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Title: A Course on Supporting Early Language and Literacy Development through Effective Teacher-Child Interactions: Effects on Teacher Beliefs, Knowledge and Practice.

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Abstract Body

Background/context: The National Center for Research on Early Childhood Education's (NCRECE) program of research is a series of experimental studies of specific approaches to training early childhood (EC) educators to be effective in implementation of curriculum and instructional interactions focused on promoting language and literacy skills, two domains that operate as gatekeepers to later achievement. This program builds progressively on research demonstrating that: a) early education promotes early literacy and language largely as a function of effective instructional practices and implementation but enormous variation in such practices undermines the promise of early education; b) effective curricula are not enough to ensure achievement in early childhood; teachers need training to be effective in their approaches to literacy and language skill instruction and interactions with children; and c) the growing demand for early childhood educators places a premium on the value of evidence-based training linked to child performance if expanding programs are to be effective in reducing the achievement gap. This presentation reports the efficacy of a course for EC teachers designed to enhance their use of effective teaching practices. Below, we briefly discuss the context for this work.

By age 5, an unacceptably large number of children in- and near-poverty are lacking in competencies fundamental to their school success (Duncan et al., 2007; Fantuzzo et al., 2007; Raver, 2008). The long-term effects of early gaps in achievement and social functioning are so pronounced that effective and efficient interventions targeting these gaps in the preschool period increasingly are viewed as essential to the developmental success of children as well as the economic and social health of communities (Heckman, 2006; Heckman & Masterov, 2007; Magnusson, Ruhm, & Waldfogel, 2007).

Several factors have contributed to a growing interest in targeting these interventions toward improvements in the quality of teachers' interactions with children. First, there is now compelling empirical evidence that one of the most salient aspects of EC programs' effects on children's development concerns the nature and quality of teachers' interactions with children (Dickinson & Brady, 2006; Howes et al., 2008; Jackson et al., 2006; Mashburn et al., 2008). Research using the Classroom Assessment Scoring System (CLASS: Pianta, LaParo, & Hamre, 2008) documents the ways in which teachers' everyday social and instructional interactions are linked to growth in early literacy, language, math, and social skills (Curby et al., 2009; Mashburn et al., 2008). Second, national data suggest that the average pre-k child is likely to experience teacher-child interactions of mediocre to low quality (LaParo et al., in press; Phillips, Gormley, & Lowenstein, in press; Pianta et al., 2005). Despite the growing empirical base pointing to the need for EC teachers to take an active role in their students' learning, a majority of these teachers approach their work with a belief system that encourages a more passive role.

One particular area for concern is teachers' use of effective interactions during the delivery of literacy and language instruction. EC teachers rarely use effective strategies for explicitly teaching early literacy and language skills (Cunningham, Zibulsky, & Callahan, 2009; Hindman & Wasik, 2008; Justice, et al., 2008), despite evidence that these practices are essential for children at risk of school failure (Farver et al., 2009).

A new generation of controlled evaluations, suggests that intensive professional development supports that directly target improvements in teacher-child interaction can be effective (Bierman et al., 2008; Domitrovich et al., in press; Pianta et al., 2008; Ramey & Ramey, 2008; Raver et al., 2008). Across these recent studies, effect sizes for professional development supports to improve teacher-child interactions and child outcomes are in the low-to-

moderate range (.53 to .97 for teacher behaviors; .15 to .57 for child outcomes), suggesting considerable promise as these interventions are refined and scaled up.

Most of these interventions provide some combination of curriculum and classroom-based coaching or mentoring to teachers (Bierman et al., 2008; Domitrovich et al., in press; Pianta et al., 2008; Raver et al., 2008). Far fewer studies have systematically tested the effects of coursework on teacher-child interactions or child outcomes (see Dickinson & Caswell, 2007; Howes et al., 1998; Kontos et al., 1996 for exceptions). Coursework has several advantages over coaching or mentoring approaches, particularly related to use at scale. Coursework, which can be delivered for cohorts of students, is likely to be considerably less expensive than mentoring, which is typically delivered as a 1-on-1 intervention. Furthermore, effective courses have the potential of being folded into existing systems of higher education, in contrast to mentoring approaches which will remain as add-ons requiring significant resources from programs.

