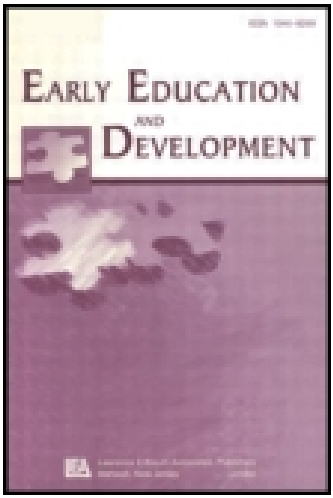

Early Education and Development

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/heed20

Preschool Teachers' Sense of Community, Instructional Quality, and Children's Language and Literacy Gains

Ying Guo [a], Joan N. Kaderavek [b], Shayne B. Piasta [a], Laura M. Justice [a] & Anita McGinty [c]

[a] Children's Learning Research Collaborative, The Ohio State University

[b] Department of Early Childhood, Physical and Special Education, University of Toledo

[c] Center for Advanced Study of Teaching and Learning, University of Virginia

Published online: 31 Mar 2011.

To cite this article: Ying Guo, Joan N. Kaderavek, Shayne B. Piasta, Laura M. Justice & Anita McGinty (2011) Preschool Teachers' Sense of Community, Instructional Quality, and Children's Language and Literacy Gains, Early Education and Development, 22:2, 206-233, DOI: 10.1080/10409281003641257

To link to this article: http://dx.doi.org/10.1080/10409281003641257

EARLY EDUCATION AND DEVELOPMENT, *22*(2), 206–233

ISSN: 1040-9289 print/1556-6935 online
DOI: 10.1080/10409281003641257

Preschool Teachers' Sense of Community, Instructional Quality, and Children's Language and Literacy Gains

Ying Guo
Children's Learning Research Collaborative, The Ohio State University

Joan N. Kaderavek
Department of Early Childhood, Physical and Special Education, University of Toledo

Shayne B. Piasta and Laura M. Justice
Children's Learning Research Collaborative, The Ohio State University

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

Research Findings: This study investigated relations among preschool teachers' ($n = 75$) sense of community, classroom language and literacy instructional quality, and children's ($n = 398$) gains in vocabulary and print concept knowledge during an academic year. Hierarchical linear modeling (HLM) results indicated that teachers' language and literacy instructional quality significantly predicted children's gains in print concept knowledge. Also, HLM results revealed significant interactions among teachers' sense of community, language and literacy instructional quality, and vocabulary and print concept knowledge gains. Higher levels of teachers' sense of community were associated with greater gains in children's vocabulary and print concept knowledge when children were in classrooms with higher quality language and literacy instruction. *Practice or Policy:* Findings underscore the importance of

Correspondence regarding this article should be addressed to Ying Guo, PhD, Children's Learning Research Collaborative, School of Teaching & Learning, The Ohio State University, 356 Arps Hall, 1945 North High Street, Columbus, OH 43210-1172. E-mail: guo.133@osu.edu

evaluating both language and literacy instructional quality and teachers' sense of community when considering high-quality preschool education.

The number of 4-year-old children participating in early education programs is growing annually in light of many states' investment in public preschool programs (Barnett & Yarosz, 2004). Complementing these initiatives are programmatic changes ensuring high-quality preschool education, particularly in language and literacy (L & L) domains (Barnett, Hustedt, Robin, & Schulman, 2004; Christina & Nicholson-Goodman, 2005; Justice, Mashburn, Hamre, & Pianta, 2008). Policymakers and administrators have evaluated the implications of teacher qualifications on child academic outcomes, but teacher qualifications, academic major, or credentialing are not consistently linked to improved classroom quality or children's academic gains (Early et al., 2006, 2007). Subsequently, policymakers increasingly consider a range of factors potentially influencing children's academic growth. Experts suggest that potential factors influencing child outcomes include teacher quality, school contexts, classroom instructional practice, and workplace climate (Bryk & Driscoll, 1988). Accordingly, this study considers one component of workplace climate—teachers' sense of community—in relation to classroom instructional quality and children's L & L gains.

Workplace climate is defined as an institution's social and work norms (Battistich, Solomon, Watson, & Schaps, 1997). In studies of workplace climate (or, as it is called in educational research, *school climate*), it is assumed that teachers and students benefit by working and learning in schools where participants feel autonomous, connected to others, and competent. In the present study, teachers were surveyed regarding their sense of community as a measure of school climate.

Teachers' sense of community has been identified as a positive predictor of the quality of instruction within the classroom (Bird & Little, 1985; Cohen, 1981; Little, 1982, 1990; Marks & Louis, 1997; McGinty, Justice, & Rimm-Kaufman, 2008). For example, McGinty et al. demonstrated that teachers' sense of community was significantly related to preschool teachers' attitudes toward teaching and that it impacted teachers' overall instructional quality. Other researchers have documented a linkage between teachers' sense of community and elementary students' academic achievement (Battistich, Solomon, Kim, Watson, & Schaps, 1995).

However, no studies have identified potential linkages between preschool teachers' sense of community and gains in children's achievement. The current study was designed to respond to this current gap in the literature by documenting preschool teachers' sense of community and its relations to children's gains in literacy and language. Furthermore, we considered

whether the relation between teachers' sense of community and children's academic gains was moderated by L & L instructional quality.

TEACHERS' SENSE OF COMMUNITY AS A CONSTRUCT

The conceptual framework of this study draws from evidence showing that teachers' sense of community is a powerful facet of school climate that relates to both teacher and student behaviors (Battistich et al., 1995; McGinty et al., 2008). The conceptual framework of teachers' sense of community reflects two dimensions, namely teacher collegiality and teacher influence (Bryk & Driscoll, 1988). Teacher collegiality is conceptualized as "the level and type of collaboration among teachers within schools" (McGinty et al., 2008, p. 363); teacher collegiality implies shared responsibility and commitment to common educational goals. Teacher influence is conceptualized as teachers' level of influence and power in administrative decision making within school systems (Bryk & Driscoll, 1988; Roberts, Hom, & Battistich, 1995; Royal & Rossi, 1999).

We propose that the two dimensions considered in this study (i.e., teacher collegiality and teacher influence) differ from the well-established construct of teacher self-efficacy, although all are related. Teachers' sense of community refers to teachers' perceptions of their workplace climate (e.g., Can I go to my colleagues for assistance? Do I have the ability to make policy changes in my school?); teachers' sense of community reflects the workplace condition. In contrast, teacher self-efficacy measures teachers' sense that they can bring about desirable changes in pupils' behavior and achievement (Gibson & Dembo, 1984). Teacher sense of community and teacher self-efficacy are related in that a teacher who has a positive perception of the school community is likely to have a stronger sense of self-efficacy. However, the present study focuses on teachers' sense of community, as it represents the mechanism that potentially improves teachers' positive career attitudes. Specifically, teachers are more likely to feel satisfied with teaching and to feel rewarded (even when working with challenging students) if they have a strong sense of school community (McLaughlin & Talbert, 2001; National Center for Education Statistics [NCES], 1997).

What leads teachers to report higher levels of sense of community? Some research evidence suggests that sense of community is linked to both school characteristics and individual differences among teachers (Bryk & Driscoll, 1988; Lee & Loeb, 2000; McGinty et al., 2008; Royal, DeAngelis, & Rossi, 1996; Royal & Rossi, 1996). For example, certain school characteristics, such as affiliation (i.e., public or private) and school size, impact teachers' participation in collaborative activities and sense of community (Bryk & Driscoll,

1988; Lee & Loeb, 2000; McGinty et al., 2008). Specifically, in schools with only one preschool classroom, teachers typically report low levels of sense of community. In contrast, when a school building has multiple preschool classrooms, teachers report higher levels of teacher collegiality. It appears that collegial relationships increase with frequent access to fellow teachers.

Individual differences among teachers are also associated with teachers' sense of community. Identified variations in teacher characteristics include tenure (i.e., length of service), race, and gender (Royal et al., 1996; Royal & Rossi, 1996). For instance, Royal and Rossi (1996) reported that female high school teachers had higher levels of sense of community as compared to their male counterparts. However, linkages between other individual characteristics and sense of community are not clear-cut. Specifically, McGinty et al. (2008) did not find teacher education level or teaching experience to be associated with preschool teachers' sense of community. Clearly, more research is needed to clarify the relation between teacher characteristics and teachers' sense of community. This study contributes to understanding the complex relationships between these constructs.

