

Published in final edited form as:

*Early Educ Dev.* 2012 July ; 23(4): 517–538. doi:10.1080/10409289.2010.548767.

## Observations of Children's Interactions with Teachers, Peers, and Tasks across Preschool Classroom Activity Settings

Leslie M. Booren, Jason T. Downer, and Virginia E. Vitiello

Center for Advanced Study of Teaching and Learning, University of Virginia

### Abstract

This descriptive study examined classroom activity settings in relation to children's observed behavior during classroom interactions, child gender, and basic teacher behavior within the preschool classroom. 145 children were observed for an average of 80 minutes during 8 occasions across 2 days using the inCLASS, an observational measure that conceptualizes behavior into teacher, peer, task, and conflict interactions. Findings indicated that on average children's interactions with teachers were higher in teacher-structured settings, such as large group. On average, children's interactions with peers and tasks were more positive in child-directed settings, such as free choice. Children experienced more conflict during recess and routines/transitions. Finally, gender differences were observed within small group and meals.

The implications of these findings might encourage teachers to be thoughtful and intentional about what types of support and resources are provided so children can successfully navigate the demands of particular settings. These findings are not meant to discourage certain teacher behaviors or imply value of certain classroom settings; instead, by providing an evidenced-based picture of the conditions under which children display the most positive interactions, teachers can be more aware of choices within these settings and have a powerful way to assist in professional development and interventions.

Recent reports have suggested that young children's attendance in classroom-based preschool programs has dramatically increased, with nearly 1.1 million children attending public preschool programs during the 2007–2008 school year (Noel, Sable, & Chen, 2009). Preschool is viewed as an important way to prepare young children for elementary school (Reynolds, Temple, Robertson, & Mann, 2001). Previous research has emphasized the importance of children's early competencies for later school success, including social relationships, self-regulation (e.g., attention) during interactions with materials, and language development (e.g., Blair, 2002; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Duncan et al., 2007; Hamre & Pianta, 2001; Ladd, 2005; Wasik, Bond, & Hindman, 2006). It is now well-established that these important early childhood skills and abilities develop within interactions between the child and context (Ladd, 2005; Pianta & Walsh, 1996), including interactions with adults, peers, and learning activities/materials within early education classrooms (Downer, Booren, Lima, Luckner, & Pianta, 2010). Young children learn through a wide range of interactions across the school day, and their competence or

adjustment is best indicated by the nature and quality of these interactions, underscoring this as an important indicator children's readiness or ability to successfully transition to school environments (Lara-Cinisomo, Fuligni, Ritchie, Howes, & Karoly, 2008; Rimm-Kaufman & Pianta, 2000). One component of children's classroom experiences that is not well understood is the extent to which activity settings (e.g., large group, free choice, meals, etc.) may support or constrain certain patterns of interactions. It is important to understand the connection between activity settings and children's interactions to shed light on the classroom as a context for learning opportunities.

The link between the classroom context and specific children's behavior is complex (Carta & Greenwood, 1985; Gump, 1967; Kontos & Keyes, 1999; Pianta, La Paro, Payne, Cox, & Bradley, 2002; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005; Rimm-Kaufman & Pianta, 2000), in part because it is not always unidirectional. Early learning occurs within dynamic contexts that are interconnected and mutually dependent (Rimm-Kaufman & Pianta, 2000; Shonkoff & Phillips, 2000), and through social processes that include resources and people (Cohen, Raudenbush, & Loewenberg-Ball, 2003; Tseng & Seidman, 2007). In other words, children's behaviors are contextually-bound, and may be better understood by considering the educational contexts in which they occur. The organization of activity settings (e.g., large group, free choice, meals, etc.) is largely a classroom feature that teachers use intentionally to structure children's time throughout the preschool day, and can play a major role in how children practice skills, develop, and successfully transition into elementary school (Pianta et al., 2005; Shonkoff & Phillips, 2000). Previous research suggests that children who have difficulty engaging in structured classroom tasks and interacting with their peers have later social difficulties and poorer achievement scores (Bulotsky-Shearer, Fantuzzo, & McDermott, 2008). Furthermore, children's experiences in certain classroom activities have been linked to academic performance and behavior several years later (Montie, Xiang, & Schweinhart, 2006).

In preschool, classroom activity settings are an important aspect of the learning environment for young children. Together, these findings emphasize the importance of examining the structure (i.e., organization of activity settings) of early childhood classrooms and underscore the need to understand the situational demands of the environment in relation to children's interactions. The purpose of the current study is to take a naturalistic view of the classroom in order to provide detailed information about children's interactions in activity settings, which teachers could then use to be thoughtful and intentional about what types of support and opportunities to provide that can meet the individual needs of children across the array of classroom contexts. The current study examines the extent to which children's preschool classroom interactions with teachers, peers, and tasks vary across activity settings (i.e., large group, free choice, meals, etc.) and whether patterns of variation differ based on child gender and basic teacher behavior.

## **Eco-behavioral Approach to Understanding Classroom Interactions**

For decades, researchers have acknowledged the role of the environment in children's development in terms of nested systems, suggesting that understanding children's capacity to engage directly with activities, both with and without regulation by teachers, is

fundamental to education (Bronfenbrenner, 1979; Gump, 1967). Towards this, the eco-behavioral approach involves a careful study of the co-occurrence of behaviors and contextual factors that are essential when assessing children's readiness or ability to successfully transition to school environments (Carta & Greenwood, 1985). Children's developmental contexts are embedded in a hierarchy of proximal relationships, such as with peers and teachers, that are nested within larger systems like the classroom and school (Bronfenbrenner, 1979). To illustrate this point, refer to Figure 1, where the focus is how a child interacts with teachers, peers, and tasks within activity settings in an early childhood classroom. It is through interactions, embedded within proximal (e.g., activity settings) and more distal systems (e.g., preschool classroom), that development occurs over time (Bronfenbrenner & Morris, 2006; Carta & Greenwood, 1985).

Related to the eco-behavioral approach, Gump (1975) described children's physical environments as having both a physical milieu and a program, suggesting that most contexts have an agenda or regime that influences or affects children's behavior. The milieu represents the area or facility (circumjacent to the behavior), whereas the program is a procedure or way of doing things (Barker, 1968; Gump, 1975). Using an eco-behavioral approach allows researchers to identify properties in the environment, such as the milieu and program, which are associated with variations in children's behavior. The current study, as illustrated by Figure 1, examined classroom activity settings in a way that captured both the milieu and the program of early education classrooms. For example, large group activity settings were defined both by the number of children involved (greater than 6) and by the fact that the children were expected to engage together in a shared activity organized by the teacher, such as listening to a story or singing a song. Utilizing this ecological approach provided an opportunity to learn more about the role of proximal classroom contexts in children's patterns of interactions.

## Importance of Children's Observed Classroom Interactions

Research suggests children's interactions with teachers, peers, and tasks are critical to their academic and social outcomes (Buhs, Ladd, & Herald, 2006; Downer et al., 2010; O'Connor & McCartney, 2007; Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009). Young children's relationships with teachers and peers significantly predict school success: children who have warm, positive relationships tend to have higher achievement, lower levels of internalizing behavior, and higher social competence than children whose relationships are characterized by conflict (Bierman, Torres, Domitrovich, Welsh, & Gest, 2009; Konold & Pianta, 2005; O'Connor & McCartney, 2007; Palermo, Hanish, Martin, Fabes, & Reiser, 2007; Pianta, Nimetz, & Bennet, 1997; Pianta & Stuhlman, 2004). Research has also found that preschool children who are persistent, attentive, and self-reliant during learning tasks tend to have higher academic achievement than other peers (Fantuzzo, Perry, & McDermott, 2004; McClelland, Morrison, & Holmes, 2000). Clearly, children's interactions with teachers, peers, and tasks in early childhood are key precursors of later academic and social success, and in previous research these interactions have only been linked across a select few classroom activity settings. Research is needed that provides a comprehensive and detailed set of behavioral descriptors across classroom interactions that map onto or co-vary with the classroom activity settings' milieu and program. In doing so, it may be possible to link

observable behavior during interactions with properties of classroom environments that support or inhibit development.

