



# A cross-lag analysis of longitudinal associations between preschool teachers' instructional support identification skills and observed behavior

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## ARTICLE INFO

### Article history:

Received 21 December 2012

Received in revised form

18 November 2013

Accepted 25 November 2013

### Keywords:

Preschool

Knowledge

Behavior

Interactions

Teachers

## ABSTRACT

The present study examined the pattern of association(s) over time between (a) knowledge of and observational skills in identifying teacher–child interactions, and (b) observed behavior in the domain of instructional interaction for 405 preschool teachers enrolled in a professional development study. Teacher's knowledge/observational skills and observed instructional support behaviors with children were assessed in the fall and spring over a two-year period. During this time, the teachers were also randomized into a college course focused on interactions, then re-randomized into a coaching intervention, also focused on instructional interaction. Cross-lagged analyses suggest that prior observed behavior was the stronger predictor of change in both knowledge/observation skills and in later observed behavior, and that both the course and the coaching interventions contributed to improvements in teachers observed instructional support behavior. Mediation analyses of the course effects indicated longer-term impact on observed instructional behavior were through immediate impacts on those same behaviors, whereas long-term impacts on knowledge were through immediate impacts on both observed instructional behavior and knowledge. The results have implications for the design, delivery, and focus of professional development for early childhood educators.

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## 1. Introduction

Because too few children receive access to effective teacher–child interactions in early childhood education programs (LoCasale-Crouch et al., 2007; Phillips, Gormley, & Lowenstein, 2009; Pianta et al., 2005), considerable investments are being made in professional development designed to improve the quality and impact of teaching in early education settings, including statewide quality improvement programs and Head Start's focus on quality improvement (Tout & Maxwell, 2010). Despite evidence that quality improvement should target teachers' classroom behavior, if such efforts are to have an impact on children's learning, the vast majority of professional development opportunities are courses and workshops that most often focus on increasing teacher

knowledge, fostering beliefs and awareness, or to a lesser extent, teacher skills such as observation (Hyson, Horn, & Winton, 2012). In fact, most teacher professional development appears to operate under the assumption that changes in psychological processes, such as knowledge, awareness, or belief, will lead to improved practice in the classroom (Hyson et al., 2012); more rare are courses that focus on training specific skills such as observation (Scott-Little et al., 2011), and only more recently has professional development included a focus on classroom practices in approaches such as coaching. Recent experimental studies report improvements in teachers' classroom practices and interactions from professional development that directly targets behavior, such as coaching or behavioral modeling (Downer, Pianta, Burchinal, et al., 2012; Downer, Pianta, Fan, et al., 2012; Powell, Diamond, & Burchinal, 2012; Raver et al., 2011). The relatively greater impact of practice-targeted approaches than the more typical knowledge and belief-focused professional development raises important questions for the design of professional development and the

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understanding of the processes through which professional development has an impact on practice, one of which is the role of knowledge or belief for changing behavior in the classroom.

We suspect that models of teacher learning and behavior change that assume knowledge (for example as acquired in a college course) is a sufficient condition for changing teachers' classroom behavior are oversimplified, despite the fact that such models at least implicitly underly much of what is presented in most teacher professional development courses and workshops (Hyson et al., 2012). Such models do not account for various pathways and dynamics through which knowledge, beliefs, procedural skills (e.g., observing or identifying effective practice), and actual observed behavior interact over time and may be influenced differentially by professional development inputs (Downer, Jamil, Maier, & Pianta, 2012; Raver, Blair, & Li-Grining, 2012).

In the present study, we examine cross-lagged longitudinal pathways over four occasions across a period of two years between assessments of (a) teachers' knowledge of and skill in identifying interactions, and (b) observed instructional support behaviors. In so doing, we model the dynamics of teachers' development in two broad domains: (a) knowledge and identification skills associated with instructional behavior, and (b) actual observed instructional behavioral change. In this study, we make distinctions among knowledge, skill, and behavior as follows: *Knowledge* refers to information teachers acquire concerning interactions (including information on effects of interactions on development as well as labels and a framework for labeling and understanding interactions); such knowledge can be acquired through reading and assessed through essays or multiple choice items; *Skills*, in the present study, refer to teachers' capacity to correctly and accurately identify specific features of teacher–child interactions from video, using a specific framework. Observation skills can be acquired by repeated practice and feedback watching examples and assessed through actual observation and matching of responses to standards. *Behavior* refers to the actual interactions of teachers with children in classrooms, typically assessed through neutral-party observation.