TEACHERS' SENSE OF COMMUNITY, INSTRUCTIONAL QUALITY, AND STUDENT ACHIEVEMENT

Both dimensions of teachers' sense of community—teacher collegiality and teacher influence—are related to teachers' instructional quality (Bird & Little, 1985; Cohen, 1981; Little, 1982, 1990; Marks & Louis, 1997; McGinty et al., 2008). With respect to collegiality, children appear to benefit when a preschool teacher participates in frequent interactions with other teachers. Also, the effects of collegiality appear to manifest in teachers' ability to facilitate children's transition from kindergarten to preschool. Specifically, preschool teachers who collaborate with kindergarten teachers utilize classroom routines associated with kindergarten success (e.g., hand raising). Furthermore, when preschool teachers and kindergarten teachers collaborate, preschool teachers modify the curriculum to more closely align with kindergarten expectations (Desimone, Payne, Fedoravicius, Henrich, & Finn-Stevenson, 2004).

Teachers' perception of collegiality is also associated with teachers' attitudes toward teaching (McGinty et al., 2008; McLaughlin & Talbert, 2001; Rosenholtz, 1985; Rosenholtz & Simpson, 1990). When schools promote professional collaboration, teachers report increased career affirmation and feelings of success (McLaughlin & Talbert, 2001). McGinty et al. found that preschool teachers who reported higher levels of perceived teacher collegiality rated themselves as having a more positive teaching attitude and increased job satisfaction.

Teacher influence, the other dimension of sense of community, is also linked to higher levels of instructional quality (Battistich & Solomon, 1995; Bird & Little, 1985; Marks & Louis, 1997; McGinty et al., 2008). For example, elementary school teachers with high levels of self-reported ''teacher influence'' believe that teacher expertise and effort promote student achievement (Bird & Little, 1985). Furthermore, McGinty et al. found that preschool teachers with high levels of influence are rated more frequently as creating a ''high-quality'' classroom.

Although these studies indicate that teachers' sense of community is positively associated with instructional quality, there are little data linking preschool teachers' sense of community to child outcomes (i.e., child achievement). Even more important, the relation between teachers' sense of community and student achievement potentially has been confounded by other variables, such as teachers' instructional quality. The omission of instructional quality as a moderating factor is significant. Researchers have proposed that teachers' sense of community improves students' academic performance, but only when teachers provide high instructional quality (David, 1994; Marks & Louis, 1997; Smylie, 1994; Smylie, Lazarus, & Brownlee-Conyers, 1996). In this study we examine the relation between teachers' sense of community and children's L & L outcomes but also consider the potential moderating effects of L & L instructional quality.

Educators and researchers have identified specific aspects of instructional quality that are predictors of preschool children's literacy and language skills (Connor, Morrison, & Slominski, 2006; Dickinson & Tabors, 2001; National Reading Panel, 2000; Pullen & Justice, 2003; Smith & Dickinson, 2002; Vukelich & Christie, 2004; Whitehurst & Lonigan, 1998). A number of L & L learning activities are associated with high-quality instruction. Important activities include providing frequent opportunities to engage in interactive book reading (Dickinson & Tabors, 2001; Smith & Dickinson, 2002; Pullen & Justice, 2003; Whitehurst & Lonigan, 1998), engaging children in mediated writing activities (Vukelich & Christie, 2004), implementing effective literacy curricula (Smith & Dickinson, 2002), and recognizing the diversity of individual students (Connor et al., 2006).

PRESCHOOL CHILDREN'S L & L SKILLS

Children who read proficiently are more likely to succeed in school (National Reading Panel, 2000). Weak literacy skills are associated with higher high school dropout rates and higher rates of referral to special education. The preschool years are a significant period of L & L development (NICHD Early Child Care Research Network [ECCRN], 2005; Storch & Whitehurst,

2002). With this in mind, the current study focused on L & L as the critical academic outcome in preschool children.

A child's primary-grade L & L competency is linked to fundamental skills fostered during the preschool years (Lonigan, Burgess, Anthony, & Barker, 1998; Scarborough, 2001; Snow, Burns, & Griffin, 1998; Spira, Storch, & Fischel, 2005; Whitehurst & Lonigan, 1998). The skills of print and alphabetic knowledge, phonological awareness, vocabulary development, and oral language proficiency are all foundational skills that must be fostered during the preschool years to ensure children's academic success (Snow et al., 1998). Teachers are urged to incorporate research-tested educational practices to promote children's development in these critical L & L domains (Foorman & Moats, 2004; Foorman & Schatschneider, 2003). In the current study, we measured children's L & L gains using indices of vocabulary and print concept knowledge outcomes; both domains are consistent and robust predictors of children's later achievement in decoding and reading comprehension (Hammill, 2004; National Early Literacy Panel, 2008).

THE GOAL OF THE PRESENT STUDY

The current study examines relations among preschool teachers' sense of community, instructional quality specific to L & L, and preschool children's gains in vocabulary and print concept knowledge. Furthermore, we consider whether the relation between teachers' sense of community and children's gains is moderated by levels of classroom L & L instructional quality.

The present study addressed three questions. First, to what extent do program affiliation, teacher education, teacher experience, and certification relate to teachers' sense of community? We hypothesized that the affiliation of a preschool program would be associated with teachers' sense of community given that regulations and structure of programs influence teachers' engagement in collaborative practices and shared decision making (Bryk & Driscoll, 1988; Lee & Loeb, 2000). In addition, research has demonstrated that individual teacher characteristics relate to their sense of community (Royal et al., 1996). As such, we expected that preschool teachers' level of education, teaching experience, and certification would be associated with teachers' sense of community.

Second, what are the relations among teachers' sense of community, teacher L & L instructional quality, and children L & L gains? We hypothesized that teachers' sense of community would have a positive and significant relation with the level of classroom L & L instructional quality. We also hypothesized that teachers' L & L instructional quality would be related to children's L & L gains (Connor et al., 2006; Dickinson & Tabors, 2001; National Reading Panel, 2000; Vukelich & Christie, 2004).

Third, to what extent are the relations between teachers' sense of community and children's L & L gains moderated by teachers' L & L instructional quality? We hypothesized that teachers' sense of community would facilitate children's L & L gains but that positive sense of community must occur in tandem with L & L instructional quality (David, 1994; Marks & Louis, 1997; Smylie, 1994; Smylie et al., 1996). Specifically, we anticipated that the relations between teachers' sense of community and children's L & L growth would be moderated by teachers' L & L instructional quality.

METHOD

Participants

Participants were 75 preschool teachers drawn from a larger total group ($n = 86$) enrolled in a multisite study of classroom practices. Participants were excluded when all data were not available to answer the current research question. All participants were classroom lead teachers. Approximately half of the teachers taught in Virginia classrooms; the remaining teachers were in Ohio. The teachers were primarily female (94.7%), and 62.7% ($n = 47$) were non-Hispanic White; the remaining were African American ($n = 22$), Native American ($n = 1$), Hispanic ($n = 1$), and multiracial ($n = 4$). Teachers' highest level of education varied: 17.3% had a master's degree ($n = 13$), 37.4% had a bachelor's degree ($n = 28$), 24% had an associate's degree ($n = 18$), 17.3% had a high school diploma ($n = 13$), and 4% had a specialist degree (i.e., 1 year or more beyond a master's degree, $n = 3$). On average, teachers had 15 years of total teaching experience ($SD = 10$, range = 0–40 years). The classrooms were affiliated with different program types, including Head Start ($n = 28$, 37.3%), state and/or federally funded (Title I) programs ($n = 34$, 45.3%), and private programs ($n = 13$, 17.3%).

Teachers in the larger study were randomly assigned to one of three conditions, with 25, 23, and 27 teachers, respectively, in each condition. All the teachers completed a 30-week classroom book-reading program. Conditions differed in the way and frequency with which teachers read books to children (see Justice, McGinty, Piasta, Kaderavek , & Fan, 2010, for further details). The current study aimed at examining potential relations among teachers' sense of community, their L & L instructional quality, and children's L & L gains above and beyond any effects attributable to condition variations. Thus, we included all teachers in the three conditions, expecting that the relations would not be different across three conditions. However, given the main effect of condition variations (see Justice, Kaderavek, Fan, Sofka, &

Hunt, 2009), we controlled for the effect of condition status on children's L & L gains in the statistical analysis.

