Article

Teacher Sensemaking in an Early Education Research–Practice Partnership

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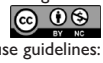

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Abstract

Background/Context: High quality early education, preschool through third grade, has received significant attention as a vehicle for addressing academic disparities. Research–practice partnerships (RPPs) offer a promising strategy for improving early education and closing the gap between research and practice; however, RPPs in the early learning context are understudied, and there is little information about how teachers experience them.

Purpose/Research Questions: Grounded in a framework of sensemaking theory and research on teachers' beliefs and RPPs, this paper addresses the following questions: (1) How did an early education RPP attempt to build a meaningful and trusting partnership and amplify teacher voices? (2) How did teachers make sense of new knowledge within the context of the RPP and their practical wisdom? (3) To what degree were teachers reaffirming existing beliefs vs. questioning or adjusting current beliefs through their participation in the RPP?

Research Design: This paper relies on qualitative data gathered as part of an interdisciplinary education neuroscience longitudinal RPP project between university researchers and educators in a California school district. The data analyzed for this paper included field notes and artifacts from RPP meetings and transcripts of teacher interviews.

Conclusions/Recommendations: The RPP intentionally created opportunities for teachers to amplify their perspectives and interpretations. Within RPP meeting spaces, teachers reflected on their beliefs and practices in light of research conducted in their schools and, more generally, sometimes adjusting and other times reaffirming

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their views. The extent to which teachers incorporated new knowledge into their cognitive schemas varied based on the topic and how and where the information was presented. These findings yield important implications for research–practice partnerships and system change in early childhood education.

Keywords
P-3 education system, early childhood education, teacher sensemaking, research–practice partnerships

Research–practice partnerships (RPPs) offer a promising strategy for closing the gap between research and practice in education and for addressing equity concerns related to student outcomes (Bassok et al., 2021; Henrick et al., 2019). In RPPs, researchers and educators create meaningful, trusting partnerships to address urgent problems of practice (Anderson & Shattuck, 2012; Coburn & Penuel, 2016; Farrell et al., 2021; Penuel & Gallagher, 2017). In contrast to more traditional models of research, RPPs strive for more equitable relationships between researchers and practitioners (Henrick et al., 2017). To realize these goals, RPPs must organize research priorities around educators' concerns (Denner et al., 2019; Farrell et al., 2019). The value of such transformative partnerships is especially notable during "unusually disruptive times such as the COVID-19 pandemic" (Bassok et al., 2021, p. 7).

Studies have typically examined how RPPs support pedagogy and practice in elementary and high school settings (e.g., Cobb et al., 2020; Cohen-Vogel et al., 2016; Marshall et al., 2021; Penuel, Farrell, et al., 2020). Few studies have examined the efficacy of RPPs within early education settings (Brotman et al., 2021; Schindler, et al., 2017). Meanwhile, there is broad consensus that schools fail to meet many young children's needs, often focusing on remediating deficits rather than building on strengths (Morgan et. al., 2019). Children from marginalized groups and those who experience early adversity are at a particular disadvantage (Crosnoe, 2006; Galindo & Fuller, 2010). High quality early childhood education (ECE), defined in this paper as preschool through third grade, has received significant attention in research and policy as a solution to these academic disparities (Ansari & Pianta, 2019; Reynolds et al., 2019). Although participation in early education can have an initial impact on narrowing achievement gaps, disparities often remain after first grade (Reardon & Galindo, 2009), with many children experiencing a widening achievement gap throughout elementary school (Duncan & Magnuson, 2005; Reardon, 2013). Inequities in access to high quality early education are a significant barrier across socioeconomically and culturally diverse populations (Bassok & Galdo, 2016; Meek et al., 2020; Mendez-Smith et al., 2021).

Investments in early childhood education (ECE) have proven to enhance child and family outcomes and have greater economic benefits than educational investments at any other age (Heckman, 2011). These investments also have heightened impacts for

low-income and Hispanic children (Weiland & Yoshikawa, 2013). However, investment in ECE programs alone, despite best intentions, is not enough to achieve equity in educational outcomes (Chaudry et al., 2021). Progress is hampered by a fragmented system characterized by a fractured early education system separating learning in ages 0–5 and early elementary school, as well as teacher isolation (Takanishi & Kaurez, 2008). Given the importance of early education in laying the foundation for students' long-term trajectories, it is important to examine whether RPPs could be impactful in transforming inequitable educational systems.

We are engaged in an RPP in which an interdisciplinary team of university researchers collaborates with educators to understand and improve schooling for children in the early elementary grades. The research is oriented around teachers' pressing questions about children's learning and development across school and home. Teachers have been positioned as active partners throughout the project in order to co-construct a safe and supportive environment for them to reflect on how research may have relevance for their everyday classroom practice. Teachers' deeply held beliefs about learning and development can be both barriers and facilitators of educational innovations designed to improve classroom practice. Although the ultimate goal of RPPs is to make meaningful impacts on the daily experience of young children in classrooms, these transformations cannot occur without understanding how teachers make sense of what they learn within the RPP and how they incorporate that new knowledge and evidence into the existing beliefs that inform their pedagogy. The current study examines these relationships by addressing the following questions:

1. How did an early education RPP attempt to build a meaningful and trusting partnership and amplify teacher voices?
2. How did teachers make sense of new knowledge within the context of the RPP and their practical wisdom?
3. To what degree were teachers reaffirming existing beliefs vs. questioning or adjusting current beliefs through their participation in the RPP?

Literature Review

Three bodies of literature informed this study: (1) research on teachers' beliefs about children's development in the context of ECE, (2) theory and research on teacher sensemaking in the context of reform, and (3) research on RPPs in education.

Teachers' Beliefs and Practices

Teacher classroom practices are the essential component defining high quality early learning environments and the focus of education reforms (Early et al., 2007; Pianta et al., 2017). Teacher practices and sensemaking are often assumed to be driven by professional development and an understanding of learning sciences, where teachers

are cast as professionals making decisions based on evidence, past knowledge, and context to address the individual needs of students (Erickson, 1986). Concurrently, teacher practice and thinking are shaped by beliefs that serve as their "compass" to guide their pedagogical decisions (Isenberg, 1990; Pajaraes, 1992; Vartuli, 2005; Wen et al., 2011) and their interactions with children (Early et al., 2007). These beliefs stem from their past personal experiences with child rearing, education, and cultural values, as well as more proximal experiences with professional development nested in their school context (Garrity & Wishard Guerra, 2015). Many observed classroom practices have been shown to reflect deeply held beliefs about students' cultural/ethnic membership rather than developmental science or research-based practices, further illustrating how beliefs impact practice (Espinosa, 2008; Gutiérrez, 2006).

Teacher beliefs about learning and development have been linked to children's academic achievement (Upadyaya & Eccles, 2015). Although early childhood teachers generally endorse beliefs aligned with developmentally appropriate practice (DAP) (Bredekamp & Copple, 1997), their beliefs and practices are not always congruent (McCarty et al., 2001; Vartuli, 1999). Teacher beliefs and practices are informed by a complex array of factors including the constraints of the classroom setting, state and local policies for child care and education, and teachers' pedagogical training (Ritchie & Gutmann, 2013). Wen and colleagues (2011) found that although most teachers of 3- to 5-year-olds strongly endorsed the National Association for the Education of Young Children (NAEYC) recommended child-initiated learning (e.g., child chooses to explore art materials and makes something of their own imagination), they most commonly engaged in teacher-initiated practices (e.g., teacher selects specific art materials and directs children to create a preconceived image) (Schweinhart, 2016), commonly associated with lower classroom quality (Justice et al., 2008). Teacher work experience and training appears to moderate the relationship between beliefs and observed practices. Teachers with seven or more years of experience demonstrated more congruence between child-initiated learning beliefs and practices, whereas teachers with more professional development experience demonstrated more congruence between teacher-directed learning beliefs and directive teaching behaviors. In another study, Vartuli (1999) found that ECE teachers (preschool to third grade) expressed beliefs that were more developmentally appropriate than were observed in their classroom practices, and teachers' endorsement of developmentally appropriate beliefs and practice decreased as grade levels increased.

