Abstract Title Page

Title: Variation in Teachers' Instructional Interactions within Two Interventions: Associations with Intervention Responsiveness and Teacher/Classroom Characteristics

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Abstract Body

Background / Context

The long-term effects of well-documented readiness skill gaps are so pronounced that effective and efficient interventions in preschool are viewed as essential for children and the economic health of communities (Heckman, 2006; Magnusson, Ruhm, & Waldfogel, 2007). Controlled studies show that the benefits of preschool are highly dependent on teachers' effectiveness of planned and everyday interactions with young children (Mashburn et al., 2008). Given the clear need for interventions that enhance the effectiveness of early childhood educational offerings in the U.S. (Moorehouse et al., 2008), how to most effectively and efficiently improve the quality and potential impact of teachers' daily interactions with children is a key focus for research.

Over a decade ago, Bredekamp asserted (1996) that the field of early childhood education lacked a research base to document the effectiveness of approaches to producing highly skilled and effective early educators. The National Center for Research in Early Childhood Education's (NCRECE) Course and MyTeachingPartner (MTP) Coaching were developed to fill the gap in effective PD targeted toward improving teacher-child interactions. In both cases, this PD focused on improving the interactions known to support children's development, as identified by the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008). The NCRECE study was intentionally designed to use two distinct professional development approaches, targeted toward the same outcome (improved teacher-student interactions), to examine their unique individual or combined influence on enhancing interactions. As part of the randomized controlled trial, intent to treat results suggest that both the NCRECE Course and the MTP Coaching do change teachers' interactions in ways that support children's development (Hamre et al, in press; Pianta et al., 2011).

Examining the effectiveness of any intervention, however, is only half the picture in considering its potential for impact: understanding variation in implementation – under what conditions and for whom they work - is crucial (Summerfelt, 2003). There is a rich literature that underlines the importance of examining implementation in order to learn more about the factors that may contribute to the success of an effective intervention (Greenberg, Domitrovich, Graczyk, & Zins, 2005). One important aspect of this is participants' responsiveness to the intervention (Berkel et al., 2011), identified by Dane and Schneider (1998) as the level of enthusiasm exerted toward the intervention. Uptake of school-based interventions has also been affected by a number of contextual factors. For example, teachers who are less authoritarian, demonstrate good teaching skills (Rohrbach et al., 2006), or have fewer years of experience (Downer et al., 2009; Rohrbach, 1993) implement at higher rates of quality. Others have suggested that intervention response is influenced by limited resources available (Greenberg et al., 2005) or a stressful and chaotic environment (Fullan and Pomfret, 1977; Gottfredson, 1984). As a natural follow up to the intent to treat findings, then, the current paper takes a close look at how responsive participants were within each intervention, and the extent to which this, along with teacher and classroom characteristics, are associated with change in participants' instructional interactions.

Purpose / Objective / Research Question / Focus of Study

This paper explores variation in teachers' responsiveness during both the Course and MTP Coaching phases of the NCRECE study. Of particular interest is the identification of classroom and teacher factors that may serve as moderators between participants' responsiveness and change in their instructional practice.

Setting

The recruitment process for the NCRECE Professional Development Study targeted large community preschool and Head Start programs across the country with enrollment organized into two cohorts of sites. There were five sites for Cohort 1 starting in the spring of 2008: New York, NY; Hartford, CT; Chicago, IL; Stockton, CA; and Dayton, OH. Five additional sites joined the study in Cohort 2, starting in the spring of 2009: Columbus, OH; Memphis, TN; Charlotte, NC; Providence, RI; and a second set of programs in Chicago, IL.

Population / Participants / Subjects

A total of 433 teachers were recruited into the course phase of the study. Upon consent, they were randomized at the site location level into the course or control group for the first phase of the study so that approximately half of the teachers participated in each group. A total of 405 teachers were recruited into the consultancy phase of the study. Of teachers in the analytic sample, 41% worked in Head Start programs and a significant portion worked in public schools (37%). Teachers were experienced, with an average of 14 years of experience teaching and an average of 16 years of education. Most of the teachers were African American (47%) or White (31%) with a smaller number of Latino (15%), Asian American (4%), and multi-ethnic (4%). The poverty rate among children in the classrooms taught by teachers in the sample was quite high (mean = .88, sd = .21).

Intervention / Program / Practice

The National Center for Research on Early Childhood Education's (NCRECE) Professional Development Study tested the efficacy of two specific approaches to improving everyday teacher-child interactions and instructional interactions focused on promoting language and literacy skills: 1) a semester-long course focused on effective interactions, and 2) the MTP approach to coaching.

NCRECE Course. 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. The course was delivered in 14, three-hour long sessions, through collaborations with local colleges and universities in each site. Instructors were provided with standardized 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, including weekly phone calls from course developers.