In total, 398 preschoolers from the 75 classrooms were randomly selected to participate in an ongoing assessment of their L & L skills. Specifically, an average of six children were randomly selected from each classroom. At the beginning of the academic year (Fall 2005), children were on average 52 months old ($M = 52$ months, $SD = 4.48$ months, range = 41–64 months). Approximately 48.6% of the children were female, and 41.8% of the children were White; 39.8% were African American, 5.9% were Hispanic, 0.5% were Asian, 0.3% were Native American, and 11.7% were other or multiracial. With respect to child's family characteristics, mother-reported educational levels showed that the highest level of education attained was eighth grade for 1.3% of mothers, a high school diploma for 61.2%, an associate's degree or technical certification for 19.5%, a bachelor's degree for 5.3%, and an advanced graduate degree for 1.1%. More than half of families (56.3%) earned an annual household income less than or equal to $30,000, 22.4% earned between $30,000 and $65,000, and 4.5% earned more than $65,000.

Measures

Teachers and children participated in a series of activities during the academic year for the larger study. We describe here only those procedures relevant to the present study. In the fall of the year, teachers completed a portfolio of questionnaires, including a questionnaire assessing their sense of community. In the fall and spring of the year, a systematic observation was conducted in each classroom to assess teachers' L & L instructional quality. Also, in the fall and spring of the year, each child was individually tested by trained research assistants to measure his or her L & L skills.

Demographic Questionnaire

All of the teachers were asked to complete a demographic questionnaire. The research team collected data documenting each teacher's age, ethnicity, teaching experience, education, and certification. To document level of teacher education, each teacher answered the question "What is the highest level of education you have completed?" and chose among 11 options. We recoded the education category to document whether a teacher did (1) or did not (0) have a bachelor's degree; this recoding was completed in response to data suggesting that teachers with a bachelor's degree provide a higher level of instructional quality compared to teachers with an associate's degree (Howes, 1997). To document the teacher certificate classification, we identified whether a teacher did (1) or did not (0) have certification to teach

4-year-old children. Finally, to document program affiliation, we differentiated whether a teacher taught in a public pre-kindergarten program (0) or Head Start program (1).

Teachers' Sense of Community

Teachers' sense of community was assessed using the Teacher's Sense of the School as Community Questionnaire (Battistich et al., 1997). This 13-item questionnaire measures two aspects of teachers' sense of community: (a) teacher collegiality with shared educational goals and supportive relationships and (b) teachers' influence over school decision-making processes. Teachers used a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*) to indicate the extent to which they agreed with each item. Previous studies have demonstrated that this questionnaire captures two distinct dimensions of teachers' sense of community: collegiality and influence (McGinty et al., 2008; Roberts et al., 1995). To measure the factor structure of this questionnaire, we conducted two exploratory factor analyses based on the present sample.

Similar to McGinty et al. (2008), we found that three items showed low communality loading (.024–.499); this level of communality loading (lower than .500) suggests a poor fit with the factors and thus—in keeping with standard practice—the items were eliminated (McGinty et al., 2008). The deleted items were "Teachers at this school keep to themselves," "Most of my colleagues share my beliefs and values about what the central mission of the school should be," and "The faculty here falls into conflicting cliques."

A subsequent exploratory factor analysis using principal factoring and oblique rotation obtained the expected two-factor structure: (a) teacher collegiality and shared goals (Collegiality) and (b) teacher influence over school norms and decision-making processes (Influence). The items on the teacher collegiality factor included statements such as "Teachers cooperate with each other" and "Teachers work together toward common goals." Items on the teacher influence factor included statements such as "Administration consults with teachers about decisions" and "Teachers play a part in organizational planning." Results showed that the internal consistency of each factor was adequate (Collegiality, $\alpha = .90$; Influence, $\alpha = .84$). The Collegiality and Influence scores were derived by averaging each set of items. Higher scores on these two scales reflected higher reported levels of Collegiality and Influence. Descriptive statistics for teachers' sense of community are shown in Table 1. The curve of teachers' collegiality is skewed to the left, indicating that more teachers in this sample had a high level of collegiality, but skewness (−.57) and kurtosis (−.09) values were within the acceptable ranges.

TABLE 1
Descriptive Statistics for Teachers' Sense of Community

Variable	*M*	*SD*	*Range*
Collegiality score	4.05	0.69	2.0–5.0
Influence score	3.67	0.88	1.0–5.0
Global sense of community score	3.90	0.67	2.0–5.0
Language & literacy instructional quality	16.50	4.16	6.5–26

Note. Collegiality score, Influence score, and Global sense of community score are from the Teacher's Sense of the School as Community Questionnaire (Battistich et al., 1997); Language and literacy instructional quality is from the Early Language and Literacy Classroom Observation (Smith & Dickinson, 2002).

Teachers' L & L Instructional Quality

The Early Language and Literacy Classroom Observation (ELLCO; Smith & Dickinson, 2002) instrument was the sole measure used to assess teachers' L & L instructional quality for this study. The ELLCO was designed to evaluate the quality of literacy and language practices and materials within early childhood classrooms and consists of three parts: (a) Literacy Environment Checklist, (b) Classroom Observation, and (c) Literacy Activities Rating Scale. The Classroom Observation focuses on classroom instruction with two subsections: (a) General Classroom Environment and (b) Language, Literacy, and Curriculum. In this study, we used the ELLCO items contained in the Language, Literacy, and Curriculum subsection as the primary index of instructional quality, and thus ELLCO items used in the current study represent primarily the quality of L & L instruction. Instructional quality was rated on a scale from 1 to 5, with 5 representing exemplary/strong evidence, 3 representing basic/some evidence, and 1 representing deficient/minimal evidence.

In the present study, trained observers used written field notes to guide and conduct the ELLCO observations, which were conducted in both the fall and spring of the year in each classroom. The classroom observation was conducted at a time when teachers and students were actively engaged in large-group book reading and discussion. Each observation lasted 30–40 min. When the observation was completed, the observers referred to the written evidence to score each item. The Language, Literacy, and Curriculum subsection comprised 10 items. The 10 items measured (a) oral language facilitation, (b) presence of books, (c) approaches to book reading, (d) quality of reading instruction, (e) approaches to children's writing, (f) opportunities for writing and quality of writing instruction, (g) approaches to curriculum integration, (h) recognizing diversity in the classroom, (i) facilitating home support for

literacy, and (j) approaches to assessment. Smith and Dickinson (2002) reported that the internal consistency of the Language, Literacy, and Curriculum composite as very good (Cronbach's $\alpha = .86$). Fall and spring ELLCO scores were averaged to derive a single rating for each teacher's L & L instructional quality, thereby promoting the validity of the observational data.

L & L Outcomes

Children's L & L skills were assessed in the fall (Time 1) and spring (Time 2) of the year. The Peabody Picture Vocabulary Test–III (Dunn & Dunn, 1997) and Preschool Word and Print Awareness (Justice & Ezell, 2001) were selected as the L & L measures.

The Peabody Picture Vocabulary Test–III (PPVT) is a measure of receptive vocabulary that requires participants to select a picture depicting the verbal stimulus provided by the examiner. When the examiner reads aloud the stimulus word, the child is asked to choose from picture alternatives. Stimulus items are presented in order of increasing difficulty. Dunn and Dunn (1997) reported internal consistency reliabilities ranging from .93 to .95 in a sample of children whose age ranged from 2 to 6 years. Table 2 shows children's standard and raw scores on this measure at the two time points; the raw scores were used for analysis.

Preschool Word and Print Awareness (PWPA) assessed children's knowledge of 14 print concepts. The PWPA takes place during an adult–child shared storybook reading using the picture book *Nine Ducks Nine* (Hayes, 1990). For most items, an incorrect or lack of response is assigned 0 and a correct response is assigned 1. For some items, a more sophisticated response is assigned a higher point value than a less sophisticated response. Justice, Bowles, and Skibbe (2006) reported that the interrater reliability (point-by-point) of the PWPA is .94. Table 2 presents children's PWPA raw and standard scores at the two time points; raw scores were used for analysis.