One way of assessing child behaviors and the classroom environment is through observations. Many researchers agree that naturalistic observations provide an ecologically valid approach to assessing children's behavior (American Educational Research Association [AERA], 1999; Kontos & Keyes, 1999; Meisels & Atkins-Burnett, 2006; Neisworth & Bagnato, 2004). Observational approaches, which focus on children's responses to situational demands, allow researchers to examine how children calibrate their behavior in classroom interactions overtime (Volpe, DiPerna, Hintze, & Shapiro, 2005), rather than defining competence in terms of the presence or absence of a specific, isolated behavior. The current study therefore investigates the classroom context by observing children's interactions with teachers, peers and tasks during multiple cycles across the school day and capturing information about the classroom activity settings that may vary from moment to moment. This represents a child-centered approach that considers both teacher and child behaviors in the classroom context and allows for children's behavior to be observed across multiple settings throughout the day.

## **Classroom Interactions across Activity Settings**

Early research suggests that children's behavior varies depending on classroom activity setting (Gump, 1967). Recent studies have examined the amount of time children spend in activities settings, suggesting that most of the preschool day is spent in free choice, teacher-assigned activities and meals/routines (Early et al., 2010). For the purposes of the current study, children's interactions with teachers, peers, and tasks across activity settings will be investigated, as well as the role of basic teacher behavior (i.e., presence and direction) and child gender.

### **Patterns of classroom interactions**

Some observational work has been done to determine the ways in which children's interactions with teachers, peers, and tasks vary systematically from one setting to the next. For example, it appears that children interact most frequently with teachers during whole-group, teacher-structured time (Pianta et al., 2005). For peer interactions, children spend a significantly greater proportion of time in social interaction during play activities (e.g., play with toys or pretend play) than any other activities (Odom & Peterson, 1990). Similarly, Innocenti and colleagues (1986) reported that peer interaction occurred more frequently in free play than in other, more teacher-directed activities. For task related behaviors, children were more likely to be engaged in a task with individually targeted interactions than in more group-oriented settings (McWilliam, Scarborough, & Kim, 2003), and similarly off-task behavior was reduced when in whole-class teacher-directed settings (Rimm-Kaufman et al., 2005). Other research suggests that children have more complex interactions with objects during activities that present more of a cognitive demand on the child, such as engaging in goal-directed problem-solving or systematic experimentation during free choice settings (Kontos, Burchinal, Howes, Wisse, & Galinsky, 2002; Kontos & Keyes, 1999).

## Basic teacher behavior

The literature clearly points to a set of complex teacher behaviors that contribute to student learning (Hamre & Pianta, 2001; Pianta et al., 2005; Pianta & Stuhlman, 2004), but there is also evidence that simple, basic actions by the teacher can support or inhibit children's experiences across activity settings. For example, Tomes (1995) found that dramatic play areas, such as those commonly set up during free choice or center time, are not enhanced by teacher presence; whereas other areas, like the library during a structured time, were significantly enhanced by the teacher presence. Other research has also examined teacher behaviors as they initiate or direct interactions across contexts in free choice settings, suggesting that some teacher behaviors may influence children's interactions (Harper & McCluskey, 2003). The current study isolates two basic teacher behaviors, and examines the extent to which a teacher's presence (or availability), as well as the degree to which they direct an activity, contribute to variation in a child's experience with different activity settings.

## Gender differences

Research suggests that preschool children in the same classroom may have very different experiences, based in part on characteristics of the children themselves (Dobbs & Arnold, 2009). In particular, children's gender may be related to their classroom interactions across activity settings. Howe and McWilliam (2001) examined peer arguments across various activity contexts and found that boys consistently displayed more dominance in arguments, except during dynamic play (a free choice setting). Other research has examined more positive behaviors with peers, suggesting that boys and girls tend to act similar within various classroom settings (Anderson, Hilton, & Wouden-Miller, 2003; Carpenter & Huston-Stein, 1980; Farran & Son-Yarborough, 2001), and taking a slightly different view, portions of time spent in settings rarely differ by gender (Early et al., 2010).

## Study Aims

The goal of the current study was to examine a complete picture of young children's interactions in the classroom (with teachers, peers, and tasks) and the degree to which children experience more positive interactions across certain activity settings (such as large group, free choice, meals, etc.). The aim was to observe children's behaviors during the settings in which they occurred, in order to provide descriptions of contextual factors alongside ratings of behavior (Carta & Greenwood, 1985). This approach focuses on the likelihood of children's behaviors co-occurring with environmental conditions or factors, providing a more detailed picture of what happens in preschool classrooms. The current study provides a novel observational approach and design that allows for multiple observations on each child in order to examine patterns of behaviors across and within classroom activity settings, and how these relate to the child's gender and basic teacher behaviors. This study had three specific objectives: 1) to document the distribution of children's time and basic teacher behaviors (i.e., presence and direction) across activity settings; 2) to identify patterns in children's interactions with teachers, peers, and tasks across classroom activity settings; and 3) to determine whether patterns of children's interactions within classroom activity settings varied by gender.

## Method

### Participants

The sample consisted of 164 children from the central region of a mid-Atlantic state (see Table 1 for child, teacher, and classroom characteristics). Complete data were available for 145 children (19 were absent for one of the classroom visits), and it is these 82 girls and 63 boys who were included in the current analyses. Fifty-five of the participating children were three years old at the time of data collection, 73 were four, and 16 were five (one missing date of birth). The majority of children were White (91%), with the second largest group being African American (5%). The sample of participating children was similar in family (i.e., maternal education, family income, race/ethnicity) and classroom (i.e., teacher age, teacher education) demographic characteristics to the children who were excluded from analyses due to incomplete observation data, except that participating children tended to be in smaller classrooms than excluded children ( $t[163] = 3.10, p = .01$ ).

As a whole, the 44 classrooms were slightly more ethnically diverse, as reported by the teachers, than the sample of participating children. Most of the classrooms (64%) reported no children with limited English proficiency (LEP), and 84% of classrooms had no children with known individualized education plans (IEP). Forty lead teachers participated (some teachers led more than one participating classroom, since some classes met on alternate days). All teachers were female, with 95% white. Twenty-three percent of teachers reported a bachelor's degree as their highest level of education, and 28% had majored in early childhood education. Additional teacher demographics are also reported in Table 1.

### Procedures

**Recruitment**—After permission was granted by the principal/director, lead teachers at each preschool were invited to participate. All parents or guardians in each participating classroom were given an informational consent letter and short family demographic survey to return to their child's preschool teacher. Of the parental consents received, four children were randomly selected from each classroom for full study participation: two girls and two boys, whenever possible. The response rate from parents was 44% for a total of 291 children consented. Teachers were offered a choice of either a monetary stipend or a new video camera in compensation for their participation: allowing access to their classroom for observations, completing multiple teacher rating forms, and assisting with the parental consent process.

**Training**—All inCLASS observers (2 research scientists, 4 graduate students, and 1 undergraduate student) were required to attend an intensive training session and reliably code video training clips before observing live in the field. During training, observers watched five training clips (10 min. each), which they coded using a manual and discussed extensively. At the end of training, all observers were required to code five reliability clips independently (without discussion), and had to score within 1 point of the mastercode on 80% of their scores to be deemed reliable and ready for live data collection. All training and reliability video clips were mastercoded by a group of researchers, educators, and designers of the observation system. Inter-rater reliability was calculated using results from these



initial clips, and as a team, the coders were within one point of the mastercode 85% of the time (a range of 74 to 92% across the 9 dimensions). In addition, the intraclass correlation was .65, considered a good level for observational assessments (Cicchetti & Sparrow, 1981).

**Observation protocol**—Two observational visits were made to each classroom in a 3–4 month period during the fall (typically one week apart, and not more than two weeks). Observations were scheduled at the teachers' discretion and lasted for an entire morning. During each visit, observers watched each of the participating children in turn, in a series of alternating 15-minute cycles or occasions (10-minute observation, 5-minute coding), for an average of 16 observations (four per child). Observations continued throughout all activity settings: at each cycle, observers recorded relevant setting information, such as the type of activity (e.g., large group, free choice, etc.), number of adults and children present in the room, and two teacher behavior variables. The same children were observed during the first and second visits for a total of 4–9 cycles.