Understanding the connection between teachers' beliefs and their pedagogy is essential to understanding variations in and improving quality of classroom practices (Isenburg, 1990). Teachers whose beliefs are more child-centered have routinely been observed to be more responsive to children's social-emotional and cognitive needs (Ansari & Pianta, 2019; Forry et al., 2013; Justice et al., 2008). Interventions focused on improving the quality of classroom practices in ECE have included efforts to help teachers understand the importance of holding child-centered beliefs about early learning as a mechanism to increase the instructional and social-emotional quality of

teachers' classroom practices (Early et al., 2007; Pianta et al., 2017). In an evaluation of the MyTeachingPartner intervention, Pianta and colleagues (2017) found that both coursework focused on DAP and professional coaching had positive impacts on children's language, literacy, and self-regulation skills. Teachers who received a combination of the two demonstrated the greatest improvements in classroom practices.

Ultimately, professional learning experiences must support teachers in collectively developing shared beliefs to guide their everyday classroom practices. We now turn to theory and research on teacher sensemaking to illuminate how teachers both collectively and individually integrate new ideas in the context of their existing belief systems and professional environments.

Teacher Sensemaking

The notion of sensemaking derives from organizational theory and has been applied to studies of education (Weick, 1995). Sensemaking is the interpretive process by which individuals place new information into an existing framework that guides their understanding (Weick, 1995). Sensemaking theory has been applied to studying how teachers make sense of new, sometimes conflicting, ideas in the context of their professional lives and belief systems (Allen & Penuel, 2015). The literature on teacher sensemaking explains how teachers interpret reforms and policies in relation to their prior knowledge and experiences (Bertrand & Marsh, 2015; Coburn, 2001; Coburn & Woulfin, 2012; Datnow & Park, 2009; Spillane et al., 2002). Teachers accumulate practical wisdom in the course of their teaching experiences and their past learning (Huang, 2015; Shulman & Wilson, 2004), and this knowledge shapes how they make sense of new ideas. Studies using a sensemaking framework have been conducted on a range of topics including how teachers make sense of curriculum shifts (Allen & Penuel, 2015; Coburn, 2001; März & Kelchtermans, 2013), student learning data (Bertrand & Marsh, 2015; Goffin et al., 2022), and professional development (Patrick & Joshi, 2019). Teachers make sense of new information in relation to their existing ways of thinking (Coburn, 2001). In constructing these mental models, teachers, like all individuals, may not draw on all available information or may use more than one mental model, even unwittingly (Bertrand & Marsh, 2015). They also make sense of reforms in relation to their current practice and their connections to the new ideas (Coburn, 2005).

Sensemaking is not only a cognitive or individual process; it is social as well (Coburn, 2005; Weick, 1995). Teachers' meaning making about reform occurs both within the social and organizational context in which they work and within the broader sociopolitical context. The broader culture of teaching and norms within a school shape how teachers make sense of reforms (Coburn, 2001). Their immediate contexts, such as their teacher work groups, grade-level teams, or departments, are especially important in shaping teachers' understanding and enactment of new practices (März & Kelchtermans, 2013). Coburn (2001) describes a process of "collective sensemaking"

in which "teachers co-construct understandings of policy messages, make decisions about which messages to pursue in their classrooms, and negotiate the technical and practical details of implementation in conversations with their colleagues" (p. 145). RPPs can function as space for shared collective sensemaking in which researchers and teachers build joint understandings, address local problems of practice, and make sense of research data (Bevan et al., 2017; Marshall et al., 2021; Zuckerman & Wilcox, 2019). In our project, teachers participated as collaborative members of an RPP that involved individual and collective sensemaking about data and information about research-based classroom practices.

Research–Practice Partnerships

Research–practice partnerships (RPPs) are seen as promising in closing the gap between research and practice in the field of education (Coburn et al., 2016; Farrell et al., 2021; Penuel et al., 2015) and in helping ECE deliver on the promise of promoting equity (Bassok et al., 2021). In RPPs, researchers and practitioners work closely over a long period of time around practice-based problems of mutual concern. RPPs take a variety of forms including research alliances, design research partnerships, and networked improvement communities, or a combination (Henrick et al., 2017). Common among RPPs is a focus on gathering data iteratively to inform ongoing activities and "assess incremental impact" (Henrick et al., 2017, p. 12). In fact, early education research is rooted in designs aimed at delivering high quality education while continuously improving through research (e.g., Perry Preschool Project, Abecedarian Project, Chicago Child Parent Centers).

Compared to more typical forms of research, outcomes of RPPs are less effectively measured by traditional research outcomes. Henrick et al. (2017) propose five dimensions upon which RPPs can be assessed. First, RPPs can be examined in the degree to which they build trust and cultivate partnerships. Second, RPPs should be characterized by rigorous research that can inform action. Third, RPPs should assist the partner organization in reaching its goals. Fourth, RPPs should generate knowledge to inform improvement more generally, beyond the bounds of the RPP. Finally, RPPs should build the capacity of those involved to engage in partnership work.

Penuel, Riedy, and colleagues (2020) propose a complementary set of values that are characteristic of RPPs. In contrast to more typical research projects where the problem is defined by researchers, in RPPs the problem definition is a collaborative process involving practitioners. The roles of partners should be clear, and often a structure is built intentionally to bring people together to collectively define problems and find solutions. The research should support the agency of partners, including teachers, whose voices are often not heard, and take into account the unique attributes of the educational settings in which the problems exist. Involvement in the work also needs to be of practical value and contribute to shifting the organizational culture in order to support the use of evidence. Penuel and colleagues also discuss the need for the work to inform others outside the RPP, including with respect to challenges.

Meanwhile, "authentic researcher–practitioner partnerships in community sites are not common," particularly within early education settings (Schindler et. al., 2017, p. 1436). Recent evidence calls for RPPs in ECE settings and increased funding to support such collaborations (McLanahan et al., 2021). ECE RPPs have the potential to guide instructional practice and inform policy (Williford et al., 2021). They can also inspire educator interest and enable effective scaling of early childhood evidence-based interventions (Brotman et al., 2021) to more effectively reduce inequalities (Potter et al., 2021).

We framed this project through a lens of collaboration and mutual inquiry, following many of the above recommendations. With limited existing literature on rigorous ECE RPP collaborations (Goldstein et al., 2019; Schindler, et al., 2017), we hope to advance the field through sharing how the partnership created opportunities for teachers to learn about research on young children's development and learning experiences, as well as how teachers made sense of this information within the context of the RPP and their practical wisdom.

Methods

Context of the Research–Practice Partnership

This paper relies on qualitative data gathered as part of an interdisciplinary education neuroscience longitudinal RPP study between university researchers and educators in a California school district. (See Wishard Guerra et al., 2020, for a detailed overview of the project.) The school district serves approximately 20,000 students from preschool to grade 12. With significant numbers of students from low-income and immigrant families, and English learners, the demographics of the district represent the growing diversity of the state and nation. Table 1 provides demographic details for the six elementary schools in this project. Pseudonyms are used for the purpose of anonymity.