TABLE 2
Descriptive Statistics for Children's Language and Literacy Outcomes

	Time 1			*Time 2*		
Measure	*M*	*SD*	*Range*	*M*	*SD*	*Range*
RW: Vocabulary (PPVT)	46.93	17.36	2–96	58.31	17.24	6–115
SS: Vocabulary (PPVT)	91.61	14.90	31–135	95.22	13.82	40–134
RW: Print concept knowledge (PWPA)	6.25	3.38	0–16	9.35	3.95	1–17
SS: Print concept knowledge (PWPA)	95.20	16.43	46–145	108.77	19.46	11–161

Note. RW = raw score; SS = standard score; PPVT = Peabody Picture Vocabulary Test–III; PWPA = Preschool Word and Print Awareness.

Analytic Strategy

For the first research question (i.e., examining the relation between teacher and school variables and teachers' sense of community), we used correlation analysis. For the remaining research questions investigating the relations among (a) teachers' sense of community, (b) quality of L & L instruction, and (c) children's L & L gains, we used hierarchical linear modeling (HLM; Raudenbush & Bryk, 2002) to account for the nested nature of the data. The two-level hierarchical linear models nested children within classrooms and predicted children's residualized gain (i.e., Time 2 scores with Time 1 scores as covariates) on vocabulary and print concept outcomes; teacher collegiality, influence, and the quality of L & L instruction were used as classroom-level measures. We also included children's gender, children's ethnicity, mother's education level, and family income as covariates in the Level 1 model.

The HLM model building consisted of a number of steps, with child variables entered into Level 1 of the model and teacher variables entered at Level 2. First, we tested the unconditional model without any predictors to compute the intraclass correlation coefficient (ICC); the ICC refers to the amount of variance in individual child outcomes that is explained by class-level variables. Second, we included children's Time 1 scores to examine residualized gain from fall to spring and children's gender, children's ethnicity, mother's education level, and family income as covariate variables. Third, we included teacher variables at Level 2 to model changes in children's vocabulary scores (Time 1 to Time 2) as a function of teacher collegiality, influence, and/or L & L instructional quality. All continuous predictors were centered at their grand means. Two dummy-coded variables indicating treatment status (Treatment 1, Treatment 2, with Treatment 3 as the reference group) were entered to test the effects of teacher collegiality, influence, and L & L instructional quality above and beyond intervention effects. Lastly, we included the interactions between teachers' collegiality or influence and L & L instructional quality in the model. A model for vocabulary as an exemplar and additional information on HLM analysis appear in the Appendix.

RESULTS

Relations Between Teacher Variables and Teachers' Sense of Community

To address the first research question (To what extent do program affiliation, teacher education, teacher experience, and certification relate to teachers' sense of community?), we present bivariate correlations between teacher

TABLE 3
Correlations Among Teacher Variables and Teachers Sense of Community

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Collegiality	—	.498**	−.120	.288**	.277**	−.331**	−.133	.001
2. Influence		—	−.330**	.101	.153	−.313**	−.264*	−.072
3. Program affiliation[a]			—	−.416**	−.170	.316**	.262*	.299*
4. Degree				—	−.311**	−.306**	−.073	−.110
5. Teaching experience (elementary)					—	−.154	.363**	−.165
6. Teaching experience (preschool)						—	.752**	.041
7. Total teaching experience							—	−.053
8. Certificate (preschool)								—

[a]Whether teachers were in a Head Start program.
*$p < .05$; **$p < .001$.

variables and teachers' sense of community in Table 3. As shown, there was a significant association between teachers' sense of collegiality and whether teachers had a bachelor's degree ($r = .288$, $p < .001$). Teachers' sense of collegiality was also significantly and positively correlated with their years of experience teaching in the elementary grades ($r = .277$, $p < .001$). Teachers' sense of influence was significantly and negatively correlated with whether teachers taught in a Head Start program ($r = -.33$, $p < .001$) and with their total years of teaching experience ($r = -.264$, $p < .001$). Both teachers' sense of collegiality and influence were negatively correlated with years of teaching children in preschool ($r = -.331$, $p < .001$; and $r = -.313$, $p < .001$, respectively). There were no significant relations between teacher certification and teachers' sense of collegiality or influence.

In addition, we examined the relations between teachers' sense of community and L & L instructional quality using bivariate correlation analysis; neither teachers' sense of collegiality ($r = -.082$, $p = .486$) nor teachers' sense of influence ($r = -.087$, $p = .458$) was significantly related to teachers' L & L instructional quality.

Teachers' Sense of Community, L & L Instructional Quality, and Children's L & L Gains

To answer the research question regarding relations among teachers' sense of community, the quality of L & L instruction, and children's gains (the

second research question), we first tested the unconditional model for each outcome (vocabulary and print concept knowledge) using HLM. The ICC obtained from the unconditional model predicting vocabulary indicted that 13% of the variance in Time 2 vocabulary scores was attributable to between-classroom variance; the ICC from the unconditional model predicting print concept knowledge showed that 29% of the variance in Time 2 print concept knowledge scores was explained by between-classroom variance. On average, the children in the current study exhibited substantial gains in vocabulary and print concept knowledge (see Table 2). Moreover, children with stronger Time 1 scores generally demonstrated greater gains in vocabulary and print concept knowledge (see Tables 4 and 5).

TABLE 4
Hierarchical Linear Modeling Results for Relation of Teachers' Sense of Collegiality and L & L Instructional Quality to Children's Vocabulary and Print Concept Knowledge Gains

	Vocabulary				*Print Concept Knowledge*			
Variable	*Coefficient*	*SE*	*df*	*p*	*Coefficient*	*SE*	*df*	*p*
Time 2 score (γ_{00})	58.11	0.523	66	<.001	9.192	0.215	66	<.001
Child-level variables								
Time 1 score (γ_{10})	0.756	0.034	290	<.001	0.605	0.044	297	<.001
Gender (boy = 1)	–0.760	1.277	290	.552	–0.664	0.356	297	.062
Mother's education (γ_{20})	3.249	2.195	290	.140	1.490	0.535	297	.006
Family income (γ_{30})	–0.057	0.130	290	.662	0.022	0.040	297	.588
Black vs. White (γ_{40})	–2.738	1.110	290	.013	0.123	0.419	297	.769
Latino vs. White (γ_{50})	–1.305	2.552	290	.609	–0.390	0.764	297	.609
Other race vs. White (γ_{60})	–3.165	1.583	290	.046	0.534	0.515	297	.301
Classroom-level variables								
Teacher collegiality (γ_{01})	0.091	0.107	66	.398	0.015	0.005	69	.771
L & L instructional quality (γ_{02})	0.070	0.118	66	.552	0.133	0.048	66	.007
Treatment condition								
Treatment 1 (γ_{03})	–3.777	1.316	66	.006	0.161	0.532	66	.763
Treatment 2 (γ_{04})	1.738	1.186	66	.148	1.376	0.615	66	.028
Collegiality × L & L Instructional Quality	0.338	0.128	69	.010	0.066	0.053	66	.222
Random Effects	*Variance*	χ^2	*df*	*p*	*Variance*	χ^2	*df*	*p*
Classroom-level intercept (U_0)	0.241	57.041	66	>.500	1.237	136.226	66	<.001
Child level (R)	105.623				7.492			

Note. Results with robust standard errors are reported. L & L = Language and Literacy; Vocabulary = Peabody Picture Vocabulary Test–III; Print Concept Knowledge = Preschool Word and Print Awareness assessment; Time 2 = spring; Time 1 = fall.