## Measures

The *Individualized Classroom Assessment Scoring System* (inCLASS) is an observational system comprised of nine dimensions: Positive Engagement with the Teacher, Teacher Communication, Teacher Conflict, Peer Sociability, Peer Assertiveness, Peer Communication, Peer Conflict, Engagement within Tasks, and Self-Reliance (Downer et al., 2010). The dimensions were organized into four developmental domains, as reported by Downer et al. (2010): Teacher Interactions ( $\alpha = .80$ ), Peer Interactions ( $\alpha = .92$ ), Task Orientation ( $\alpha = .72$ ), and Conflict Interactions ( $\alpha = .71$ ). Each child receives a global score on a 7-pt. scale (where 1–2 is low, 3–5 is mid, and 6–7 is high) for each dimension based on the observation of specific behavioral markers, which are developmentally graded. This scoring procedure is unique in that it allows for the frequent of behavior to be examined within the naturalistic setting, but also for developmentally graded scores to be assigned across multiple observations in a morning. Observers use the inCLASS manual to compare the behavioral descriptors to their own observation notes to determine a score in each dimension. Inter-rater reliability was calculated across 20% of all live observations, as two coders observed and independently rated the same children. Coders were within one point of each others' scores 87% of the time (with a range of 71–99% across the 9 dimensions). An intraclass correlation was also calculated across all dimensions and reached .84, within the excellent range according to standards in the field (Cicchetti & Sparrow, 1981).

Observers also used checklists to record ecological factors that co-occurred with inCLASS ratings, and two main lists were used in the current study. First, coders rated two dichotomous basic teacher behavior codes to indicate whether an adult was present and whether an adult was directing the activity for a majority of the observation. These variables provide valuable information about the teachers' basic role, involvement, and behavior that are often times separate from classroom activity settings. Second, coders also rated all activity settings during each observation cycle, and indicated the primary setting: large group, small group, individual time, free choice, recess, meals, and routines/transitions. The classroom activity setting definitions presented in Table 2 were adapted from Ritchie and colleagues (2001) Snapshot measure and have been used in other studies, specifically the

NCEDL's Multi-State Pre-Kindergarten Study (Pianta et al., 2005). All activities were assigned a code based on these definitions, and two codes were combined based on low frequencies (e.g., small group and individual time). Settings codes were developed based on the structure of the classroom and demands placed on the child, and are less about the instructional content of the activity. However, two setting codes imply both a structure and content; meals typically involve eating and routines/transitions typically involve some sort of classroom clean-up. The remaining four codes (i.e., large group, small group, free choice, and recess) have a dominant goal that encompasses instruction, learning, and play, but can be inclusive of a variety of content, such as drawing, book reading, or dramatic play. Refer to Table 3 for percent of cycles or occasions, which generally match the frequency of activity settings in other studies (Early et al., 2010; Powell, Burchinal, File, & Kontos, 2008). It should be noted that the activity codes reflect the setting to which the target child was exposed and that the totals do not reflect settings that other children in the classroom were engaged in during the observation.

## Results

To preserve the co-occurrence of child behavior and setting information, the data remained at the cycle level for each child, and were not collapsed within child or across observations. A total of 1,001 observations for the 145 children were used.

### Teachers' Behavior and Distribution across Activity Settings

To investigate the first research goal, frequencies were run to examine the distribution of children's time and basic teacher behavior (i.e., present or directive) across classroom activity settings, and are presented in Table 3. In most observations, children were involved in free choice (32%) or in large group settings (26%). The difference in activity setting for teacher presence was significant,  $\chi^2(5, N = 972) = 421.53, p = 0.001$ , and for teacher directed,  $\chi^2(5, N = 973) = 527.80, p = 0.001$ . Teachers were present and directed a majority of the large group settings, whereas during free choice and recess teachers were mostly present but rarely directed the activity. To further explore the variability in scores across the classroom activities, mean scores and standard deviations for the inCLASS dimensions are presented in Table 4. Conflict tended to occur infrequently, whereas other dimensions displayed more normal distributions.

### Children's Interactions across Activity Settings

To investigate the second research aim, a MANOVA was conducted to examine the patterns of children's interactions for each of the nine inCLASS dimensions across classroom activity settings. A multivariate effect for activity setting was significant,  $F(45,4409) = 7.72, p = .001$ . All follow-up univariate ANOVAs for each of the inCLASS dimensions were also significant and are presented in Table 4 with post-hoc mean differences and the eta-squared. Results are organized by inCLASS domain (see Downer et al., 2010), but are presented for each dimension so that a complete portrait of children's behaviors can be examined.

The univariate post-hoc differences revealed that children received the highest ratings of positive teacher interactions during teacher-organized or -directed activities (e.g., large



group, small group) as compared to settings such as free choice and recess. Following a different trend, children were observed in more positive peer interactions during more child-focused activities as compared with large group. For task orientation, post-hoc tests indicated that children's self-reliant behavior was significantly lower during large group ( $M = 3.65$ ) than in all other settings except routines/transitions ( $p$ 's  $.01$ ). For conflict, on average, children engaged in more conflictual interactions with peers during free choice ( $M = 1.44$ ,  $p = .001$ ), recess ( $M = 1.63$ ,  $p = .001$ ), and routine/transitional periods ( $M = 1.44$ ,  $p = .01$ ), than in settings that were more teacher-directed like large group ( $M = 1.14$ ).

### Gender Differences within Activity Settings

Previous analyses have been *across* classroom activity settings, whereas for the gender aim an examination *within* settings was completed. To investigate the third research goal, a series of MANOVAs were conducted to examine gender differences by inCLASS dimension within each activity setting. Results are presented in Table 5 and revealed a multivariate effect for small group and meals. Follow-up univariate ANOVAs for small group revealed significant differences in girls and boys behavior for Positive Engagement ( $p = .01$ ), Peer Communication ( $p = .05$ ), and Peer Conflict ( $p = .001$ ) in small group, whereas for meals the only difference was for the Peer Conflict dimension ( $p = .01$ ). For these settings, girls were rated as having more positive engagement with teachers and higher peer communication, whereas boys were consistently higher in conflict than girls.

### Discussion

The purpose of this study was to describe how activity settings relate to children's interactions with teachers, peers, and tasks in a preschool classroom, and to explore whether teacher behavior and child gender play a role in the pattern of these associations. Shifts in activity setting from occasion to occasion allowed for co-occurrences of activity settings, children's interactions, and basic teacher behavior to be documented. Observations of children's interactions and basic teacher behaviors varied across settings, and some limited gender differences were observed in small group and meals. Observed behaviors revealed some intuitive patterns, such as teachers being involved in directing activities like large group and routines/transitions; however there were other interesting patterns, as well. For example, teachers were present for a majority of the time in both large group and recess settings, but children's interactions with teachers were less positive in more child-directed activities such as recess compared to large group. The implications of these findings might encourage teachers to be thoughtful and intentional about what types of support and resources to provide for children so that they can successfully navigate the demands of each setting. These findings are not meant to discourage certain teacher behaviors or imply value of one classroom setting over any other, but instead provide evidenced-based information about patterns of interactions in preschool classrooms that teachers can use to be intentional when providing learning opportunities for children. Specific patterns across and within the inCLASS domains of interactions, including a focus on the role of teacher involvement and child gender, are discussed below.

## Patterns of Teacher Behavior across Activity Settings

Two basic teacher behaviors, physical presence and active direction, play well-established roles in preschool classrooms (Harper & McCluskey, 2003; Kontos, 1999; Kontos & Wilcox-Herzog, 1997; Tomes, 1995), and the current study extended past work by exploring patterns of these teacher behaviors across common activity settings. During large group settings, teachers were present and directing the activity the majority of the time, whereas during free choice and recess, teachers were mostly present but rarely directed the activity. Though on the surface this pattern seems intuitive, when interpreted in light of other research on classroom processes these findings hold implications for what teachers do to support children's learning. First, past research indicates that providing children with opportunities to be autonomous and a leader is linked to early learning (Gutman & Sulzby, 2000; Pianta et al., 2002). With this in mind, current findings suggest that teachers consider ways to integrate more child-directed opportunities into typically teacher-directed contexts, such as large group work. Second, the fact that teachers are largely present, but non-directive, during center time and free play begs the question – what are teachers doing within these settings? A constructivist approach to early childhood education, and related recent findings (Mashburn et al., 2008), indicate how influential an adult can be during free play through active scaffolding and feedback loops, rather than remaining in a passive, silent standby role. Other observational work in preschool classrooms has established that this type of an active role in children's learning is rare (Clifford et al., 2005; Pianta et al., 2005), perhaps due to teacher pedagogies that value children's independent play or consider a teacher's role in learning to be constrained to more formal, teacher-directed moments. Yet, current findings indicate that teachers are clearly present and physically available in these free play/center time moments; it may be that some teachers just need additional education, professional development, and support to maximize their input during these child-directed learning opportunities (Pianta, Mashburn, Downer, Hamre, & Justice, 2008). Understanding these subtle differences in the setting may help teachers be more intentional in their actions to help facilitate positive, meaningful interactions.

