199–225). New York: Cambridge University Press.
- Bredenkamp, S., & Copple, C. (Eds.). (1997). *Developmentally appropriate practice in early childhood programs*. Washington, DC: National Association for the Education of Young Children.
- Campbell, S. (1995). Behavior problems in preschool children: A review of recent research. *Journal of Child Psychology & Psychiatry & Allied Disciplines*, 36, 113–149.
- Cannella, G. S. (1993). Learning through social interaction: Shared cognitive experience, negotiation strategies, and joint concept construction for young children. *Early Childhood Research Quarterly*, 8, 427–444.
- Children's Defense Fund. (1998). *The state of America's children yearbook 1998*. Washington, DC: Author.
- Cicchetti, D. (1990). The organization and coherence of socioemotional, cognitive, and representational development: Illustrations through a developmental psychopathology perspective on Down's Syndrome and child maltreatment. In R. Thompson (Ed.), *Nebraska Symposium on Motivation: Vol. 36* (pp. 259–279). Lincoln: University of Nebraska Press.
- Coie, J., Dodge, K., & Coppotelli, H. (1982). Dimensions and types of social status: A cross-age perspective. *Developmental Psychology*, 18, 557–571.
- Coie, J., Dodge, K., Terry, R., & Wright, V. (1991). The role of aggression in peer relations: An analysis of aggression episodes in boys' play groups. *Child Development*, 62, 812–826.
- Conners, C. K. (1990). *Conners' rating scales manual*. Toronto, Canada: Multi-Health Systems.
- Coplan, R. J., Rubin, K. H., Fox, N. A., & Caulkins, S. D. (1994). Being alone, playing alone, and acting alone: Distinguishing among reticence and passive and active solitude in young children. *Child Development*, 65, 129–137.
- Denham, S. A., & Holt, R. W. (1993). Preschoolers' likability as cause or consequence of their social behavior. *Developmental Psychology*, 29, 271–275.
- De Rosier, M., Kupersmidt, J. B., & Patterson, C. J. (1994). Children's academic and behavioral adjustment as a function of the chronicity and proximity of peer rejection. *Child Development*, 65, 1799–1813.
- Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early childhood development. *Child Development*, 65, 296–318.
- Eisenberg, N., & Mussen, P. (1989). *The roots of prosocial behavior in children*. Cambridge, England: Cambridge University Press.

- Elliott, C. D. (1990). The nature and structure of children's abilities: Evidence from the Differential Abilities Scales. *Journal of Psychoeducational Assessment*, 8, 376–390.
- Fantuzzo, J., Childs, S., & Pugh, W. (1998, September). Transition Project: An analysis of curriculum and family involvement data from prekindergarten through first grade Paper presented at the regional meeting of Head Start, Philadelphia.
- Fantuzzo, J., Coolahan, K., Mendez, J., McDermott, P., & Sutton-Smith, B. (1998). Contextually-relevant validation of peer play constructs with African American Head Start children: Penn Interactive Peer Play Scale. *Early Childhood Research Quarterly*, 13, 411–431.
- Fantuzzo, J. W., Manz, P. H., & McDermott, P. (1998). Preschool version of the Social Skills Rating System: An empirical analysis of its use with low-income children. *Journal of School Psychology*, 36, 199–214.
- Fantuzzo, J., & Mohr, W. (in press). Pursuit of wellness in Head Start: Making beneficial connections for children and families. In D. Cicchetti, J. Rapaport, I. Sandler, & R. Weissberg (Eds.), *The promotion of wellness in children and adolescents*. New York: Sage.
- Fantuzzo, J., Sutton-Smith, B., Atkins, M., Meyers, R., Stevenson, H., Coolahan, K., Weiss, A., & Manz, P. (1996). Community-based resilient peer treatment of withdrawn maltreated preschool children. *Journal of Consulting and Clinical Psychology*, 64, 1377–1386.
- Fantuzzo, J. W., Sutton-Smith, B., Coolahan, K. C., Manz, P., Canning, S., & Debnam, D. (1995). Assessment of play interaction behaviors in young low-income children: Penn Interactive Peer Play Scale. *Early Childhood Research Quarterly*, 10, 105–120.
- Farver, J. M., & Howes, C. (1993). Cultural differences in American and Mexican mother–child pretend play. *Merrill-Palmer Quarterly*, 39, 344–358.