TABLE 5
Hierarchical Linear Modeling Results for Relation of Teachers' Sense of Influence and L & L Instructional Quality to Children's Vocabulary and Print Concept Knowledge Gains

	Vocabulary				*Print Concept Knowledge*			
Variable	*Coefficient*	*SE*	*df*	*p*	*Coefficient*	*SE*	*df*	*p*
Time 2 score (γ_{00})	58.024	0.528	66	<.001	9.166	0.209	66	<.001
Child-level variables								
Time 1 score (γ_{10})	0.761	0.034	290	<.001	0.595	0.044	297	<.001
Gender (boy = 1)	–0.637	1.252	290	.611	–0.667	0.353	297	.059
Mother's education (γ_{20})	3.088	2.182	290	.158	1.499	0.530	297	.005
Family income (γ_{30})	–0.042	0.131	290	.747	0.025	0.041	297	.537
Black vs. White (γ_{40})	–3.094	1.126	290	.007	–0.003	0.404	297	.993
Latino vs. White (γ_{50})	–1.159	2.535	290	.647	–0.477	0.766	297	.533
Other race vs. White (γ_{60})	–3.218	1.513	290	.034	0.483	0.519	297	.354
Classroom-level variables								
Teacher influence (γ_{01})	0.076	0.111	66	.494	0.069	0.058	66	.235
L & L instructional quality (γ_{02})	–0.014	0.108	66	.898	0.115	0.046	66	.016
Treatment condition								
Treatment 1 (γ_{03})	–3.318	1.376	66	.019	0.390	0.516	66	.452
Treatment 2 (γ_{04})	1.279	1.144	66	.268	1.355	0.594	66	.026
Influence × L & L Instructional Quality	0.356	0.126	66	.007	0.140	0.042	66	.002
Random Effects	*Variance*	χ^2	*df*	*p*	*Variance*	χ^2	*df*	*p*
Classroom level intercept (U_0)	0.056	56.826	66	>.500	1.262	125.795	66	<.001
Child level (R)	105.486				7.524			

Note. Results with robust standard errors are reported. L & L = Language and Literacy; Vocabulary = Peabody Picture Vocabulary Test III; Print Concept Knowledge = Preschool Word and Print Awareness assessment; Time 2 = spring; Time 1 = fall.

We then examined the relationship between teachers' sense of community and the two child outcomes. HLM results showed that for vocabulary, neither teachers' sense of collegiality ($\gamma_{01} = 0.132$), $t(71) = 1.119$, $p = .267$; nor teachers' sense of influence ($\gamma_{01} = 0.034$), $t(71) = 0.129$, $p = .796$, significantly predicted the residualized change in children's vocabulary scores. Similarly, there were no main effects for teachers' sense of collegiality ($\gamma_{01} = -0.006$), $t(71) = -0.110$, $p = .913$; or influence ($\gamma_{01} = 0.030$), $t(71) = 0.482$, $p = .631$, on the residualized change in children's print concept knowledge scores.

We then explored the relation of teachers' L & L instructional quality to child outcomes. HLM results showed that for the vocabulary outcome, the direct effect of teachers' L & L instructional quality on children's vocabulary

gains was not significant after controlling for children's fall vocabulary scores, child and family characteristics, and treatment status ($\gamma_{01} = 0.011$), $t(71) = 0.086$, $p = .932$. However, teachers' L & L instructional quality significantly predicted the residualized change in children's print concept knowledge scores once children's fall print concept knowledge scores, child and family characteristics, and treatment status were controlled ($\gamma_{01} = 0.124$), $t(71) = 2.579$, $p = .012$.

Interactions Among Teachers' Sense of Community and Teachers' L & L Instructional Quality

In response to the third research question (To what extent are the relations among teachers' sense of community and children's L & L gains moderated by teachers' L & L instructional quality?), we considered children's gains in vocabulary and print concept knowledge skills. Teachers' sense of collegiality and their L & L instructional quality significantly interacted in predicting children's residualized vocabulary gains (see Table 4). Figure 1 depicts this relation. In general, higher levels of teachers' sense of collegiality were related to higher child vocabulary scores only when teachers provided high

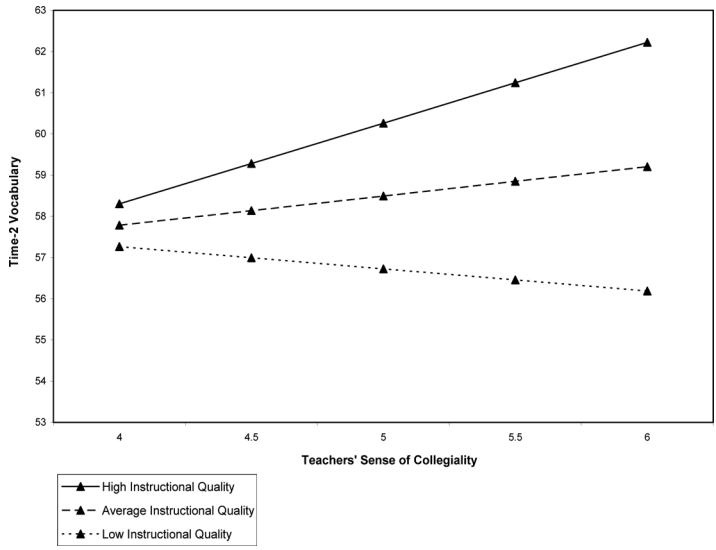

FIGURE 1 Teachers' Sense of Collegiality × Language and Literacy Instructional Quality interaction effect on fitted spring vocabulary scores. Language and literacy instructional quality scores fall at the 25th (low), 50th (average), and 75th (high) percentiles.

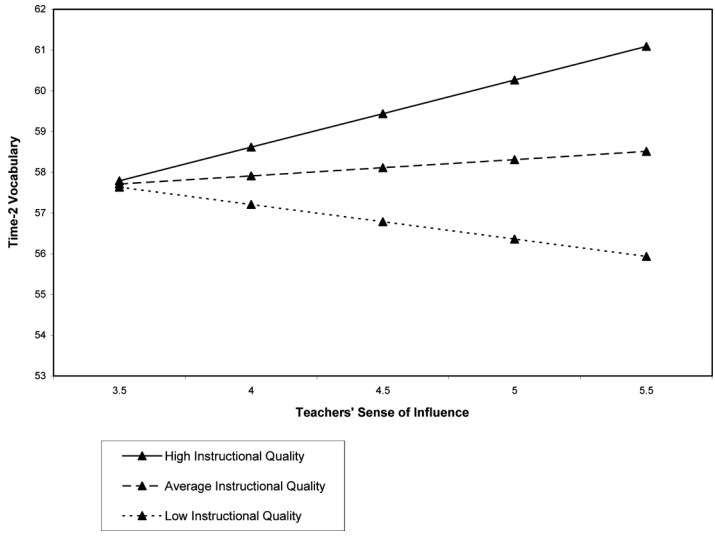

FIGURE 2 Teachers' Sense of Influence × Language and Literacy Instructional Quality interaction effect on fitted spring vocabulary scores. Language and literacy instructional quality scores fall at the 25th (low), 50th (average), and 75th (high) percentiles.

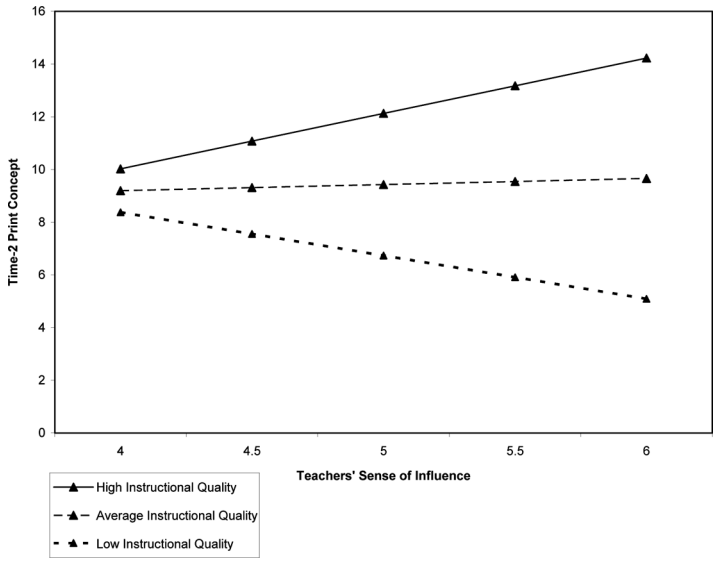

FIGURE 3 Teachers' Sense of Influence × Language and Literacy Instructional Quality interaction effect on fitted spring print concept scores. Language and literacy instructional quality scores fall at the 25th (low), 50th (average), and 75th (high) percentiles.

L & L instructional quality. Teachers' sense of collegiality did not interact with L & L instructional quality in predicting residualized gain in children's print concept knowledge scores (see Table 4).

Similarly, there was a significant interaction between teachers' sense of influence and their L & L instructional quality in relation to gains in children's vocabulary and print concept knowledge (see Table 5). These interactions are depicted, respectively, in Figures 2 and 3. As shown, higher levels of teachers' sense of influence were associated with higher child vocabulary and print concept knowledge gains in classrooms with a higher quality of L & L instruction.

