Using an Individualized Observational Measure to Understand Children's Interactions in Underserved Kindergarten Classrooms

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Abstract

This study extended existing work on the Individualized Classroom Assessment Scoring System (inCLASS), established as a measure of preschool-age children's observed interactions in the four domains of Teacher Interactions, Peer Interactions, Task Orientation, and Negative Engagement. Our sample included kindergarten-age children ($N = 117$; mean age = 5.53 years) in 11 classrooms in four schools from a low-income community. We had three aims: (a) examine the inCLASS' applicability in this new sample, (b) examine associations with teacher reports of children's social skills and learning behaviors, and (c) identify characteristics at the time point, child, and classroom levels that contribute to inCLASS scores. We found limited variability in scores for each of the four inCLASS domains, with scores related to teacher reports of children's skills as expected. Children's inCLASS scores were highly variable from one observation time point to the next, and time point, child, and classroom characteristics differentially contributed to their scores. Implications for observational assessment are discussed.

Keywords

low-income kindergarteners, multilevel modeling, classroom interactions, relationship skills, teacher report

Thriving in school environments requires children to interact effectively with teachers and peers, focus their attention on learning tasks, and avoid interpersonal conflict (Ladd, Birch, & Buhs, 1999). Positive interactions in early learning environments support learning and healthy development (Hamre & Pianta, 2007) and may be most valuable for children from impoverished

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backgrounds (Ladd & Burgess, 2001). Children from families with low socioeconomic status (SES) encounter disadvantage in a myriad of ways: chronic exposure to stress, less opportunities for cognitive stimulation, reduced accessibility to quality support services including day care, and increased likelihood of living in harsh social environments (Hair, Hanson, Wolfe, & Pollak, 2015; Raver, Blair, & Willoughby, 2013). These poverty-related factors converge to affect multiple aspects of child development and diminish chances for academic success in the early years (Duncan & Murnane, 2011). Meanwhile, early interactions at the school transition have the potential to either ameliorate or exacerbate problems (Mashburn et al., 2008). This makes understanding interactions in early learning environments particularly important for low-SES children and children of color, who are three times more likely than Caucasian children to live in poverty, according to the 2016 census data (Semega, Fontenot, & Kollar, 2017).

Moreover, because teacher-reported measures are economical and many validated versions exist, they are commonly used to assess young children's classroom functioning. However, teachers' ratings of children's skills are often subject to systematic errors, which say more about the teacher and their potential biases due to factors such as the child's SES or race/ethnicity, rather than children's directly assessed skills (Gilliam, Maupin, Reyes, Accavitti, & Shic, 2016; Mashburn, Hamre, Downer, & Pianta, 2006; Ready & Chu, 2015). For instance, in a comprehensive literature review of 13 studies of teacher bias in ratings of behavior, there was strong evidence of bias due to teacher culture, especially when there was violation of positive stereotypes (Mason, Gunersel, & Ney, 2014). Observational measures can thus complement teacher reports and provide information about children's developing skills, as well as capture the complexity of interactions and behaviors within classroom settings. However, observational measures are sensitive to the procedures and conditions of the environment, which have implications for the validity of classroom observations (Mashburn, 2017).

The inCLASS, or Individualized Classroom Assessment Scoring System (Downer, Booren, Lima, Luckner, & Pianta, 2010), is an observational tool originally developed to measure individual children's interactions in early childhood contexts. Most existing studies have examined the inCLASS in preschool settings and with children who are sociodemographically advantaged. Despite evidence from these studies, this does not mean that a strong validity argument for the interpretation of inCLASS scores and its uses should be assumed for other populations (Reeves & Marbach-Ad, 2016). This is the first study to examine the measure with kindergarten-age children in a sample that is low income and largely African American. Recent evidence indicates a heightened focus on academic skills and teacher-directed instruction in kindergarten (Bassok, Latham, & Rorem, 2016). Furthermore, low-income educational settings, which disproportionately serve children of color, tend to be relatively more rigid and to be characterized by, on average, lower quality learning and interaction opportunities compared with more sociodemographically advantaged settings (Duncan & Murnane, 2014). Thus, extending existing work on the inCLASS (Booren, Downer, & Vitiello, 2012; Hartz, Williford, & Koomen, 2017; Slot & Bleses, 2018; Vitiello, Booren, Downer, & Williford, 2012), the present study investigates (a) the measure's applicability in a high-poverty, mostly African American kindergarten sample; (b) associations between inCLASS and teacher reports of children's social skills and learning behaviors; and (c) characteristics at the time point, child, and classroom levels that contribute to inCLASS scores.

Children's Interactions With Their Teachers, Peers, and Tasks: inCLASS

Observing classroom behavior real time is complex, with children constantly encountering other children, teachers, and other adults, and learning materials throughout the day. These encounters provide myriad opportunities for engagement or distraction that, together,

constitute proximal processes within an ecological systems framework (Bronfenbrenner & Morris, 2006). In this framework, children's ongoing interactions with other people, symbols, or objects guide their development in a transactional and dynamic system. The inCLASS distinguishes four different domains related to children's interactions in the classroom: Teacher Interactions, Peer Interactions, Task Orientation, and Negative Engagement. Teacher Interactions, such as frequent communication and warm physical exchanges such as hugs, are linked to adaptive developmental outcomes for both preschool and kindergarten children, especially those from impoverished backgrounds (Hamre & Pianta, 2005). Peer Interactions, including effectively communicating ideas and needs, as well as initiating and maintaining positive social relationships with peers, are associated with more prosocial behaviors and fewer problem behaviors (Mashburn & Pianta, 2006). Task Orientation refers to "a child's use of on-task, self-directed, and self-reliant behavior in managing the social and academic/learning demands of the classroom" (Downer et al., 2010, p. 4) and indicates children's ability to access learning activities (Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009). Negative Engagement refers to conflictual, tense, and dysregulated engagement with teachers, peers, and tasks. Children who display behavioral problems and negative engagement, such as arguing with or avoiding other people, or have trouble controlling their bodies, voices, or attention in the classroom exhibit difficulty in multiple areas (Ladd et al., 1999).

Observing these types of interactions in the classroom provides information about kindergarteners' developing skills (Connor, Morrison, & Slominski, 2006) that can complement other types of assessments, such as direct assessments and teacher reports, as well as capture the complexity of interactions and behaviors within classroom settings. For example, among ethnically and linguistically diverse, low-income preschoolers, those who had more positive interactions, as measured by the inCLASS, showed greater gains in their self-regulation, compared with children with less positive interactions and more negative engagement behaviors (Williford, Maier, Downer, Pianta, & Howes, 2013). Moreover, Bulotsky-Shearer, Fantuzzo, and McDermott (2008) found that children who had early difficulty in structured learning situations, which required attention to a task or to the teacher, suffered later in their peer relationships and in their learning. This finding is especially relevant given that kindergarten has changed dramatically in recent years, with children spending far more time in structured, academic learning settings than in the more play-based and preschool-like exploratory settings of years past (Bassok et al., 2016).