The Research–Practice Partnership. The university and the district have developed a strong partnership lasting more than eight years and originating from a shared commitment to bridge research to practice and promote equity in education. Recognizing that it is difficult to shift students' trajectories after adolescence, the district has prioritized addressing early achievement gaps and is aiming to create a seamless learning pathway from preschool through third grade by co-locating preschool classrooms on each elementary campus and creating joint professional development learning opportunities for P–3 teachers. This is unique for California, because many early childcare programs function independently from K–12 public schools, essentially limiting the opportunities for supporting continuous learning experiences that build from content beginning in Pre-K and extending through third grade. As such, the goals of this RPP that joins the district and university partners include creating equitable learning opportunities for all young children in early education and creating opportunities for teacher professional learning.

Table 1. Sample School Demographics.

	Banyon	Cedar	Douglas	Elm	Fir	Golden
Enrollment 2018	549	838	614	576	527	678
Race/Ethnicity						
Black	1.3%	2.9%	1.1%	1.0%	2.3%	0.9%
Native American	0.4%	0.0%	0.8%	0.2%	0.2%	0.6%
Asian	0.2%	32.%	0.8%	0.3%	0.4%	3.8%
Filipino	0.4%	2.4%	0.5%	1.4%	0.2%	0.6%
Latinx	85.1%	35.9%	77.4%	59.5%	57.5%	66.7%
Pacific Islander	0.9%	0.5%	0.5%	1.7%	0.9%	1.3%
White	9.7%	44.4%	14.5%	30.2%	32.8%	17.8%
Multiracial	2.0%	9.7%	14.4%	5.6%	5.7%	6.2%
Other	0.0%	0.3%	0.0%	0.1%	0.0%	0.1%
Low-Income	86.2%	31.9%	84.5%	59.0%	65.0%	65.8%
English Learners	43.5%	6.0%	37.3%	19.3%	19.7%	18.0%
Students with Disabilities	17.7%	9.7%	14.3%	14.9%	11.2%	14.7%
Foster Youth	0.2%	0.1%	0.0%	0.0%	0.0%	0.9%

This particular project began in early 2018. We report on 2.5 years of data gathering from February 2018 through May 2020. The project began with researchers participating in the P–3 Teacher Think Tank—a collaborative work group of teachers, researchers, school leaders, and community stakeholders that was established by the district to support young children's learning and development. We incubated our project within this collaborative context, asking participants to share their pressing questions, all of which fell under the general topic of "What characterizes children's learning and development across school and home, and how can knowing about how children learn improve education for young children in the district?"

After researchers spent the 2018–2019 academic year embedded in the district's P–3 Teacher Think Tank to co-develop the research questions and study design, all 13 transitional kindergarten (TK) teachers in the district were invited to participate in the project. In California, TK is offered for 4-year-olds (turning 5 years old between September and December) and is state-funded.[1] Of the 13 teachers who were invited, six TK teachers volunteered to participate and support initial child and family study recruitment and have their classes be focal sites for the project; several others participated in collaborative group meetings connected to the project. The participating TK teachers had an average of 26 years of teaching experience, ranging from 9 to 34 years, and an average of 17 years of teaching at their current school (range 5 to 30 years). All of the participating teachers self-identified as female, and most were white.

Beginning in fall 2018, we followed a cohort of 70 four-year-old children enrolled in TK classrooms in six elementary schools, matriculating into 27 kindergarten classrooms in fall 2019. Children were recruited through scheduled parent information

sessions at each school site. Researchers and participating teachers described the study to families, and interested families followed up with a phone call to research staff, who enrolled them in the study. Each year our team completed multiple data collection time points, assessing the children's neurocognitive, language and literacy, numeracy, attentional, executive function and self-regulation, and social-emotional development. A subset of children was invited to complete magnetic resonance imaging (MRI) assessments. We gathered observational data on children's learning in classrooms and homes and conducted parent and teacher interviews. (See the following Current Study section for more information on the teacher interviews.) In 2019–2020, we collected a second year of data with two timepoints in fall and winter of kindergarten before COVID-19 impacted school closure, and we pivoted to conduct data collection virtually with children, parents, and teachers. A more detailed discussion of these data collection activities appears in Wishard et al. (2020).

Data from these sources provided a rich characterization of students' academic and developmental trajectories across home and school. Data were shared in aggregate form with the partner teachers individually and collectively to a larger team of P–3 educators and administrators in monthly Teacher Researcher Collaborative (TRC) meetings. The TRC was established so that team members could shape the ongoing direction of the project, collaboratively interpret data, and co-develop instructional strategies based on the data through an iterative process. Our purpose in this paper is not to report findings on children's development, but rather to examine how teachers made sense of the data we shared with them as they engaged in the TRC and the RPP more generally.

Current Study

The data for this paper are derived from various opportunities for engagement between the district educators and the university researchers. The corpus of data included field notes, meeting documents, and interview transcripts. In the following sections we provide a description of the types of data that were collected and analyzed in the current study.

Professional Development Meetings. Researchers participated in two sets of professional development meetings with teachers: The Teacher Researcher Collaborative (TRC) and the Teacher Think Tank (TTT). The TRC included research team members, teachers, and administrators. The administrators included the superintendent, another district administrator, and two administrators from the preschool program co-located on elementary school campuses. In addition to the focal classroom teachers, a group of teachers and administrators representing preschool to third grade were invited by district staff to participate in the TRC given their involvement in improving P–3 education in the district. Between seven and 19 teachers and administrators attended each TRC meeting (nine per academic year) from February 2018 through May 2020, with a total of 52 educators attending at least one of the 36 meetings during this time.

The monthly TRC meetings were 90 minutes and held after school. During the pandemic, meetings shifted to a Zoom format. Typically, a district leader would open the meeting with updates in P–3 education, and then turn to the researchers to lead the meetings. The researchers provided data collection updates and invited teacher input. Thereafter, researchers would lead an interactive presentation, often presenting preliminary data gathered in the project and/or sharing extant research relevant to teachers' practice. Because these sessions were designed for feedback and dialogue among teachers, there were opportunities for discussion and sharing interpretations and reflections, most often verbally in small and large group dialogues but also in written form in feedback documents that were co-created within the meetings. More details are provided in the Findings section. Topics for the TRC meetings included bringing an equity lens to data use, examining demographic variations in children's learning profiles, understanding classroom management and behavior, examination of classroom language practices as a pedagogical strategy, learning from families, cognitive neuroscience and education, and framing the work of the RPP within the larger district goals. Teachers regularly raised new topics, both in surveys we sent them and verbally in meetings. These topics, such as learning and the brain, the importance of play, and how to engage parents, were taken up in subsequent meetings. In general, teachers' voices (rather than administrators) were most prevalent in these dialogues. At times teachers used the TRC as an opportunity to share with administrators the challenges they were facing in their classrooms.

The voices of the educators who participated in the TRC and TTT meetings are represented in our observational data. As noted previously, the majority of attendees were teachers, along with several administrators. Almost all members of the research team, including three faculty in education and three faculty with expertise in cognitive neuroscience, consistently attended TRC meetings, as did the project coordinator and, when schedules permitted, graduate student research assistants. The six faculty members, three of whom are authors of this paper, alternated leading the TRC meetings, whereas the TTT meetings were led by district staff. During both the TRC meetings ($n = 18$) and the TTT meetings ($n = 8$), members of the research team took field notes and gathered artifacts (e.g., PowerPoint presentations, handouts, meeting agendas), which were analyzed for this paper.

