ELSEVIER

Alignment and misalignment of classroom experiences from Pre-K to kindergarten

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A B S T R A C T

Areas of misalignment between children's experiences in preschool and kindergarten are increasingly viewed as contributing to the fade-out of preschool effects. The current study examined alignment and misalignment of classroom experiences across the transition from public pre-k into kindergarten. As part of a longitudinal cohort study, we examined structural features, process features, and teacher beliefs and practices in 295 public kindergarten classrooms and 117 public pre-K classrooms that feed into them. Analyses revealed a number of differences indicative of potential misalignment, including fewer ethnically and linguistically diverse teachers, more time in teacher-structured activities, and less effective teacher–child interactions in kindergarten. Potential alignment was indicated in some areas, such as more time in kindergarten spent on academics; progression toward more advanced literacy and math content from pre-k to kindergarten; and teachers across both grades reported similarly child-centered ideas about children. Exploratory results by pre-K auspice comparing school-based and center-based pre-K raised further questions about what the meaningful components of alignment are. The field lacks a robust empirical base for defining "good" alignment, thus these descriptive results are discussed in terms of implications for future, predictive research.

Public pre-K initiatives largely focus on supporting early development among children traditionally considered at-risk of school failure, with the goal of preparing them for success in school. From the earliest days of these initiatives, though, there have been serious concerns about whether pre-K programs can produce lasting benefits that justify their expense. To date, multiple research and evaluation projects have demonstrated that preschool benefits – even from high quality programs – fade out over time, resulting in barely discernible, null, or even negative long-term effects by the time children enter third grade (Camilli, Vargas, Ryan, & Barnett, 2010; Lipsey, Farran, & Hofer, 2015; Puma et al., 2012). The accumulation of these findings has raised urgency around understanding why fade-out occurs and what can be done to prevent it. One focus of this work has been to examine the alignment between children's experiences in pre-K and kindergarten and to determine whether areas of alignment and misalignment can shed light on the conditions that lead to fade-out (Scott-Little & Reid, 2010).

The term alignment refers to increased consistency in a range of policies, practices, and experiences that can make starting kindergarten feel like a natural extension of children's pre-K experiences rather than a jarring transition into a new environment (Bogard & Takanishi, 2005). For example, pre-K and kindergarten systems may be considered aligned at a policy level if the learning goals for pre-K are concordant with the expectations for incoming kindergarteners, or if the same system for home-school communication is used across pre-K and kindergarten. Arguably, though, a deeper level of alignment – alignment in the factors that comprise children's daily experiences – may be particularly important to supporting children's wellbeing as they start school (Rimm-Kaufman & Pianta, 2000; Yelverton & Mashburn, 2018).

Despite substantial writing, thinking, and research on alignment, there remain serious challenges in defining what it means for children's experiences to be aligned or misaligned (Rimm-Kaufman & Pianta, 2000; Scott-Little & Reid, 2010; Stipek, Franke, Clements, Farran, & Coburn, 2017; Yelverton & Mashburn, 2018). In fact, the early childhood field has often been more successful at identifying *what* should be aligned than what that alignment might look like in practical terms. As an example, kindergarten has become significantly more academic than it was a decade ago (Bassok, Latham, & Rorem, 2016). To improve alignment, should pre-K programs also be much more academic? (Some research suggests that they

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should (Fuller, Bein, Bridges, Kim, & Rabe-Hesketh, 2017).) Only recently have researchers begun to operationalize alignment in specific terms and to show how specific forms of misalignment are associated with weaker child gains (Ansari & Pianta, 2018; Engel, Claessens, & Finch, 2013).

The current, descriptive study examines areas of alignment and misalignment in the proximal characteristics of pre-K and kindergarten teachers and classrooms that affect children's daily school experiences. The purpose of this study is to present a more comprehensive picture of these factors than prior studies have been able to do. Most notably, we include observational data from pre-K and kindergarten classrooms in addition to teacher reports, and we present exploratory analyses examining differences by pre-k program auspice. Our primary goal is to build on the strong conceptual foundations and emerging empirical work that is extant in the literature to raise important questions about what should be aligned, and how, and why. Future work must delve more deeply into how these additional aspects of alignment affect children; this initial step is meant to raise some of the practical challenges in defining, measuring, and analyzing what alignment *is*.