DISCUSSION

The main purpose of this study was to investigate preschool teachers' sense of community, particularly with respect to their quality of L & L instruction and children's gains in L & L. An additional purpose was to evaluate whether the relation between teachers' sense of community and children's gains was moderated by L & L instructional quality. Here we provide an overview of the major findings of this study as well as a consideration of educational implications.

Sense of Community and Teacher/School Characteristics

The results of this work demonstrate some significant relations among teacher characteristics, school organizational variables, and teachers' sense of community. We found that (a) teacher education (bachelor's degree vs. no bachelor's degree) and (b) the number of years of kindergarten teaching were positively related to teachers' perceived level of collegiality. The significant association between teacher education and teachers' sense of collegiality supports the potential importance of teacher education on teachers' sense of community and has implications for attracting and retaining quality preschool teachers. Currently, a majority of preschool teachers do not have a degree beyond high school (Christina & Nicholson-Goodman, 2005). Our results suggest that additional years of training may result in employment in a workplace with more resources and/or that a teacher with more training may actively pursue collaboration. This relationship may result from personal characteristics of individuals who complete a course of study or from skills or habits acquired during the training program. We also hypothesize that this result may be due to the increased use of "learning communities" in teacher-training programs. This preparation may encourage teachers to work with their peers and mentor teachers in more collegial and reciprocal ways (Le Cornu & Ewing, 2008).

We found that kindergarten teaching experience was positively correlated with teachers' level of perceived collegiality. In contrast, preschool teaching experience was negatively correlated with teachers' sense of collegiality and influence. However, there was no relation between teacher collegiality and total years of teaching. Program affiliation was significantly related to teachers' perception of influence. Specifically, teachers in Head Start classrooms perceived themselves as having less influence as compared to non–Head Start teachers. These results, interpreted together, suggest that variations in educational environment may improve or limit the ability of teachers to develop a strong sense of collegiality and teacher influence.

The positive association between teachers' sense of collegiality and teaching experience in kindergarten is encouraging. This finding suggests that when teachers have opportunities to work in elementary schools and have increased access to fellow teachers, the environment facilitates collaborative professional relationships and skills (Vecchiotti, 2003). Accordingly, it may be beneficial for schools to explicitly build reflective learning communities that facilitate increased teacher interactions (Le Cornu & Ewing, 2008).

Unfortunately, our analysis suggests that increased preschool teaching experience does not demonstrate the same benefit as kindergarten teaching experience. In fact, our results indicated that teachers' years of preschool teaching was negatively correlated with teachers' sense of collegiality and influence. This finding may reflect characteristics of preschool working environments. The preschool programs in our study often were the only preschool classrooms in a building. As has been reported by other researchers, preschool classrooms are sometimes housed in public schools, community centers, or churches (Clifford et al., 2005). Preschool teachers in this situation may have no direct access to peers (McGinty et al., 2008; Vecchiotti, 2003). Classroom isolation may have influenced some preschool teachers in our study to report less involvement in collaborative activity and school decision making.

Even when preschool classrooms are placed in elementary school buildings, preschool teachers may not garner the same intrinsic rewards as elementary classroom teachers placed in the same building. Experts have speculated that preschool teachers feel a lack of reward for teaching in early childhood classrooms and that they report a lack of preparation (Manlove, 1993, 1994; Townley, Thornburg, & Crompton, 1991). Our finding that years of teaching in and of itself did not significantly impact teachers' sense of community is critical. Specifically, some teaching experiences (i.e., kindergarten teaching) improve a teacher's sense of community, whereas other kinds of teaching experience (i.e., Head Start preschool) have a negative effect.

The finding that Head Start teachers perceived themselves as having less influence in school decision-making processes is particularly significant.

We speculate that the structure and regulation of programs may impact teachers' peer collaboration and decision making (Bryk & Driscoll, 1988; Lee & Loeb, 2000; McGinty et al., 2008; Royal & Rossi, 1996). The negative association may reflect the organizational structure of the Head Start Program. All Head Start programs are required to follow program standards (U.S. Department of Health and Human Service (DHHS), 1995). Every 3 years, federal site visitors evaluate a classroom's adherence to Head Start performance standards (Love et al., 2005). Consequently, Head Start teachers may perceive that they are required to adhere to mandated program standards and subsequently lack influence on school policies and practices. A feeling of powerlessness may lead teachers to avoid program-level decision-making process or to participate selectively (Alutto & Belasco, 1972). It is important to note that the lack of influence felt by Head Start teachers may also reflect the background of teachers who are hired to be Head Start teachers and the training (or lack thereof) provided to teachers in Head Start. Given that these variables were not measured or controlled, our findings in this regard should be evaluated with caution and should be examined carefully in future research.

Taken together, our data underscore the importance of the school environment for improving preschool teachers' sense of community. Creating a preschool work environment more similar to the elementary school work environment has the potential to increase teachers' sense of community. Preschool teachers' sense of community is likely to be enhanced by providing more access to fellow teachers and by encouraging professional collaboration. Our data also suggest that regulatory policymakers (i.e., those associated with agencies such as Head Start) should embed program strategies to build teachers' ownership for program-level decision making.

Sense of Community, L & L Instructional Quality, and Children's L & L Gains

This study found significant interactions between teachers' sense of community and the quality of L & L instruction in predicting children's L & L gains. What is important is that the results of this study suggest the value of considering both variables together when estimating children's growth within preschool programs. Specifically, higher teacher collegiality scores—in combination with higher L & L instructional quality—was associated with greater gains in children's vocabulary levels. Similarly, higher teacher influence scores were associated with children's gains only in classrooms with a high quality of L & L instruction. Conversely, children made less vocabulary and print concept gains in classrooms with a low quality of

L & L instruction, even when teachers reported high levels of collegiality and influence.

These findings extend recent findings by the NICHD Early Child Care Research Network (2002) that suggest that teachers' instructional quality is the overarching and primary factor influencing children's academic gains. Our data indicate that teachers' sense of community may relate to L & L outcomes in young children through enhanced classroom L & L quality. Our findings support the view that teachers' sense of community "works to the academic advantage of students" only when it supports improvements in classroom instructional quality (Malen Ogawa, & Kranz, 1990; Marks & Louis, 1997). Specifically, teachers' sense of community is necessary but not sufficient for children's L & L gains. L & L instructional quality must be considered along with teachers' sense of community. As our data are correlational, however, we cannot infer a causal connection. Instead, we suggest that a teacher's sense of community is a valued-added factor.

We did not find any direct significant relations between teacher collegiality or influence and L & L instructional quality. This finding is surprising given that teachers' sense of community has been shown in other studies to be associated with teacher instructional quality (Bird & Little, 1985; Cohen, 1981; Little, 1982, 1990; Marks & Louis, 1997; McGinty et al., 2008). We hypothesize that this finding was due to the complex nature of the sense of community domain and the participants in our study pool. Our participants were teachers who had a range of experience, training, and classroom placement. Some teachers had extensive training (i.e., a master's degree) but were working in Head Start classrooms. In contrast, other teachers did not have an associate's degree. We believe that the heterogeneity of the participants in terms of their ability to demonstrate high-quality instruction mitigated the strength of the sense of community domain.

Finally, we found that the quality of L & L instruction significantly (and directly) predicted children's print concept gains. This finding expands the growing literature demonstrating the impact of teacher instructional quality on child outcomes (Connor, Morrison, Fishman, Schatschneider, & Underwood, 2007; La Paro & Pianta, 2000; National Reading Panel, 2000; Pianta, 1999). In the context of high L & L instructional quality, children demonstrate greater gains on measures of print concept knowledge over the academic year as compared to children in classrooms with a low quality of L & L instruction.

In contrast to the results for children's print gains described earlier, the quality of L & L instruction did not significantly or directly predict children's vocabulary gains. This may reflect the fact that our L & L instructional quality assessment measures primarily targeted literacy-focused instruction. It is possible that our instructional quality rating failed to capture nuances with regard to teachers' vocabulary instruction. In addition, teachers in our

sample varied in L & L instructional quality, and many of the teachers were rated as having a low level of instructional quality. Accordingly, the L & L instructional quality measures may not have captured slight variations in vocabulary instructional practice, particularly at the lower level of teaching ability.

