American Educational Research Journal

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>> Version of Record - May 14, 2009

OnlineFirst Version of Record - Dec 19, 2008

What is This?

The Impact of Professional Development and Coaching on Early Language and Literacy Instructional Practices

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This study examines the impact of professional development on teacher knowledge and quality early language and literacy practices in center- and home-based care settings. Participants from 291 sites (177 centers; 114 home-based) in four cities were randomly selected to: Group 1, 3-credit course in early language and literacy; Group 2, course plus ongoing coaching; Group 3, control group. Analysis of covariance indicated no significant differences between groups on teacher knowledge. However, there were statistically significant improvements in language and literacy practices for teachers who received coursework plus coaching with substantial effect sizes for both center- and home-based providers. Professional development alone had negligible effects on improvements in quality practices. Coursework and coaching may represent a promising quality investment in early childhood.

KEYWORDS: early childhood, literacy, professional development

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Recent research (Snow, Griffin, & Burns, 2005) supports the oft-repeated phrase from parents that "it all comes down to the teacher," when describing the quality of their children's school experience. Some have suggested that nothing can replace the power of a high-quality teacher during children's formative years (Barnett, 2004). Multilevel analyses have reported that teacher quality is a strong predictor of children's school-readiness skills (Howes, 1997; National Institute of Child Health and Human Development [NICHD] Early Child Care Research Network, 2002; Phillipsen, Burchinal, Howes, & Cryer, 1997), surpassing class size, school context, and other related variables.

Nevertheless, our knowledge about how to prepare quality teachers, particularly for children in their very earliest years, is far less clear. Although enhanced teacher education has been identified as a key strategy for improving children's learning in pre-K, the links from evidence about teacher education to quality practices to children outcomes have required a fairly high level of inference (Strickland, Snow, Griffin, & Burns, 2002). To date, we simply do not have convergent evidence on either the content or the methods in teacher preparation or professional development programs to ensure high-quality early care and education settings for young children (Zaslow & Martinez-Beck, 2006).

Studies (Burchinal, Cryer, Clifford, & Howes, 2002; Phillips, Mekos, Scarr, McCartney, & Abbott-Shim, 2000) confirm that the quality of early education programs is strongly associated with the qualifications of the programs' teachers (Bowman, Donovan, & Burns, 2000) and that quality programs are especially important if we are to improve low-income children's early literacy skills (NICHD Early Child Care Research Network, 2005; Snow, Griffin, & Burns, 2005). Not surprisingly, this research suggests that to meet the demands of quality teaching, specific to reading readiness, effective early childhood educators need to be immersed in knowledge about language and literacy development (Dickinson & Brady, 2006). They need to know not only what to teach but how to teach developmentally effectively (Neuman, Copple, & Bredekamp, 2000). They need to understand what individual children bring to learning, their cultural histories, building upon their prior knowledge in a way that engages children's understanding in meaningful literacy practices (Neuman, Roskos, Wright, & Lenhart, 2007). And they need to know how to monitor children's growth and progress and effectively communicate with families to create respectful, reciprocal relationships that support and empower families (Bredekamp & Rosegrant, 1995).

In short, effective teachers of early literacy must bring a substantial knowledge base, reflecting an understanding of child development, and the knowledge, skills, and dispositions necessary to shape appropriate learning experiences that are engaging to children. Together, these qualifications represent a significant challenge to a professional field that has been traditionally poorly compensated and underfunded (American Federation of Teachers, 2004). Recent evidence (Lee & Burkam, 2002; National Assessment

533

of Educational Progress, 2004), however, suggests a growing sense of urgency if we are to improve our capacity to staff early childhood programs with highly qualified teachers.

Aware of this urgency and the growing social and educational inequities many poor children face (Neuman, 2008), policy makers at state and federal levels have targeted greater professional efforts for teachers of young children. Early Reading First, established as a component of the No Child Left Behind Act (2002), for example, raised the bar for teacher quality by calling for intensive professional development to equip teachers with the content knowledge and skills necessary for effective instructional practices in early literacy. Similarly, the Good Start, Grow Smart initiative (U.S. Department of Health and Human Services, 2002) focused on achieving better alignment between preschool and primary grades, providing teachers in nonrelative care settings with professional development and training in effective early literacy pedagogy.

Although these and other early childhood initiatives (Zaslow & Martinez-Beck, 2006) call for states to improve the quality of their early childhood care and education workforce and early literacy in particular, policy makers and researchers still have limited knowledge about effective professional development programs and their potential impact on instructional practices. To this end, this article reports the results of an effort to improve the quality of early language and literacy practices in center- and home-based care through professional development. We hypothesized that a practice-based approach that included coursework and coaching would result in improvements specifically associated with quality early literacy activities. We sought to contrast this model with a randomly selected group, who received coursework alone, and a control group, constituting business as usual.

Theoretical Perspective and Context for the Study

Our theoretical perspective is informed by research on economic production function (input-output) studies, synthesis reports on the preparation of early literacy teachers, and more recent views of professional development that emphasize the application of knowledge in practice. Although much of the research to date has focused on teaching in K–12 setting (Cochran-Smith & Zeichner, 2005), recent research reviews (Karp, 2006; Zaslow & Martinez-Beck, 2006) have shown its applications to early childhood education. Together, this literature highlights key assumptions that underlie this research project. These include the following: (a) quality teaching plays an enormous role in children's early literacy development; (b) early literacy teaching requires a solid foundation of content knowledge; and (b) professional development that contains both content and pedagogical knowledge may best support the ability of teachers to apply literacy knowledge in practice. Below, we briefly review this knowledge base.

534

Quality Teachers Matter

In his landmark study of schools, "Equality of Educational Opportunity," noted sociologist James Coleman et al. (1966) brought national attention to what has since become known as economic production function, or "input-output," studies. These studies have sought to examine the question of whether specific school resources affect achievement scores. Commissioned by the Civil Rights Act of 1964, and involving 60,000 teachers in 3,000 schools, the study reported among other findings that student achievement was associated with teachers' verbal ability and teachers' education level. In fact, for minority students and upper level students, teacher quality had the strongest impact on achievement, suggesting that teachers could have differential effects on student achievement as well as cumulative effects as students progress to higher grades.

Coleman's methodology is now understood to be seriously flawed due to aggregating data at the school level instead of the classroom and student levels. Still, a careful reanalysis of the data has essentially substantiated many of his claims (Mosteller & Moynihan, 1972; Rothstein, 2004). Using more sophisticated analytic techniques, researchers have since attempted to provide more precise estimates of these teacher effects. Scheerens and Bosker (1997), for example, reported that one fifth of the variance in student achievement could be explained by differences in individual teachers, with the remaining variance attributed to differences among individual children and the characteristics of the schools they attended.

Until recently, however, studies have measured the quality of teaching at one point in time and, as such, have potentially underestimated the influence of teaching. Rather, a child's achievement is likely to be affected by his or her instructional history—the cumulative effects of instruction in previous grades. Sanders and Rivers (1996) have used what have come to be known as "value-added methods" to examine the cumulative and residual effects of teacher quality on academic achievement. This research attempts to estimate the average amount of annual growth of students that can be attributable to the individual teacher. Sanders and Rivers, in a large study of elementary math teachers in Tennessee, revealed a dramatic finding: Children assigned to three *effective* teachers in a row scored at the 83rd percentile in math at the end of fifth grade, while children assigned to three *ineffective* teachers in a row scored at the 29th percentile. Although Sanders and Rivers's statistical model and its use by policy makers has been recently challenged, effect sizes still favor the gains of expert teachers on student achievement. Students of National Board–certified teachers, for example, make about 1 month's greater growth than students of regularly certified teachers (Amrein-Beardsley, 2008).