Purpose / objective / research question / focus of study: Based on this research, NCRECE designed a course focused on improving the quality of teachers' interactions with children. The current study examines the efficacy of this 14-week course among a group of 331 early childhood teachers. The treatment is based on a model that providing teachers with new skills and knowledge about effective interactions will result in closer and more responsive teacher-child relationships and more effective instruction. Thus, as the first test of our intervention, we examine the extent to which teachers who participate in the course (compared to a control group) display positive changes in their: a) beliefs emphasizing the central role of the teacher in facilitating children's development of social, literacy, and language skills; b) beliefs about importance of teaching early literacy and language skills; c) knowledge of effective teacher-child interactions; and d) use of effective teacher-child interactions (as observed and coded from videotapes). We then examine the extent to which the effects of this course may be moderated by characteristics of the teacher or program in which s/he works (e.g. teacher education, years teaching experience, type of program, etc).

Setting: The NCRECE course was offered in nine sites across the country: Charlotte, North Carolina; Chicago, Illinois, Columbus, Ohio; Dayton, Ohio; Hartford, Connecticut; Memphis, Tennessee; New York City; Rhode Island; and Stockton, California. Participating teachers worked in a variety of EC programs including Head Start, preschool, and child care.

Population / Participants / Subjects: 331 EC teachers participated in the study. Data are currently available for the first of two cohorts of teachers (n=164); however the final presentation will include data from both cohorts. Teachers in cohort 1 were diverse in terms of their racial/ethnic and educational backgrounds. Among the first (of two) cohorts of teachers, 37% were African-American, 36% were Caucasian, 20% were Hispanic, 5% were Asian, 9% were multiethnic and 3% reported an other ethnicity. The majority of teachers (59%) held at least a Bachelor's degree. Almost one fourth of teachers (23%) reported an Associate's degree as their highest educational attainment and 17% of teacher held less than an AA degree. There were not significant differences in these demographic characteristics between course and control teachers.

Intervention / Program / Practice: The course, entitled *Support of Language and Literacy Development in Preschool Classrooms through Effective Teacher-Child Interactions and Relationships*, was designed to increase teachers' knowledge about the vital role that

teacher-child interactions play in learning and skill acquisition and to build specific skills for observing teacher-student interactions that contribute to language and literacy skills. Because language and early literacy skills are the gatekeepers for later school success, this course also provided teachers with the knowledge they need to implement language and literacy curricula through effective teacher-child interactions. Objectives for the course included: 1) Teachers will describe how teacher-child interactions in early education settings promote language development, social development, and literacy skills; 2) Teachers will describe and identify effective teacher-child interactions consistent with the three domains of the CLASS; 3) Teachers will describe how to implement language and literacy curricula (during child-directed and teacher-directed activities) using effective teacher-child interactions that focus on key areas of language and literacy (Vocabulary, Narrative, Pragmatics, Print Concepts, Alphabet Knowledge, Phonological Awareness). Teachers will describe a rationale for explicitly teaching these areas, identify instructional objectives for each area, and identify specific strategies for teaching these skills; and 4) Teachers will enact effective teaching practices in their classrooms.

The course was delivered in 14, 3-hour long sessions, through collaborations with local colleges and universities in each site. There were between 5 and 15 teachers in each course section. Instructors (n = 15) were provided with instructor manuals which included PowerPoint presentations, videos, and written assignments for each course section. Instructors attended a week-long training and were provided with ongoing implementation support by NCRECE staff. Videotape coding of course sections indicated relatively high levels of implementation fidelity.

Research Design: The study employed a randomized control trial methodology. Teachers within each site were randomly assigned to receive the course or to be in a business as usual control group. The final sample includes 149 course teachers and 182 in the control group.

Data Collection and Analysis: This presentation focuses on data that were collected through teacher report (pre- and post-course) and observations made using videotaped footage of teachers' classrooms. Teachers reported on their beliefs and knowledge regarding effective teacher-child interactions and effective literacy and language instruction and completed a web-based assessment in which they were asked to identify another teachers' use of effective interactions in several video scenarios. Teachers in both conditions sent in four videotapes of their instructional interactions over the course of the semester. Measures included:

Beliefs. The *Beliefs about Intentional Teaching* scale is a 13-item, 5-point Likert scale survey that aims to assess the extent to which teachers believe that children's learning is contingent upon intentional interactions in the classrooms. The *Beliefs about Importance of Specific Skills-MTP L/L Objective Beliefs* asks teachers to report how important literacy and language skills (e.g. maintaining 2 turns in a conversation; identifying the first letter in their name) are to children entering kindergarten.

Knowledge. A 15-item scale which tests a teacher's understanding of and knowledge about the types of interactions with children that lead to positive development (*Teachers' Knowledge of Effective Teacher-Child Interactions-Overall Assessment*). A set of multiple choice items provide a brief classroom scenario, and then ask teachers to choose the best answer from a set of four. *Knowledge about language/literacy skills* was assessed through 12 items in which teachers had to categorize particular skills into one of six language/literacy domains: alphabet knowledge, print concepts, vocabulary and linguistic concepts, pragmatics and social language, narrative skills, and phonological awareness. Scores are computed for percent correct within each of the

six domains.