Teacher Interviews and Data Feedback Sessions. In addition to regularly interacting with teachers in the TRC meetings, the six TK teachers from the first year were invited to participate in a data presentation and interview during the fall after the first year. These sessions, which lasted 90 minutes in total, were led by the two researchers leading the child assessments and classroom observations. TK teachers were provided an individual printed report of the data collected in their classroom during fall, winter, and spring of Year 1 (2018–2019), including child-level cognitive and academic outcomes, and classroom observations of teacher and child language practices and classroom quality. (See Wishard et al., 2020, for a full description of research design

and measures.) The data sharing portion of the meeting lasted about 45 minutes, and teachers were able to ask questions about interpretation and share their insight around application and relevance for their pedagogical approaches in their classroom. Following the presentation of the data report, the researcher leading the classroom observations conducted a structured open-ended interview to explore topics such as teacher perceptions about child learning and development, teachers' articulated pedagogy, and how they made sense of children's learning and development in light of the data. We completed individual teacher interviews with each of six TK teachers, which averaged approximately 45 minutes each.

Summary of Data Sources. Data analyzed include field notes ($n = 24$) and artifacts ($n = 52$) from TRC and TTT professional development meetings, and TK teacher interviews ($n = 6$) conducted as part of the data feedback sessions. This large repository of data was uploaded into Dedoose 8.0.35 qualitative data coding software. Using principles of grounded theory, we first worked with content-rich artifacts and interviews to collaboratively create, define, and apply codes based on the theory and literature guiding this study. For example, to examine how the RPPs created opportunities for teacher learning, we examined the role of practitioners in problem definition, whether the RPP added practical value, and so forth. We also drew upon concepts from the literature on teacher beliefs and teacher sensemaking to understand how teachers made sense of the research information.

We developed a comprehensive coding dictionary to analyze all data sources. A list of codes and definitions is in Appendix A. To establish inter-rater reliability, two authors utilized the rigorous Dedoose reliability test feature to create and take at least two reliability tests—one upon initial coding and another midway through coding the data. Researchers obtained a pooled Cohen's Kappa of 0.82. Examples of coded data are included in Appendix B. For specific codes with lower Kappa scores on the reliability test, a joint consensus approach was used among all authors to resolve discrepancies in coding (Campbell et al., 2013). The coding process resulted in 432 coded segments of data. Finally, we examined coded data to reveal common themes. The themes that arose in the interview data were consistent with those gathered in the meeting observations, strengthening our confidence in the findings even though there was a limited number of interviews.

Findings

An analysis of data yielded several findings regarding how the RPP aimed to cultivate teacher engagement and how teachers made sense of what they learned within the context of their own practical wisdom. Guided by the literature on teacher beliefs, teacher sensemaking, and research–practice partnerships, we focus our analysis on several key areas. First, we explain how researchers attempted to amplify teachers' voices and create a trusting partnership in the RPP. Second, we examine the beliefs

that grounded teachers' work, because this is important for understanding their sensemaking in the RPP. Third, we discuss efforts to use research to inform teacher reflection about practice. In doing so, we examine teacher sensemaking and discuss the extent to which the RPP provided the occasion for teachers to reaffirm, question, or adjust existing beliefs about teaching and learning. Each of these areas is deeply intertwined, and as we foreground one facet, we background the others. Appendix C shows the connections among the conceptual framework, the research questions, and the findings. Our findings are elaborated in the following sections.

Building a Partnership and Amplifying Teacher Voices

In an effort to create a meaningful and trusting partnership, the RPP was designed to empower teachers and center their voices at all stages of the work. As we noted, the project was built around teachers' questions. In initial P–3 Teacher Think Tank meetings, which involved teachers from the early elementary grades and the district's preschool partner, researchers asked teachers about their pressing questions to co-develop the overarching research question that would guide the RPP. One teacher wondered, "What can we learn to help us understand the significant increase in behavior problems?" Another teacher pondered why some children didn't appear to be motivated by "what seems like anything," while others found interest in learning about many things. Teachers wondered how they would know whether early interventions were effective in impacting learning through school. Teachers wanted to know how to best support language development for multilingual learners, among other concerns. As teachers posed questions, we saw a willingness to examine their thinking and beliefs about teaching and learning, questioning assumptions rather than reinforcing existing knowledge. One might argue that this shows evidence of Piaget's (1952) process of accommodation where existing schemas must be revised when new conflicting information is discovered.

Researchers attempted to build a project that would address teachers' problems of practice, but at times felt the need to question assumptions. In one Teacher Think Tank meeting, teachers rooted their questions in a variety of theories about how parents were engaging with their children at home. Teachers described some parents as "babying" and "spoon-feeding" their children. They saw parents as "afraid to discipline" and allowing their children too much screen time. Researchers built on teachers' interest in learning about family involvement by guiding them to ask questions rather than make generalizations. Researchers suggested co-developing a broader research question that could help the group learn about children's development across home and school. As the conversation evolved, teachers began to raise questions that were more consonant with this framing such as "How can we learn more information about families to help form relationships? What kind of information matters?" and "How do family processes and engagement relate to early learning and assessment?" In a subsequent TRC meeting, researchers asked teachers "what questions they had about students' experiences at home." Teachers raised a range of questions such as "What does

a typical weekend look like?" and "What is the interaction between parents and children like?" In these examples, we see how teacher sensemaking was shaped by their experience in the meeting, helping to shift the discussion of a set of implicit theories about families to more open-ended questions that prompted curiosity and an interest in learning from their students and their families.

In addition to asking questions in meetings that informed the framing of the family component of the study, teachers helped guide how the study procedures would unfold. For example, teachers suggested ways to recruit parents for the study, including hosting evening information sessions where food would be served or setting up a table at drop-off with donuts and coffee. When researchers mentioned they planned to collect data on child development in the home context, teachers noted that it was important not to call these "home visits" because this would have negative connotations for some families who had experienced visits from Child Protective Services.

As the project unfolded, teachers also shared their practical wisdom about how to address certain problems of practice that were discussed in the RPP. For example, teachers shared their knowledge that there is a connection between children's home language environment and their language development outcomes, that physical challenges early in life can impact speech and language development, and that children may go through a silent phase while developing a second language. Teachers expressed their belief that kindergarten expectations were not aligned with developmentally appropriate practice for 5-year-olds, noting that "something needs to change." Teachers also shared their concern that teacher–student ratios in early elementary classrooms contributed to the challenges they face in creating space for discovery and discussion. A TK teacher explained how during group time she is interrupted so many times "it is impossible to get everything done with just one adult." A preschool teacher in the TRC argued that TK should have similar ratios as preschool, "Preschool has 22 children with 3 adults, and we can have small groups all the time. . .. This should show that TK teachers should have more adults in the classroom." Thus, teachers used the RPP not only to raise insights and questions about child development, but also to question and challenge structural conditions that they felt constrained their ability to be responsive to students' needs. It is notable that the RPP created professional development spaces that scaffolded conversations between teachers and district administrators who had the authority to respond to teacher concerns.

As the work proceeded, the project was designed for continual opportunities for teachers to impact the direction of the research. A teacher explained:

> I think we've been asked what do we want to see, what are some questions we would like to have answered, or what do we want the data to show us? So, when you guys would bring back some of that initial data and show us different subgroups and things, it was very informative.