Children's observed behaviors related to learning tasks and classroom expectations are fundamental contributors to teachers' reports of children (Downer et al., 2010). Therefore, we examined associations between children's observed classroom interactions using the inCLASS and reports of children's social and emotional behaviors and teacher–child relationship quality using published and validated measures. Research shows that classroom interactions over the course of the preschool year measured by the inCLASS predict teachers' perceptions of teacher–child relationships (Hartz et al., 2017). Specifically, children observed as having more positive interactions with their teachers and better task orientation earned higher ratings on teachers' perceptions of closeness. In contrast, teachers reported more relational conflict with children observed with more negative interactions; positive interactions with peers were not associated with teacher ratings of closeness or conflict (Hartz et al., 2017). In another study of the inCLASS, teachers' perceptions of preschoolers' social skills were more favorable when their children were observed with higher task orientation (Downer et al., 2010). In Downer's study, children's task orientation was even more strongly related to teachers' perceptions of children's skills, such as language and literacy, social communication, social skills, and problem behaviors, than were their observed interactions with the teacher himself or herself, which suggests some complexity in how teacher ratings relate to observational ratings (Mashburn et al., 2006), warranting further exploration.

Characteristics Associated With Children's Classroom Interactions

Young children's interactions and behaviors are a function of environmental opportunities and constraints (e.g., Blair, 2002). Studies show that young children are sensitive to environmental cues, and therefore, their behavior can differ drastically from one context to another (Rose, Blank, & Spalter, 1975). The third aim of this study was to examine how characteristics at three contextual levels—time point, child, and classroom—contribute to low-income kindergarteners' observed interactions on the inCLASS.

Among preschoolers on the inCLASS, Vitiello et al. (2012) found that the largest source of variance was at the time point level as opposed to child or classroom level. In other words, conceptually, this means that the specific context of an individual observation period for a child—such as who they are interacting with, the task in front of them, and other features of the environment—may contribute substantially to children's observed behaviors. These findings suggest that, similar to its classroom-focused predecessor, the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008), the inCLASS may be highly sensitive to the idiosyncrasies of the activity at the time of observation (Mashburn, 2017). These results have implications for how observational measures are used and interpreted.

Child-level factors, including age and gender, may also be associated with how effectively or negatively children interact with their teachers, peers, and tasks (e.g., Downer et al., 2010). Teachers report that relatively older children have better task orientation; they also report having closer relationships with older children compared with younger children (Saft & Pianta, 2001). In terms of gender, one study using the inCLASS found that boys had more negative engagement compared with girls (Slot & Bleses, 2018), but no other studies have found significant gender differences (Booren et al., 2012; Downer et al., 2010; Vitiello et al., 2012). Finally, at the classroom level, a higher adult–child ratio increases the opportunity for, and possibly the quality of, interactions with adults (Blatchford, Moriarty, Edmonds, & Martin, 2002). In contrast, more children per classroom could decrease the number and quality of teacher interactions. We therefore measured overall teacher–child interaction quality in the classroom using the CLASS.

Together, existing work on the inCLASS points to the importance of gauging observation-level, child-level, and classroom-level characteristics that might contribute to children's observed inCLASS scores.

Present Study

Most existing work on the inCLASS has been conducted in preschool classrooms in middle-class communities. Thus, this study addressed the need for more psychometric work on the inCLASS with kindergarten-age children, and in classrooms serving low-SES students of color. To extend previous findings and address gaps in current literature, the following research questions were explored:

Research Question 1 (RQ1): Do the inCLASS domains show applicability among low-income kindergarteners?
Research Question 2 (RQ2): How are inCLASS scores related to teacher reports of children's skills in the classroom?
Research Question 3 (RQ3): What are the characteristics at the time point, child, and classroom levels that contribute to children's observed classroom interactions?

Given that, to our knowledge, the inCLASS has not been used with a kindergarten sample, the first question is exploratory. Based on prior studies (e.g., Downer et al., 2010; Hartz et al., 2017), we expected children who were observed on the inCLASS with stronger interaction skills to earn better teacher ratings across measures of children's relationships with themselves and their peers, classroom self-regulation, and conflict behaviors. We also expected child- and classroom-level factors to be related to inCLASS scores. At the same time, based on recent evidence suggesting within-child inCLASS variability is substantial compared with variability between children or classrooms (Vitiello et al., 2012), we expected significant variance at the time point level. In addition, we hypothesized classroom activity settings to be important sources of variance based on previous studies (Booren et al., 2012; Vitiello et al., 2012).

Method

Participants

Participants were 117 kindergarten students involved in a longitudinal evaluation of an after-school social-emotional skills program, which children attend 3 hr per day, 5 days a week, that teaches children how to make good decisions and build healthy relationships (R. E. Anderson, 2015; Brock, Kim, & Grissmer, 2018). The sample comes from four Title I schools in a south-eastern state, and as a group, would traditionally be considered disadvantaged based on demographic characteristics. Approximately 88% of the students in our sample received free or reduced lunch. This corresponds to the larger population's characteristics in which more than 90% are eligible for free or reduced-price lunch, and 98% of children in the area live below the poverty index. During data collection period, the per capita family income was US$20,526, and the median family income during data collection period was US$39,543 compared with US$63,211 for the nation, placing the majority of the residents below 200% of the poverty level (U.S. Census Bureau, 2015).

The children were on average 5.5 years of age, attended full-day kindergarten, and 93% reported their ethnicity to be African American/Black, which matches the overall community demographics as well. In addition, self-reported maternal education ranged from less than high school (27%) to high school or more (73%). Eleven (9%) mothers did not report their education. Also participating were 11 kindergarten teachers, who reported their ethnicity or race as Black/African American ($n = 3$; 27%) or White/Caucasian ($n = 8$, 73%) and had from 1 to 30 years of experience in teaching ($M = 12.2$ years; $SD = 11.5$); each classroom had on average 18 enrolled students ($SD = 4.17$) and 2 teachers ($SD = 0.79$). See Table 1 for descriptive statistics.

Procedure and Measures

Family recruitment occurred either in person at a kindergarten registration event in April and May of children's prekindergarten year or through a flyer during the first few weeks of the kindergarten year. In a separate interview or phone call, parents provided demographic information and were compensated US$10. Students were observed on different days during regular school hours in their kindergarten classrooms from February to April. After observations were completed, teachers completed various measures on all of the study children in their class between April and May of the kindergarten year and were compensated with a US$10 gift card per child. The number of study children ranged from 7 to 16 per class (median = 11 children per class). Each packet of teacher-reported questionnaires (one for each study child in the class) was estimated to take the teacher 10 minutes to complete.