Teachers' ability to detect effective interactions was assessed by the *Video Assessment of Interactions and Learning (VAIL)*. This measure consists of watching two short videos (2-3 minutes each) and responding to several questions that assess teachers' ability to identify strategies they see other teachers using to facilitate effective interactions. After each video, participants are asked to identify up to 5 *strategies* the teacher is using, as well as *specific, behavioral examples* of each strategy. Teacher responses are then coded for accuracy in relation to a standard identified in the CLASS framework (Hamre & Pianta, 2007). Coders were trained to reliability and protocols that were double coded had exact agreement levels of 82.5%.

Delivery. The use of effective teacher-child interactions was assessed with the *Classroom Assessment Scoring System (CLASS)*. Through our previous work we have refined methods for obtaining video footage from teachers for coding purposes. Teachers used mini-DV cameras to capture weekly observations of their interactions with children. Each videotaping session lasted 30 minutes and included a structured, teacher-led language/literacy activity using guidelines to ensure high quality video footage. The quality of teachers' interactions with children during these videotaped activities will be assessed using the CLASS (Pianta, LaParo, & Hamre, 2008). The CLASS measures 11 dimensions of interactions using 7-point scales: (a) positive climate, (b) negative climate, (c) teacher sensitivity, (d) regard for student perspectives, (e) behavior management, (f) productivity, (g) concept development, (h) instructional learning formats, (i) quality of feedback, (j) language modeling, and (k) literacy focus. Interrater agreement (ratings within 1 point on the 1 to 7 rating scale) for these dimensions ranged from .75 to .92.

Analyses presented below were analysis of covariance in which outcomes were predicted based on group membership (course vs control), controlling for site. In future analyses we will use hierarchical linear models that will account for the random assignment of the teachers to treatment or control groups at the intervention class level. We will estimate a random-effects intercept for each of the treatment classes and the teachers assigned to the control group to account for the sampling of teachers within these groups. In addition, a small number of potential moderators will be added and interacted with treatment to determine whether the treatment might be more effective for some individuals than for others.

Findings / Results: Results below were obtained based on analyses with the first cohort (n=164) of teachers. The final presentation will include similar analyses using the full sample. Furthermore, results presented below provide effect sizes based on differences between groups at post-test. Final analyses will include an examination of effects on belief, knowledge, and practices, as observed through *changes* from pre- to post-intervention.

Teachers who participated in the course displayed more positive beliefs and greater knowledge about effective teacher-child interactions, compared to those in the control condition (effect size range from $d=.34$ to $d=.79$). Tables 1 and 2 provide a summary of these effects. Teachers in the course also were better able to identify effective interactions in videotapes ($d = .45$), than were teachers in the control group. Finally, teachers in the course group were observed to have higher quality instructional interactions than were teachers in the control group (effect size range from $d=.42$ to $d=.77$). Table 3 provides a summary of these effects.

Final analyses will also examine the extent to which these effects on belief, knowledge, and practices may be moderated by teacher characteristics such as education levels and experience.

Conclusions: Despite a clear need for improvement in the quality of EC teachers interactions with children, programs and teachers remain uncertain about how to make systematic changes in the nature and quality of these classroom interactions. In one national survey of teachers (NCES, 1999), only 17% felt very well prepared to interact supportively to meet the diverse needs of students in their classroom. The professional development system built to address this problem has a history of incoherence and ineffectiveness (Ball & Cohen, 1999); in-service teachers pursue learning opportunities on their own (e.g., weekend workshops), pick up advice within informal settings at school (e.g., in the lunchroom), attend district-mandated workshops, and learn from daily experiences with children in the classroom (Wilson & Berne, 1999) without attention to how these experiences are linked to classroom performance. There is virtually no evidence of positive effects for any of the approaches. The findings reported here suggest that the NCRECE coursework, designed to enhance teachers' knowledge about effective teacher-child interactions, is effective at changing teachers' beliefs, knowledge and practices. This work supplements other recent research documenting effective professional development for EC teachers, which has tended to focus on curricular or mentoring programs, by providing evidence of ways in which coursework can enhance effective teaching practice.