- Fisher, E. P. (1992). The impact of play on development: A meta-analysis. *Play & Culture*, 5, 159–181.
- Gallagher, T. M. (1993). Language skill and the development of social competence in school-age children. *Language, Speech, and Hearing Services in Schools*, 24, 199–205.
- Garbarino, J. (1995). *Raising children in a socially toxic environment*. San Francisco: Jossey-Bass.
- Garcia Coll, C., Lamberty, G., Jenkins, R., McAdoo, H., Crnic, K., Wasik, B., & Vazquez Garcia, H. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development*, 67, 1891–1914.
- Gaskins, S. (1994). Integrating interpretive and quantitative methods in socialization research. *Merrill-Palmer Quarterly*, 40, 313–333.
- Goleman, D. (1995). *Emotional intelligence*. New York: Bantam Books.
- Gresham, F. M., & Elliot, S. N. (1990). *The Social Skills Rating System*. Circle Pines, MN: American Guidance Services.
- Guay, F., Boivin, M., & Hodges, E. V. (1999). Predicting change in academic achievement: A model of peer experiences and self-system processes. *Journal of Educational Psychology*, 91, 105–115.
- Guralnick, M. J. (1993). Developmentally appropriate practice in the assessment and intervention of children's peer relations. *Topic in Early Childhood Special Education*, 13, 344–371.
- Hampton, V. R. (1999). *The Penn Interactive Peer Play Scale for Kindergarten: Building essential linkages in early childhood assessment* Unpublished doctoral dissertation, University of Pennsylvania.

- Hart, C. H., Olsen, S. F., Robinson, C. C., & Mandlco, B. L. (1997). The development of social and communicative competence in childhood: Review and a model of personal, familial, and extrafamilial processes. *Communication Yearbook*, 20, 305–373.
- Hartup, W. W. (1983). Peer relations. In E. M. Hetherington (Ed.), *Handbook of child psychology: Vol. 4. Socialization, personality, and social development* (pp. 103–196). New York: Wiley.
- Howes, C. (1987). Social competence with peers in young children: Developmental sequences. *Developmental Review*, 7, 252–272.
- Howes, C. (1992). Sequences in the development of competent play with peers: Social and social pretend play. *Developmental Psychology*, 5, 961–974.
- Huston, A. C., McLoyd, V. C., & Garcia Coll, C. (1994). Children and poverty: Issues in contemporary research. *Child Development*, 65, 275–282.
- Kochenderfer, B. J., & Coleman, C. C. (1996). Friendship quality as a predictor of young children's early school adjustment. *Child Development*, 67, 1103–1118.
- Kupersmidt, J., Burchinal, M., & Patterson, C. (1995). Developmental patterns of childhood peer relations as predictors of externalizing behavior problems. *Development and Psychopathology*, 4, 825–844.
- Ladd, G. W. (1990). Having friends, keeping friends, making friends, and being liked by peers in the classroom: Predictors of children's early school adjustment? *Child Development*, 61, 1081–1100.
- Ladd, G. W., Price, J. M., & Hart, C. H. (1988). Predicting preschoolers' peer status from their playground behaviors and peer contacts. *Child Development*, 59, 986–992.
- LaFreniere, P. J., & Dumas, J. E. (1996). Social competence and behavior evaluation in children ages 3 to 6 years: The short form (SCBE-30). *Psychological Assessment*, 8, 369–377.
- Leigh, N. (1996). Factor analysis, reliability, and validity of the Preschool Learning Behaviors Scale Unpublished doctoral dissertation, University of Pennsylvania.
- Maccoby, E. E., & Jacklin, C. N. (1980). Sex differences in aggression: A rejoinder and reprise. *Child Development*, 51, 964–980.
- McDermott, P. A. (1984). Comparative functions of preschool learning style and IQ in predicting future academic performance. *Contemporary Educational Psychology*, 9, 38–47.
- McDermott, P. A. (1986). The observation and classification of exceptional child behavior. In R. T. Brown & C. R. Reynolds (Eds.), *Psychological perspectives on childhood exceptionalty: A handbook* (pp. 136–180). New York: Wiley-Interscience.
- McDermott, P. A., Green, L. F., Francis, J. M., & Stott, D. H. (1996). *Preschool Learning Behaviors Scale*. Philadelphia: Edumatic and Clinical Science.