## Patterns in Children's Interactions across Activity Settings

This paper had an exploratory goal of examining the unique patterns of children's interactions across classroom settings. Many of the findings fall in line with previous research but the distinctiveness of these results lies largely in the ability to simultaneously look across all children's classroom interactions in all common settings via a unique observational method. These findings are not intended to be a prescription for classroom behavior, but instead an acknowledgement that classroom settings provide opportunities for certain behaviors and towards this, practice and research can be more reflective and purposeful.

**Teacher interactions—**In the current study, children's positive interactions with the teacher were observed for engagement and communication across settings. Following past trends (Coplan & Prakash, 2003; Konig, 2009), the current findings suggest that children exhibit less positive interactions with the teacher when in child-directed activities, such as recess, as compared with teacher-structured activities like large group. Although it is not a requirement for the teacher to be present or lead during activities like large and small group,

it is often the case that the teacher takes on this role; whereas in free play or recess teachers may be less available (Innocenti et al., 1986) or children may have fewer opportunities to engage in conversation with teachers (Dickinson, 2001; Smith & Dickinson, 1994). Current findings suggest that teachers were present a majority of the time during the more child-directed activities, such as free choice and recess, but despite this accessibility children tended to be less positively engaged or communicative with the teacher. It is possible that the teacher may be in the vicinity of child-directed activities to serve a monitoring role, but only steps in to interact when there is a problem to address; in this case, less positive and fewer verbal teacher interactions may simply be a function of a restricted range of opportunities. Alternatively, children may have to seek out or be more intentional in initiating teacher interactions during child-centered activities, as opposed to more teacher-structured activities wherein teacher interactions are often embedded in the activity itself (such as the teacher leading morning calendar in large group). These possible explanations may be a guide for future research; from a teacher practice perspective, current findings suggest that it might take a greater, more explicit effort by the teacher to get involved with children during more child-centered activities (Mashburn et al., 2008). It is possible that teachers would need to be more intentional about incorporating opportunities for children to engage with teachers in activity settings where less communication occurs (Justice, 2004). Following previous research trends, it might be beneficial for teachers to regulate their role and language use with children by activity settings (Kontos, 1999).

**Peer interactions**—Findings from the three positive peer dimensions (i.e., sociability, assertiveness, and communication) suggest that children consistently displayed higher prosocial peer behaviors in all settings except for large group and occasionally routines/transitions. Current findings add to previous research trends that show fewer social behaviors occurring when the teacher is involved and the setting is highly structured by an adult (Huston-Stein, Friedrich-Cofer, & Susman, 1977; Kontos & Wilcox-Herzog, 1997) and that children have more positive peer interactions and are more expressive in free play activities (Goncu & Weber, 2000; Innocenti et al., 1986; Montie et al., 2006). Though on the surface this pattern may seem intuitive, these findings have implications for what teachers do to support children's learning. It is possible that children have less of an opportunity or feel less comfortable engaging, conversing, and positively asserting themselves with their peers in settings that are primarily teacher-directed. From a social-developmental perspective, children of preschool age are just starting to understand and expand ideas when interacting with their peers, and perhaps this developmental stage, in addition to opportunities embedded in the activity setting, contributes to these observed trends (Rosenblatt & Howes, 1995). Teachers may be able to be more intentional about incorporating interactions that allow children to be more expressive with their peers during times that are typically structured or directed by an adult, such as "Turn, Pair, Share" activities. Current findings do not diminish the importance of large group settings, but provide documentation that positive peer interactions are typically lower during these times, suggesting that teachers may want to purposefully facilitate these types of interactions during teacher-structured settings.

**Task orientation**—Two important task-related behaviors, engagement and self-reliance, were observed. First, the Engagement within Tasks dimension examines children's ability to remain actively on-task and sustain attention to assigned tasks (Downer et al., 2010), whereas previous research utilized teacher reports of engagement, or dichotomously coded on-task/off-task behavior (Rimm-Kaufman et al., 2005). Current findings suggest that children were observed with lower task-oriented behaviors in settings that were more structured by the teacher, such as large group and routines/transition. In teacher-structured tasks, the teacher typically chooses the activity for all children and therefore the difficulty level embedded within; it is possible that some children would be less excited about this work compared to child-directed activities. Ruff and colleagues (1998) suggest that children's attention in particular contexts vary based on the demands of the task and the child's individual interest in meeting those demands. With this in mind, perhaps in situations where the task may be less defined (like in routines/transitions), the demand on attention regulation is high (such as in large group), or the activity may be less compelling, the child is likely to be less engaged than during activities like recess. Current findings also suggest that during these settings an adult is typically initiating and directing the activity, which might prompt teachers to consider ways to facilitate more active, intense engagement when leading these more structured activities. For example, during a read-aloud, the teacher may be able to incorporate question and answer moments that allow the teacher to follow the lead of the children's thoughts and ideas, engaging them further in the activity.

Second, children were observed displaying more self-reliant task behaviors in all activities except large group and routines/transitions (where there is more teacher direction). Similar trends were observed from the Peer Assertiveness dimension, suggesting that children who have the ability to positively initiate and lead in peer interactions also have these higher-order initiation skills to persist with tasks in the classroom (Downer et al., 2010). Current findings add to previous research suggesting that children exhibited less independence with tasks when in highly teacher structured activities (Huston-Stein et al., 1977), and less persistence in activities where interest and motivation waned compared to when children took a greater pleasure in learning (Gmitrova & Gmitrov, 2003). Creating opportunities for children to be actively engaged in the classroom is important for early learning (Gutman & Sulzby, 2000). Towards this, there may be ways for teachers to be more intentional in creating novel learning opportunities that help children initiate and be more independent within more structured settings.

**Conflict interactions**—Observed conflict was more frequent during recess and routines/transitions, even though conflict interactions had relatively low frequencies across settings. This finding extends previous research suggesting the frequency of aggression or conflict is highest during recess (Craig, Pepler, & Atlas, 2000) or free play settings (Chen, Fein, Killen & Tam, 2001; Ostrov & Keating, 2004). On average, children tended to be less engaged, display fewer self-reliant behaviors, and exhibit higher conflict during routines and transitions than in more child-directed activities. Young children are learning to follow rules and regulate emotions that relate to how they handle classroom situations (Elias & Berk, 2002), and it is possible that, in less structured settings, tension may spill over to conflict. More tension may occur in these child-directed activities compared to large group, because

children have the opportunity for more creative play and peer involvement that can lead to disagreements or negativity. Yet, it is important to note that conflict is a natural and important part of development (for example, when children negotiate turn-taking or sharing resources), and it is possible that the low levels noted in this study may reflect normative developmental process. Future research should attempt to untangle these possible explanations to determine causality.

Current findings suggest that, even though a teacher was initiating or directing the activity during routines/transitions, they were not present a majority of the time. In routines/transition settings, children might not always know what to do (i.e., lower engagement scores) and therefore end up in more tense interactions. This setting is a natural part of the early childhood classroom, and these results provide information for teachers to be more knowledgeable and reflective in possibly providing more proactive management of children's behavior and classroom expectations (Pianta et al., 2008). Understanding when conflict tends to happen and under what circumstances (i.e., teacher presence or directed) may help teachers facilitate more positive and potentially meaningful classroom interactions, or make the most of these naturally tense moments to help children learn perspective-taking, sharing, and emotion regulation.

