



Unpacking intervention effects: Teacher responsiveness as a mediator of perceived intervention quality and change in teaching practice



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ABSTRACT

Preschool teachers were randomly assigned to participate in two professional development interventions over two phases, both designed to improve their interactions with children: the NCRECE college course ($N = 169$) and MyTeachingPartner video-based coaching ($N = 202$). Using Berkel et al.'s (2011) integrated model of intervention implementation, we examined whether the association between teachers' perception of intervention quality and their improvement in instructional interactions was mediated by their responsiveness to the intervention. We tested the model across both professional development opportunities. Findings indicated that preschool teachers were more responsive to the intervention when they reported higher perceived quality for both the course and coaching. The association between perceived intervention quality and improvement in instructional teaching practice was mediated by teacher responsiveness in the coaching intervention only. Findings indicate that professional development implementers need to focus on how participants perceive interventions and what exactly the key aspects within the interventions are, given the importance of their perspective to what they actually do within interventions that lead to change.

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Growing evidence points to the importance of professional development (PD) specifically focused on improving teachers' interactions with children for enhancing children's developmental and learning outcomes (Bierman, Ni, Greenberg, Blair, &

Domitrovich, 2008; Domitrovich et al., 2009; Hsieh, Hemmeter, MCollum, & Ostrosky, 2009; Pianta Mashburn et al., 2008; Raver et al., 2008). Initial results from a randomized controlled trial conducted by the National Center for Research on Early Childhood Education (NCRECE) found that two different teacher professional development (PD) interventions, a college course and ongoing coaching, changed preschool teachers' emotional, organizational, and instructional interactions in ways that support children's development (Downer et al., 2012; Hamre et al., 2012). This study aimed to better understand teachers' responsiveness in these two different PD interventions and how responsiveness relates to changes in teachers' instructional interactions. Understanding how participants, in this case, teachers, vary in their response to PD

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interventions and how that variation relates to intervention outcomes is crucial to advancing the use of such interventions across large numbers of teachers and settings, and for further refinement of treatments to obtain greater impact on desired outcomes (Irwin & Supplee, 2012; Knoche, Sheridan, Edwards, & Osborn, 2010; Summerfelt, 2003). Specifically, we examined the extent to which variation in teachers' responsiveness to each PD (e.g., sessions attended) was associated with their improvement in instructional interactions. We also examined whether teachers' perception of the PD quality of delivery (e.g., the effectiveness of the instructor/coach) related to their intervention responsiveness. Finally, we directly tested aspects of Berkel, Mauricio, Schoenfelder, & Sandler, (2011) intervention implementation model by examining whether participant responsiveness served as a mediator of the relation between perceived intervention quality and participants' improved instructional interactions.

1. Professional development to improve early childhood teacher–child interactions

Recent work suggests that PD *directly* targeting improvements in preschool teacher-child emotional, organizational, and instructional interactions can be effective in improving these behaviors (Bierman et al., 2008; Clements & Sarama, 2007; Domitrovich et al., 2009; Hsieh et al., 2009; Pianta La Paro et al., 2008; Pianta Mashburn et al., 2008; Raver et al., 2008). Most of these empirically supported PD approaches provide some combination of curriculum training and classroom-based coaching to teachers. Additionally, a few studies have systematically tested the effects of a specific course on teacher-child interactions or child outcomes (Dickinson & Caswell, 2007; Neuman & Cunningham, 2009) with promising results.

Building off this research, the NCRECE course and My Teaching Partner (MTP) coaching interventions were developed to improve preschool teachers' observed teacher-child interactions related to children's school readiness (Burchinal et al., 2008; Hamre, Pianta, Downer, & Mashburn, 2007; Mashburn, Downer, Justice, Hamre, Pianta, 2010; Pianta La Paro et al., 2008; Pianta Mashburn et al., 2008). Specifically, both interventions use the Teaching Through Interactions Framework (TTIF; Hamre et al., 2013), with a focus on teacher-child interactions as measured by the Classroom Assessment Scoring System (Pianta et al., 2008) as the central component on the interventions.