Table 1. Descriptive Statistics.

	N	Frequency (%)	% missing	M	SD	Minimum	Maximum
Child demographic variables							
Child age in years	117			5.53	0.30	4.73	6.16
Financial stress (SES)	109		7	2.07	0.81	1	4.33
Male	117	42				0	1
Treatment condition	117	59				0	1
Maternal education	105		10			0	2
Less than high school	28	27					
High school or more	77	73					
Ethnicity	109		7				
White/Other	2	2					
African American	101	93					
Hispanic	6	5					
Teacher demographic variables							
Female	34	97					
Age (years)	33		3	37.88	12.84	23	62
Highest level of education	34						
Bachelor's degree	12	35					
Beyond bachelor's degree	22	65					
Degree in education or related field	34	85					
Years of elementary teaching experience	33		3	12.08	11.32	0	49
Ethnicity	34						
White	24	71					
African American	10	29					
inCLASS domains							
Teacher Interactions	117			1.48	0.33	1	3
Peer Interactions	117			1.91	0.52	1	3.88
Task Orientation	117			3.22	0.34	2.25	4
Negative Engagement	117			1.33	0.26	1	2.06
CLASS domains							
Emotional support	117			4.52	0.75	3.34	5.42
Instructional support	117			2.6	0.48	1.96	3.58
Classroom organization	117			4.83	0.41	4.08	5.5
Social skills							
Social awareness (DESSA)	111		5	3.79	0.72	2.11	5
Decision making (DESSA)	111		5	3.73	0.65	2	4.88
Relationship skills (DESSA)	111		5	3.84	0.74	2	5
Self-awareness (DESSA)	111		5	3.64	0.82	1.57	5
Self-management (DESSA)	111		5	3.72	0.74	1.82	5
Conflict (STRS)	111		5	1.82	0.85	1	4.25
Closeness (STRS)	111		5	4.21	0.67	2.29	5
Self-control (SSIS)	117			2.89	0.72	1	4
Engagement (SSIS)	117			3.27	0.59	1.57	4
Classroom self-regulation (CBRS)	117			2.98	0.65	1.4	4
Classroom problem behavior (SSIS)	117			1.64	0.51	1	3.36

Note. The ranges (minimum and maximum) reported are based on inCLASS and CLASS scores that were averaged across two observational sessions of four 10-min periods each, for an average of eight time points total (possible range of scores is 1-7).
SES = socioeconomic status; CLASS = Classroom Assessment Scoring System (Pianta, La Paro, & Hamre, 2008; possible range of scores is 1-7); inCLASS = Individualized Classroom Assessment Scoring System; DESSA = Devereux Student Strengths Assessment (LeBuffe, Shapiro, & Naglieri, 2009; possible range of scores is 1-5); STRS = Student–Teacher Relationship Scale (Pianta, 2001; possible range of scores is 1-5); SSIS = Social Skills Improvement System–Rating Scales (Gresham & Elliott, 2008; possible range of scores is 1-4); CBRS = Child Behavior Rating Scale (Bronson, Tivnan, & Seppanen, 1995; possible range of scores is 1-4).

inCLASS. Observations of children's interactions with their teachers, peers, and tasks were conducted using the Individualized Classroom Assessment Scoring System (inCLASS; Downer et al., 2010). The inCLASS includes 10 dimensions with codes for each dimension ranging 1 to 7. A code of 1 indicated that the observable behaviors in that dimension were *rarely* observed during the observational period, whereas a code of 7 indicated the observable behaviors were *often* observed. A time point is defined as a 10-min observation period, which was followed by a 5-min coding period where the observers assessed the period on the 10 inCLASS dimensions, organized within four domains.

Domains and dimensions. The Teacher Interactions domain includes two dimensions: positive engagement and communication. The Peer Interactions domain includes three dimensions: sociability, communication, and assertiveness. The Task Orientation domain includes two dimensions: engagement and self-reliance. Finally, the Negative Engagement domain includes three dimensions: teacher conflict, peer conflict, and behavior control (reverse coded). Negative Engagement is the only domain where lower scores indicate more adaptive interactions. Summary scores for each of the four domains were created by averaging dimension scores within the domains, with possible scores ranging from one to seven (with behavior control dimension reverse scored). Cronbach's alphas for the domain scores were .68 for Teacher Interactions, .94 for Peer Interactions, .32 for Task Orientation, and .46 for Negative Engagement. Despite the low reliability for these latter two domains, we retained the domain-based composite scores because one study goal was to extend previous work on the inCLASS.

Observation procedure. Observations began as soon as students arrived to school in the morning, and each coder observed up to four students per day. Observers were randomly assigned to a classroom and remained in the same classroom until all study children were observed. Each study child was observed for a total of 80 min across two consecutive weekdays (four time points per student each day), with 23% of the total observations occurring on Mondays, 24% on Tuesdays, 21% on Wednesdays, 20% on Thursdays, and 11% on Fridays.

During each 10-min observational period, researchers also recorded information regarding the child's activity setting, which included whole group (34%), small group (14%), individual (27%), free play (3%), routine/transition (10%), and meals/snacks (19%). We translated this information into the percentage of the 10-min period that the child spent in each setting.

Importantly, the observers were blind to the student's condition in the after-school program study. To further minimize bias, observation order was randomly assigned, and individual students were observed on differing observation days within the same week. We consulted with the inCLASS authors, and these procedures are aligned with their recommendations for observing individual children, specifically, that children be observed for multiple days over multiple time points on a given day (Downer et al., 2010).

Training and observer reliability. Three research assistants (RAs) were trained over 2 days to code the behavioral indicators for the inCLASS measure. All three observers were female and White and had previous experience working with this community and population (mean age = 24 years; range = 22-26 years). The observers had at least a bachelor's degree, with one coder having her master's degree. After training, coders watched and coded master videos, reaching 90% reliability with the master codes. During the study, RAs also dual coded 20% of the live observations, with over 90% interrater reliability. Including the dual-coded observations, Coder 1 conducted 41% of the observations, Coder 2 conducted 20% of the observations, and Coder 3 conducted 39% of the observations.

Teacher–child relationships. The Student–Teacher Relationship Scale–Short Form is a teacher-reported measure to gauge the level of closeness and conflict between the teacher and individual students (STRS-SF; Pianta, 2001). On each item, teachers indicated on a scale from 1 (*definitely does not apply*) to 5 (*definitely applies*) whether a statement captured the nature of their relationship with each individual student, with higher scores indicating more closeness and less conflict. Consistent with Pianta (2001), internal consistency for the current sample was adequate for both closeness ($\alpha = .87$) and conflict ($\alpha = .89$).