### Gender Differences within Activity Settings

Discussion thus far has provided a descriptive examination of children's and teachers' behaviors *across* activity settings. In addition to this cross-setting focus, an investigation of gender differences *within* these settings by inCLASS dimension was completed. In most settings, there were no significant gender differences suggesting that girls and boys have mostly similar behavior, adding to previous research trends that were limited by the breadth of settings examined (Anderson et al., 2003; Carpenter & Huston-Stein, 1980; Farran & Son-Yarborough, 2001). Only in small group and meals were gender differences observed, and these were mainly in conflict. Boys tended to be higher than girls in their Peer Conflict behaviors, which generally follows previous research (Holmes-Lonergan, 2003; Ostrov & Keating, 2004). In small group, boys also tended to be higher in Peer Communication than girls, but girls were scored higher in Positive Engagement with the Teacher than boys. These findings generally support the argument that young children's gender and the early education social ecology need to be considered when trying to understand children's classroom interactions (Fabes, Hanish, & Martin, 2007).

### Practical Implications

Given the consistent patterns noted above, observations of children's classroom behaviors paired with activity settings have implications for working with individual children, as well as how teachers make choices about setting up the classroom for all children. Within the busy, active environment of a preschool classroom, patterns of an individual child's behavior across and within activity settings may be difficult to see without the use of a systematic, formal observation system. Yet, there are clear benefits to being able to identify children's positive interactions that then offer context-specific targets for individualized interventions. For example, a girl may be shy and rarely raise her hand to ask questions or share her ideas during a book reading in a large group (considered lower Engagement within

Tasks and Self-Reliance on the inCLASS), but during free choice she sits in the book area with a peer and is actively engaged in pointing to pictures in the book and finding all of the letter B's. This scenario highlights how observational data across activity settings could help teachers understand that a child interacts with her surroundings very differently depending on the context, and therefore may have more positive behavior under one set of conditions that, with support, might be transferred to other more challenging conditions.

The teacher is often a major contributor in the early childhood settings by setting up, leading, or being present during the classroom activities. Current findings could be used by teachers to be more intentional in practice, and purposeful in their role during these learning opportunities and classroom interactions. These findings can be meaningful to teachers who may not have previously been knowledgeable of various types of children's interactions and how activity settings affect classroom behavior. These patterns help provide evidence and documentation for teachers to be more aware of the interactions occurring in their classroom and the choices they make within these settings in order to promote certain behaviors across all children. The current study is not meant to be a prescription for how to use classroom settings; instead applications of these findings may be useful for teachers to be more proactive and intentional in setting up the classroom environment. Possible next steps might be to observe whether having opportunities to engage in these positive behaviors and interactions are associated with better skill development in children. Overall, it is important to observe children developing these skills and behaviors, and it is possible that structuring the environment through the intentional use of certain activity settings might help foster development.

## Limitations

This study examines children's positive interactions across activity settings using an observational system focused on the developmentally salient interactions children have within early childhood classrooms. Findings provide initial support for the hypothesis that children's behavior varies by activity setting, however, it is important to acknowledge several limitations. First and foremost, as covered in the introduction, children's interactions with their pre-kindergarten environment are transactional in nature. Therefore, the current correlational findings do not address the directionality of the link between settings and child behavior. The two are clearly connected in interesting patterns, but further mixed methods longitudinal work is needed to examine whether certain contexts lead to or elicit specific behaviors or if children with particular behaviors select themselves into specific settings. Future work could help to establish the conditions under which these classroom interactions occur in different settings, and at what point these interactions serve a facilitative role in children's academic and socio-emotional development.

For the current study, the classroom setting and teacher behavior codes are from a series of alternating cycles or occasions during two mornings of observations. Although using observation approaches allows for the examination of how children calibrate their behavior by responding to situational demands in classroom interactions (Volpe et al., 2005), it does not solely capture the child's experience in that classroom. For example, information about children's personal interest and motivations were not captured in the current study, and



should be considered in future research (Gump, 1975). It is possible that some children were observed to be less engaged in some settings due to the topic being taught and not necessarily about the setting itself, and therefore data about content and nature of task would be helpful. Additional information that more directly looks at the demands (i.e., cognitively and social-emotionally) placed on the child by examining how teachers manage the settings is also needed (see Conner, Morrison, & Slominski, 2006). The current study utilized two basic teacher behavior variables that provided a snapshot of the role of teacher involvement across the activity settings, but future mixed method research should consider pairing more expansive teacher or classroom-focused data, such as the Classroom Assessment Scoring System (CLASS) (Pianta, La Paro & Hamre, 2008), with the current child-focused inCLASS observations. Future studies using such data could examine if teachers' specific behaviors look different across activity setting in ways that may contribute to children's classroom interactions and developmental outcomes.

Finally, the study sample was limited in cultural and socioeconomic diversity at the child/family level, as well as in the types of pre-kindergarten programs represented. The experiences of this largely white, middle to upper class group of children may not be typical of other more diverse samples, and the activity settings available in these private preschools might look quite different in a set of family daycare or publicly funded pre-kindergarten settings. The link between children's interactions and activity settings requires further research in a set of early childhood settings that are more representative of those available to the full spectrum of children and families in the United States.

## Conclusion

This study provided a picture of children's classroom interactions with teachers, peers and tasks across activity settings. Studies examining the role of the environment are limited when information about children's classroom-based interactions and elements of the classroom setting are aggregated to higher levels, potentially missing relevant findings that are at a basic, moment-to-moment level. As the early childhood education field works toward an improved understanding of how children learn in preschool settings, the current study indicates a need to broaden the scope of this work to include more ecological measures of children's behavior and interactions. Findings from the current study suggest that there are differences in children's behaviors at a micro level within classrooms and activity settings, underscoring the importance of taking into account the classroom activity setting when attempting to understand children's development.

## Acknowledgments

This study was supported by the National Institute of Child Health and Human Development and the Interagency Consortium on Measurement of School Readiness: R01 HD051498. The opinions expressed are those of the authors and do not represent views of the funding agencies. We extend our gratitude to the teachers, parents, and children who invited us into their classrooms. Special thanks to Claire Ponitz for her assistance in the early conceptualization and later reviews of this paper.

## References

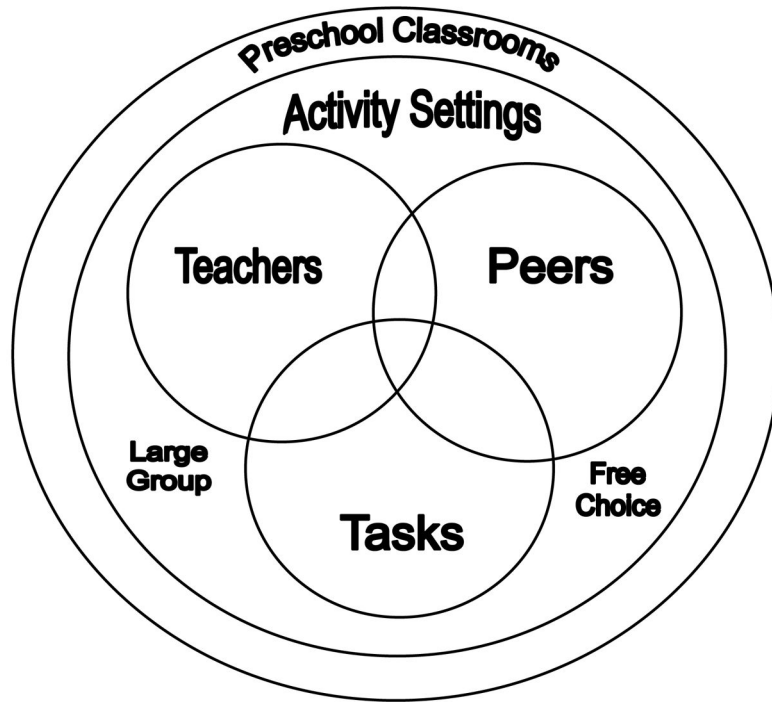
- Anderson GT, Hilton SC, Wouden-Miller M. Gender comparison of the cooperation of 4-year-old children in classroom activity centers. *Early Education & Development*. 2003; 14(4):441–452.