Although some teachers were not involved in planning the research project at the beginning, they did acknowledge they felt they had a voice as the project unfolded.

One teacher remarked: "Maybe not so much as having a role, but we were definitely—throughout the meetings—were definitely heard." She expressed her belief that teachers were rarely listened to generally speaking, and the TRC meetings gave them a platform. Another teacher also felt that her voice was heard throughout the project: "I think it's been really wonderful that you guys have invited us, and you've made us feel welcome and a part of the research. I think that's been really unique, right?" She added, "we feel a direct connection to the study. And we feel, hey, I am going to get some feedback on my students, and what their challenges and strengths are, and how I can better teach them."

The aim of the RPP was to create opportunities for educators to learn about research on young children's development throughout the cyclical process of data collection, interpretation, and application. In the TRC, data were shared in aggregate across classrooms and schools, and in an anonymized fashion so that teachers' and students' identities were confidential. At the same time, some teachers were eager to see child-level, identified data on the student study participants so they could use data to address students' individual needs. Although confidentiality protections did not allow for this, researchers did share classroom-level data with teachers. This created some frustration for teachers who saw the data as potentially helping to answer their questions about specific students. As one teacher explained: "I get that we won't have access. . .. I know it's all confidential." She explained that she had a child in her class who was born prematurely, and she wondered what the data may reveal about her development. A second teacher said she would like to have "something comprehensive to identify early red flags." Another teacher said, "sooner the better even if it's not all polished data." Ideally, teachers wanted data right after each trimester so they could adjust their practices, but they acknowledged that researchers had "stacks and stacks and hours and hours and hours of data." The challenge for the research team was to analyze the data both quickly and accurately. Although the barriers of data sharing and timing may have served as inhibitors to teachers' use of data to inform practice, the examples shared here provide evidence of teachers' comfort in sharing their opinions about the effectiveness of the RPP.

Teachers were also eager to know more about the data collection instruments. One teacher asked, "I'm wondering if you were going to explain the assessments and how they were administered?" A researcher explained the student measures, and noted that, "We have the flexibility to change measures with what the teachers want." In another instance, a teacher asked how classroom observation data were coded with respect to student dialogue, asking, "Would it count if a child said, 'Get out of my seat?" The researcher explained, "Yes, that would count. We also counted for sustained conversations, five times back and forth." Creating an opportunity for the teacher's question to guide future work, she added, "We have not looked at when these side conversations occur most. What context this happens in, that would be a future question."

Cultivating a community characterized by empowerment, trust, and partnership was a top priority of researchers in the RPP. In TRC meetings, researchers repeatedly

told teachers that their practical wisdom was highly valued and essential in analyzing the data. For example, in one TRC meeting, a researcher (not one of the paper authors) said to the teachers:

> We have to learn what you know. You have a very strong sense of how they [the students] learn, and how you deal with individual differences. This is absolutely required for the work we are doing. . .. It's also important for ecological validity. We really want to work together with you all and come up with things you find useful.

Teachers also recognized that they brought a unique perspective. As one teacher said, chuckling, "I just think I have more experience with kids than you [researcher]. So I see it differently, and I look at the results differently." Teachers asked important questions about the data that were rooted in their experience. In one meeting, a teacher asked how the classroom observation data may look different for classes of different sizes and wondered if additional analyses could be done: "This would look really different for a class of 26 or a class of 17. We can't see that. But will we be able to?"

Teachers were regularly invited to share their perspectives on the data. For example, in one meeting, a researcher explained to the teachers that the "goal is to think together about what data means. Teachers can help us answer: So what? What does this mean? What do we do with it?" Researchers reiterated that this was "a slow process where we think carefully together" and that it was intended to be "a safe space to think openly," and one in which a "strengths-based perspective" was paramount. For example, in one meeting, researchers presented data on teacher talk in relation to maternal education of the child. The data revealed that students who received more directives are those with mothers with a high school education or less. Some teachers expressed this was not surprising, and one teacher hypothesized that these children are likely to "have less experience being independent, or preschool experience." Researchers then raised deeper questions about the data, which appeared to influence teacher sensemaking. The researcher asked, "How might this be informative for you in thinking about your practices?" In response, a couple of teachers noted that it would be helpful to dig deeper and see a breakdown through the day, as perhaps in some activities, directives were more prominent. In another meeting in which these data were shared, teachers wondered how teachers' practices were connected to student outcomes. As one teacher hypothesized, "I would think that when the students are coming up with their ideas more, and the students are doing more of the work and less of the sitting back and learning, that their scores would be higher."

Researchers and administrators worked to frame the purpose of the meetings as focused on teacher growth and development. In one meeting, a researcher reiterated that one goal of the RPP was to learn how "participating in a research–practice partnership could be more useful to you [teachers] to support your daily teaching." A district administrator further encouraged teachers to embrace this opportunity, stating, "We need to go into the middle space between researchers and practitioners to

think about how we behave as practitioners." The goal of the work was ultimately to make an impact on early learning, he explained: "Our north star is to close the achievement gap before it opens." These examples are indicative of how the RPP was organized to create opportunities for teachers to learn about research on young children's development and learning as opposed to learning about the implementation of specific district or school-level curriculum or mandates. Although it is important to acknowledge that administrators shape teacher sensemaking in important and specific ways (Coburn, 2005), we generally observed that teachers were quite comfortable airing their opinions in the presence of administrators, including at times using the meetings as an opportunity to share the structural barriers they faced. We wonder if our presence as researchers, and the RPP meeting space as somewhat different from their typical professional practice settings, provided a sort of buffer for the teachers to be candid.

Teacher Beliefs About Teaching and Learning

A goal of the RPP was to engage teachers in research that helps inform a collective understanding of children's learning and development. Of course, teachers came to the RPP with practical wisdom based on their experiences working with children and families and their own training. Teachers shared their beliefs in the TRC meetings and during teacher interviews. In line with past research, the TK teachers in this study generally expressed beliefs about teaching and learning that were consistent with developmentally appropriate practice in ECE where teachers serve as guides to support children's exploration of the environment and discovery of knowledge (Vartuli, 1999; Wen, et al., 2011).

At the same time, teachers shared their belief in the need for some teacher-directed learning around both social-emotional and academic content. Five of the six teachers interviewed described learning as a result of a combination of direct instruction and child-driven exploration or play. Some teachers explained that teacher-directed learning should precede child-driven exploration. The following interview excerpts provide insight into two teachers' beliefs:

> Teacher 1:
>
> I think it's definitely a combination of things. I think exploration, at this young age, is a big component. But it also needs to be combined with structure and direct instruction, a little bit of what the older kids are doing. Direct instruction and teacher small group instruction, as well. And exploration. So, I would say those three things.
>
> Teacher 2:
>
> They do need some direction for certain things. For other things, they need to discover and figure out for themselves. I think that gives them a deeper understanding of what

> they're learning versus just being told what to do, especially with math. And having them discover concepts. . .I mean of course there's some content that needs to be directly taught, but with that knowledge, then they can take that knowledge and use it in their own way.

Concomitantly, teachers conceived of their role as both directing and facilitating students' learning. As one teacher explained, "You have to know where the end goal is and. . .help them to achieve that but know when to back off and know when to support more and look at them each as individuals." Teachers recognized the importance of play, including in developing students' language and social emotional skills. A teacher explained:

> . . .the social/emotional component of language involves the children learning to compromise with each other, learning to negotiate, they compromise, they reason. There's so much higher-level language that goes on that you don't see elsewhere when they're in a situation that is play.