Social skills and problem behaviors. Teachers also rated students' social skills including problem behaviors within the classroom using the Social Skills Improvement System–Rating Scales (SSIS-RS; Gresham & Elliott, 2008). Questions asked how often a particular behavior occurs; teachers' responses ranged from 1 (*never occurs*) to 4 (*almost always occurs*). The SSIS-RS demonstrated high internal consistency for our sample ($\alpha = .91$).

Teachers rated students' classroom learning behaviors using 10 items measuring classroom self-regulation from the Child Behavior Rating Scale (CBRS; Bronson, Tivnan, & Seppanen, 1995). Teachers rated the occurrence of the behavior on a 4-point scale, from 1 (*children never exhibited the desired behavior*) to 4 (*children always exhibited the desired behavior*). The CBRS had strong reliability in our sample ($\alpha = .95$).

The Devereux Student Strengths Assessment (DESSA; LeBuffe, Shapiro, & Naglieri, 2009) was also used to measure students' social and emotional strengths. The DESSA consists of 45 items asking teachers to rate individual children on a 5-point scale varying from 1 (*never*) to 5 (*very frequently*). The DESSA, which was shown to have high internal consistency for the current sample, measures five components of students' social and emotional skills, including self-awareness ($\alpha = .92$), social awareness ($\alpha = .94$), self-management ($\alpha = .95$), relationship skills ($\alpha = .96$), and decision making ($\alpha = .94$).

Teacher–child interactions. Observations of overall teacher–child interaction quality were conducted using the CLASS (Pianta et al., 2008), a psychometrically valid observational tool for the classroom as a whole. The CLASS is organized into three overarching domains: *Emotional Support* (degree of warmth present in the classroom and the degree to which the teacher is sensitive to the needs and perspectives of students), *Classroom Organization* (managerial behaviors and interactions that provide structure and consistency to the learning environment), and *Instructional Support* (degree to which higher order learning is encouraged and the extent of teacher behaviors that promote student understanding and learning). Like the inCLASS, dimensions within domains are rated on a 1 to 7 scale, with scores of 1 and 2 representing *low quality interactions*, scores of 3 to 5 representing *mid-range quality*, and scores of 6 and 7 representing *high-quality interactions*.

Classroom observations were randomly assigned to avoid bias and live coded on 2 days for each classroom, once in the morning and once in the afternoon, by trained and certified CLASS observers on different days than when the inCLASS observations occurred. There were four observers for the CLASS, and of those four, two people were also certified inCLASS observers. Each observation day consisted of four time points of observation (15 min of observation followed by 5 min of coding). As instructed by the CLASS observation protocol (Pianta et al., 2008), 20% of observations were dual coded, and on average, coders were reliable within one point, 95% of the time; all observers are required to score within one point on 80% of the scores to be considered reliable.

Child demographics. Children's age at the beginning of the kindergarten year, gender (1 = *male*; 0 = *female*), family financial stress, and maternal education (0 = *less than high school diploma*; 1 = *high school diploma or more*) were included in the study. Family financial stress

was measured by the Financial Strain Questionnaire (from Vinokur, Price, & Caplan, 1996), which was part of a larger questionnaire measuring economic hardship. Parents were asked to complete three questions that measured the degree of financial strain they had experienced during the previous year. Parents completed questions about their household income ("How difficult is it for you to live on your total household income right now?") and any economic hardship they predicted within the next 2 months ("In the next two months, how much do you anticipate that you or your family will experience actual hardships such as inadequate housing, food, or medical attention?"). The measure consists of three items rated on a 5-point scale varying from 1 (*almost never or never*) to 5 (*almost always or always*). In addition, given that the data come from a larger evaluation of an after-school social-emotional skills program, treatment information (whether child was randomized into the 1 = *treatment group* or 0 = *control group*) was also included to control for the potential influence of exposure to the program on children's interactions and classroom skills.

Analytic Plan

To address each research question, we ran a series of analyses.

RQ1: Applicability of inCLASS in this sample.

First, we examined descriptive statistics, including distributions, means, standard deviations, missing data, and correlations between domains. Analyses were completed using Stata 14.2 (StataCorp, 2016). This approach allows inCLASS scores to be described for this new sample and to be assessed for variability. Examining descriptives comprehensively also allows informal comparison with other study's results on the inCLASS.

RQ2: inCLASS and teacher report associations.

To examine associations between teacher reports of children's skills in the classroom and inCLASS scores, we conducted regression analyses in a Structural Equation Modeling (SEM) framework using Stata 14.2 (StataCorp, 2016). An important consideration of SEM models is whether or not we have a sufficient sample size for accurate estimation. Given that SEM models can perform well even with small samples (50-100) as well as the fact that with "three or more indicators per factor, a sample size of 100 will usually be sufficient for convergence" (J. C. Anderson & Gerbing, 1984, p. 170), our sample size of more than 100 children was adequate. Path analysis evaluated associations between the four inCLASS domains and teacher reports of children's corresponding social and learning skills (i.e., teacher–child relationships, social skills and problem behaviors, and classroom self-regulation). The analysis controlled for child gender, age, family financial stress, treatment condition, and maternal education. Due to the large number of teacher-reported skills, three separate path models were run: one for teacher–child relationships (STRS), one for classroom social skills and problem behaviors (SSIS and CBRS), and one for children's social and emotional learning (DESSA).

RQ3: Contributors to children's inCLASS scores.

To examine how much variance in children's interactions with their teachers, peers, and tasks could be explained by differences across observation time points (time point level; Level 1), differences between children (child level; Level 2), and differences between classrooms (classroom

Table 2. Bivariate Pearson Correlations for the inCLASS by Domain Scores.

		1	2	3	4
1	Teacher Interaction	—			
2	Peer Interactions	−.04	—		
3	Task Orientations	.22*	.20*	—	
4	Negative Engagement	.05	.18	−.35***	—

Note. inCLASS = Individualized Classroom Assessment Scoring System.
*p < .05. **p < .01. ***p < .001.

level; Level 3), multilevel modeling was conducted using R base version 3.1.0—"Spring Dance" (R Development Core Team, 2014), with the lme4 version 1.1-6 package (Bates, Maechler, Bolker, & Walker, 2014). Although the Level 3 sample size is small (11 classrooms), recent work by McNeish and Wentzel (2017) that looked at the context of three levels of clustering, where the first level is repeated measures, the second is the individual, and the third level is an organizational unit—similar structure to the present study—found that as long as the sample sizes are adequate for the first two levels, "level 3 sample sizes as small as four were not problematic; no additional assumptions are required" (p. 12). All predictors were included together in the final model. The only exception was for the three CLASS domains due to their multicollinearity ($r =$ .72-.86). Therefore, we included the CLASS domains separately, and we report the table with Emotional Support domain included, but the pattern of findings was similar when Instructional Support or Classroom Organization was included.