- McLoyd, V. S. (1985). Are toys (just) toys? Exploring their effects on pretend play of low-income preschoolers. In M. B. Spencer, G. K. Brookins, & W. R. Allen (Eds.), *Beginnings: The social and affective development of black children* (pp. 201–214). Hillsdale, NJ: Erlbaum.
- National Association for the Education of Young Children. (1991). Guidelines for appropriate curriculum content and assessment in programs serving children ages 3 through 8. *Young Children*, 41(6), 21–38.
- Parke, R. D., & Slaby, R. G. (1983). The development of aggression. In P. H. Mussen (Series Ed.) & E. M. Hetherington (Vol. Ed.), *Handbook of child psychology: Vol. 4. Socialization, personality, and social development* (4th ed., pp. 605–641). New York: Wiley.
- Parten, M. B. (1932). Social participation among preschool children. *Journal of Personality and Social Psychology*, 27, 243–269.

- Patterson, C. J., Kupersmidt, J. B., & Vaden, N. A. (1990). Income level, gender, ethnicity, and household composition as predictors of children's school-based competence. *Child Development*, 61, 485–494.
- Piaget, J. (1962). *Play, dreams, and imitation in childhood*. New York: Norton.
- Raver, C. C., & Zigler, E. F. (1997). Social competence: An untapped dimension in evaluating Head Start's success. *Early Childhood Research Quarterly*, 12, 363–385.
- Reynolds, A. J. (1991). Early schooling of children at risk. *American Educational Research Journal*, 28, 392–422.
- Rogers, M. (1998). Psychoeducational assessment of culturally and linguistically diverse children and youth. In H. Vance (Ed.), *Psychological assessment of children* (pp. 355–384). New York: Wiley.
- Schuck, L. A., Oehler-Stinnett, J., & Stinnett, T. A. (1995). Predictive validity of the Teacher Rating of Academic Achievement Motivation (TRAAM) with Hispanic students. *Journal of Psychoeducational Assessment*, 13, 143–156.
- Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). *Significant benefits: The High/Scope Perry Preschool Study through age 27*. (High/Scope Educational Research Foundation Monograph No. 10). Ypsilanti, MI: High/Scope Press.
- Smith, P. K. (1978). A longitudinal study of social participation in preschool children: Solitary and parallel play reexamined. *Developmental Psychology*, 14, 517–523.
- Stallard, P. (1993). The behavior of 3-year-old children: Prevalence and parental perception of problem behavior: A research note. *Journal of Child Psychology and Psychiatry*, 34, 413–421.
- Steinberg, L. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do*. New York: Touchstone.
- Topping, K., & Ehly, S. (1998). *Peer-assisted learning*. Mahwah, NJ: Erlbaum.
- U. S. Department of Education. (1992). *Starting school ready to learn. Questions and answers on reaching National Education Goal 1: By the year 2000, all children in America will start school ready to learn*. Washington, DC: Author. (ERIC Document Reproduction Service No. ED 355013)
- U. S. Department of Education. (1996). *Urban schools: The challenge of location and poverty*. Washington, DC: Author.
- U. S. Department of Health and Human Services. (1996). *Final rule—Head Start Performance Standards* (Publication No. 45 CFR Part 1304). Washington, DC: U. S. Government Printing Office.
- U. S. General Accounting Office. (1993). *Poor preschool-aged children: Numbers increase but most not in preschool*. (GAO Publication No. HRD-93-111BR). Washington, DC: Author.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Weinberger, L. A., & Starkey, P. (1994). Pretend play by African American children in Head Start. *Early Childhood Research Quarterly*, 9, 327–343.
- Weiss, D. J. (1972). Canonical correlation analysis in counseling psychology research. *Journal of Counseling Psychology*, 19, 241–252.
- Wentzel, K. R. (1991). Classroom competence may require more than intellectual ability: Reply to Jussim (1991). *Journal of Educational Psychology*, 83, 156–158.
- Wentzel, K. R. (1999). Social–motivational processes and interpersonal relationships: Implications for understanding motivation at school. *Journal of Educational Psychology*, 91, 76–97.

Wentzel, K. R., & Asher, S. (1995). Academic lives of neglected, rejected, popular, and controversial children. *Child Development*, 66, 754–763.