However, teachers also had to reconcile their beliefs about teaching and learning with shifting curricular expectations. Thus, although they may have at times espoused a play-based or developmental approach, some teachers felt the curriculum standards dictated otherwise. In a TRC meeting, a kindergarten teacher shared, "With kindergarten so much has been pushed down. I have been teaching a long time, and I can tell you that what I am teaching is end-of-first-grade [content]." Teachers believed the district's new math program made it hard to do small-group work because they felt it required so much direct instruction. A teacher said, "I can't do the rotations anymore." A teacher summed up the challenges they regularly face in balancing various demands, including curricular expectations and the wide range of students' needs in the classroom, in concert with their own beliefs about teaching and learning:

> It's difficult sometimes because you know what curriculum you need to get through and when you have some real diverse learners and it's taking a little bit longer sometimes, but you always have to stop and remember it's about the child, it's not about the curriculum.

In contrast to the kindergarten teachers, TK teachers felt they had more flexibility to address students' social-emotional and academic needs because the curriculum was developmentally appropriate. They were glad that some students "had that extra year" to get ready for elementary school.

In sum, most teachers articulated the beliefs that child-initiated learning is social and emotional, yet they also endorsed beliefs that supported teacher-directed academic learning. Teachers considered these beliefs in light of their classroom circumstances and the district's expectations for them to meet certain curriculum requirements. In the section that follows, we discuss how teachers incorporated research knowledge into

their current schemas when presented with opportunities to learn about research on children's development and learning.

Teacher Reflection on Shifts in Classroom Practice

A central goal of the RPP was for research to inform reflection upon classroom practice based on data that were shared. There was a conscious effort to provide opportunities for teachers to consider their own beliefs about teaching and learning in light of the research evidence that was jointly examined. Generally, teachers found the data to be illuminating in providing "a third party" view of their teaching, classroom life, and their students' progress, allowing them to "look at things more comprehensively" and "with a magnifying glass." As one teacher elaborated in response to student outcome data, "when I was exposed to the results of what you guys were doing, it was a little bit more of an 'eye opener.'. . . It was much more specific. . .and much more, of course, scientific." Regarding classroom observation data, teachers were surprisingly open as well. One teacher noted that other than observations by administration, "every other year, I have no feedback in terms of. . .my quality of teaching. So this is great." She added that she appreciated the RPP-related classroom observations because she knew they were not evaluative and did not affect her tenure, and instead provided information to inform improvement.

In one TRC meeting, researchers shared data gathered on the use of language in the classroom. Using the Language Interaction Snapshot (LISn) (Atkins-Burnett et al., 2018) classroom observation measure in the TK classrooms, researchers documented limited student opportunities to use language for personal expression and critical thinking. Complex language use in the classroom, specifically opportunities to hear and use *decontextualized language*, has been shown to promote complex thinking and academic outcomes for young learners (Curenton et al., 2008; Frausel et al., 2021; Uccelli et al., 2019). Whereas contextualized language is based in the "here and now," often including labeling or describing items in the immediate context and direct procedural instructions, decontextualized language focuses on the "there and then," abstract language that requires mental reasoning for meaning making (Rowe, 2013). In addition to sharing data on the presence of decontextualized and contextualized language in the observed classrooms, researchers also shared ways to incorporate more decontextualized language into instruction and invited teachers to share as well. For example, using contextualized language, a teacher may point to a picture in a book and simply ask, "What color is this?," whereas using decontextualized language, a teacher would ask, "What do you think is happening in this picture?" Or, instead of telling students to get crayons for a project (contextualized language), a teacher might ask, "What materials do you need for this project?" (decontextualized language).

Examining data on language use in the classroom, teachers reflected on their own practices according to their previously articulated beliefs about learning as a process

of exploration. After researchers shared data on the difference between decontextualized and contextualized language, a teacher shared:

> Just learning about the decontextualized language was really eye-opening. . .and. . .It's just another label, though, for critical thinking too, so that part's not new, but how it's broken down helped.. . . and we fall short. That part, the study was really good for me to see, and how I could use that to improve my questioning, see how my kids are doing that.

The teacher added: "It caused me to think deeper into what I was doing, and it still is because it's challenging to do that. It takes a lot of energy to come up with the deeper questions instead of the yes/no questions." Another teacher explained that the data inspired her to stop "to think what kind of questions I am asking. Am I just responding or am I following up with more questions?" Here we see evidence of teachers' reflection on their classroom practice and assimilation of scientific knowledge into their cognitive schemas about teaching and learning.

The preceding example regarding language use in the classroom is one instance in which teachers applied lessons from research to their practice and collectively worked to resolve the perceived conflict between structural constraints and evidence-based practices. On a more general level, one teacher reflected on the fact that project data led to the realization that her approach to instruction was different than what she espoused:

> I noticed that I spent a lot of time teacher directed. However, that goes against what my belief is, so it's something that ideally, I wouldn't want. But on the day-to-day, it happens more than I would like to admit. So that. . .is something that I'm looking to change.

She added that the research data were, "100% very useful." The research data enlightened her to reflect on her teaching approach. Similarly, another teacher noted that upon examining the data, she realized that, "I've learned that I'm maybe doing a little too much talking." A third teacher said: "I need to talk to my kids more. Even though I thought I was. And find out their interests more, and know more about them." A fourth teacher said that seeing the data caused her to slow down and reflect on what was happening in her classroom, "Sometimes you just go through the day and are putting fires out all day, and don't really know what we are doing." Another teacher said:

> Sometimes you get comfortable in doing things a certain way, and so it's good to be reminded, "Oh wait I need to ask this, I do need to let them try this, I do need to do this." So that's why I like being part of these kinds of things, because it keeps me fresh.

In these examples, we can see how examining research data led teachers to engage in a reflective process and shaped their sensemaking about how the demands and routines of teaching sometimes were at odds with their instructional goals.

In another instance, the RPP sought to respond to teachers' concerns about student behavior challenges by planning two TRC sessions focused on classroom management

and children's socioemotional development. At the earliest stages of the project, teachers raised these issues. During an interview, one teacher emphasized: "Urgent things in our classrooms right now tend to be discipline issues, behaviors, and the social/emotional. . .because if we don't have [those] under control, we are not able to teach." Another TK teacher said during an interview, ". . .we have talked about how more and more children are coming to school with a lot of social/emotional problems, and how it's getting worse and worse. And we've asked the questions, 'Why is this? Why is this going on?'" She noted that this hadn't yet been addressed in the context of the RPP. The researchers sought to ameliorate this, and in a subsequent TRC meeting, introduced teachers to case studies of student behavior and socioemotional learning.

Researchers presented a research-based video (not from the project) involving a student who was misbehaving and had to "move his clips down" because of his behavior. The student looked despondent. In the discussion about the video, teachers agreed that the student felt demoralized, did not learn anything about self-regulation, and felt less connected to the teacher. Researchers asked teachers to suggest ways that a teacher could better support the child to prepare him for learning. Even though some teachers admitted to using behavior charts in their classrooms, they also recognized that the behavior chart in the video example wasn't building a nurturing student–teacher relationship and may not be useful in allowing the child to reflect upon his behavior. As one teacher said, "It's a quick fix." Some teachers provided specific language for how they could get the child to reflect upon his behavior, such as, "Was it a good choice to rip your paper in half?" Others struggled with integrating this alternative way of thinking within deeply held beliefs that children need consequences for their behaviors. For example, one teacher remarked, "I think in a supportive way children need to understand there are some consequences for their behavior. There have been some disturbing things happening in [in the city] among teenagers this week." Another teacher reinforced her belief in clip charts, noting that she liked them because they were "fluid" and kids had the opportunity to move up or down. The researcher responded with, "Fluidity is important, but who has power and control? You, the teacher." She added, "We are trying to teach children the skills to manage their emotions, but if the teacher is moving it then they don't get to control it."