Missing data. All participants had complete data on the inCLASS (see Table 1). Missingness occurred both on student and teacher demographic variables, including financial stress (7%), maternal education (10%), student ethnicity (7%), teacher age in years (3%), and years of elementary teaching experience (3%), and on other teacher-reported measures collected in the study, including the DESSA (5%) and STRS (5%). Missing data analyses revealed that children's background information was not predictive of missingness in teacher-reported measures. Full information maximum likelihood (FIML) estimation uses all available information to provide a more efficient estimate, thus addressing missing data where appropriate (Acock, 2005).

Results

In the present study, we explored (a) the applicability of the inCLASS in an underserved kindergarten sample, (b) associations between observed classroom interactions and teachers' reports of children's social and relationship skills in the classroom, and (c) the contextual factors at the time point, child, and classroom levels associated with children's inCLASS scores.

RQ1: Do the inCLASS Domains Show Applicability for Low-Income Kindergarteners?

Table 1 presents the descriptive statistics. The inCLASS domain scores ranged from a one to four, with standard deviations between 0.26 (Negative Engagement) to 0.52 (Peer Interactions). The means for Teacher Interactions, Peer Interactions, Task Orientation, and Negative Engagement were 1.48, 1.91, 3.22, and 1.33, respectively. Most domains, with the exception of Task Orientation, were positively skewed with limited overall variability.

Pearson correlations indicate that inCLASS variables were correlated with each other in the expected directions and magnitudes (Table 2). Between domains, Task Orientation was

significantly related to Teacher Interactions ($r = .22$, $p < .05$) and Peer Interactions ($r = .20$, $p < .05$) and negatively related to Negative Engagement ($r = −.35$, $p < .001$). Negative Engagement was not correlated with Teacher or Peer Interactions, and Teacher Interactions was not significantly correlated with Peer Interactions.

RQ2: Are the inCLASS Domains Associated With Teacher Reports of Children's Skills?

Table 3 shows associations between inCLASS scores and teacher-reported measures of children's social and learning skills. Overall, the results match our hypothesis that children who have stronger interaction skills as observed on the inCLASS would have better teacher ratings across various measures of children's relationship skills, self-regulation, and conflict behaviors. Children's scores on inCLASS Teacher Interactions were significantly and positively associated with teacher-reported closeness with the child ($\beta = .18$, $p < .05$) but not associated with conflict. Teacher Interactions was also significantly associated with teacher reports of children's self-awareness ($\beta = .19$, $p < .05$). No other teacher measures were significantly related to Teacher Interactions.

Children observed with higher quality Peer Interactions earned significantly higher ratings of self-awareness ($\beta = .24$, $p < .01$) and marginally higher teacher–student closeness ($\beta = .17$, $p = .07$). No other teacher measures were significantly related to Peer Interactions.

Children's Task Orientation on the inCLASS was related to a wide range of teacher ratings of children's classroom social and behavioral skills. Children with higher Task orientation scores were reported as having less conflict with their teachers ($\beta = −.33$, $p < .001$), fewer classroom problem behaviors ($\beta = −.34$, $p < .001$), higher ratings of closeness with the child ($\beta = .23$, $p < .01$), and better self-management ($\beta = .25$, $p < .01$), self-control ($\beta = .20$, $p < .05$), engagement ($\beta = .25$, $p < .01$), and classroom self-regulation ($\beta = .34$, $p < .001$).

Children observed with more Negative Engagement were given lower teacher ratings of social awareness ($\beta = −.27$, $p < .001$), relationship skills ($\beta = −.24$, $p < .05$), self-awareness ($\beta = −.33$, $p < .001$), and self-control ($\beta = −.22$, $p < .05$) and had more problem behaviors ($\beta = .28$, $p < .001$). Negative Engagement was not correlated with teacher ratings of conflict or closeness with the child.

We also examined variables such as teacher–child match in terms of their race/ethnicity and the number of surveys the teacher completed about the child to see whether these might be related to teacher ratings of children's behaviors and skills. Out of 23 correlations between the two variables and teacher-reported measures, we found three correlations that were $p < .05$. Of relevance to the present study, when the teacher and child were the same race, teachers reported marginally more closeness. In this sample, 73% of the students did not match the race of their teachers and 27% of the students did match the race of their teachers; most students and teachers who matched were both African American.

RQ3: What Are the Contextual Factors Associated With inCLASS Scores?

In line with our hypothesis, and similar to findings from Vitiello et al. (2012), we also found that for each inCLASS domain, children's interactions were highly variable from each observation time point to the next (Table 4). Note that these results emerged controlling for all variables listed in Table 4, such as the number of adults in the classroom and the overall classroom environment.

For all four domains of the inCLASS, the majority of variance in children's interactions with teachers, peers, and tasks was due to differences from one observation time point to

Table 3. Regression Model Results for Three Path Models.

| | Path Model 1 | | | | | | Path Model 2 | | | | | | | | | | | |
| | Conflict (STRS) | | | Closeness (STRS) | | | Classroom self-regulation (SSIS) | | | Classroom problem behaviors (SSIS) | | | Self-control (SSIS) | | | Engagement (SSIS) | | |
	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z
Age	0.07	0.08	0.80	−0.15	0.08	−1.77	0.11	0.08	1.36	0.11	0.08	1.44	−0.01	0.09	−0.07	−0.01	0.09	−0.07
Male	0.02	0.09	0.24	−0.17	0.08	−2.04*	−0.17	0.08	−1.97	0.11	0.08	1.33	−0.12	0.09	−1.32	−0.08	0.09	−0.88
Treatment	0.05	0.08	0.58	−0.16	0.08	−1.99*	−0.04	0.08	−0.42	0.14	0.08	1.74	−0.14	0.08	−1.70	−0.06	0.09	−0.67
Maternal education	−0.03	0.09	−0.33	−0.08	0.09	−0.88	0.00	0.09	0.00	−0.11	0.08	−1.35	0.07	0.09	0.75	0.06	0.09	0.66
Financial stress	−0.03	0.09	−0.33	−0.03	0.09	−0.29	−0.04	0.09	−0.50	−0.05	0.08	−0.64	−0.02	0.09	−0.25	−0.02	0.09	−0.19
Teacher Interactions	−0.07	0.09	−0.75	0.18	0.09	2.15*	−0.13	0.09	−1.54	0.06	0.08	0.73	−0.06	0.09	−0.65	−0.04	0.09	−0.45
Peer Interactions	−0.15	0.09	−1.61	0.17	0.09	1.84	−0.07	0.09	−0.71	0.03	0.09	0.36	−0.17	0.09	−1.79	0.15	0.09	1.56
Task Orientation	−0.33	0.09	−3.58*	0.23	0.09	2.45*	0.34	0.09	3.74*	−0.34	0.09	−3.88*	0.20	0.10	2.10*	0.25	0.10	2.54*
Negative Engagement	0.13	0.09	1.41	−0.02	0.09	−0.20	−0.11	0.09	−1.17	0.28	0.09	3.20*	−0.22	0.09	−2.35*	−0.17	0.10	−1.77