Briefly, the NCRECE interventions are: (a) a semester-long course focused on effective interactions as specified through the TTIF; and (b) the year-long MyTeachingPartner (MTP) approach to coaching focused on improving teacher-child interactions as defined by the TTIF (see Downer et al., 2012 and Hamre et al., 2012 for more information about the interventions and study design). In the NCRECE study, the course was delivered in 14, 3 h-long sessions through collaborations with local colleges and universities. As part of the course, participants learned about the TTIF, completed readings, engaged in analyzing videos of teaching practice and completed homework in which they practiced analyzing others' teaching practice and then reflected on their own. For those receiving MTP coaching, teachers engaged in regular cycles with their coach that included taping their teaching practice, reflecting on specific aspects of their teaching as defined by the TTIF, conferencing with their coach to talk in detail about the shared observations, and then developing a plan of what interactions to focus on for the next coaching cycle. This coaching cycle occurred over a two-week period, though sometimes took closer to three weeks to complete due to teacher and coach schedules. As part of both interventions, teachers also had unlimited access to a website providing video examples of effective preschool teacher-child interactions.

Impacts of the NCRECE course and MTP coaching were evaluated relative to no-intervention controls on multiple outcomes, including teachers' observed instructional interactions as measured by the CLASS. In both cases, preschool teachers who received either the course or MTP coaching demonstrated improvements in observed instructional interactions (Downer et al., 2012; Hamre et al., 2012), though additive benefits of receiving both interventions were not observed. The authors of those studies note several reasons why this might be. Most relevant to the reason for the current study was the finding that, within treatment groups for both interventions, variation in effects was evident. Thus, this study focuses specifically on understanding how teachers might be experiencing the two different interventions differently and if this might account for their change in instructional interactions.

2. Unpacking what happens within interventions

Recent reviews of intervention evaluation studies note the progress made in conducting field-based randomized trials as a primary mechanism for determining impact, but also call for going beyond understanding if an intervention works to the unpacking of "how" and "why" it works (Berkel, Mauricio, Schoenfelder, & Sandler, 2011; Dane & Schneider, 1998; Domitrovich & Greenberg, 2000; Durlak & DuPre, 2008; Irwin & Supplee, 2012). Some of these questions pertain to implementation. Increased attention to implementation stems in part from studies finding mean effect sizes of outcomes at least two to three times higher when implementation with high fidelity is intentionally supported and monitored (Durlak & DuPre, 2008). Additionally, when implementation is not managed as interventions attempt to scale up in the field, decrease in efficacy is evident (Hulleman & Cordray, 2009).

3. Intervention implementation fidelity and the NCRECE interventions

As outlined by Fixsen, Naoom, Blase, Friedman, and Wallace (2005) in their synthesis of the implementation research literature, intervention implementation should ideally pay attention to multiple facets of fidelity. Most implementation research has focused specifically on *fidelity to the model*, which typically involves verifying that key intervention components were delivered as intended (Durlak & DuPre, 2008). Fidelity to the model tends to be assessed in a straightforward manner, often with a checklist that ensures critical elements are provided. The most common approach in the implementation field is to measure fidelity to the model, and fidelity has been consistently linked to improved intervention outcomes (Durlak & DuPre, 2008).

The NCRECE Course and MTP coaching interventions were manualized and implementation was supported by experts in the intervention so they could be delivered with high fidelity across the multiple intervention sites across the country. For example, the NCRECE course instructors and MTP coaches received extensive training from the intervention developers, along with fully detailed implementation materials to address any potential questions or issues that might arise. Additionally, NCRECE course instructors and MTP coaches received individual and group feedback weekly from the intervention team to ensure they were continuing to implement the intervention as intended.

Examination of observer-rated intervention fidelity that occurred throughout intervention implementation indicated that the NCRECE course instructors and MTP coaches provided the interventions with very high fidelity throughout the interventions (LoCasale-Crouch et al., 2011; Pianta et al., 2012). These analyses answer one piece of the implementation puzzle, providing important information on the impact of the supports offered to

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