Value-added studies, unfortunately, are unavailable in early childhood education. However, the national trend to raise teacher qualifications in early education has resulted from the recognition that teacher quality in early childhood leads to better outcomes for young children (Whitebook, 2003). A recent synthesis of 16 published studies examining the linkages between

535

program characteristics and environmental quality in early childhood settings (Fukkink & Lont, 2007) found that teachers with more education, particularly specialization in early childhood development, had higher quality programs and engaged children in best practices. In fact, the National Research Council report on pedagogy (Bowman, Donovan, & Burns, 2000) found that teacher quality was the most consistent predictor of high-quality early learning programs. Indeed, new standards adopted by the National Association for the Education of Young Children (NAEYC; 2005) have emphasized the importance of high levels of formal education and specialized early childhood professional preparation.

These and other studies (Snow, Griffin, & Burns, 2005) confirm what anecdotal experiences have previously reported: Teacher quality in early education matters. Therefore, identifying strategies and practices to promote higher quality teaching in these early years is critical if we are to provide all children with the quality of preschool education they so richly deserve.

Content Expertise Matters

A number of studies and reports (Burchinal et al., 2002; Early et al., 2006; Phillips et al., 2000) have attempted to identify the characteristics that distinguish quality teachers in early childhood and to determine how these characteristics can be enhanced and scaled up to other programs. Although this topic has often generated more heat than light (Whitehurst, 2002), one of the more robust findings is the effect of subject-matter expertise on higher quality practice and better learning outcomes. Defining subject knowledge as both the actual content that teachers teach and the specialized knowledge for understanding how to teach it, Dickinson and Caswell (2007), for example, developed an in-service program known as the Literacy Environmental Enrichment Program (LEEP). Much like a university-based course on instructional methods, the 45-hour course was attended by 30 Head Start teachers along with their supervisors, who were enlisted to help support their efforts and to provide on-site support as they adopted new teaching strategies. Using a wait-list comparison group of teachers who had not received the intervention, the researchers reported significant gains for LEEP teachers on all measures of classroom supports in language and literacy. These results suggest that helping teachers to learn content knowledge and to draw on that knowledge to plan effective practices may improve the quality of the language and literacy environment.

Much of the research (Cunningham, 2006), however, has focused on math and science content knowledge in K–12. To date, there has been a paucity of research in the area of early literacy. Nevertheless, a modest amount of evidence has begun to emerge indicating that specialized training in early literacy content knowledge can affect language and literacy practices and child outcomes. Whitehurst et al. (1994) and Neuman (1999), for example, demonstrated that engaging early childhood providers in specialized

training in storybook reading had a significant impact on children's receptive and expressive language and phonological awareness.

Extending Whitehurst et al.'s (1994) training program, Wasik, Bond, and Hindman (2006) focused on helping teachers to ask questions, build vocabulary, and make connections to children's lives using books, concrete objects that represented target words in books, and lesson plans. Following training, 70% of the intervention teachers significantly changed the way they talked to and listened to children during book reading with subsequent improvements in children's vocabulary. Taking professional development to scale, Jackson et al. (2006) reported the effects of a 15-week, distance-learning approach (HeadsUp! Reading) for over 50 early childhood centers who served children in high-poverty communities in Nebraska. Jackson et al.'s findings indicated improved effectiveness of classroom practices compared to controls, with subsequent benefits on language and literacy skills for children. Similarly, Landry, Swank, Smith, Assel, and Gunnewig (2006) reported gains in children's language and early literacy skills as a result of a statewide professional development program targeted to preschool teachers.

Typifying each of these successful professional development interventions was a strong emphasis on content knowledge. For example, HeadsUp! Reading was based on the convergence of research summarized in the National Academy's report on preventing reading difficulties (Snow, Burns, & Griffin, 1998). In the same manner, Landry et al.'s (2006) intervention responded to the research consensus in early literacy by focusing on key foundational skills necessary for children entering kindergarten to succeed in reading, including general conceptual knowledge, oral language comprehension, phonological awareness, letter knowledge, and print concepts (National Reading Panel Report, 2000). Equally important (Hoffman & Pearson, 2000), each approach provided critical opportunities for early childhood educators to discuss, to deliberate, and to incorporate that knowledge into their existing knowledge structures and classroom practices.

Professional development initiatives and teacher preparation programs that emphasize developing content expertise in early literacy are well supported by this emerging research base. Content matters, and methods that help teachers develop and convey these understandings to children are an important part of the equation for improving children's literacy development.

Embedding Knowledge in Practice Matters

Nevertheless, a recent study by Justice, Mashburn, Hamre, and Pianta (2008) caution policy makers that content knowledge alone may not be sufficient to enhance early literacy practice. Rather, there is a growing body of research that indicates the importance of connecting content and context in professional development. Ball and Cohen (1999), for example, have argued that since the work of effective teaching occurs in practice, professional education aimed toward developing effective teachers needs to occur in the learning context of their own practices.

537

As a practice-based professional development approach, coaching has generated a tremendous interest among educators in recent years (Blachowicz, Obrochta, & Fogelberg, 2005; Joyce & Showers, 1983). Although coaching has long been used in athletic training programs and leadership programs (Nettles, 1993), its application to reading and early childhood teaching is relatively new. While there are many forms (e.g., content focused and student focused; Salinger, 2006) and practices, the consensus among applications appears to be that coaching is a form of professional development that involves ongoing classroom modeling, supportive critiques of practice, and specific observations (Shanklin, 2006). Similar in many aspects to teacher mentoring in which beginning teachers are paired with a more experienced teacher or team of teachers, coaching involves a collaborative relationship between an expert and a practitioner, who may have been working in the field for many years, to develop specific knowledge and skills related to instructional practice.

There are promising indications that coaching can lead to improvements in language and literacy practices. Evaluating the coaching model used in America's Choice schools, Poglinco and Bach (2004) found literacy coaching to be a promising approach to help teachers change their instructional practices. Coaches had three major functions: in-class modeling of instruction, facilitating study groups, and leading teacher meetings. Poglinco and Bach (2004) reported high teacher satisfaction with coaching and overall improvements in teacher practices. Similarly, based on survey and interview data, Bacevich and Salinger (2006) concluded from their evaluation of the Alabama Reads Initiative in secondary schools that reading coaches could have a positive impact on teacher instructional practices across content areas and on various student literacy outcomes.

Previous professional development opportunities for early childhood educators have tended to be short lived and activity based, with little to no sustained impact on practice (Moats, 1999). In contrast to this approach, there is some evidence that carefully designed ongoing professional development strategies embedded in practice (Cohen & Hill, 2001) may have positive impact on teacher practices and child outcomes. In a study of 500 child-care centers in low-income neighborhoods, Neuman (1999) found that early childhood caregivers attended more frequently and engaged in higher quality literacy practices when preschool specialists worked alongside them, demonstrating, modeling, and providing support to teachers. Whether such efforts are potentially scalable, however, still remains to be tested.

Consequently, our research is based on the premise that improvements in professional development for early childhood providers may hold great promise for improving the quality of early literacy teaching and practice for young children. Content knowledge of language and literacy and knowledge of children's development and appropriate practice are essential for teachers to be well prepared for their challenging tasks. At the same time, even expert-level knowledge will be insufficient unless caregivers understand how they might apply that learning to practice. To our knowledge, such a

538

coordinated approach to professional development in early literacy has not yet been the subject to empirical testing. This project, therefore, was designed to examine the effects of professional development and coaching on early childhood caregivers' knowledge of early literacy development and impact on quality language and literacy practices in center- and home-based early childhood care and education settings.

Method

Background

Data from this study come from Project Great Start Professional Development Initiative funded through the U.S. Department of Education Office of Elementary and Secondary Education. The project was designed to improve early childhood educators' language and literacy instructional practices and child outcomes in high-priority urban areas, serving the very poorest children in Michigan's poorest cities. Detroit and midsized cities in urban counties, including Flint, Grand Rapids, and Lansing, constituted priority urban centers targeted by the governor to receive additional attention and resources in efforts to improve the quality of early care and education and children's school-readiness skills. Licensed centers and family child-care settings were eligible to participate.

To bring professional development opportunities to child-care practitioners in these high-priority areas, the project assembled a collaboration of educational, child-care, and public-service organizations headed by the University of Michigan to include Community Coordinated Child Care Association (4C), three state government agencies (Health, Education, and Human Services), and four community colleges. Working with regional 4C offices, which maintained databases of all regulated child-care providers, the project identified center-based and family day-care providers who had earned a Child Development Credential or less and who lived in the attendance areas of these high-priority urban areas. These providers became the target population for an intensive professional development program.