Table 3. (continued)

	Path Model 3														
	Social awareness (DESSA)			Decision making (DESSA)			Relationship skills (DESSA)			Self-awareness (DESSA)			Self-management (DESSA)		
	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z	Standardized coefficients	SE	Z
Age	−0.04	0.09	−0.43	0.02	0.09	0.21	−0.04	0.09	−0.47	0.01	0.08	0.08	0.06	0.09	0.72
Male	−0.09	0.09	−1.05	−0.13	0.09	−1.45	−0.09	0.09	−0.99	0.00	0.08	−0.03	−0.19	0.09	−2.23*
Treatment	−0.07	0.09	−0.87	−0.10	0.09	−1.11	−0.12	0.09	−1.35	−0.15	0.08	−1.87	−0.06	0.08	−0.75
Maternal education	0.11	0.09	1.24	0.00	0.09	−0.02	0.06	0.09	0.72	0.11	0.09	1.32	0.01	0.09	0.06
Financial stress	−0.05	0.09	−0.55	−0.04	0.09	−0.41	0.02	0.09	0.23	0.00	0.08	0.04	−0.09	0.09	−1.02
Teacher Interactions	0.00	0.09	0.02	0.10	0.09	1.12	0.12	0.09	1.38	0.19	0.08	2.28*	0.03	0.09	0.40
Peer Interactions	−0.01	0.09	−0.06	0.03	0.10	0.32	0.06	0.10	0.58	0.24	0.09	2.72*	−0.06	0.09	−0.61
Task Orientation	0.19	0.10	1.93	0.17	0.10	1.70	0.16	0.10	1.61	0.07	0.09	0.73	0.25	0.10	2.58*
Negative Engagement	−0.27	0.09	−2.93*	−0.18	0.10	−1.84	−0.24	0.10	−2.50*	−0.33	0.09	−3.70*	−0.18	0.09	−1.95

Note. 1 = male, 0 = female; 1 = treatment, 0 = control; maternal education (0 = less than high school; 1 = high school or more). STRS = Student–Teacher Relationship Scale; SSIS = Social Skills Improvement System–Rating Scales; DESSA = Devereux Student Strengths Assessment.
*p < .05.

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Table 4. Multilevel Models of the Classroom Conditions at Time Point, Child, and Classroom Levels That Contribute to Children's Interactions.

Coefficients	Teacher Interactions			Peer Interactions			Task Orientation			Negative Engagement		
	Estimate	SE	t value	Estimate	SE	t value	Estimate	SE	t value	Estimate	SE	t value
Intercept	1.321	0.583	2.266*	0.468	1.019	0.459	2.329	0.703	3.313*	1.671	0.523	3.195*
Level 1: time point level												
Small group[a]	0.000	0.000	1.870	0.001	0.000	5.638*	0.001	0.000	7.774*	0.000	0.000	−0.267
Individual[a]	0.000	0.000	−2.900*	0.001	0.000	4.783*	0.001	0.000	6.274*	0.000	0.000	0.339
Free play[a]	0.000	0.000	−1.084	0.003	0.001	5.585*	0.002	0.000	5.328*	0.000	0.000	−1.566
Routines/transitions[a]	0.000	0.000	−1.058	0.001	0.000	4.941*	0.000	0.000	−0.826	0.000	0.000	1.407
Meals/snacks[a]	0.000	0.000	−2.878*	0.001	0.000	5.972*	0.000	0.000	0.854	0.000	0.000	−2.246*
Time Point 2[b]	−0.124	0.078	−1.594	0.120	0.126	0.949	−0.094	0.099	−0.947	0.091	0.060	1.534
Time Point 3[b]	−0.093	0.080	−1.164	0.129	0.129	1.005	−0.085	0.101	−0.843	0.064	0.061	1.051
Time Point 4[b]	−0.183	0.080	−2.284*	0.061	0.129	0.470	−0.113	0.101	−1.121	0.147	0.061	2.397*
Time Point 5[b]	−0.028	0.079	−0.352	0.046	0.127	0.360	−0.079	0.099	−0.802	0.023	0.061	0.374
Time Point 6[b]	−0.077	0.083	−0.919	0.121	0.135	0.900	0.028	0.105	0.265	0.066	0.064	1.028
Time Point 7[b]	−0.165	0.087	−1.904	0.036	0.140	0.258	−0.112	0.109	−1.024	0.107	0.067	1.595
Time Point 8[b]	−0.140	0.083	−1.685	0.043	0.134	0.321	−0.174	0.104	−1.668	0.093	0.064	1.447
Tuesday[c]	−0.033	0.063	−0.521	−0.069	0.105	−0.658	0.044	0.079	0.554	−0.022	0.050	−0.453
Wednesday[c]	−0.017	0.063	−0.264	−0.032	0.104	−0.304	−0.009	0.079	−0.113	0.000	0.050	0.006
Thursday[c]	−0.091	0.064	−1.421	−0.203	0.105	−1.922	−0.028	0.081	−0.350	0.040	0.050	0.793
Friday[c]	−0.007	0.080	−0.085	−0.053	0.131	−0.406	−0.056	0.100	−0.564	0.017	0.063	0.271
Coder 2[d]	0.037	0.070	0.532	0.310	0.116	2.672*	0.124	0.086	1.447	0.323	0.057	5.701*

(continued)

Table 4. (continued)