The course targeted improvements in teachers' beliefs and knowledge about the importance of purposefully interacting with children to create learning opportunities during both child-directed and teacher-directed activities. Although the types of beliefs and knowledge described by the CLASS Framework are consistent with recent definitions of "developmentally appropriate practice," early childhood teachers often assert beliefs that downplay the role of adults in children's learning (Bredekamp & Copple, 2008). Findings reported here suggest that after taking the course, teachers were more likely to endorse the importance of teachers taking an active role in facilitating children's learning (Hamre et al., 2009). For example, 75% of course teachers strongly agreed with the statement, "Young children learn best when teachers are actively involved in their play," compared to only 57% of the teachers in the control group.

The course was also designed to change teachers' beliefs about the importance of providing explicit instruction in early literacy and language, as well as teachers' knowledge about these practices. In general, EC teachers tend to endorse the importance of systematically and intentionally developing children's language skills, but report more disparate beliefs with regard to the importance of teaching early literacy (Hindman & Wasik, in press). Several recent reports have suggested that these beliefs are amenable to intervention (e.g., Cunningham, Zibulsky, & Callahan, 2009; Dickinson & Caswell, 2007). In this study, teachers in the course condition were more likely to report that specific literacy and language skills were important targets for instruction. For example, 90% of course teachers (compared to 69% on control teachers) reported that it was essential or pretty important for children entering kindergarten to have skills blending syllables into words. They also indicated greater knowledge about these practices. Most importantly, observations indicated that teachers in the course condition used more effective literacy and language instructional practices in their classrooms.

Although there is a substantial literature documenting links between teacher-child interaction and children's social and academic development (e.g., Howes et al., 2008) as well as evidence suggesting that interventions targeting these interactions have impacts on children (e.g. Raver et al., 2009), it will be important for future work to assess the degree to which the changes in teacher beliefs and practices observed in this study may translate into positive child outcomes.

Appendices

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Appendix A. References

References are to be in APA version 6 format.

Appendix B. Tables and Figures

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Table 1. Teachers Post-Course Beliefs about the Importance of Intentional Interactions and Instruction in Literacy and Language

	Course M(SD)	Control M(SD)	Effect Size (Cohen's d)
Intentional Interactions	3.7 (.63)	3.5 (.62)	0.34
Phonological Awareness	3.5 (.63)	3.0 (.79)	0.64
Vocabulary	3.2 (.69)	2.8 (.82)	0.40
Narrative	3.5 (.57)	3.0 (.68)	0.79
Print Concepts	3.5 (.54)	3.1 (.71)	0.63
Pragmatics	3.7 (.45)	3.6 (.55)	0.19
Alphabet Knowledge	3.6 (.55)	3.4 (.65)	0.33

Note. All effect sizes at or above .34 were statistically significant at $p < .05$.

Table 2. Teachers Post-Course Knowledge about Effective Interactions and Instruction in Literacy and Language

	Course M(SD)	Control M(SD)	Effect Size (Cohen's d)
Intentional Interactions	75.7 (15.9)	68.4 (15.0)	0.45
Phonological Awareness	80.0 (30.1)	80.7 (30.2)	0.03
Vocabulary	60.6 (39.1)	49.4 (40.1)	0.29
Narrative	74.1 (30.7)	67.0 (33.1)	0.20
Print Concepts	74.7 (27.5)	59.6 (38.0)	0.41
Pragmatics	74.9 (29.7)	71.0 (35.8)	0.06
Alphabet Knowledge	85.0 (25.1)	73.6 (28.8)	0.38

Note. All effect sizes at or above .38 were statistically significant at $p < .05$.

Table 3. Teachers Post-Course Observed Effective Teacher-Child Interactions (CLASS) in Delivery of Literacy and Language Activities

CLASS Dimension	Course M(SD)	Control M(SD)	Effect Size (Cohen's d)
Positive Climate	5.6 (.78)	5.5 (.83)	0.14
Negative Climate	1.2 (.30)	1.2 (.39)	0
Teacher Sensitivity	4.9 (.74)	4.8 (.80)	0.37
Regard for Student Perspectives	4.3 (.73)	4.0 (.92)	0.18
Behavior Management	5.6 (.77)	5.6 (.75)	0.28
Productivity	6.1 (.58)	6.0 (.62)	0.27
Instructional Learning Formats	4.9 (.55)	4.7 (.75)	0.47
Concept Development	2.9 (.81)	2.3 (.78)	0.76
Quality of Feedback	3.2 (.70)	2.9 (.81)	0.42
Language Modeling	3.2 (.72)	2.8 (.91)	0.51
Literacy Focus	2.3 (.88)	2.1 (.88)	0.25

Note. All effect sizes at or above .42 were statistically significant at $p < .05$.