The present analysis is conducted in the context of a three-phase professional development intervention study, in which the first phase is a college course focused on improving knowledge and skills in observing interactions, the second phase is a coaching model focused on teachers' actual classroom behaviors and interactions, and the third phase is a non-treatment post-intervention year. Teachers were randomized into course and control groups for the first phase and then after the course was completed, they were re-randomized into coaching and control groups for the second phase. Thus, there were four groups reflecting different exposures to treatment(s): course/coaching, course/control, control/coaching, control/control. Because teachers were assessed across two years, we are also able to test the extent to which the college course, which improved knowledge, observation skills, and actual classroom behaviors immediately following the course (Hamre et al., 2012) might also influence teachers' observed behavioral interactions 6–12 months later during the coaching intervention year. Moreover, we tested whether any longer-term impact was a result of its effects on changing teacher knowledge/identification skills or its impacts on teachers' behavior. The results not only have implications for the design of professional development opportunities but also for theoretical models of teachers' acquisition of knowledge and skills related to effective practice.

Nearly every state has a list of standards for early educators that guide their preparation and professional development (Bredenkamp & Goffin, 2012; Hyson et al., 2012). These standards include domains of knowledge (e.g., knowledge about child development, knowledge about working with families), skills teachers are expected to display (e.g., to identify or describe effective practices in literacy instruction), and behaviors that presumably

could or should be enacted in the classroom (e.g., stimulating vocabulary through conversation). For example, the domain of "Knowledge About Human Growth and Development" could include domains of cognitive, social, or physical development, with each one of these areas broken down into more specific knowledge (e.g., "understands pathways of syntactic development" or "understands role of attachment in emotional development"); for these knowledge areas, there may be skills associated with each such as "identifies/observes variation in children's syntax." Similarly, in domains such as "Working with families," one might find specific enacted practices or behaviors such as "plans and implements effective transition plans with parents." These lists, and the knowledge, skills, and behaviors they include, often provide a focus for credentialing and professional development (Bredenkamp & Goffin, 2012; Hyson et al., 2012; Tout & Maxwell, 2010). In this way, knowledge, skill, and behavior create targets for professional preparation and development, and for investments and resources to enhance the quality and impact of the early childhood workforce. In the present study, we provide specific operational definitions of these knowledge, skill, and behavior targets (as described earlier) in reference to teacher–child interactions and assess patterns of intercorrelation across time in the context of two professional development interventions designed to improve these targets.

The vast majority of early childhood teachers are prepared in the United States through degree-granting programs in institutions of higher education; 36,000 early childhood educators are trained each year in higher education (Maxwell, Lim, & Early, 2006). And it would not be unreasonable to assume that a considerable portion of a trainee's credit hours are occupied by coursework that focuses on acquiring an understanding of effective practices – input focused largely on knowledge acquisition, awareness, and attitudes as well as associated skills that could be displayed that demonstrate such knowledge – for example, identifying effective teaching practices on video (Scott-Little et al., 2011). Once in the field, many teachers accumulate credits toward further degrees or credentials through coursework (usually knowledge-focused) or they are exposed to the most common form of in-service training, the ubiquitous one-shot workshop (Hyson et al., 2012), which again is most often focused on knowledge and awareness. Thus, to the extent that most professional development experiences aim to influence classroom practices, this involves a path through increasing teacher knowledge or skills associated with demonstrating knowledge, rather than through a focus on teachers' actual classroom behaviors (Early et al., 2007; National Council on Teacher Quality, 2005).

Perhaps as a result of the lackluster impacts of standard-fare professional development, as well as empirical studies demonstrating the impacts on child outcomes of teachers' actual classroom behavior and interactions (Early et al., 2007), professional development models (mostly in-service and mostly not for higher education credit) slowly are turning to focus on teachers' actual classroom practices and behaviors, approaches that use a variety of behavior change techniques such as coaching, modeling, and rehearsal-practice. In support of this shift, a recent meta-analysis suggests that these forms of specialized training that focus directly on teachers' classroom practice improve both the competency of child-care providers ( $d=0.45$ ,  $SE=0.10$ ) and children's outcomes ( $d=0.55$ ,  $SE=0.30$ ), and that such training is most effective when there is a specific behavioral focus (Fukkink, 2007). As one example of applying this emphasis on skills, the MATCH program, a charter school-based model of teacher preparation, uses repeated drill and practice of a number of high-leverage instructional behaviors in an effort to foster fluency and automaticity of performance. And a behaviorally focused process that involves teachers' guided review of video and feedback on their own classroom behaviors appears especially promising in helping

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