Coefficients	Teacher Interactions			Peer Interactions			Task Orientation			Negative Engagement		
	Estimate	SE	t value	Estimate	SE	t value	Estimate	SE	t value	Estimate	SE	t value
Coder 3[d]	−0.031	0.070	−0.446	0.328	0.115	2.845*	0.018	0.082	0.222	−0.061	0.059	−1.034
Level 2: child level												
Age	−0.100	0.087	−1.145	0.011	0.155	0.070	0.074	0.110	0.668	−0.068	0.073	−0.919
Gender[e]	0.031	0.053	0.587	−0.181	0.095	−1.913	0.027	0.067	0.406	−0.004	0.045	−0.098
Maternal education[f]	0.038	0.058	0.647	0.136	0.103	1.314	0.054	0.073	0.738	0.027	0.049	0.544
Treatment[g]	0.034	0.051	0.664	−0.050	0.091	−0.548	0.077	0.065	1.181	−0.104	0.043	−2.395*
Financial stress	−0.027	0.032	−0.834	0.007	0.057	0.126	−0.039	0.041	−0.968	−0.005	0.027	−0.174
Level 3: Classroom level												
Number of adults in the classroom	0.081	0.028	2.914*	−0.118	0.046	−2.582*	0.034	0.035	0.967	0.023	0.022	1.067
Number of children in the classroom	−0.005	0.007	−0.746	0.015	0.012	1.241	0.007	0.008	0.807	−0.009	0.006	−1.381
Teacher/student ethnicity match[h]	0.128	0.091	1.407	0.176	0.156	1.134	−0.009	0.100	−0.088	0.078	0.086	0.904
CLASS emotional support	0.175	0.062	2.809*	0.150	0.104	1.439	0.014	0.063	0.225	0.011	0.066	0.175

Note. Referents are indicated as superscripts a to h. CLASS = Classroom Assessment Scoring System; inCLASS = Individualized Classroom Assessment Scoring System.
[a]Whole group.
[b]Time Point 1.
[c]Monday.
[d]Coder 1.
[e]1 = boy; 0 = girl.
[f]Maternal education: 0 = less than high school; 1 = HS or more.
[g]Treatment: 1 = treatment group; 0 = control group.
[h]Teacher/student ethnicity match: 0 = no match; 1 = match.
*$p < .05$.

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another, such as children's behaviors, activity settings, and observers (81%-93%). A smaller portion of the variance was due to differences between children (6%-13%), and the remainder of the variance was due to differences between classrooms (1%-7%). When all of the predictors were included, together they explained, on average, only about 13% of the variance in children's inCLASS scores. From the original to the final model, predictor variables explained the most variance in the domains of Peer Interactions and Negative Engagement: about 14% and 21% of the original variance, respectively. The final model explained only 8% and 11% of the original variance in Teacher Interactions and Task Orientation, respectively.

Compared with whole group activities, children exhibited less positive Teacher Interactions during individual work ($t = -2.900$, $p < .05$) and during meals ($t = -2.878$, $p < .05$); children also exhibited less positive Teacher Interactions toward the latter part of the morning compared with earlier in the day as determined by time point order ($t = -2.284$, $p < .05$). Children exhibited more positive Teacher Interactions when the classroom had better emotional ($t = 2.809$, $p < .05$) and instructional support ($t = 2.561$, $p < .05$) and when there was a greater number of adults present ($t = 2.914$, $p < .05$) as compared with during whole group activities and/or in settings with fewer adults. Children exhibited more positive Peer Interactions during small group ($t = 5.638$, $p < .05$), individual work ($t = 4.783$, $p < .05$), free choice ($t = 5.585$, $p < .05$), routines/transition ($t = 4.941$, $p < .05$), and meals ($t = 5.972$, $p < .05$) as compared with during whole group activities. They exhibited less positive Peer Interactions when there were more adults in the classroom ($t = -2.582$, $p < .05$). Observers 2 ($t = 2.672$, $p < .05$) and 3 ($t = 2.845$, $p < .05$) rated children higher on Peer Interactions compared with Observer 1. Children exhibited higher quality Task Orientation behaviors during small group ($t = 7.774$, $p < .05$), individual work ($t = 6.274$, $p < .05$), and free choice ($t = 5.328$, $p < .05$) compared with during whole group activities. No other predictors were significantly related to this domain. Finally, children displayed less Negative Engagement during meals ($t = -2.246$, $p < .05$) compared with whole group activities and more Negative Engagement toward the latter part of the morning ($t = 2.397$, $p < .05$). In addition, Observer 2 ($t = 5.701$, $p < .05$) rated children higher on Negative Engagement compared with Observer 1.

Discussion

This is the first study to examine the inCLASS in an underserved group of kindergarten-age children. Similar to previous work in preschool (e.g., Booren et al., 2012; Downer et al., 2010), the inCLASS captured individual differences among kindergarten students and related as expected with teacher reports of children's social and learning behaviors. Given the large contributions of the environment to young children's observed behaviors documented in previous research on the measure (Vitiello et al., 2012), it was not surprising that the majority of the variance to be explained was at the time point level rather than child characteristics or classroom variables.

The inCLASS Among Low-Income Kindergarteners: Comparison With Previous Research

As in other samples (e.g., Downer et al., 2010), we found that individual domains of the inCLASS were related, yet distinct in capturing different types of low-income kindergarteners' interactions with teachers, peers, and tasks. Moreover, the inCLASS captured individual differences between kindergarten students in the four domains. However, in three of the four inCLASS domains, including Teacher Interactions, Peer Interactions, and Task Orientation, standard deviations were about a third to half as large as those in other studies (e.g., Downer et al., 2010; Hartz et al.,

Table 5. Previous Studies Using the inCLASS (Downer, Booren, Lima, Luckner, & Pianta, 2010).

	Present study		Downer, Booren, Lima, Luckner, and Pianta (2010)		Vitiello, Booren, Downer, and Williford (2012)		Williford, Maier, Downer, Pianta, and Howes (2013)		Hartz, Williford, and Koomen (2017)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Teacher Interactions	1.48	0.33	3.20	0.85	2.21	0.80	2.47	0.93	2.21	0.84
Peer Interactions	1.91	0.52	3.42	0.93	2.55	0.76	2.62	0.95	2.50	0.88
Task Orientation	3.22	0.34	4.64	0.64	3.69	0.77	4.40	0.86	4.26	0.81
Negative Engagement	1.33	0.26	1.27	0.29	1.65	0.44	1.38	0.46	1.37	0.38

Note. The previous studies include samples of preschool-aged, mostly non–African American children who are more advantaged than the present study sample.

2017), whereas limited variability and skewness that we observed for Negative Engagement matched other work (e.g., Downer et al., 2010; Vitiello et al., 2012). It should be noted, however, that the alphas for each domain in our study were lower than in other work, so comparisons should be considered with this in mind.

Table 5 provides means and standard deviations from previous studies for comparison purposes. The limited variability within each of the domains may be due to the fact that there were infrequent instances of Teacher and Peer Interactions and Negative Engagement, in the new context of low-income kindergarten classrooms in this study. Negative Engagement dimensions, by nature, include low-incidence behaviors, such as physical aggression toward others, which are difficult to capture using observational assessments (e.g., Downer et al., 2010). Teacher ratings of these conflict behaviors are also often skewed (McEvoy, Estrem, Rodriguez, & Olson, 2003).