MTP Coaching. MTP coaching involves observation-based analysis and feedback enacted through a regular cycle of web-mediated interaction (both synchronous and asynchronous) between a teacher and coach. Every two weeks, teachers videotape their implementation of an instructional activity focused on literacy or language content and send this footage to their coach. The coach edits the tape into three segments that focus on a specific CLASS dimension (e.g., concept development). Video clips and prompts are posted to a secure website where teachers view the videos, read the prompts, and respond in writing. Teachers and coaches then meet by phone to discuss prompts, feedback, and responses, and to problem-solve for future language/literacy activities. An action plan is co-developed, including links to clips of "high quality" exemplars from an MTP Video Library and ideas for alternative interactions to try during the next videotaped language/literacy activity implementation. This MTP coaching cycle is spread over two weeks and repeats continually during the year.

Research Design

As part of a randomized control trial with two planned phases of intervention, teachers were enrolled and assigned randomly to the course or control (business as usual) in the first phase of the study, which lasted roughly one semester (6 months). At the end of the course phase, teachers were re-randomized into the coaching or control conditions (including some replacement teachers new to the study). This second phase of the study lasted for roughly the entire academic year following the course phase.

Data Collection and Analysis

Measures.

Teacher and classroom characteristics. Teachers completed surveys during both the course and the coaching phase, providing information about themselves and the children they teach. Variables used from these surveys included teachers' education, experience, ethnicity, beliefs about children and their emotional state. Classroom characteristics included number of children in the class, percent of minority present, percent of children with IEPs or LEP, and average income to need ratio for the entire class.

Teacher responsiveness. In both the course and the coaching phase, the NCRECE support person working directly with that participant reported on their responsiveness to the intervention. The construct was parallel across the two phases, though the items were specific to the phase. For example, in the NCRECE Course phase, instructors reported on items such as the participant "shared own ideas in class " and the coaches in the MTP phase reported on items such as the participant "shared own ideas in conference". Alphas on scales in both phases were over .8, and items were composited for use in this study.

Quality of teacher-child instructional interactions. The Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2008) was used to code videotapes from teachers' classrooms at the end of the school year. 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. The CLASS served both as an outcome measure and as a focus of the intervention. A principal components analysis typically reveals a three-factor solution: emotional support, classroom organization, and instructional support, with alphas of .81-.89, respectively. CLASS instructional scales predict growth in language and literacy skills in pre-k (Howes et al., 2008; Mashburn et al., 2008) and first grade (Hamre & Pianta, 2005), and the outcome used here.

For collection and coding of practice, all teachers were provided with a digital video camera and digital video cassettes at the teacher training and with detailed documentation and training on how to use the camera. Teachers sent in tapes during the course and coaching phases of the study, each recording 30 minutes of class time focused on literacy and language instruction. Two 15-minute segments were double CLASS coded from each 30-minute DV. From these ratings, cut-offs were established to create a "pre" and "post" phase CLASS score.

Analysis Plan.

To address our research questions, we first examined the partial correlations of each of our classroom/teacher variables with the post-intervention instructional support after controlling for pre-intervention instructional support. These partial correlations therefore represent the association of the classroom/teacher variables with changes in instructional support. Afterwards, we used general linear models to test the interactions between the classroom/teacher variables and a measure of responsiveness to determine whether the classroom/teacher variables

moderated the relation between responsiveness and changes in instructional support.

Findings / Results

Analyses of the partial correlations indicated that, in the course intervention, change in observed instructional support is greater when there are more minority children in the class ($r = .21$, $p = .03$), when teachers have less pre-k experience ($r = -.24$, $p = .02$), and when the teacher is not white ($F[2, 99] = 4.44$, $p = .01$). During the coaching phase, we see an effect for income/need ($r = .23$, $p = .03$), such that greater improvement in instruction support is associated with higher poverty classrooms. Participant responsiveness in the course phase was not related to changes in instructional support ($r = -.07$, $p = .50$), though we do observe a significant influence of responsiveness on changes in instructional support during MTP coaching ($r = .37$, $p < .001$).

The second set of analyses addressed moderation questions, and whether teacher/classroom characteristics may influence the association between responsiveness and change in instructional practice. Within the course intervention, none of the teacher/classroom variables significantly moderated the relation between responsiveness and changes in instructional support (all $p > .05$). Within the coaching intervention, the relation between responsiveness and changes in outcomes is stronger when the teachers have fewer years of pre-k experience ($F[1, 119] = 6.21$, $p = .01$) and when there are more minority children in the classroom ($F[1, 121] = 7.99$, $p = .006$).

Conclusions

The NCRECE Course and MTP coaching intent to treat findings reported elsewhere indicate there are different types of intervention designs that can improve teachers' practice in ways that matter for children's development (Pianta et al., 2011). The current treatment on the treated study takes this work a step further, looking inside main effects of interventions to begin to understand the mechanisms through which change can occur, and for whom. In this case, participants' personal and classroom characteristics as well as their responsiveness to two different types of intervention were considered, and shown to matter in some ways the same, and in some ways different, across the interventions.