- American Educational Research Association [AERA], American Psychological Association, & National Council on Measurement in Education. Standards for educational and psychological testing. Washington DC: American Educational Research Association; 1999.
- Barker, RG. Ecological psychology: Concepts and methods for studying the environment of human behavior. Stanford, CA: Stanford University Press; 1968.
- Bierman KL, Torres MM, Domitrovich CE, Welsh JA, Gest SD. Behavioral and cognitive readiness for school: Cross-domain associations for children attending Head Start. *Social Development*. 2009; 18:305–323.
- Blair C. School readiness as propensity for engagement: Integrating cognition and emotion in a neurobiological conceptualization of child functioning at school entry. *American Psychologist*. 2002; 57:111–127. [PubMed: 11899554]
- Bronfenbrenner U. Contexts of child rearing: Problems and prospects. *American Psychologist*. 1979; 34:844–850.
- Bronfenbrenner, U.; Morris, PA. The Bioecological model of human development. In: Lerner, RM.; Damon, W., editors. *Handbook of child psychology*. Hoboken, NJ: John Wiley & Sons, Inc; 2006. p. 793-828.
- Buhs ES, Ladd GW, Herald SL. Peer exclusion and victimization: Processes that mediate the relation between peer group rejection and children's classroom engagement and achievement? *Journal of Educational Psychology*. 2006; 98:1–13.
- Bulotsky-Shearer RJ, Fantuzzo JW, McDermott PA. An investigation of classroom situational dimensions of emotional and behavioral adjustment and cognitive and social outcomes for Head Start children. *Developmental Psychology*. 2008; 44:139–154. [PubMed: 18194013]
- Burchinal MR, Peisner-Feinberg E, Pianta RC, Howes C. Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology*. 2002; 40:415–436.
- Carpenter CJ, Huston-Stein A. Activity structure and sex-typed behavior in preschool children. *Child Development*. 1980; 51:862–872.
- Carta JJ, Greenwood CR. Eco-behavioral assessment: A methodology for expanding the evaluation of early intervention programs. *Topics in Early Childhood Special Education*. 1985; 5:88–104.
- Chen DW, Fein GG, Tam HK. Peer conflicts of preschool children: Issues, resolution, incidence, and age-related patterns. *Early Education and Development*. 2001; 12:523–544.
- Cicchetti DV, Sparrow SA. Developing criteria for establishing interrater reliability of specific items: Application to assessment of adaptive behavior. *American Journal of Mental Deficiencies*. 1981; 86:127–137.
- Clifford RM, Barbarin O, Chang F, Early DM, Bryant D, Howes C, Burchinal M, Pianta R. What is pre-kindergarten? Characteristics of public pre-kindergarten programs. *Applied Developmental Science*. 2005; 9(3):126–143.
- Cohen DK, Raudenbush SW, Loewenberg-Ball D. Resources, instruction, and research. *Educational Evaluation and Policy Analysis*. 2003; 25:119–142.
- Conner CM, Morrison FJ, Slominski L. Preschool instruction and children's emergent literacy growth. *Journal of Educational Psychology*. 2006; 98(4):665–689.
- Coplan RJ, Prakash K. Spending time with teacher: Characteristics of preschoolers who frequently elicit versus initiate interactions with teachers. *Early Childhood Research Quarterly*. 2003; 18:143–158.
- Craig WM, Pepler D, Atlas R. Observations of bullying in the playground and in the classroom. *School Psychology International*. 2000; 21(1):22–36.
- Dickinson, DK. Large-group and free-play times. In: Dickinson, DK.; Tabors, PO., editors. *Beginning literacy with language*. Baltimore: Paul H. Brooks Publishing Co; 2001. p. 223-255.
- Dobbs J, Arnold DH. Relationship between preschool teachers' report of children's behavior and their behavior towards those children. *School Psychology Quarterly*. 2009; 24(2):95–105. [PubMed: 20431714]
- Downer JT, Booren LM, Lima OK, Luckner AE, Pianta RC. The Individualized Classroom Assessment Scoring System (inCLASS): Preliminary reliability and validity of a system for

- observing preschoolers' competence in classroom interaction. *Early Childhood Research Quarterly*. 2010; 25:1–16. [PubMed: 23175598]
- Duncan GJ, Claessens A, Huston AC, Pagani LS, Engel M, Sexton H, Dowsett CJ, Magnuson K, Klebanov P, Feinstein L, Brooks-Gunn J, Duckworth J, Japel C. School readiness and later achievement. *Developmental Psychology*. 2007; 43:1426–1446.
- Early DM, Iruka IU, Ritchie S, Barbarin OA, Winn DC, Crawford GM, Frome PM, Clifford RM, Burchinal M, Howes C, Bryant DM, Pianta RC. How do pre-kindergartners spend their time? Gender, ethnicity, and income as predictors of experiences in pre-kindergarten classrooms. *Early Childhood Research Quarterly*. 2010; 25(2):177–193.
- Elias CL, Berk LE. Self-regulation in your children: Is there a role for sociodramatic play? *Early Childhood Research Quarterly*. 2002; 17:216–238.
- Fabes RA, Hanish LD, Martin CL. Peer interactions and the gendered social ecology of preparing young children for school. *Early Childhood Services*. 2007; 1(3):205–218.
- Fantuzzo J, Perry MA, McDermott P. Preschool approaches to learning and their relationship to other relevant classroom competencies for low-income children. *School Psychology Quarterly*. 2004; 19:212–230.
- Farran DC, Son-Yarborough. Title I funded preschools as a developmental context for children's play and verbal behaviors. *Early Childhood Research Quarterly*. 2001; 16:245–262.
- Gmitrova V, Gmitrov J. The impact of teacher-directed and child-directed pretend play on cognitive competence in kindergarten children. *Early Childhood Education Journal*. 2003; 30(4):241–246.
- Goncu A, Weber E. Preschoolers' classroom activities and interactions with peers and teachers. *Early Education & Development*. 2000; 11(1):93–107.
- Gump, PV. Final Report. Washington, DC: U.S. Department of Education, Bureau of Research; 1967. The classroom behavior setting: Its nature and relation to student behavior. (ERIC Document Reprint Service No. ED 015 515)
- Gump, PV. Ecological psychology and children. In: Hetherington, EM.; Hagen, JW.; Kron, R.; Stein, AH., editors. Review of child development research. Chicago: The University of Chicago Press; 1975. p. 75-126.
- Gutman LM, Sulzby E. The role of autonomy-support versus control in the emergent writing behaviors of African-American kindergarten children. *Reading Research & Instruction*. 2000; 39(2):170–183.
- Hamre BK, Pianta RC. Early teacher-child relationship and the trajectory of children's school outcomes through eighth grade. *Child Development*. 2001; 72:625–638. [PubMed: 11333089]
- Harper LV, McCluskey KS. Teacher-child and child-child interactions in inclusive preschool settings: Do adults inhibit peer interactions? *Early Childhood Research Quarterly*. 2003; 18:163–184.
- Holmes-Lonergan HA. Preschool children's collaborative problem-solving interactions: The role of gender, pair type, and task. *Sex Roles*. 2003; 48(11/12):505–517.
- Howe C, McWilliam D. Peer argument in educational settings: Variations due to socioeconomic status, gender, and activity context. *Journal of Language and Social Psychology*. 2001; 20(1/2):61–80.
- Huston-Stein A, Friedrich-Cofer L, Susman EJ. The relation of classroom structure to social behavior, imaginative play, and self-regulation of economically disadvantaged children. *Child Development*. 1977; 48:908–916.
- Innocenti MS, Stowitschek JJ, Rule S, Killoran J, Striefel S, Boswell C. A naturalistic study of the relation between preschool setting events and peer interaction in four activity contexts. *Early Childhood Research Quarterly*. 1986; 1:141–153.
- Justice L. Creating language-rich preschool classroom environments. *Teaching Exceptional Children*. 2004; 37:36–44.
- Konig A. Observed classroom interaction processes between pre-school teachers and children: Results of a video study during free-play time in German pre-schools. *Educational & Child Psychology*. 2009; 26(2):53–65.
- Kontos S, Keyes L. An ecobehavioral analysis of early childhood classrooms. *Early Childhood Research Quarterly*. 1999; 14:35–50.