The lower ratings for Teacher and Peer Interactions in our study compared with other studies with preschool children (e.g., Downer et al., 2010; Hartz et al., 2017; Williford et al., 2013) may be the result of fewer opportunities (relative to preschool classrooms) for the kindergarten children in our study to exhibit behaviors that would have been considered high-quality with the inCLASS. The most common settings in our sample—whole group and individual work taking up more than 50% of children's time—were consistent with national samples. Research on the national scale shows that kindergarten classrooms exhibit more teacher-directed instruction on academic content and less child-directed activities compared with preschool classroom, and this trend is most pronounced for schools serving predominantly low-income and non-White children (Bassok et al., 2016). Because more whole group instruction and individual tasks are implemented in kindergarten versus preschool, children have more opportunity to be observed interacting with tasks—hence, the larger variability and higher mean for Task Orientation scores in this study, relative to the other inCLASS domains.

Associations Between inCLASS Observation and Teacher Report Measures

Overall, inCLASS domains were associated with teacher report measures in expected directions. Despite moderately low reliability, Task Orientation had the relatively strongest associations with teacher reports of children's social skills and classroom behaviors. Children observed with better Task Orientation were reported as having less conflict with the teacher and fewer problem behaviors in the classroom. Children's task engagement may help children avoid problem behaviors and increase their academic achievement (Bulotsky-Shearer, Bell, Romero, & Carter, 2014), which likely improves how teachers see the child. In addition, children in this study observed

with more Negative Engagement were rated by their teachers as having lower social and relationships skills and more problem behaviors, which aligns with research showing the negative consequences of conflict and aggressive behaviors (Ostrov & Keating, 2004), as well as behavioral problems in classroom settings (Hamre & Pianta, 2001).

Associations for inCLASS Teacher Interactions and Peer Interactions with teacher report measures were relatively weaker, but both Teacher Interactions and Peer Interactions were positively associated with teacher reports of children's self-awareness. Research suggests that the development of self-awareness needs to be in place before understanding the self in relation to others, and the kindergarten children in the current study may be in the process of developing their self-awareness, hence, the predictive ability of self-awareness to the two interaction domains (Rochat, 2003). Children observed with higher quality Teacher Interactions also earned higher ratings of perceived closeness from their teachers. inCLASS Teacher Interactions assesses observed behaviors that are also on the teacher report measure, such as warm moments between teacher and the child.

Contextual Factors Associated With inCLASS Scores

We were not able to explain much of the total variance in children's observed behaviors on the inCLASS. Even so, predictors at the time point, child, and classroom levels explained almost three times as much variance in observed Negative Engagement (21% variance explained) as in Teacher Interactions (8% variance explained). Our model predictors explained similar amounts of variance in both Peer Interactions (14%) and Task Orientation (11%).

Across all four domains, time point (activity setting, time of day, coder) and classroom (number of adults in the room and overall classroom environment) level factors contributed to inCLASS scores in different ways. How children spent their time during a given time point (i.e., activity setting variables including whole group, small group, individual, free play, routine/transition, and meals/snacks) was the most consistent—relative to time of day, day of week, coder, child, or classroom variables—in explaining inCLASS scores across the four domains. This result is in line with previous studies that have found that young children's observed behaviors, specifically how they spend their time in the classroom (activity type and whole class versus small group instruction) correspond to meaningful outcomes, such as emergent literacy growth (Connor et al., 2006).

Importantly, children's demographic characteristics did not predict their scores in any of the four inCLASS domains, although the limited variability in their demographics might have constrained our findings. Nevertheless, results from the study point to the fact that there are many different factors, outside of the child, that contribute to children's observed interactions as measured using the inCLASS. The scores may rely more on the opportunities that are available, as well as the environmental or contextual aspects of the classroom, including the number of adults and the supportiveness of the classroom environment. A better understanding of the behaviors of the teachers and peers and types of tasks offered during the different activity settings would help researchers understand when interactions have the most potential to be high quality.

Implications and Future Directions

We found more limited variability and lower quality in Teacher and Peer Interactions among low-income kindergarteners than previous inCLASS studies did with mid-SES preschoolers (see Table 5). Perhaps this difference is because of age (preschool vs. kindergarten), SES differences, race/ethnicity, or a combination (Ready & Chu, 2015). By kindergarten, children are confronted with more rigid, higher demand learning environments, and this may be especially true in low-income communities (Bassok et al., 2016; LoCasale-Crouch et al., 2007). In addition to the rigid

nature of kindergarten classrooms that serve disadvantaged children, there may be sociocultural influences that shape not only how students think and behave in classrooms but also the "sets of values, beliefs, experiences, communication patterns, teaching and learning styles, and epistemologies inherent in the students' cultural backgrounds, and the socioeconomic conditions prevailing in their cultural groups" (Solano-Flores, 2011, p. 3). As such, although beyond the scope of the article, our findings may also underscore the need for a critical examination of the inCLASS and its practices from a cultural perspective to identify ways that the assessment can take into account differences in sociocultural influences (Solano-Flores, 2011).

On the encouraging side, inCLASS domains were generally aligned with other established measures of children's skills at school entry, tentatively suggesting the measure's appropriateness for assessing how well low-SES kindergarteners navigate interactions in the classroom. At the same time, we were not able to explain much variance in children's observed behaviors with the variables that we measured, which further emphasizes the importance of considering contextual factors and characteristics at multiple levels that could contribute to children's behaviors in the classroom. In addition, perhaps there are other predictors of children's behaviors that would be more relevant in this mostly African American, low-income sample, which we did not measure.

A remaining question is how best to use the inCLASS. It was intended to be a global measure of children's interactions with teachers, peers, and tasks; however, the relatively large contribution of setting variables suggests that the measure is more appropriate for identifying particular contexts in which high-quality interactions are more likely. Although research with young children established that contextual factors including setting for an activity matter for children's learning and social skills (Bulotsky-Shearer et al., 2008), this previous work relied on teacher ratings only. Therefore, a next research step is to use an observational measure like the inCLASS to see, for example, whether certain contextual factors, such as the activity setting, may be more conducive for creating opportunities for particular interactions, which in turn, may then be differentially related to children's cognitive and classroom behaviors (Booren et al., 2012). Understanding these links at a setting-specific level of detail can help reveal a child's strengths that tend to be masked in more general descriptions of behaviors and point to effective, context-dependent classroom interventions. Furthermore, the fact that activity settings matter has implications for how teachers structure their days to be more intentional about providing the kinds of opportunities for children to interact with teachers and peers as these interactions are important for developing children's language and communication abilities, social competence, and achievement (e.g., Mashburn et al., 2008). We suggest that in this context—in kindergarten classrooms with African American children primarily of low-SES—inCLASS be used to complement teacher report measures and encourage further study to discover the contexts in which children are likely to have high-quality interactions and less negative engagement.

Declaration of Conflicting Interests

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