Sample

The sample consists of intervention and comparison teachers recruited from child-care centers and family day cares in the four priority areas. Participants for the study were recruited by the statewide 4C organization in cooperation with the Department of Human Services' Teacher Education and Compensation Helps (T.E.A.C.H.) program. Begun in North Carolina, and funded by the Child Care Block Grant quality set-aside, T.E.A.C.H. was designed to provide scholarships and incentives for child-care workers already in the field to receive professional development in ways that might advance their education and improve quality practices (Cassidy, Buell, Pugh-Hoese, & Russell, 1995).

To be eligible for the project, practitioners needed to meet four criteria: (a) They needed to be open to taking a course at their local community college in pursuit of an associate's degree in early childhood education; (b) they had to be employed at least 20 hours per week in a licensed child-care center or home; (c) they had to care for children ages 3 to 5; and (d) they needed to have an agreement from their sponsoring organization (center director or educational director) if they taught in a center. Only one teacher per center or family/group home provider was eligible to participate in the project.

From an initial pool of 353 eligible child-care centers and 1,038 home-based centers in these priority areas, providers from 304 centers (168 centers, 136 homes) agreed to participate in the project. Participants were then stratified by center- and home-based setting and randomly assigned (using a table of random numbers) to one of three groups: Group 1 ($n = 86$), professional development three-credit course in early language and literacy at their local community college; Group 2 ($n = 85$), professional development course plus ongoing coaching; Group 3 ($n = 133$), control group with no professional development course or coaching (with the understanding that such opportunities would be available next year).

Participants in each of the groups came from the four urban areas in roughly equal proportions to their overall representation in the study. For example, Grand Rapids had the fewest number of participants overall (17.2%), and this was proportionate to the breakdown of participants in each of the three groups (Group 1 = 13.8%; Group 2 = 16.5%; Group 3 = 19.8%). The sample was all women and diverse, with 68% Caucasian, 24% African American, 6% Hispanic, 1% Asian, and 1% multiracial. More than three quarters of the sample worked between 30 and 60 hours per week and had considerable experience in child care (between 6 and 25 years). Chi-square analyses indicated no significant differences across the three groups by race or experience in child care. However, there were statistically significant differences in education level, $\chi^2(2, 301) = 45.72$, $p < .001$; number of previous courses taken groups, $\chi^2(2, 301) = 40.25$, $p < .001$; and age, $\chi^2(2, 301) = 4.01$, $p < .01$. The control-group participants were more educated, had taken more education courses, and were slightly older (42 vs. 38 years) than were the treatment-group participants.

As shown in Table 1, basic demographic characteristics of ethnicity, gender, and years of experience were similar across group.

Intervention

The intervention constituted a 45-hour, three-credit course in language and literacy held at one of four local community colleges, closest in proximity to the child-care site. For those randomly selected, a yearlong coaching intervention occurred *in addition* to the professional development course. Each intervention is described below.

540

Table 1
Demographic Characteristics of Sample

Teacher Characteristics	Group 1 PD Only (%) (*n* = 80)	Group 2 PD Plus Coaching (%) (*n* = 85)	Group 3 Control (%) (*n* = 126)
Ethnicity			
Caucasian	61	64	67
African American	27	24	22
Hispanic	10	8	9
Asian	0	2	1
Mixed race	2	2	1
Years of work experience in early childhood			
5 or less	42.9	36.0	28.2
6–20	51.4	52.0	56.4
More than 20	5.7	12.0	15.4
Hours worked per week			
20–30	20.1	24.7	14.8
31–40	41.3	32.9	37.6
41–60	38.8	42.4	47.5
Level of education			
High school or less	39.2***	40.5***	16.2
Early childhood			
Classes	22.8	15.5	19.2
CDA	31.6	40.5	31.3
Noncredit bearing classes	6.3	3.5	33.3***
Age	38.09	39.25	42.9*
Urban city			
Detroit	25.0	23.5	21.4
Flint	27.5	28.2	34.9
Grand Rapids	13.8	16.5	19.9
Lansing	33.7	31.8	23.8

Note. CDA = Child Development Associate; PD = professional development.
*$p \le .05$. **$p \le .01$. ***$p \le .001$.

Language and literacy course. Working collaboratively with faculty partners at the four community colleges, we developed a three-credit course in early language and literacy. The course was designed to provide students with content knowledge considered by experts to be essential for quality early language and literacy practice.

Course content was based on a set of core competencies that reflected accreditation standards from the NAEYC, the International Reading Association, and the state licensing requirements (see Appendix A). These core competencies were aligned to measures of quality early childhood practices including the Early Childhood Environmental Rating Scale (Harms, Clifford, & Cryer, 1998), the Family Day Care Rating Scale (Harms, Cryer, &

541

Clifford, 2007), and the Early Language and Literacy Classroom Observation (ELLCO; Smith & Dickinson, 2002). For each core competency, the research base and instructional strategies were identified.

A course syllabus was developed to align with these core competencies. All lectures and assignments were taken from the seventh edition of the text *Early Childhood Experiences in Language Arts* (Machado, 2003). Specifically, the course focused on developing providers' knowledge in the following areas: oral language comprehension, phonological awareness, letter knowledge and the alphabetic principle, print convention, strategies for working with second-language learners, literacy assessments, parental role in early language and literacy development, and linkages between literacy and other aspects of the curriculum.

Two weeks were devoted to each of these topics, focusing on strategies to enhance effective practices for preschoolers. Each class used a lecture format to present the week's topic, followed by simulation and hands-on activities designed to link theory to practice. Instructors used videotape examples frequently in class to augment instruction and to demonstrate examples of quality practices.

Assignments required teachers to use course content in their instructional practice and to reflect on their effectiveness. For example, teachers were asked to record themselves engaging with one or two children in a storybook reading situation and to reflect on the children's responses to the story, their interests, and their uses of sophisticated vocabulary. Similarly, another assignment asked teachers to encourage a child or children to write a story "their way" and to examine the products for evidence of developmental writing. These assignments were then used in class discussions to help instructors create linkages between their understanding of child development, early literacy development, and their current practices with children.

The courses were taught by experienced early childhood faculty who also served as coordinators for each of the four community colleges. Instructors covered the topics in weekly 3-hour classes over the 15-week period. Class size varied between 18 and 25 students, with two of the colleges having two sections each.

Given that the four sites were widely dispersed across the state, we used several indirect methods to determine fidelity of instructional implementation. First, attendance was taken at all sites to ensure that students participated in at least 13 to 15 sessions. (Given that T.E.A.C.H. stipends were dependent on attendance and completion of the course, there was high attendance throughout sessions—overall attrition was less than 2%.) Second, biweekly discussions with instructors were conducted to ensure that the pacing of content and materials was maintained throughout the course. Third, two unannounced observations by a research assistant were conducted in each class and reported high fidelity to the course syllabus. Fourth, instructors were required to send us products from the same four specified assignments (related to reading, writing, oral language, and play) in each class to indicate that students had participated and completed work in these areas.

542

And, fifth, evidence from student grades, reviewed by coordinators, indicated that they had completed the course requirements according to the guidelines on the syllabus.

Coaching intervention. We employed a diagnostic or prescriptive model of coaching that focused on helping participants apply research-based strategies to improve child outcomes in language and literacy. Based on a review of the literature (Koh & Neuman, 2006), the model was designed to include the following elements:

- On site: Successful coaches meet teachers ”where they are”—in their own practice settings to help providers learn through modeling and demonstrating practices (Poglinco & Bach, 2004).
- Balanced and sustained: Coaches involve teachers in ongoing continuing education rather than just a temporary infusion or a rapid-fire string of professional development activities (Darling-Hammond, 1997; Guiney, 2001; Speck, 2002).
- Facilitative of reflection: Effective coaches observe, listen, and support instructional practices that improve child outcomes; they do not dictate ”the right answer” (Guiney, 2001; Harwell-Kee, 1999).
- Highly interactive: Coaches establish rapport, build trust, and engender mutual respect among practitioners and interact extensively to benefit children's outcomes (Herll & O'Drobinak, 2004).
- Corrective Feedback: Coaches provide descriptive, not evaluative or judgmental, feedback based on observable events in settings to enable practitioners to engage in collaborative problem solving for improving practice (Gallacher, 1997; Schreiber, 1990).
- Prioritizes: Coaches assist teachers in identifying priorities and developing action plans for improving children's language and literacy practices (Herll & O'Drobinak, 2004).