Limitations

There are some limitations to the present study that provide guidance for future research. First, the current study did not allow for causal inferences, as our methods were correlational. Future experimental research is needed to examine the effects of teachers' sense of community on children's academic performance to more fully assess causal impacts. Second, teachers in the current study were teaching in preschool programs serving at-risk children. It is unknown whether the relation among teachers' sense of community, L & L instructional quality, and children's L & L gains would be replicated in a general population of students. Third, in the current study, the classroom observation assessing teachers' L & L instructional quality was conducted only during a large-group book-reading activity. However, L & L instruction occurs throughout the school day. Future research should include additional measures of instructional quality to represent the full range of L & L classroom activities.

Implications and Conclusions

A goal of early childhood education is to build children's emergent literacy and language skills to ensure later academic success. Many preschool programs today, in response to a variety of state and national initiatives, embrace the concept of providing a language- and literacy-rich curriculum, or at the least implement specific practices designed to elevate children's learning in these areas. However, we contend that high-quality instruction goes hand in hand with embedding teachers within a positive school community. Unfortunately, evidence suggests that the preschool teacher workforce is highly unstable, with a high annual turnover rate (Barnett, 2003) and a lack of career rewards (Manlove, 1993, 1994). Consequently, for learning initiatives to have a high impact, and for developmental science to be fully translated into improved practices, issues regarding teacher workforce should be considered.

The current study provides an important consideration for policymakers and administrators. In order to ensure the highest level of children's L & L gains, administrators should foster both high-quality instruction and teachers' sense of community. Specifically, our data demonstrate that a

combination of high-quality instruction and a higher teacher sense of community is positively associated with student achievement. We suggest that empowering and connecting teachers at the school level (i.e., improving teachers' sense of community) in addition to improving instructional quality is the optimal combination contributing to positive educational gains for preschool children. Future research should work to identify specific programmatic and worksite strategies to maximize teachers' sense of community and to document the impact on student outcomes.

ACKNOWLEDGMENTS

This research was supported in part by Grant No. R305G050057 from the U.S. Department of Education, Institute of Education Sciences. The content of this article does not necessarily demonstrate the position or policy of the Institute of Education Sciences, nor does it imply any official endorsement. We are very grateful to the children, families, teachers, and administrators who participated in this project.

REFERENCES

Alutto, J. A., & Belasco, J. A. (1972). A typology for participation in organizational decision-making. *Administrative Science Quarterly*, *9*, 27–41.

Barnett, W. S. (2003). *Low wages = low quality: Solving the real preschool teacher crisis*. (Preschool Policy Matters No. 3). New Brunswick, NJ: National Institute for Early Education Research, Rutgers University.

Barnett, W. S., Hustedt, J., Robin, K., & Schulman, K. (2004). *State of preschool: 2004 state preschool yearbook*. New Brunswick, NJ: National Institute for Early Education Research, Rutgers University.

Barnett, W. S., & Yarosz, D. J. (2004, August). Who goes to preschool and why does it matter? *Preschool Policy Matters*, *8*, 2–16.

Battistich, V., & Solomon, D. (1995, April). *Linking teacher change to student change*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Battistich, V., Solomon, D., Kim, D., Watson, M., & Schaps, E. (1995). Schools as communities, poverty level of student populations, and students' attitudes, motives, and performance: A multilevel analysis. *American Educational Research Journal*, *32*, 627–658.

Battistich, V., Solomon, D., Watson, M., & Schaps, E. (1997). Caring school communities. *Educational Psychologists*, *32*, 137–151.

Bird, T., & Little, J. (1985). *Instructional leadership in eight secondary schools* (Final report to the National Institute of Education). Boulder, CO: Center for Action Research.

Bryk, A. S., & Driscoll, M. E. (1988). *The high school as community: Contextual influences and consequences for students and teachers*. Madison, WI: University of Wisconsin, National Center on Effective Secondary Schools.

Christina, R., & Nicholson-Goodman, J. (2005). *Going to scale with high-quality early education: Choices and consequences in universal pre-kindergarten efforts*. Santa Monica, CA: RAND.

Clifford, R., Barbarin, O., Chang, F., Early, D., Bryant, D., Howes, C., … Pianta, R. (2005). What is pre-kindergarten? Characteristics of public pre-kindergarten programs. *Applied Developmental Science*, *9*, 126–143.

Cohen, E. (1981). Sociology looks at team-teaching. *Research in Sociology of Education and Socialization*, *2*, 163–193.

Connor, C. M., Morrison, F. J., Fishman, B. J., Schatschneider, C., & Underwood, P. (2007, January 26). Algorithm-guided individualized reading instruction. *Science*, *315*, 464–465.

Connor, C. M., Morrison, F. J., & Slominski, L. (2006). Preschool instruction and children's literacy skill growth. *Journal of Educational Psychology*, *98*, 665–689.

David, J. L. (1994). *School-based decision making: Linking decisions to learning. Third year report to the Pritchard Committee*. Palo Alto, CA: Bay Area Research Group.

Desimone, L., Payne, B., Fedoravicius, N., Henrich, C., & Finn-Stevenson, M. (2004). Comprehensive school reform: An implementation study of preschool programs in elementary schools. *Elementary School Journal*, *104*, 369–389.

Dickinson, D. K., & Tabors, P. O. (Eds.). (2001). *Beginning literacy with language: Young children learning at home and school*. Baltimore, MD: Brookes.

Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test–third edition*. Circle Pines, MN: American Guidance Service.

Early, D. M., Bryant, D., Pianta, R., Clifford, R., Burchinal, M., Ritchie, S., … Barbarin, O. (2006). Are teachers' education, major, and credentials related to classroom quality and children's academic gains in prekindergarten?. *Early Childhood Research Quarterly*, *21*, 174–195.

Early, D. M., Maxwell, K. L., Burchinal, M., Alva, S., Bender, R. H., Bryant, D., … Zill, N. (2007). Teachers' education, classroom quality, and young children's academic skills: Results from seven studies of preschool programs. *Child Development*, *78*, 558–580.

Foorman, B. R., & Moats, L. C. (2004). Conditions for sustaining research-based practices in early reading instruction. *Remedial and Special Education*, *25*, 51–60.

Foorman, B. R., & Schatschneider, C. (2003). Measurement of teaching practices during reading/language arts instruction and its relationship to student achievement. In S. Vaughn, & K. L. Briggs (Eds.), *Reading in the classroom: Systems for the observation of teaching and learning* (pp. 1–30). Baltimore, MD: Brookes.

Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, *76*, 569–582.

Hammill, D. D. (2004). What we know about correlated of reading. *Exceptional Children*, *70*, 453–468.

Hayes, S. (1990). *Nine ducks nine*. Cambridge, MA: Candlewick Press.

Howes, C. (1997). Children's experiences in center-based child care as a function of teacher background and adult:child ratio. *Merrill Palmer Quarterly*, *43*, 404–425.

Justice, L. M., Bowles, R. P., & Skibbe, L. E. (2006). Measuring preschool attainment of print-concept knowledge: A study of typical and at-risk 3- to 5-year-old children using item response theory. *Language, Speech, and Hearing Services in School*, *37*, 224–235.

Justice, L. M., & Ezell, H. K. (2001). Word and print awareness in 4-year old children. *Child Language Teaching and Therapy*, *17*, 207–225.

Justice, L. M., Kaderavek, J. N., Fan, X., Sofka, A., & Hunt, A. (2009). Accelerating preschoolers' early literacy development through classroom-based teacher-child storybook reading and explicit print referencing. *Language, Speech, and Hearing Services in Schools*, *40*(1), 67–85.

Justice, L. M., Mashburn, A., Hamre, B., & Pianta, R. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk pupils. *Early Childhood Research Quarterly*, *23*, 51–68.

Justice, L. M., McGinty, A., Piasta, S. B., Kaderavek, J., & Fan, X. (2010). Print-focused read-alouds in preschool classrooms: Intervention effectiveness and moderators of child outcomes. *Language, Speech, and Hearing Services in Schools*, *41*, 521–530.

La Paro, K. M., & Pianta, R. C. (2000). Predicting children's competence in the early school years: A meta-analytic review. *Review of Educational Research*, *70*, 443–484.

Le Cornu, R., & Ewing, R. (2008). Reconceptualising professional experiences in pre-service teacher education . . . reconstructing the past to embrace the future. *Teaching and Teacher Education*, *24*, 1799–1812.