1. Theory and research on alignment

The study of alignment is an extension of research on school readiness and the transition into kindergarten. School readiness refers to a child's readiness to engage fully in kindergarten (including physical health, academic knowledge, social skills, self-regulation, etc.; Snow, 2006). The transition into kindergarten is conceptualized as the full period during which children learn about kindergarten, get some exposure to their new school or classroom, start kindergarten, and adjust to its demands (Ramey & Ramey, 2010). Early childhood professionals widely view this time, between ages 4 and 5, as a dense developmental period that combines rapid physical and cognitive maturation with a great deal of exposure to novelty (Yelverton & Mashburn, 2018). Importantly, the terms school readiness, transition, and alignment refer not only to what children know and experience directly, but also to the systems in place to make families, teachers, and schools feel connected to each other and efficacious in supporting children (Early, Pianta, Taylor, & Cox, 2001; Kagan, 2010).

Theoretical perspectives on alignment emphasize the multiple layers of factors that influence children's transition experiences and how those factors interact with each other over time (Pianta, Rimm-Kaufman, & Cox, 1999; Yelverton & Mashburn, 2018). Alignment can involve high-level policies, local policies, curricula, outreach, teaching practices, and many other factors operating across spheres of influence. For example, funding from the federal government influences what programs are available in a community and how wide their reach is; state governments license private child care programs, appropriate funds, administer state programs, and set early learning standards; and local communities turn state and federal funding into brick-and-mortar programs serving children (Sandfort, Selden, & Sowa, 2008; Stipek et al., 2017). At each of these levels, policies and practices can be aligned with each other or at cross-purposes. Aspects of alignment that are salient to children's daily experiences include how teachers interact with children, how they structure the day, what curriculum is used, how parents interact with teachers, and characteristics of the children and teachers themselves (Kagan, 2010). These proximal factors likely transfer the effects of higher levels of alignment to children's actual experiences of the pre-K to school transition (Yelverton & Mashburn, 2018).

Growing evidence suggests that misalignment between proximal characteristics of pre-K and kindergarten may be one factor contributing to the pattern of fade out in the benefits of pre-K. In particular, multiple studies indicate that children lose ground when they transition from a high quality pre-K program into a lower-quality elementary school (Ansari & Pianta, 2018; Carr, Mokrova, Vernon-Feagans, & Burchinal, 2019; although it is important to acknowledge that some evidence contradicts this idea (Jenkins et al., 2018)). Additional work suggests that teaching that is too easy for children given their skills at school entry may contribute to the loss of early pre-K benefits (Claessens, Engel, & Curran, 2014).

Below we review evidence on alignment between proximal characteristics of children's pre-K and kindergarten experiences. We focus on *pedagogical alignment* (Kagan, 2010), which incorporates all of the ingredients that contribute to children's direct experiences inside the classroom. This includes structural classroom features (e.g., who the teacher and students are, what physical space and resources are available), process features (the "how" of teaching and learning – e.g., how class time is used to maximize learning and engagement), and teacher beliefs and practices that influence the learning environment (e.g., child-centered versus adult-centered beliefs; Kagan, 2010). Of note, this review does not capture all of the potential factors that may be important during children's transitions to kindergarten but focuses on key factors that have been discussed in prior literature and have been raised as potential targets for alignment (Kagan, 2010).

1.1. Structural features

Research on the importance of structural classroom features to child outcomes is mixed. Many studies have examined preschool teacher education, early childhood credentials, and years of experience but have found few consistent associations with classroom quality or child outcomes (Early et al., 2006; Lin & Magnuson, 2018). Findings from elementary school research are similarly inconclusive. Results from the Early Childhood Longitudinal Study (ECLS-K) suggested that having a post-secondary degree was not associated with children's achievement gains but having a degree in elementary education showed a small association with reading gains (Croninger, Rice, Rathbun, & Nishio, 2007). Another study of urban elementary schools similarly showed no associations between having an advanced degree and greater student gains (Buddin & Zamarro, 2009). Research on teaching experience among elementary teachers suggests that teachers reach their highest level of effectiveness just a few years into teaching, indicating that experience may have diminishing returns in promoting child outcomes (Rice, 2010).

Another factor of potential interest is classroom composition: class size; racial, ethnic, and language diversity; and teacher–child racial match. There is fairly strong evidence that smaller class sizes are associated with better student achievement, attainment, and long-term outcomes, especially when implemented in the early grades (Mosteller, 1995; Whitehurst & Chingos, 2011). Some evidence indicates that larger class sizes are associated with lower student engagement, less time on task, and more teacher-led instruction (Blatchford, Bassett, & Brown, 2011). In terms of the racial, ethnic, and linguistic composition of classrooms, evidence is somewhat limited but does suggest that ethnic and linguistic match between teachers and students can be beneficial. Spanish-speaking children appear to make greater literacy gains in English when their teachers are Spanish speakers, and some research indicates that teachers may rate different-race children differently than same-race children, suggesting that teachers' perceptions of children are influenced by their own racial or ethnic backgrounds (Bates & Glick, 2013; Downer, Goble, Myers, & Pianta, 2016).