Based on these practices, we developed a coaching model that focused on the following cycle: Coaches engaged teachers in reflection and goal setting; the coaches helped to identify desired outcomes and strategies to achieve these outcomes; collaboratively, they developed an action plan for the implementation of new practices the following week, which became the source of further reflection and action.

Sessions were weekly, one on one, and on site, for approximately 1 to 1-1/2 hours. Coaching sessions for the first 15 weeks were designed to align with the professional development course. Based on the topic of oral language development, for example, coaches were encouraged to demonstrate how to ask open-ended questions, elicit discussions, and group children in ways that could support greater interaction in activities like book reading. Similarly, coaches helped providers to use their in-class assignments such as developmental writing to better understand children's written products.

Weekly debriefing meetings with the instructional coordinator at each college helped to build important linkages between the professional development in school and the professional development in practice. Once the class was completed, coaches continued throughout the academic year for

543

an additional 17 weeks, drawing on the material from the class and engaging providers in instructional efforts to implement best practices for a total of 32 sessions. Weekly debriefing meetings continued throughout the year to support the coach's efforts and to help sustain the changes in teachers' instructional practices.

Instrumentation

Based on our theoretical model of teacher development, we assumed that content-knowledge expertise in early language and literacy aligned with practice-sensitive professional development might represent the most powerful approach for transforming teachers' knowledge and instructional practices. To our knowledge, however, previous research has not measured increases in teachers' content knowledge in early language and literacy, nor have there been direct linkages between the content of professional development and specific instructional practices. To better understand these relationships, therefore, it was necessary to construct instruments, which we detail below.

Teacher Knowledge Assessment of Early
Language and Literacy Development

We constructed a multiple-choice, true-false assessment to examine participants' growth in knowledge of early language and literacy. Recognizing that high-quality early language and literacy instruction must rest on sound child-development principles, 45 of the items tapped the eight core competencies (language and literacy), and 22 tapped foundational knowledge in child development (based on NAEYC standards). Two forms of the assessment were developed for pre- and posttest purposes, with an average completion time of 45 minutes.

Items were designed to assess knowledge encountered in the work or practice of teaching language and literacy. Our effort was to place the focus on identifying the knowledge that teachers would *use* in practice. Grounding examples in activities that might occur in center- and home-based care settings, we developed items to tap the type of content knowledge most likely associated with successful early literacy practices (Phelps & Shilling, 2004). For example, this might entail the knowledge of how to help a child learn the letters of her name or how to construct a play setting that could support language and literacy development. Sample items and item types are presented in Appendix B.

This assessment was reviewed by several experts in the field of early literacy to ensure that the content was accurate and research based. Each community-college instructor reviewed the assessment for content validity and alignment with the course syllabus. On the basis of their comments, revisions were made. The Teacher Knowledge Assessment of Early Language and Literacy Development was then administered to 302 second-year early childhood students. Results from this pilot were analyzed using item analysis to

544

identify the best items for further analysis and inclusion in the assessment of teacher knowledge. Final forms of the assessment were administered in the spring. Results indicated excellent overall reliability (Cronbach's alpha = .96). These results indicated that the assessment worked well to define a corpus of early language and literacy knowledge that could accurately be assessed by this instrument.

Teacher Practice

We used two measures to assess the quality of language and literacy practices in center-based and home-based care settings: The ELLCO (Smith & Dickinson, 2002) and the Child/Home Early Language and Literacy Observation (CHELLO; Neuman, Dwyer, & Koh, 2007), which was specially developed to measure home-based practices. Both measures were based on the theoretical assumptions of ecological psychology (Bronfenbrenner, 1979), which attribute children's learning to the influences of the physical and the instructional supports in their environments.

ELLCO. The ELLCO is composed of three interdependent research tools: the Literacy Environment Checklist, the Classroom Observation and Teacher Interview, and the Literacy Activities Rating Scale. The ELLCO is designed to measure the language and literacy environment for learning in center-based classrooms. The Literacy Environment Checklist, for example, assesses the visibility of such literacy-related materials as books, alphabet, word cards, teacher dictation, alphabet puzzles, and writing implements. The Observational Ratings span activities including reading aloud, writing, assessments, presence, or absence of technology, which are examined along a rubric from 1 (*deficient*) to 5 (*exemplary*). The Literacy Activities Rating Scale summarizes information on the nature and duration of literacy activities such as book reading and writing during the observation period. Reliability of the instrument for all three components of the toolkit, as measured by Cronbach's alpha for the entire scale, is .90 (Smith & Dickinson, 2002).

CHELLO. Designed to assess many of the same environmental characteristics as the ELLCO, the CHELLO examines language and literacy practices specific to the contextual features of family and home-based child-care settings (Neuman, Dwyer, & Koh, 2007). The CHELLO is composed of two interdependent research tools: the Literacy Environment Checklist and the Observation and Provider Interview. The Literacy Checklist measures the presence or absence of 22 items in the environment, including the accessibility of books, writing materials, and displays of children's work. The Observation and Provider Interview focuses on the psychological supports in the educational environment, including teacher-child interactions in storybook reading, vocabulary development, and play. Similar to the ELLCO, the CHELLO uses a rubric ranging from 1 (*deficient*) to 5 (*exemplary*).

Psychometric properties show good internal consistency, with a Cronbach's alpha of .82 for the checklist and .91 for the observation.

Designed to focus on the unique characteristics of each environment (e.g., center and home), the toolkits share complementary features. For the Literacy Environment Checklist in both tools, items are used to rate settings for the presence or absence of literacy-related materials, using a yes/no response format (e.g., is an area set aside for books?). For example, the Books subscale is the summed score of items that describe the area, book condition, and book use (ELLCO = 12; CHELLO = 10). Similarly, the Writing subscale is the summed score of items that describe the use and accessibility of writing tools (ELLCO = 12; CHELLO = 6). The overall checklist is the sum of both subscales. For the current study, alphas ranged between .73, for the ELLCO, and .84, for the CHELLO, indicating acceptable internal consistency for these measures.

For the Classroom Observation and Teacher interview, the dimensions are conceptually clustered into three subscales, Physical Environment for Learning, Support for Learning, and Teaching Strategies. Reliability analyses conducted in the current study and on the CHELLO of 123 classrooms serving low-income children (Neuman, Dwyer, & Koh, 2007) provide support for these subscales. Cronbach's alphas ranged from .76 to .93, reflecting good internal consistency.

The Physical Environment for Learning subscale captures the extent to which the environment supports children's learning. For both the ELLCO and the CHELLO, it examines the organization of the environment, accessibility of materials, and daily routines that provide both structure and choice. These design features, in addition to the use of time, space, and resources, are known to relate to children's engagement in language and literacy behaviors (Roskos & Neuman, 2001).

The Support for Learning subscale examines the relationship between the provider and the child(ren) and the quality of interactions. For the ELLCO, it includes the classroom climate, classroom-management strategies, and opportunity for child choice and independent explorations; for the CHELLO, observational rating includes adult affect, adult-child interactions, and adult control behaviors, recognizing the important linkages between children's emotional security and cognitive activity. Close emotional attachments between caregivers and children have been shown to strongly influence social and cognitive development, language, and literacy (Miles & Stipek, 2006).

The Teaching Strategies subscale measures the extent to which providers make use of effective instructional and support strategies to enhance children's language and literacy development. In the ELLCO, it includes eight features of teaching: oral language facilitation, presence of books, approaches to book reading, approaches to children's writing, approaches to curriculum integration, recognizing diversity in the classroom,

546

facilitating home support for learning, and approaches to assessment. In the CHELLO, it examines seven features of teaching: vocabulary building, responsive strategies, uses of print, storybook or storytelling activities, writing activities, progress monitoring, and family support and interactions.