Lee, V., & Loeb, S. (2000). School size in Chicago elementary schools: Effects on teachers' attitudes and students' achievement. *American Educational Research Journal*, *37*, 3–31.

Little, J. (1982). Norms of collegiality and experimentation: Workplace conditions of school success. *American Educational Research Journal*, *19*, 325–340.

Little, J. (1990). Teachers as colleagues. In A. Lieberman (Ed.), *Schools as collaborative cultures: Creating the future now* (pp. 165–232). New York, NY: Falmer Press.

Lonigan, C. J., Burgess, S. R., Anthony, J. L., & Barker, T. A. (1998). Development of phonological sensitivity in two- or five-year-old children. *Journal of Educational Psychology*, *90*, 294–311.

Love, J. M., Kisker, E. E., Ross, C., Raikes, H., Constantine, J., Boller, K., . . . Vogel, C. (2005). The effectiveness of Early Head Start for 3-year-old children and their parents. *Developmental Psychology*, *41*, 885–901.

Malen, B., Ogawa, R. T., & Kranz, J. (1990). What we know about school based management: A case study of the literature. In W. H. Clune & J. F. Witte (Eds.), *Choice and control in American education* (Vol. 2, pp. 289–342). Philadelphia, PA: Falmer.

Manlove, E. (1993). Multiple correlated of burnout in child care workers. *Early Childhood Research Quarterly*, *8*, 499–518.

Manlove, E. (1994). Conflict and ambiguity over work roles: The impact on child care worker burnout. *Early Education and Development*, *5*, 41–55.

Marks, H. M., & Louis, K. S. (1997). Does teacher empowerment affect the classroom? The implication of teacher empowerment for instructional practice and student academic performance. *Educational Evaluation and Policy Analysis*, *19*, 245–275.

McGinty, A. S., Justice, L. M., & Rimm-Kaufman, S. E. (2008). Sense of school community for preschool teachers serving at-risk children. *Early Education and Development*, *19*, 361–384.

McLaughlin, M., & Talbert, J. (2001). *Professional communities and the work of high school teaching*. Chicago, IL: University of Chicago Press.

National Center for Education Statistics. (1997). *Teacher professionalism and teacher commitment: A multi-level analysis*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

National Early Literacy Panel. (2008). Developing early literacy: Report of the National Early Literacy Panel. Jessup, MD: National Center for Family Literacy, National Institute for Literacy. Available at http://www.nifl.gov/nifl/publications/pdf/NELPReport09.pdf. Washington, DC: National Institute for Literacy. National Family Literacy Association.

National Reading Panel. (2000). *Report of the National Reading Panel: Teaching children to read* (No. 00-4769). Washington, DC: National Institute of Child Health and Human Development.

NICHD-ECCRN. (2002). The relation of global first grade classroom environment to structural classroom features and teacher and student behaviors. *The Elementary School Journal*, *102*, 367–387.

NICHD Early Child Care Research Network. (2005). Pathways to reading: The role of oral language into the transition to reading. *Developmental Psychology*, *41*, 428–442.

National Reading Panel. (2000). *National Reading Panel report: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (National Institutes of Health Publication No. 00-4769). Washington, DC: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Child Health and Human Development.

Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington, DC: American Psychological Association.

Pullen, P. C., & Justice, L. M. (2003). Enhancing phonological awareness, print awareness and oral language skills in preschool children. *Intervention in School and Clinic*, *39*, 87–98.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods.* (3rd ed.). Thousand Oaks, CA: Sage.

Roberts, W., Hom, A., & Battistich, V. (1995, April). *Assessing students' and teachers' sense of the school as a caring community*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Rosenholtz, S. (1985). Effective schools: Interpreting the evidence. *American Journal of Education*, *93*, 352–388.

Rosenholtz, S., & Simpson, C. (1990). Workplace conditions and the rise and fall of teachers' commitment. *Sociology of Education*, *63*, 241–257.

Royal, M., DeAngelis, K., & Rossi, R. (1996). *Teachers' sense of community: How do public and private schools compare?* Washington, DC: American Institutes for Research in the Behavioral Sciences and the National Center for Education Statistics.

Royal, M., & Rossi, R. (1996). Individual-level correlates of sense of community: Findings from workplace and school. *Journal of Community Psychology*, *24*, 395–416.

Royal, M., & Rossi, R. (1999). Predictors of within school differences in teachers' sense of community. *Journal of Educational Research*, *92*, 259–273.

Scarborough, H. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory and practice. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research* (pp. 97–110). New York, NY: Guilford Press.

Smith, M., & Dickinson, D. (2002). *User's guide to the Early Language and Literacy Classroom Observation toolkit*. Baltimore, MD: Brookes.

Smylie, M. A. (1994). Redesigning teachers' work: Connections to the classroom. In L. Darling Hammond (Ed.), *Review of research in education* (Vol. 20, pp. 129–177). Washington, DC: American Educational Research Association.

Smylie, M. A., Lazarus, V., & Brownlee-Conyers, J. (1996). Instructional outcomes of school-based participative decision making. *Educational Evaluation and Policy Analysis*, *18*, 181–198.

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Research Council, National Academies Press.

Spira, E., Storch, S. B., & Fischel, J. E. (2005). Predicting improvement after first-grade reading difficulties: The effects of oral language, emergent literacy, and behavior skills. *Developmental Psychology*, *41*, 225–234.

Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology*, *38*, 934–947.

Townley, K. F., Thornburg, K. R., & Crompton, D. (1991). Burnout in teachers of young children. *Early Education and Development*, *2*, 197–204.

U.S. Department of Health, & Human Services, Administration for Children, & Families. (1995). Early Head Start program grant availability: Notice. *Federal Register*, *60*, 14548–14578.

Vecchiotti, S. (2003). Kindergarten: An overlooked educational policy priority. *Social Policy Report*, *17*, 3–19.

Vukelich, C., & Christie, J. (2004). *Building a foundation for preschool literacy: Effective instruction for children's reading and writing development*. Newark, DE: International Reading Association.

Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development*, *69*, 848–872.

APPENDIX: Multilevel Equations for Models

Level 1

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{Time1 score}) + \beta_{2j}(\text{child and family}) + r_{ij} \quad (1)$$

Level 2

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \gamma_{01}(\text{Collegiality}) + \gamma_{02}(\text{Treatment1}) + \gamma_{03}(\text{Treatment2}) + u_{0j}\\ \beta_{1j} &= \gamma_{10}\\ \beta_{2j} &= \gamma_{20}\end{aligned} \quad (2)$$

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \gamma_{01}(\text{Quality}) + \gamma_{02}(\text{Treatment1}) + \gamma_{03}(\text{Treatment2}) + u_{0j}\\ \beta_{1j} &= \gamma_{10}\\ \beta_{2j} &= \gamma_{20}\end{aligned} \quad (3)$$

$$\begin{aligned}\beta_{0j} &= \gamma_{00} + \gamma_{01}(\text{Collegiality}) + \gamma_{02}(\text{Quality}) + \gamma_{03}(\text{Treatment1})\\ &\quad + \gamma_{04}(\text{Treatment2}) + \gamma_{05}(\text{Collegiality} * \text{Quality}) + u_{0j}\\ \beta_{1j} &= \gamma_{10}\\ \beta_{2j} &= \gamma_{20}\end{aligned} \quad (4)$$

As shown in Equation 1, this model predicted the Time 2 vocabulary score ($_Y$) of child i in classroom j as a function of the classroom mean of Time 2 vocabulary scores (β_{0j}) after adjusting Time 1 vocabulary scores (β_{1j}), characteristics of child and family (β_{2j}), and the child-level error (r_{ij}). Child and family variables included the child's gender, child's race, mother's education, and family income. Equation 2 presents the Level 2 model used to assess the direct effects of teacher collegiality and influence. In this model, the mean classroom Time 2 vocabulary scores (β_{0j}) are a function of the

grand mean (γ_{00}) plus the effects of teachers' collegiality (γ_{01}), treatment status (γ_{02} and γ_{03}), and classroom-level error (u_{0j}). Equation 2 presents the collegiality model; influence results simply replaced the collegiality variable. Equation 3 presents the quality model. In this model, γ_{01} represents the direct effect of instructional quality above and beyond the effects of condition. Equation 4 presents the final model, which included the interactions between teachers' collegiality and instructional quality. An identical model was run for the interaction between teacher influence and instructional practices.