Drawing on research, researchers introduced alternative ways of supporting children beyond behavior charts. They described the need for students to feel connected with their teachers and to have scaffolded opportunities to develop their own self-regulation skills, and the need for natural consequences that align with the misbehavior as opposed to consequences controlled by the teacher. In some cases, teachers added to their existing understandings with additional detail and nuance and appeared to revise their understandings. Overall, however, teachers seemed to be generally less likely to shift their beliefs and practices around classroom management and to adhere to beliefs about the need for teacher control of classroom behaviors. For example, when presented with the use of a Take a Break space as an alternative to a behavior clip chart for children who were having a difficult time staying engaged, one teacher was

doubtful that children could be trusted to self-regulate and effectively use a Take a Break space, asking the researcher how she could "address students who are taking advantage of the chance to take a break just to avoid the work."

Researchers tried in earnest to tailor TRC content to teachers' pedagogical concerns; however, when asked about the impact of the RPP, teachers explained that it promoted reflection, but did not always address something "pressing." A teacher shared, "I don't know if it's addressing 'urgent problems.' I think it's kind of just giving us a different view or look at what's going on in classrooms and how it is affecting children's learning." It is possible that teachers defined urgent or pressing problems in ways that were temporally different from the researchers. Teachers may have seen pressing concerns as something arising in the data that needed to be addressed in their classrooms immediately, whereas researchers were engaged in research designed to help teachers to refine their pedagogical approach more generally. This experience yields important insights for how the RPP can be refined to be more responsive to teacher feedback and problems of practice.

Conclusion and Implications

There is limited literature examining the role of RPPs in transforming early education in general, and specifically how engaging in an RPP can support teachers in the development of beliefs and pedagogical practices that promote equity within early childhood settings (Bassok et al., 2021; Schindler et al., 2017). This paper provides an empirical understanding of how the structures and activities within an RPP can support early elementary teachers to understand and make sense of new information about learning and development that could shape their classroom pedagogical practices. In an effort to include all educators and their perspectives, researchers intentionally amplified teachers' perspectives, interpretations, and ideas as part of efforts to build a trusting partnership and to conduct practically relevant research that could have a proximal impact on educational practices (Henrick et al., 2017). In meetings and interviews, teachers raised important questions about the data and the research process that shaped the ongoing work of the RPP.

As expected, teachers and administrators came to the partnership with distinct beliefs about child development and learning that were formed through their training and practical experience. Some teacher beliefs were aligned with developmentally appropriate practice (Bredekamp & Copple, 1997). In other cases, teachers shared beliefs about early learning that prioritized teacher-directed practices that reflected more traditional notions of teaching and learning. Within the context of the RPP meetings, teachers expressed that curricular expectations and classroom realities were at times incongruent with their previously held beliefs. Marshall et al. (2021) explain that "teachers are in a precarious position given the varied and conflicting messages they receive and are responsible for acting on" (p. 1207). They further explain that RPPs can be spaces for researchers to learn about the multiple demands that teachers juggle.

We would argue that RPPs can also be a place to reconcile them in light of research evidence.

The RPP meetings in this project provided an opportunity for teacher sensemaking and reflection about their beliefs and practices. Teachers reported that it was illuminating to see classroom-level data and that it helped them reflect on, and in some cases shift, their practices, particularly around language use in the classroom. They found these data particularly illuminating. However, the extent to which teachers incorporated new knowledge into their cognitive schemas appeared to vary based on the topic and how and where new information was presented. TRC meetings were mediated by data, facilitating sensemaking by shifting thinking beyond biases, whereas Teacher Think Tank meetings were not. Teachers seemed more open to revisiting schemas when the data related to their own classrooms (e.g., the language use data). They also appeared to be more open to adjusting their conceptions on a topic about which they may have less in-depth knowledge and that is outside of the domain of their control (e.g., child development in the home). On the other hand, teachers appeared more likely to reinforce their existing beliefs and practices about classroom management, a topic that was addressed in TRC meetings but that did not involve examining data from their own classrooms. Classroom management is also a domain in which teachers' practices often reflect long-standing routines and are reinforced by existing policies and structures. Thus, the context of the sensemaking around research appears to be important.

Relatedly, the creation of a meeting setting oriented around research and researcher–practitioner interactions may have provided critical space, flexibility, and autonomy for teachers to engage in reflection and sensemaking that was distinct from other professional development experiences. In TRC meetings, teachers shared feeling constrained by the curricular expectations of the district and finding it difficult to implement pedagogical practices that were congruent with their beliefs about early learning and development. District-led professional development sessions are more likely to be oriented around implementation of district initiatives, thereby bounding the nature of sensemaking to fit within these constraints. By inviting teachers into a more autonomous professional development and empowerment space, the RPPs have created what sociocultural theorists call a *third space* (Gutierrez et al., 1999) where teachers are able to represent their hybrid identities as lifelong educators, district employees, and researchers to engage in transformative learning and development.

For these reasons, RPPs that are embedded into teachers' professional development programs may have long-term transformative impacts on teacher learning and development (Kauerz et al., 2021). We found that the process of co-analyzing data with teachers and administrators served to support each of the five dimensions of effective RPPs articulated by Henrick and colleagues (2017), with teacher sensemaking scaffolded through joining data analysis specifically facilitating the maintenance of trusting relationships, application of rigorous research to inform practice, and supporting the partner organization to achieve its goals.

While raising important insights regarding RPPs in the early education domain, there were limitations to this study. Teacher interviews were limited to only TK teachers at the start of Year 2. Other teacher sensemaking data came from teacher comments shared during larger meetings. The role of the TTT and the TRC meetings were quite different within the context of the RPP, with the TTT operating within existing district structures and serving primarily as a relationship-building context and the TRC functioning as the primary professional activity setting of the RPP, including data sharing and opportunities to grapple with how practices cohere or conflict with extant research on best practices in early elementary school. The public context of the TRC and TTT meetings may have influenced teachers' comfort level in sharing. As data were collected within the context of an RPP and the researchers were collecting the data about reflecting on the value of the RPP, the teachers may not have felt at liberty to share honestly about their perceptions of the benefit of the RPP. However, the presence of some negative feedback about the value of the RPP indicates that teachers had developed trust with the researchers to share openly.

This study yields implications for RPPs in early education. First, building projects around teachers' own problems of practice is essential in making the work relevant (Henrick et al., 2017), as is allowing opportunity for reflection on pedagogy as well as larger implications of the research. Future research might consider empirically exploring how knowledge learned in the context of an RPP translates into shifts in teachers' classroom practices, not just through their own reports, but also through feedback from focused classroom observations and classroom-embedded professional development. At the same time, it can be challenging to study an RPP while remaining actively engaged with it, and researchers should be mindful to build in opportunities to gather insights on participants' experiences with the RPP from the outset. Using mixed methods, such as a combination of interviews and surveys, would help create a more holistic portrait of participant engagement.