Each item is rated using a 5-point scale with anchor descriptions at 1, 3, and 5. Each subscale score is calculated by averaging scores across each item in the subscale. The total score is the average of the three subscales.

Both instruments require trained certified observers (i.e., with an average of 8 hours of training), knowledgeable in early childhood education and early literacy development. Scores are derived after visits during planned activity or instructional time, with a brief follow-up interview with the teacher. Average observation times for both instruments lasts between 1-1/2 and 2 hours. While CHELLO is a more recent addition to a corpus of environmental tools (e.g., Early Childhood Environmental Rating Scale; Harms, Clifford, & Cryer, 2004), ELLCO has been used substantially in Early Reading First programs to provide information about the quality of environmental support for children's language and literacy development.

Although both the ELLCO and the CHELLO were designed as independent measures of the quality of language and literacy practices, they share a common set of 16 items. Five items evaluate the book area; four items, the writing area on the checklist; and seven items, adult teaching strategies on the observation. By examining this subset of items (across all sections of the tool), we were able to make comparisons and contrasts of language and literacy practice outcomes across these different educational settings, as well as to measure changes over time in these environments. Correlations between these shared items and the overall ELLCO and CHELLO toolkits were high (r = .91 and .92, respectively).

Procedures

Prior to the Intervention

Prior to the start of the intervention, teachers in all three groups were administered the Teacher Knowledge Assessment of Early Language and Literacy Development. To provide easy access, the assessment was placed on the Web; participants were assigned unique identifier codes, and the information was immediately collected and coded into a database.

During the same period, observations were conducted of each center or home-based center by trained research assistants using the ELLCO or the CHELLO. To establish interrater reliability, observers independently rated 30 centers and home-based settings in pairs. Cohen's kappa statistic (Cohen, 1960, 1968) was used to calculate reliability. Weighted kappas for the ELLCO and the CHELLO were .64 and .60, respectively. Landis and Koch (1977) suggest that kappa values from .41 to .60 are moderate and that values above .60 are substantial. Consequently, the kappa values indicated an acceptable level of interrater reliability. Once interreliability was established, individual

observers conducted all other observations. Average observation was 1-1/2 to 2 hours in length.

During the Intervention

Professional development coursework. Starting in September, participants in Groups 1 and 2, receiving professional development, attended the community college closest to them in proximity for the 15-week, 3-hour early language and literacy course.

Coaching. Fourteen coaches were recruited, hired, and supervised by community colleges. To be eligible, coaches needed to have a bachelor's degree in early childhood, experience working with adults, previous early childhood teaching in the priority urban area, and knowledge of research-based early language and literacy practices. All coaches were female; 10 were Caucasian, and 4, African American. All had significant teaching experience (ranging from 10 to 25 years) in child-care settings. Twelve had earned a specialized credential in early childhood. All coaches had taken a previous course in early literacy development. Two of the coaches had prior experiences mentoring adults; however, the majority of coaches did not. Nevertheless, all of them were seasoned professionals, with an average of 15 years of work experience in early childhood.

Prior to the coaching intervention, a 2-day coaching institute was held, providing an orientation and training to coaches. Course syllabi were discussed and distributed to coaches. Alignment between the course topic and the coaching activity for each week was discussed, along with specific, key, research-based practices that would be highlighted throughout the course. Social etiquette was emphasized, reminding coaches that they were neither a friend nor a supervisor but a professional "guest" in the setting. Coaches role-played specific scenarios and brainstormed solutions to common problems. Finally, we described specific procedures to be used throughout the study.

Based on geographic locations, coaches were randomly assigned to participants in both center- and home-based settings. Participants were called and informed that they would receive weekly coaching for the year. Although several providers were somewhat reluctant at first, all agreed to participate in coaching. The coaches began their weekly visits 2 weeks after the course had begun.

A number of common procedures were implemented to ensure fidelity of coaching across all four community colleges. For example, to maintain fidelity to the coaching model, coaches were required keep a log of their visits and to document their daily progress with practitioners using a reflection form. On this form, they were asked to specify the language and literacy content area(s) being addressed, the goals set, and the strategies and action plans for completing next steps.

These reflection sheets were collected each week at their debriefing meetings with supervisors at the community colleges. These debriefing sessions

gave coaches opportunities to review their notes with others and to share experiences and resources with each other. They also served as an account-ability mechanism to us, providing information on any missed or rescheduled sessions, as well as the number of hours they worked.

We also made two unannounced visits to coaches throughout the year. Detailed observations from these visits in center-based and home-based set-tings provided us with a rich set of observations on the quality of the coach-ing sessions and the interactions among the coach, caregiver, children, and occasional parent volunteers (for discussion of the qualitative data, see Cunningham, 2007).

Postintervention. Following the 15-week course, participants in all three groups took an equivalent form of the Teacher Knowledge Assessment in Language and Literacy Development. Group 1, professional development only, continued taking a course at the local community college (i.e., each provider was required to take 6-credit hours to receive their T.E.A.C.H. scholarship and stipend); Group 2, professional development plus coaching, continued to receive coaching; and Group 3, control, continued business as usual.

Observations were once again conducted in all centers and homes using the ELLCO and the CHELLO environmental instruments. The final *N* included 291 teachers (177 centers; 114 home-based centers), representing an overall attrition rate of 4.3%, due to reassignments, end of employment, or other unspecified personal reasons.

Results

In this section, we first address the effects of professional development on teachers' knowledge of early language and literacy development. Second, we examine differences in posttest language and literacy practices across the two professional development groups and the control group. Finally, using items shared in both measures, we look at treatment effects across the entire sample of centers and home-care settings.

To test our hypotheses, we began by conducting descriptive analyses to examine the distributional properties of the data and to determine the equiv-alency of the treatment and control groups prior to further analysis. Our analyses indicated that scores on the pretests of the teacher knowledge mea-sure and the environmental assessments (ELLCO/CHELLO) approximated normal distributions. Prior to the intervention, we then conducted two-way analyses of variance (ANOVA), with treatment (3 levels) and setting (2 lev-els) as independent variables, to examine whether there were differences between groups on initial outcome measures, including teacher knowledge and the shared language and literacy practices in homes and centers. We also examined the equivalence between groups on language and literacy quality practices using one-way ANOVA with treatment as the independent variable on initial quality rating scores for homes (e.g., CHELLO) and centers (e.g.,

**Descriptive Statistics on Teacher Knowledge Assessment of Early Language
and Literacy: Pre- and Posttest Scores for Entire Sample**

	n	Pretest		Posttest		Effect Size (Cohen's *d*; T × C)
		M	*SD*	*M*	*SD*	
Group 1: PD only						
Home based	27	51.9	10.66	58.7	11.64	−.10
Center based	53	58.3	12.41	64.2	11.81	.09
Group 2: PD + coaching						
Home based	32	55.9	10.66	61.7	8.87	.20
Center based	53	58.9	12.41	63.4	10.52	.03
Group 3: Control						
Home based	55	56.2	9.39	59.8	10.00	
Center based	71	59.9	11.40	63.1	11.07	
Total	291	57.5	11.40	62.1	10.86	

Note. T = treatment; C = control; PD = professional development.

ELLCO). As described in the analyses below, there were no significant differences between groups.

We used the analysis of covariance (ANCOVA), a general linear model, to examine the impact of the intervention. Since classrooms were not nested within centers, and centers were widely dispersed across four major urban areas, it was not appropriate for multilevel analysis or hierarchical linear modeling, which is used with nested data. Rather, in these data, the center in many areas *was* the classroom, and the home-based center constituted the educational setting in which the teacher (provider) engaged with children.