- Kontos S, Burchinal M, Howes C, Wisseh S, Galinsky E. An eco-behavioral approach to examining the contextual effects of early childhood classrooms. *Early Childhood Research Quarterly*. 2002; 17:239–258.
- Kontos S. Preschool teachers' talk, roles, and activity settings during free play. *Early Childhood Research Quarterly*. 1999; 14(3):363–382.
- Kontos S, Wilcox-Herzog A. Influences on children's competence in early childhood classrooms. *Early Childhood Research Quarterly*. 1997; 12:247–262.
- Konold TR, Pianta RC. Empirically-derived, person-oriented patterns of school readiness in typically-developing children: Description and prediction to first-grade achievement. *Applied Developmental Science*. 2005; 9:174–187.
- Lara-Cinisomo S, Fuligni AS, Ritchie S, Howes C, Karoly L. Getting ready for school: An examination of early childhood educators' belief systems. *Early Childhood Education Journal*. 2008; 35:343–349.
- Ladd, GW. Children's peer relationships and social competence: A century of progress. New Haven, CT: Yale University Press; 2005.
- Mashburn AJ, Pianta RC, Hamre BK, Downer JT, Barbarin O, Bryant D, Burchinal M, Early D, Howes C. Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*. 2008; 79:732–749. [PubMed: 18489424]
- McClelland MM, Morrison FJ, Holmes DL. Children at risk for early academic problems: The role of learning-related social skills. *Early Childhood Research Quarterly*. 2000; 15:307–329.
- McWilliam RA, Scarborough AA, Kim H. Adult interactions and child engagement. *Early Education & Development*. 2003; 14(1):7–27.
- Meisels, SJ.; Atkins-Burnett, S. Evaluating early childhood assessments: A differential analysis. In: McCartney, K.; Phillips, D., editors. *The Blackwell handbook of early childhood development*. Oxford: Blackwell Publishing; 2006. p. 533–549.
- Montie JE, Xiang Z, Schweinhart LJ. Preschool experience in 10 countries: Cognitive and language performance at age 7. *Early Childhood Research Quarterly*. 2006; 21:313–331.
- Neisworth T, Bagnato SJ. The mismeasure of young children. *Infants & Young Children*. 2004; 17:198–213.
- Noel, AM.; Sable, J.; Chen, CS. Public elementary and secondary school student enrollment and staff counts from the common core of data: School year 2007–08. Washington, DC: National Center for Education Statistics; 2009.
- O'Connor E, McCartney K. Teacher-child relationships and achievement as part of an ecological model of development. *American Education Research Journal*. 2007; 44:340–369.
- Odom SL, Peterson C. Ecobehavioral analysis of early education/specialized classroom settings and peer social interaction. *Education & Treatment of Children*. 1990; 13(4):316–331.
- Ostrov JM, Keating CK. Gender differences in preschool aggression during free play and structured interactions: An observational study. *Social Development*. 2004; 13:255–277.
- Palermo F, Hanish LD, Martin CL, Fabes RA, Reiser M. Preschoolers' academic readiness: What role does the teacher-child relationship play? *Early Childhood Research Quarterly*. 2007; 22:407–422.
- Pianta R, Howes C, Burchinal M, Bryant D, Clifford R, Early D, Barbarin O. Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions? *Applied Developmental Science*. 2005; 9:144–159.
- Pianta, RC.; La Paro, KM.; Hamre, BK. Classroom Assessment Scoring System [CLASS]. Baltimore: Paul H. Brookes Publishing; 2008.
- Pianta RC, La Paro KM, Payne C, Cox MJ, Bradley R. The relation of kindergarten classroom environment to teacher, family and school characteristics and child outcomes. *Elementary School Journal*. 2002; 102(3):225–238.
- Pianta R, Mashburn A, Downer J, Hamre B, Justice L. Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly*. 2008; 23:431–451.
- Pianta RC, Nimetz SL, Bennett E. Mother-child relationships, teacher-child relationships, and school outcomes in preschool and kindergarten. *Early Childhood Research Quarterly*. 1997; 12:263–280.

- Pianta RC, Stuhlman MW. Teacher-child relationships and children's success in the first years of school. *School Psychology Review*. 2004; 33:444–458.
- Pianta, RC.; Walsh, DJ. High risk children in the schools: Creating sustaining relationships. New York: Routledge; 1996.
- Ponitz CC, Rimm-Kaufman SE, Grimm KJ, Curby TW. Kindergarten classroom quality, behavioral engagement, and reading achievement. *School Psychology Review*. 2009; 38:102–120.
- Powell DR, Burchinal MR, File N, Kontos S. An eco-behavioral analysis of children's engagement in urban public school preschool classrooms. *Early Childhood Research Quarterly*. 2008; 23:108–123.
- Reynolds AJ, Temple JA, Robertson DL, Mann EA. Long term effects of an early childhood intervention on educational achievement and juvenile arrest. *Journal of the American Medical Association*. 2001; 285:2339–2346. [PubMed: 11343481]
- Rimm-Kaufman SE, La Paro KM, Downer JT, Pianta RC. The contribution of classroom setting and quality of instruction to children's behavior in kindergarten classrooms. *The Elementary School Journal*. 2005; 105:377–394.
- Rimm-Kaufman, Pianta. An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology*. 2000; 21(5):491–511.
- Ritchie, S.; Howes, C.; Kraft-Sayre, M.; Weiser, B. Unpublished measure. University of California; Los Angeles: 2001. Emerging Academic Snapshot.
- Rosenblatt SM, Howes C. Alternative influences on children's development of friendships: A social-developmental perspective. *American Journal of Community Psychology*. 1995; 23(3):429–434. [PubMed: 7572838]
- Ruff HA, Capozzoli M, Weissberg R. Age, individuality, and context as factors in sustained visual attention during the preschool years. *Developmental Psychology*. 1998; 34:454–464. [PubMed: 9597356]
- Shonkoff, JP.; Phillips, DA., editors. From neurons to neighborhoods: The science of early childhood development. Washington, DC: National Academy Press; 2000.
- Smith MW, Dickinson DK. Describing oral language opportunities and environments in Head Start and other preschool classrooms. *Early Childhood Research Quarterly*. 1994; 9:345–366.
- Tomes RE. Teacher presence and child gender influences on children's activity preferences in preschool settings. *Child Study Journal*. 1995; 25(2):123–141.
- Tseng V, Seidman E. A systems framework for understanding social settings. *American Journal of Community Psychology*. 2007; 39:217–228. [PubMed: 17436080]
- Volpe RJ, DiPerna JC, Hintze JM, Shapiro ES. Observing students in classroom settings: A review of seven coding schemes. *School Psychology Review*. 2005; 34:454–474.
- Wasik BA, Bond MA, Hindman A. The effects of a language and literacy intervention on Head Start children and teachers. *Journal of Educational Psychology*. 2006; 98:63–74.



**Figure 1.**

A model of children's interactions with teachers, peers, and tasks embedded in activity settings within preschool classrooms.



**Table 1**

## Teacher, Classroom, and Child Demographics

Teacher demographics <sup>a</sup>				
	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Age (years)	42.7	9.4	24	61
Years experience pre-K	9.3	5.9	1	22

Classroom demographics <sup>b</sup>				
	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Class size	15.36	6.8	8	39
% male	50.4	11.7	20	75
% Caucasian	76.7	27.7	0	100
% African-American	5.2	12.0	0	56
% Asian	4.2	7.2	0	33
% Hispanic	1.9	4.0	0	17

Child demographics	Participating <sup>c</sup>		All consented <sup>d</sup>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (yrs; mos)	4;1	0;8	4;0	0;8
Family income	\$71,422	\$20,829	\$70,507	\$21,671
Maternal education (years)	16.3	2.32	16.4	2.33

<sup>a</sup>N = 40,<sup>b</sup>N = 44,<sup>c</sup>N = 145,<sup>d</sup>N = 295

**Table 2****Activity Setting Definitions**

<b>Code:</b>	<b>Definition:</b>
Large Group	The child is part of an organized whole class or large group activity, with 6 or more children. Such structured activities can include stories, songs, calendar instruction, discussions, book reading, demonstrations, etc. Such structured activities are often completely teacher-led, but do not have to be. There may be instances when a teacher organizes a whole class/large group activity, but then does not have an active role in leading it – though rare, this would still be coded in this category.
Small Group	The child is part of an organized small group activity with 5 or fewer children, or been assigned to work individually with or without teachers. Teacher organized means that the teacher decides what children are to be doing and assigns which children participate, even if the teacher is not participating in the group. Small groups can include group art projects, writing stories, collective building, cooking projects, or small group instruction, etc. May be coded when all children in the class are doing the same thing, but under the direction of teachers in smaller groupings. Individual time can include worksheets, independent projects, computer work etc. This is coded when this is the activity setting for the whole class or for a small group in which the target child is involved.
Free Choice	During this time children are able to select what and where they would like to play or learn. Activities can include individual art projects, blocks, pretend area, puzzles, reading, puppets, computers, science areas, etc. The key here is that children have chosen their activities. It does not matter if the activity they have chosen is individual or in a small group. It does not matter if the activity is with or without the teacher.
Recess	The child is outside of the classroom and/or building either for free play recess or some organized outdoor and/or gross motor activity (e.g., a game of tag).
Meals	The child is eating lunch, breakfast or snacks, or enjoying food that the class cooked during a cooking project.
Routines/Transitions	The child is part of a major transition from one activity setting to another or routine classroom procedures. For example, moving from centers to a whole group, toileting, standing in line, clean-up time, wait time between activities, and/or waiting for materials to be passed out.