Consistent with previous findings (Downer et al, 2009), and across both types of interventions, teachers who have less experience in prek classrooms benefit most from the intervention experiences. This is consistent with other literature on novice teachers, pointing to both their continued need and desire to develop (Darling-Hammond, 2001). Given the persistent concern regarding new teacher quality and retention, tending to the explicit needs of new teachers with interventions known to support effective practice should be a priority.

Although there were several teacher/classroom characteristics that related to change in one intervention phase or the other, the main difference of note is how participants' responsiveness in the MTP Coaching intervention, but not in the NCRECE Course, was associated with improved instructional interactions. Given the personal and interactive nature of coaching, responsiveness by the participant may be more critical to change in their practice then attending a course (Pianta et al., 2011). Further, participant responsiveness to MTP and change in practice was moderated by teacher experience and composition of children in the classroom. This points to a need for professional development opportunities that align with the same intended outputs, but use different learning formats or modalities that work best for the individual learner involved.

Based on these preliminary findings, future work would benefit from examining a more comprehensive look at intervention responsiveness, as well as unexplored teacher/classroom characteristics.

Appendices

Not included in page count.

Appendix A. References

Berkel, C., Mauricio, A., Schoenfelder, E., & Sandler, I. (2011). Putting the pieces together: An integrated model of program implementation, *Prevention Science, 12*(1), 23-33.

Bredekamp, S. (1996). Early childhood education. In J. Sikula, T. Buttery, & E. Guyton (Eds.), *Handbook of research on teacher education* (pp. 323-347). New York: Macmillan.

Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review, 18*, 23–45.

Darling-Hammond, L. (2001). The challenge of staffing our schools. *Educational Leadership, 58*(8), 12-17.

Downer, J., LoCasale-Crouch, J., Hamre, B., & Pianta, R. (2009). Teacher characteristics associated with responsiveness and exposure to consultation and on-line professional development resources. *Early Education & Development*. *20*(3), 431-455.

Fullan, M. & Pomfret, A. (1977) Research on curriculum and instruction implementation. *Review of Educational Research*, *47*, 335–397.

Gottfredson, G. D. (1984). A theory-ridden approach to program evaluation: A method for stimulating researcher-implementer collaboration. *American Psychologist, 39*, 1101–1112.

Greenberg, M. T., Domitrovich, C. E., Graczyk, P. A., & Zins, J. E. (2005). The study of implementation in school-based preventive interventions: Theory, research, and practice. *Promotion of mental health and prevention of mental and behavioral disorders, Volume 3*. DHHS Pub. No. Rockville MD: Substance Abuse and Mental Health Services Administration.

Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first grade classroom make a difference for children at risk of school failure? *Child Development, 76*(5), 949-967.

Hamre, B. K., Pianta, R.C., Burchinal, M., & Downer, J. T., LoCasale-Crouch, J., et al (in press). A course on effective teacher-child interactions: Effects on teacher beliefs, knowledge, and observed practice. *American Educational Research Journal.*

Heckman, J. (2006). Skill formation and the economics of investing in disadvantaged children, *Science*, 312, 1900-1902.

Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., et al (2008). Ready to learn? Children's pre-academic achievement in pre-kindergarten programs. *Early Childhood Research Quarterly, 23*(1), 27-50.

Magnusson, K. A., Ruhm, C., & Waldfogel, J. (2007). Does prekindergarten improve school preparation and performance? *Economics of Education Review, 26*(1), 33-51.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O., Bryant, D., et al (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, *79*(3), 732-749.

Moorehouse, M., Webb, M. B., Wolf, A., & Knitzer, J. (2008). Welcoming and opening remarks. *A working meeting on recent school readiness research: Guiding synthesis of early*

childhood research. Washington, DC: ASPE, OPRE, Abt, and NCCP.
Pianta, R.C., Burchinal, M., & Downer, J. T., Hamre, B. K., LoCasale-Crouch, J., et al (April, 2011). Coaching and coursework focused on teacher-child interactions during language/literacy instruction: Effects on teacher beliefs, knowledge, skills, and practice. *Society for Research in Child Development*. Montreal, Canada.
Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, C., et al (2005). Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions? *Applied Developmental Science, 9*(3),144-159.
Pianta, R. C., La Paro, K. M., Hamre, B. (2008). *The Classroom Assessment Scoring System, Pre-K Version.* Baltimore, MD: Paul H. Brookes.
Pianta, R., Mashburn, A., Downer, J., Hamre, B. & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly*, *23*(4), 431-451.
Rohrbach, L. A., Graham, J. W., & Hansen, W. B. (1993). Diffusion of a school-based substance abuse prevention program: Predictors of program implementation. *Preventive Medicine*, *22*, 237-260.
Rohrbach, L. A., Grana, R., Sussman, S., & Valente, T. W. (2006). Type II translation: Transporting prevention interventions from research to real-world settings. *Evaluation and Health Professions, 29*, 302-333.
Summerfelt, W.T. (2003). Program strength and fidelity to evaluation. *Applied Developmental Science, 7*(2), 55-61.