We entered the corresponding pretest score as a covariate on each of the outcome measures to control for any differences between the treatment and the comparison teachers at the beginning of the year. For questions that addressed the entire sample, we used two-way ANCOVA, with treatment and setting as independent factors. For questions that addressed one particular setting (e.g., home-based center), we used one-way ANCOVA, with treatment as the independent variable, to determine if there were significant differences between the two treatments and the control teachers on the quality of language and literacy practices, the outcome measures. We then conducted post hoc analyses using Tukey's honestly significant difference (HSD) test to examine the statistically significant differences among the three groups.

Teacher Knowledge

Table 2 reports pre- and posttests scores on the Teacher Knowledge Assessment of Early Language and Literacy Development for center- and

550

home-based teachers. Standard scores on the pretest, ranging from 0 to 100, showed that on average, providers clearly demonstrated prior knowledge of key concepts in early literacy prior to taking the course.

A two-way ANOVA, with treatment and setting as independent variables, revealed that pretest scores in all groups were significantly higher for center-based teachers than those in home-based settings, $F(5, 285) = 10.02$, $p < .01$. Nevertheless, there were no significant pretest differences between treatment conditions, nor were there interactions of treatment and setting.

Following the professional development course, however, posttest scores showed only modest increases. On average, scores increased by about 5 points in the treatment groups for the center-based teachers and slightly higher by about 6 points for the home-based teachers compared with the control group. To examine for possible group differences in posttest scores, we conducted a two-way ANCOVA. Since teacher's education level differed by treatment group, teachers' education was entered into the two-way ANCOVA along with the pretest score to adjust for prior educational background and prior knowledge. Although the pretest scores were significant, $F(1, 283) = 179.32$, $p < .001$, educational background was not, $F(1, 283) = .03$, $p = $ n.s.; therefore, pretest scores were included as the covariate in the analyses of posttest scores. The 3 (treatment) by 2 (setting) ANCOVA, accounting for pretest scores only as a covariate, indicated no significant differences between groups on posttest scores, $F(6, 284) = 1.62$, $p = $ n.s. Furthermore, there were no significant interactions between treatment and setting, $F(2, 284) = .21$, $p = $ n.s.

These results indicated that neither treatment condition significantly outperformed the control group on posttest knowledge scores. Furthermore, scores at posttest were essentially equivalent for participants in both treatment groups, indicating that the addition of coaching did not appear to lead to significant differences in teacher knowledge. These results also revealed that although center-based teachers had slightly higher scores at posttest than home-based teachers, differences between groups were not significant.

Teacher Practice

Next, we examined the impact of professional development on early literacy practices in center- and home-based settings. To do so, we first examined center-based practices as measured by the ELLCO. We then conducted a comparable analysis in the home-based settings as measured by the CHELLO. Finally, we compared treatment effects for quality practices across the entire sample of center-based and home-based care using a subset of items common to both instruments. Given that the large majority of the very poorest children have traditionally relied on home-based care (KIDS COUNT Data Book, 2005), quality improvements in practice might be especially important for enhancing school-readiness skills.

Table 3 presents descriptive pre- and posttest scores for center-based care settings. Although scores were slightly lower for the control-group classes prior

551

Table 3

Means and Standard Deviations on the Early Language and Literacy Classroom Observation for Teachers in Center-Based Care Settings

Group	n	Books Pre M	SD	Books Post M	SD	Writing Pre M	SD	Writing Post M	SD	Physical Environment Pre M	SD	Physical Environment Post M	SD	Support for Learning Pre M	SD	Support for Learning Post M	SD	Teaching Strategies Pre M	SD	Teaching Strategies Post M	SD	Overall Effect Size (T × C; Cohen's d)
Group 1: PD only	53	10.29	3.89	10.39_a	3.42	10.61	1.60	11.39_a	1.50	18.63	4.04	17.10_a	4.81	25.98	5.85	26.76_a	5.75	100.93	23.77	104.60_a	19.41	.23
Group 2: PD + coaching	53	10.73	3.60	$12.42_{b,c}$	4.56	11.00	1.60	$14.18_{b,c}$	0.95	17.87	4.96	$19.56_{b,c}$	4.67	26.08	5.62	28.08_c	5.59	101.46	23.83	112.55_c	27.01	.77
Group 3: Control	71	10.22	3.54	9.83_a	3.07	9.62	1.15	10.39_a	1.24	17.69	3.95	17.10_a	4.99	25.77	4.70	24.41_a	6.94	95.67	18.99	96.64_a	27.01	

Note. T = treatment; C = control; PD = professional development. Means in the same column having the same subscript are not significantly different at $p < .01$ in the Tukey comparison. Means having a subscript b indicate significant differences between Groups 1 and 2; a subscript c indicates significant differences between Groups 2 and 3.

to treatment, a one-way ANOVA indicated no statistically significant differences between groups prior to treatment. Using the pretest score as a covariate, we then entered our main predictor variable, treatment, into an ANCOVA, adjusting for pretest differences, to examine outcomes in the quality of the language and early literacy environment; specifically, the dependent variables related to structural quality (e.g., books, writing, and physical environment) and process quality (supports for learning and teaching strategies). Looking at both these structural and process characteristics of the environment, our analysis revealed a similar pattern, confirming our hypotheses: Teachers who received the professional development course and coaching scored significantly higher at posttest on the quality of their early language and literacy practices. These differences included quality improvements in the Book area, $F(2, 173) = 6.02$, $p < .01$; in the Writing area, $F(2, 173) = 12.63$, $p < .001$; and in the Physical Environment, $F(2, 173) = 4.60$, $p < .01$, as well as in Support for Learning, $F(2, 173) = 4.60$, $p < .01$, and in Teaching Strategies, $F(2, 173) = 6.20$, $p < .01$. In all cases, Tukey post hoc analyses indicated statistically significant differences between those who received professional development *plus* coaching and those who received professional development alone or the control group. There were no significant differences between Group 1, professional development alone, and the control group. According to Cohen (1988), an effect size of +.25 or more is considered an educationally meaningful difference. The effect size using Cohen's *d* was substantial for coursework plus coaching (Group 2) compared with the control group (Group 3) at .77; whereas the effect size for Group 1, coursework alone, was considered not educationally meaningful at .23.

As shown in the descriptive statistics in Table 4, a similar pattern was reported for home-based care. Although the control group's pretest language and literacy practices were slightly higher prior to treatment, the three groups were statistically equivalent before the intervention, $F(2, 111) = .888$, $p =$ n.s. Using these prepractice scores as a covariate, we conducted a one-way ANCOVA, with treatment as our main predictor, to examine differences in the quality of language and literacy practices at posttest. Our analyses indicated statistically significant differences for the dependent variables including the structural features of the environment—Book area, $F(2, 110) = 8.13$, $p < .001$; Writing area, $F(2, 110) = 5.30$, $p < .01$; and the Physical Environment, $F(2, 110) = 3.84$, $p < .05$; and statistically significant differences for the dependent variables that related to process characteristics including Support for Learning, $F(2, 110) = 4.19$, $p < .01$, and Teaching Strategies, $F(2, 110) = 8.15$, $p < .001$. Post hoc comparisons using Tukey's HSD revealed that participants in home-based settings who received professional development *plus* coaching (Group 2) demonstrated statistically significant higher language and literacy practice scores than others with an overall effect size of .82. There were no significant differences between Group 1, professional development only, and the control group. Once again, professional development course alone appeared to have negligible effects (with an effect size of .01) on posttest

Table 4

Means and Standard Deviations on the Child/Home Language and Literacy Classroom Observation for Teachers in Home-Based Care Settings

Group	n	Books Pre M	SD	Post M	SD	Writing Pre M	SD	Post M	SD	Physical Environment Pre M	SD	Post M	SD	Support for Learning Pre M	SD	Post M	SD	Teaching Strategies Pre M	SD	Post M	SD	Overall Effect Size (T × C; Cohen's d)
Group 1: PD only	32	8.62	2.91	8.67_a	3.65	1.92	1.60	2.81_a	1.50	9.12	2.66	10.01_a	3.60	9.89	2.30	10.45_a	2.41	19.78	5.18	19.92_a	4.96	.01
Group 2: PD + coaching	34	8.41	2.95	$11.10_{b,c}$	2.14	2.41	1.60	$3.86_{b,c}$	0.95	8.74	4.96	$11.07_{b,c}$	4.67	9.80	2.36	$11.78_{b,c}$	2.02	20.36	6.03	$24.06_{b,c}$	5.19	.82
Group 3: Control	45	8.12	3.02	8.37_a	2.86	2.48	1.15	3.05_a	1.24	8.55	2.60	9.18_a	3.03	10.37	2.65	10.68_a	2.44	17.53	5.16	19.94_a	6.31	

Note. T = treatment; C = control; PD = professional development. Means in the same column having the same subscript are not significantly different at $p < .01$ in the Tukey comparison. Means having a subscript b indicate significant differences between Groups 1 and 2; a subscript c indicates significant differences between Groups 2 and 3.