**Table 3**

Percentages of Observations and Teacher Behavior across Activity Settings

	% cycles	Large Group					Small Group					Free Choice					Recess					Meals					Routines/Transition				
		25%	8%	32%	15%	9%	11%	25%	8%	32%	15%	9%	11%	25%	8%	32%	15%	9%	11%	25%	8%	32%	15%	9%	11%	25%	8%	32%	15%	9%	11%
Teacher Presence	Majority	24%	5%	26%	13%	4%	4%	24%	5%	26%	13%	4%	4%	24%	5%	26%	13%	4%	4%	24%	5%	26%	13%	4%	4%	24%	5%	26%	13%	4%	4%
	Less than Majority	1%	3%	6%	2%	5%	7%	1%	3%	6%	2%	5%	7%	1%	3%	6%	2%	5%	7%	1%	3%	6%	2%	5%	7%	1%	3%	6%	2%	5%	7%
Teacher Directed	Majority	24%	4%	3%	1%	2%	7%	24%	4%	3%	1%	2%	7%	24%	4%	3%	1%	2%	7%	24%	4%	3%	1%	2%	7%	24%	4%	3%	1%	2%	7%
	Less than Majority	1%	4%	29%	14%	7%	4%	1%	4%	29%	14%	7%	4%	1%	4%	29%	14%	7%	4%	1%	4%	29%	14%	7%	4%	1%	4%	29%	14%	7%	4%

*Note:* N's range from 972–1001.

**Table 4**  
Mean (and Standard Deviation) Patterns for Teacher, Peer, Task-Oriented, and Conflictual Interactions across Activity Settings

	Large Group	Small Group	Free Choice	Recess	Meals	Routines/Transition	<i>F</i> (5,993)	<i>Eta</i> <sup>2</sup>
Teacher Interactions	Positive Engagement	4.07 <sup>a</sup> (1.25)	3.88 <sup>a</sup> (1.66)	3.30 <sup>bc</sup> (1.53)	2.91 <sup>b</sup> (1.54)	3.71 <sup>ac</sup> (1.39)	3.73 <sup>ac</sup> (1.22)	16.09 <sup>***</sup> 0.08
	Teacher Communication	2.60 <sup>abc</sup> (1.50)	3.20 <sup>ab</sup> (1.66)	2.79 <sup>ab</sup> (1.70)	2.21 <sup>c</sup> (1.47)	3.21 <sup>b</sup> (1.75)	3.01 <sup>ab</sup> (1.45)	7.11 <sup>***</sup> 0.04
Peer Interactions	Peer Sociability	3.71 <sup>a</sup> (1.15)	4.32 <sup>b</sup> (1.40)	4.47 <sup>bc</sup> (1.52)	4.95 <sup>d</sup> (1.49)	4.32 <sup>bc</sup> (1.43)	4.21 <sup>bc</sup> (1.25)	16.77 <sup>***</sup> 0.08
	Peer Assertiveness	2.15 <sup>a</sup> (1.39)	3.13 <sup>bc</sup> (1.88)	3.30 <sup>c</sup> (1.64)	3.31 <sup>c</sup> (1.72)	2.89 <sup>bc</sup> (1.85)	2.49 <sup>ab</sup> (1.44)	18.79 <sup>***</sup> 0.09
	Peer Communication	2.31 <sup>a</sup> (1.47)	3.45 <sup>bc</sup> (1.73)	3.74 <sup>c</sup> (1.86)	3.62 <sup>bc</sup> (1.91)	3.49 <sup>bc</sup> (2.01)	3.01 <sup>b</sup> (1.59)	21.93 <sup>***</sup> 0.10
Task Orientation	Engagement within Tasks	4.96 <sup>a</sup> (1.26)	5.29 <sup>ab</sup> (1.37)	5.15 <sup>ab</sup> (1.38)	5.41 <sup>b</sup> (1.31)	5.29 <sup>ab</sup> (1.13)	4.80 <sup>a</sup> (1.38)	4.18 <sup>**</sup> 0.02
	Self-Reliance	3.65 <sup>a</sup> (1.39)	4.43 <sup>bc</sup> (1.54)	4.55 <sup>b</sup> (1.47)	4.20 <sup>bc</sup> (1.34)	4.31 <sup>bc</sup> (1.21)	3.83 <sup>ac</sup> (1.51)	13.46 <sup>***</sup> 0.06
Conflict Interactions	Teacher Conflict	1.18 <sup>ab</sup> (0.47)	1.22 <sup>ab</sup> (0.70)	1.14 <sup>a</sup> (0.41)	1.20 <sup>ab</sup> (0.60)	1.16 <sup>ab</sup> (0.48)	1.35 <sup>b</sup> (0.78)	2.68 <sup>*</sup> 0.01
	Peer Conflict	1.14 <sup>a</sup> (0.40)	1.41 <sup>ab</sup> (0.90)	1.44 <sup>bc</sup> (0.82)	1.63 <sup>b</sup> (0.95)	1.24 <sup>ac</sup> (0.55)	1.44 <sup>bc</sup> (0.88)	9.44 <sup>***</sup> 0.05

*Note:* In each row, significant pairwise differences are denoted by different superscript letters ( $p < 0.05$ ). If settings have corresponding superscript letters, then the pairwise difference is non-significant.

\*  $p < .05$ ,

\*\*  $p < .01$ ,

\*\*\*  $p < .001$

Table 5

Mean Patterns by Gender for Teacher, Peer, Task-Oriented, and Conflictual Interactions within Activity Settings

		Large Group	Small Group	Free Choice	Recess	Meals	Routines/Transition
Multivariate Effect		$F(9,245) = 1.59$	$F(9,66) = 2.61^{***}$	$F(9,314) = 1.52$	$F(9,137) = 0.91$	$F(9,77) = 2.02^*$	$F(9,100) = 1.19$
Teacher Interactions	Girls	4.16	4.31	3.30	3.06	3.88	3.92
	Boys	3.96	3.11	3.30	2.73	3.42	3.51
	Girls	2.53	3.45	2.78	2.30	3.41	1.22
	Boys	2.69	2.74	2.81	2.11	2.84	1.51
Peer Interactions	Girls	3.62	4.12	4.33	5.04	4.21	3.02
	Boys	3.82	4.67	4.63	4.83	4.52	3.00
	Girls	2.03	2.96	3.26	3.26	2.68	4.17
	Boys	2.29	3.44	3.34	3.36	3.26	4.25
Task Orientation	Girls	2.11	3.14	3.69	3.56	3.46	2.29
	Boys	2.56	4.00	3.79	3.70	3.55	2.73
	Girls	5.03	5.35	5.17	5.44	5.32	2.93
	Boys	4.87	5.19	5.13	5.38	5.23	3.10
Conflict Interactions	Girls	3.59	4.43	4.45	4.21	4.36	4.97
	Boys	3.72	5.19	4.68	4.20	4.23	4.61
	Girls	1.12	1.12	1.13	1.16	1.13	1.22
	Boys	1.27	1.41	1.16	1.24	1.23	1.51
Conflict Interactions	Girls	1.13	1.16	1.38	1.49	1.13	1.31
	Boys	1.16	1.85	1.52	1.79	1.45	1.59

\*  $p < .05$ ,\*\*  $p < .01$ ,\*\*\*  $p < .001$