Supporting teacher sensemaking in the context of an early education RPP could be an important lever for improving P–3 education. RPPs can provide the space for using evidence to challenge deeply held assumptions, developing an inquiry mindset, and engaging in continuous improvement; however, this work needs to be accompanied by system change efforts, because existing routines and policies can pose obstacles to teachers seeking to put new conceptions into practice. Research-based pedagogy that prioritizes building strong student–teacher relationships and transformational educational experiences for all learners is more critically important now than ever. Equally important is support for teachers to have the space to experiment with pedagogical shifts in their classrooms and opportunities to build their capacity and leadership. Researchers—and research—could play a role in building a high-quality P–3 system that has these and other critical components. Gathering additional evidence on how to position RPPs to effectively improve early education will be critical to expanding the knowledge base in this area.

Appendix A. Codebook.

Code	Definition
Teacher Perceptions and Beliefs: Modes of Learning	
Primarily learning through play	States that child learns primarily through play
Combination of play and adult instruction	States that child learns primarily through a combined setting of play and structured classroom
Primarily through adult instruction	States that child learns primarily through adult instruction
Other: exploration, exposure, environment	Describes specific instances where child learns in exploration, exposure, and environment
Teacher Perceptions and Beliefs: Beliefs About Play	
Social skills	Describes specific instances where child learns social skills while engaging in play behaviors
Cognition and problem solving	Describes specific instances where child learns cognitive and problem-solving skills while engaging in play behaviors
Other: exploration, creativity	Describes specific instances where child learns in exploration, exposure, and environment
Teacher Perceptions and Beliefs: Assumptions Related to Learning	
Developmental milestones	Teachers' perceptions on and beliefs about children's development or developmental milestones
About families	Teachers' perceptions about children's families
About language learning	Teachers' perceptions about children's language learning
About student behavior	Teachers' perceptions about their students' behavior
About teacher practices	Teachers' perceptions about teacher practices
Evaluating the Project/Teacher–Researcher Collaborative	
TRC improvements	Teachers describe ways the TRC could be improved
Capacity-building activities to improve practice	Teachers describe capacity-building activities to improve teaching practices
Role of researcher	How the teacher perceives the researchers
Teachers' urgent problems of practice	Does the project focus on problems the teachers find urgent in their daily practice?
Evidence of collaborative iterative design	The extent to which teacher feedback informs the ongoing work of the project
Teacher role in defining research	How teachers play a role in defining the focus and direction of the research project
Teacher advice to researchers	Teachers' suggestions or advice on the project
Administrative project framing/context	An instance in which administrators or researchers give background information on the project
Reflection on Data	
Data impact on classroom practice	Descriptions of impact of project engagement on pedagogical practices, language use, and content focus
Impact of research on teaching	Explains how research informed teaching
Profile utility	Explains how research could be more useful to support daily teaching practice
Data enhancements	Suggests ways that data analysis or collection could be improved to better support teachers' practice
Beliefs about data use	Describes ways that data from the project can be used
Teacher reactions to/sensemaking about project data	Describes how teachers responded to and/or made sense of the project data

Appendix B. Examples of Coded Excerpts.

Parent Code	Child Code	Example
Teacher Perceptions and Beliefs: Modes of Learning	Primarily learning through play	"Oh, they learn so much. They learn social skills, they learn how to share, take turns. . .."
	Combination of play and adult instruction	"How do children learn best?. . . Direct instruction and teacher small group instruction, as well. . .."
	Primarily through adult instruction	". . .because TK's introduction to formal education. . .there needs to be sitting down, there needs to be, okay, I do, you do. . .."
	Other: exploration, exposure, environment	"I think. . .at this young age, exploration is a big component."
Teacher Perceptions and Beliefs: Beliefs About Play	Social skills	"I think children learn how to negotiate, like their place in a group, and negotiate how they play with others."
	Cognition and problem solving	"We're also learning how to try things out. . .. So maybe if I'm using different shapes of blocks, it's going to fall over, so I'm learning 'Okay, that didn't work. But I can try again.'"
	Other: exploration, creativity	"But playing by themselves, just creativity and unstructured, right? How to use up their time, how to occupy their time, without somebody saying 'you need to do this.'"
Teacher Perceptions and Beliefs: Assumptions Related to Learning	About development	Why are gross motor skills on the decline? And does it affect fine motor skills and learning? [field note]
	About families	Preschool director shared perspectives that were understanding of parents with young children. [field note]
	About language learning	ELLs often go through a silent phase while developing L2. [field note]
	About student behavior	Teacher says, "Why can't some kids get motivated by, what it seems like, anything?" [field note]
	About teacher practices	Teacher says, "With kindergarten so much has been pushed down. I have been teaching a long time, and I can tell you that what I am teaching is end of first grade." [field note]
Evaluating the Project/Teacher–Researcher Collaborative	TRC improvements	"It takes a lot of energy to come up with the deeper questions instead of the yes/no questions."
	Capacity-building activities to improve practice	"I'm very much aware of trying to change my approach when I'm teaching a lesson, to check for understanding."
	Role of researcher	"I feel like we had a role in defining the problems because we were a part of the research."
	Teachers' urgent problems of practice	"I don't know if it's addressing 'urgent problems.' I think it's kind of, just. . .giving us a different view or look at what's going on in classrooms and how it is affecting children's learning."
	Teacher role in defining research	"I think we've been asked what do we want to see, what are some questions we would like to have answered, or what do we want the data to show us."

(continued)

Appendix B. (continued)

Parent Code	Child Code	Example
	Teacher advice to researchers	"If there was some way to compare our data with schools who have larger class sizes because we tend to have smaller class sizes."
	Administrative project framing/ context	"To understand parents' values and expectations, raising and educating, daily routines at home. This will happen through interviews and through daily diary text messaging." [field note]
Reflection on Data	Data impact on classroom practice	"But, I took, like I said, my low scores. That was a concern right away, was a red flag in my mind. Okay, how can I help these kids?. . . There were areas of concern with my teaching. So, in that manner, it really helped me."
	Data enhancements	". . .if I had the data in more real-time, I guess, then it would be easier to utilize."
	Beliefs about data use	"I would have loved to have known how their MRIs and things like that worked into it, which I get that we won't have access to that. . .knowing. . . the whole child is sometimes interesting to see. . .."
	Teacher reactions to/sensemaking about project data	"What I found which was most interesting and eye opening, and I thought I was doing this, but I found almost you can never assume, is I need to talk to my kids more."

Appendix C. Connections Among Framework, Questions, Data, and Results.

Conceptual Framework	Research Question	Data Sources	Findings
Research on RPPs in education	How did an early education RPP attempt to build a meaningful and trusting partnership and amplify teacher voices?	Teacher interviews; meeting observations	Researchers attempted to amplify teachers' voices. Teachers drew on wisdom of practice within the context of the RPP.
Research on teachers' beliefs about children's development in the context of ECE Theory and research on teacher sensemaking in the context of reform	How do teachers make sense of new knowledge within the context of the RPP and their own professional wisdom? To what degree are teachers reaffirming existing beliefs vs. questioning or adjusting current beliefs through their participation in the RPP?	Teacher interviews; meeting observations	Teachers shared beliefs about child-initiated learning and also endorsed beliefs that supported teacher-directed learning. RPP meetings contributed to teacher sensemaking and reflection, with variation in how teachers made sense of new knowledge in light of existing beliefs and practices.

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Note

1. TK is expanding annually in the state to serve an increasing number of 4-year-olds.

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