Table 5

**Pre- and Posttest Means and Standard Deviations
for Shared Items by Group**

Group	*n*	Pretest		Posttest	
		M	*SD*	*M*	*SD*
Group 1: PD only					
Home based	27	35.87	9.31	42.43	10.15
Center based	53	43.30	9.93	48.64	7.58
Group 2: PD + coaching					
Home based	32	36.44	9.83	48.87	7.63
Center based	53	45.35	9.42	49.23	7.98
Group 3: Control					
Home based	55	37.70	9.28	41.90	11.21
Center based	71	42.54	6.97	43.34	11.24

Note. PD = professional development.

quality practices in early language and literacy in this setting. These results provided further confirmation of our hypotheses supporting a practice-based approach to professional development.

Finally, using the shared items on language and literacy practices, we examined the treatment's effects across the entire sample—home- and center-based care. Table 5 reports pre- and posttest scores on these shared items.

Prior to treatment, a two-way ANOVA, with treatment and setting as independent factors, indicated no significant differences between groups for treatment on the pretest variable, language and literacy practices, $F(2, 285) =$ .48, $p =$ n.s. However, there was a significant main effect for setting, $F(1, 285) =$ 37.63, $p < .01$, with home-based settings significantly lower at pretest in quality language and literacy practices than center-based settings. Following the intervention, a two-way ANCOVA, with pretest scores as covariates, revealed statistically significant differences for treatment, $F(2, 284) = 9.80$, $p < .001$. There were no significant differences for setting, $F(1, 284) = .02$, $p =$ n.s., and no significant interactions between treatment and setting, $F(2, 284) = 1.72$, $p =$ n.s. Post hoc analyses indicated significant differences between Groups 1 and 2 ($p < .05$) and Groups 2 and 3 ($p < .001$), showing that those who received coursework and coaching were higher in quality those who received coursework alone or no treatment.

Figure 1 illustrates the pre- and posttest quality scores for Group 2—those teachers who received both coursework and coaching. Prior to the intervention, language and literacy practices in home-based settings were substantially lower in quality than center-based practices, confirming previous reports on quality (Fuller, Kagan, Loeb, & Chang, 2004). Following the intervention, the gap between home-based and center-based care for teachers who received professional development coursework plus coaching closed. Strikingly, by the end of the treatment, coached providers in home-based care were essentially
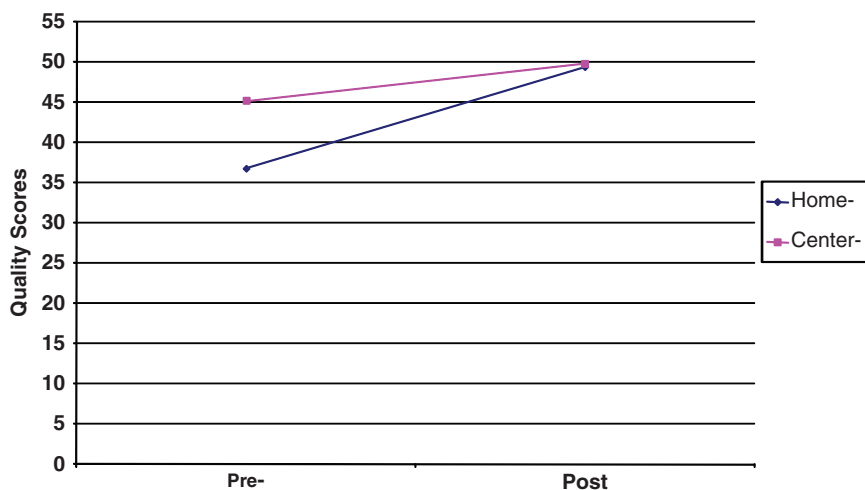
555

Figure 1. **Growth in language and literacy practices for coached providers: Center- and home-based settings.**

equal to center-based care in providing quality language and literacy practices, suggesting that the addition of coaching appeared to particularly benefit home-based teachers in our sample.

Discussion

This study examined how different types of professional development influenced early childhood educators' language and literacy practices. Using coaching as our model of embedding practice in professional development (Joyce & Showers, 1983), we contrasted how coursework alone or coursework plus coaching compared with a control condition might impact improvements in teacher knowledge and quality language and literacy practices in both center- and home-based settings.

The results of our study provided strong evidence that a practice-based model of professional development improved the quality of the structural and process features of the language and literacy environment. Professional development plus coaching seems to matter. Participants who received coursework and coaching demonstrated higher quality practices, after taking into account pretest measures of quality, than their counterparts who received no treatment or course-based professional development only. These findings were consistent across the entire sample, in two very different

556

educational settings. Effect sizes further highlighted the educational benefits. By engaging in practice and reflecting on that practice with a more experienced colleague, teachers appeared to incorporate new physical design features, supports for learning, and teaching strategies into their daily routines.

The effects of the combination of professional development and coaching in home-based care settings were particularly striking. Home-based providers have been traditionally overlooked in professional development activities (KIDS COUNT Data Book, 2005). Previous research on the effects of training in improving family child-care quality has been sparse, and the methodology, fraught with problems such as correlational designs and self-reported outcome measures (Kontos, Howes, & Galinsky, 1996). Although a small number of studies on family care training have shown that frequent coaching visits can be part of successful training (Galinsky, Howes, Kontos, & Shinn, 1994; Kontos, 1992), professional development programs (Fukkink, & Lont, 2007) have traditionally emphasized the classroom component over these more individualized, expensive, and time-consuming approaches. Nevertheless, Kontos and File (1993) have demonstrated that while training based on workshops and classroom sessions increased family care providers' knowledge and awareness, workshops and classroom sessions were not potent mechanisms for behavioral changes in practice.

Our research suggests that future training programs for family child-care providers might do well to change the balance from classroom only to classroom and coaching to influence quality practices. Home providers who received coaching, in fact, demonstrated changes in practice so dramatic as to be essentially on par with quality practices in center-based care. These results also suggest that professional development and coaching can be facilitative in multiple contexts. Given the sheer number of children who attend home-based care (nationally over 1.5 million receive care *exclusively* in home-based day care), these results are particularly heartening for improving quality practice and for providing greater opportunities for children to engage in activities known to support early literacy development.

A more troubling finding throughout our analysis, however, was the lack of change resulting from the professional development course alone. Training in this study was intensive (45 hours, plus outside assignments for the course alone; 64 hours of coaching), especially compared with other training studies that have averaged five or six sessions, with the number of hours varying from 1 to 6 (Fukkink & Lont, 2007). Evidence from this study showed only modest growth in teacher knowledge and very limited application to language and literacy practices. These findings are in contrast to Dickinson and Caswell (2007), who reported significant gains in practice resulting from professional development alone. This failure of replication might be related to the fact that our larger scale intervention was targeted to individual teachers, often isolated in settings, as opposed to Dickinson and Sprague's study in which teachers and supervisors engaged in the professional development together. Furthermore, it may relate to the power relationships between

557

supervisors and teachers and the potential authority that could enable supervisors to mandate changes in teacher classrooms.

It could also be argued that the lack of improvement might relate to the quality of the course or its relevance to the needs and practices of caregivers. Or it could be that our specially designed assessment did not adequately tap gains in knowledge and their application to practice. It might also be that the environmental measures were not sensitive to the types of changes made in the classroom practices. In addition, there could be "sleeper effects"—perhaps changes in knowledge occur not immediately but over time.

Yet there was countervailing evidence to suggest otherwise. The course was specially designed to meet quality standards set by professional organizations, cross-referenced with quality environmental measures, carefully aligned to assessment, and delivered by instructors who were highly qualified and coordinated the early childhood program at their community college. Evaluations across all campuses from participants were consistently high. Feedback and observations of classroom activities revealed active engagement, with discussions and hands-on experiences that were planned and aligned to directly link to knowledge and quality practices.

A more reasonable explanation might have less to do with the quality of the course and more to do with the linkage between theory and practice. While the professional development course may at some later point translate to greater knowledge and practice, it did not appear, alone, to successfully help practitioners develop the pedagogical, curricular, or *practical* knowledge necessary to make changes in context. The conceptual linkages between what was learned and how it could be applied seemed to be missing. This finding is consistent with inquiries on pedagogical content knowledge (Shulman, 1987), or the ability to understand language and literacy for the purposes of teaching it to others. Further study is obviously needed to reach firmer conclusions with regard to the effects of training and coursework for improving quality practices. At the same time, however, it should provide a cautionary note to policy makers who have placed great emphasis on coursework and formal educational attainment or degree programs to improve quality practice. In this respect, our findings are consistent with Early et al. (2006), who found little relationship between an early childhood teacher's degree and classroom quality for young children in most subjects.

Considering the application of our findings to other settings, it is important to recognize that the positive benefits of coaching were integrally tied to the content of the professional development course. Coaches were well advised on the topics participants were learning about. In addition, weekly debriefing meetings with course instructors were designed to maintain alignment between content and practice. Consequently, although coaching has generated a great deal of enthusiasm as a professional tool, whether or not it can or should act as a stand-alone form of professional development clearly remains to be seen. We are currently examining this thesis.

558

Also important to note, our coaching model was intensive and designed to develop relationships with teachers over time. Observations of teacher-coach relationships often demonstrated ways in which coaches would fine-tune their comments and model or demonstrate ideas to meet the needs of their teachers. Coaching involved participants in over 64 hours of individual one-on-one interaction, representing a far cry from what one colleague has called "drive-by coaching"—where a coach might be "available" in a hall or a lunchroom for teacher interaction. Although further research is clearly needed to examine the necessary frequency and intensity of coaching, dilution of effective interventions has traditionally not served either teachers or children well (Neuman, 2007). Jackson et al. (2006), for example, found no benefits of supplementary coaching (4 sessions over a 15-week period) on early childhood practices or its subsequent effect on children's skills.

There is still much work to be conducted regarding the characteristics that enable coaches to be most effective. In her qualitative analysis of practitioners and coaches experiences, Cunningham (2007) highlighted specific factors that seemed to enhance quality of interactions and the ability of coaches to become more diagnostic in their work with teachers. Studies of factors that may contribute to the effectiveness of coaching, subject to empirical manipulation, are vitally important to build a convergent program of research.

This study, therefore, provides evidence that a combination of coaching and course-based professional development improved the quality of language and literacy practices, but there are several noteworthy limitations. For one, the design of the study was quasi-experimental; all teachers volunteered to participate in the study and showed interest in professional development. Those randomly selected to receive coaching were willing to commit the time and energy to participate in an intensive professional development effort. Furthermore, the control group was older and better educated than either of the treatment groups. Although these differences did not appear to represent a serious confound given that both knowledge and practice was similar to the other groups at the outset of the study, still it would have preferable to stratify assignment based on demographic factors. Second, while both treatment groups continued their education in community college as required by their T.E.A.C.H. scholarship, participants in the coaching group in the beginning of the year received a higher dosage of professional development than those in the professional development only group. Although this problem might have been partially offset by other professional commitments related to T.E.A.C.H. (ongoing meetings with the local resource and referral agencies—4Cs), dosage is clearly an issue we intend to address in the future. Third, our findings relate to teachers in child-care settings in poor communities and, therefore, should not be generalized to average or middle- to upper-income centers and homes. Fourth, most of our center- and home-based settings were autonomous institutions, subject to licensure but not to day-to-day bureaucratic management as found in more

559

formal educational settings in schools. Thus, in most cases, teachers were able to act on the advice of their coaches to make changes in their practice. Fifth, our research focused only on the quality language and literacy practices and, therefore, cannot generalize to the overall quality of the environment. And, finally, although the language and literacy practices associated with these measures have been known to be strongly predictive of language and literacy development (Dickinson, Sprague, Sayer, Miller, & Clark, 2001; Neuman, 1999), we cannot determine whether these changes in practices result in improved children's language and literacy skills. It is quite likely that the most potent environmental features (e.g., teacher-child interaction) could be the most resistant to change. We need to be cautious, therefore, when extrapolating from observed changes in the environment to likely changes in children's performance. An investigation is currently underway to examine these relationships.

Policy makers in federal initiatives such as Early Reading First and Good Start, Grow Smart may see relevance in the findings from this study as they seek to develop initiatives for improving the professional development opportunities for early childhood educators. Professional development aimed at developing knowledge in language and literacy was insufficient by itself to change teacher practices. Specifically, for improving early literacy opportunities, this study found that coaching in addition to coursework to be an essential component of an effective professional development intervention. Furthermore, it demonstrated the benefits of an intensive professional development program, emphasizing knowledge and skills *in practice.*

Consequently, if we are to improve children's school-readiness skills—especially those who come from high-poverty circumstances—we will need to ensure that teachers in the very earliest years have a solid foundation in early literacy development and aspects of oral language acquisition as it relates to literacy. Whether new to the profession, or already in the field, teachers in early childhood will need ongoing professional development to make improvements in classroom practices and gain facility using instructional strategies that reflect the latest research. As such, evidence from this study suggests that coaching in addition to coursework may be a promising quality investment for teachers in early childhood education.

Core Competencies for Language and Literacy Course

I. Oral language comprehension

- Recognizes that language skills play a prominent role in early literacy development.
- Recognizes the central contributions of vocabulary, syntax, and discourse skills to children's literacy development.

II. Phonological awareness

- Recognizes the role of phonological awareness in early literacy development.

III. Letter knowledge

- Recognizes the importance of letter knowledge in helping children discover the alphabetic principle.

IV. Print convention

- Recognizes the importance of print convention in helping children to predict, comprehend, retell stories, and recall important information.

V. Strategies for working with second-language learners

- Recognizes that second-language learners have unique language and literacy development needs.
- Identifies features of a supportive learning environment for second-language learners.
- Understands the importance of engaging second-language learners in storybook reading, literacy and play, developmental writing, and small group instruction.

VI. Literacy assessments

- Recognizes the importance of observation, documentation, and other appropriate assessment tools and strategies in early language and literacy.
- Recognizes that language and literacy assessment for young children should occur in a natural setting.

VII. Parental role in language and literacy development

- Recognizes that parents are their children's first early language and literacy teachers.
- Identifies parental involvement activities.
- Recognizes the importance of children's home background.

(continued)

Appendix A (continued)

VIII. Literacy and other aspects of the curriculum

- Understands importance of incorporating literacy activities throughout the curriculum.
- Identifies ways to incorporate literacy activities throughout the curriculum.

Sample Items

2. During group time, Ms. Betty is about to read a book to her 5-year-olds. As she reads, she runs her finger along underneath the text. Why does she do this?

      a. To help children connect sounds and letters.
      b. To keep children's attention.
      c. To help children understand how print works.*
      d. To improve children's letter knowledge.

26. Four-year-old Sarah has drawn a picture. As Sarah tells her about the picture, the teacher writes down her words, and then reads it back to her. This activity promotes literacy development by:

      a. Helping the child learn more about narratives and their structure.
      b. Reinforcing the child's understanding of the parts of a story.
      c. Increasing the child's awareness of the relationship between written and oral language.*
      d. Expanding the child's understanding that there are many ways to write letters.

1. Children's vocabulary in the early years is a strong predictor of their later reading achievement.	True*	False
5. It is more important to have small teacher-child ratios in the toddler years when children are beginning to talk, than in early infancy when children spend most of their time napping.	True	False*

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