One study that descriptively examined alignment from pre-K to kindergarten using nationally-representative Head Start data from the 2009 FACES study found several areas of misalignment in structural classroom features (Abry, Taylor, Jimenez, Pratt, &

LoCasale-Crouch, 2018). Specifically, kindergarten classrooms had larger class sizes, higher levels of teacher education, and more children in full-day versus part-day programs compared with Head Start (Abry et al., 2018).

1.2. Process features

Process features of classrooms include how teachers and children interact with each other, how class time is organized, and what content is covered over the course of the year. Studies across pre-K and early elementary school have demonstrated small but significant associations between warm, supportive, and stimulating teacher–child interactions and child achievement gains (Curby, Rimm-Kaufman, & Ponitz, 2009; Hamre, Hatfield, Pianta, & Jamil, 2014). Evidence suggests that consecutive years of high-quality experiences have an additive, positive benefit to children (Cash, Ansari, Grimm, & Pianta, 2018) although research also indicates that there is great variability in children's experiences of interactions from year to year (Ansari & Pianta, 2018). This evidence linking higher quality teacher–child interactions to better child outcomes suggests that alignment should be defined *not* as mere similarity across settings, but as kindergarten classrooms providing equal or greater quality of teacher–child interactions as compared with pre-K classrooms.

There is growing evidence on content alignment: *what* is taught, and whether content covered in kindergarten advances children's current understandings. Evidence suggests that children who have attended pre-K are often re-taught information they were previously exposed to, potentially leading them to benefit less from their kindergarten experiences compared with children who had not attended pre-K (Bassok, Fitzpatrick, Greenberg, & Loeb, 2016; Bassok, Latham, et al., 2016; Claessens et al., 2014). This line of inquiry represents some of the clearest evidence in favor of better alignment, but even these studies had data only from the kindergarten year and were not able to directly examine what content was taught in pre-K.

Regarding how much class time is devoted to academic content, there is tension between early childhood stakeholders who view self-directed play as paramount to learning (Nicolopoulou, McDowell, & Brockmeyer, 2006) and those who argue in favor of more structured time on content (Fuller et al., 2017). Evidence suggests that more academic time is associated with greater learning outcomes (Fuller et al., 2017), but there is little evidence in early education to define how much time is enough or too much. Interestingly, evidence from Head Start FACES suggested that pre-K classrooms may spend more time on math than kindergarten classrooms: about two-thirds of pre-K and kindergarten classrooms reported daily literacy instruction but reports of daily math instruction were lower in kindergarten than in pre-K (Abry et al., 2018). For content alignment, we expect a well-aligned system to show a progression of content from pre-K to kindergarten, with kindergarten teachers reporting that they spend more time on academic topics and focus on more challenging skills than the pre-K teachers.

Time in teacher-structured learning is another factor that may be important for children's experiences of alignment. A large survey study found sharp increases in teacher-structured learning and decreases in free play from pre-K to kindergarten (Ritchie, Clifford, Malloy, Cobb, & Crawford, 2010). However, there is, again, little research to indicate how much time children should spend in different types of settings, and therefore little basis for defining what it means for settings to be aligned or misaligned.

1.3. Teacher beliefs and practices

There are several types of teacher beliefs and practices that may influence how children experience classrooms and the transi-

tion to kindergarten. Teachers' adult-centered ideas about children – the extent to which they believe that children should defer to adults' authority under most circumstances – are associated with teachers' perceptions that they must rigidly follow school district policies, versus having some control over learning activities (Parker & Neuharth-Pritchett, 2006). Teachers' greater use of data is associated with student gains in reading and math (Faria et al., 2012) and may influence the extent to which teachers individualize or differentiate instruction based on children's skills (Shields, Cook, & Greller, 2016). Lastly, communication between parents and teachers about school is an important aspect of classroom culture (Fantuzzo, Tighe, & Childs, 2000). Longitudinal research suggests that contacts between teachers and parents decrease from pre-K to kindergarten (Rimm-Kaufman & Pianta, 1999, 2005).

2. Alignment and auspice

Public pre-K programs are often administered by several different types of organizations, or auspices, within a single community (Weiland, 2018). Many communities have center-based Head Start classrooms, public pre-K programs located within public schools, and even subsidized placements for children within private, for-profit, childcare centers. Findings are increasingly clear that pre-K classrooms located within public schools tend to be higher on several indicators of quality (Bassok, Fitzpatrick, et al., 2016) and are more effective at preparing children for kindergarten compared with center-based classrooms (Phillips et al., 2017). Because they are co-located with kindergarten classrooms within schools, it may be the case that school-based pre-K classrooms show greater alignment to kindergarten classrooms than do center-based classrooms. Although the majority of pre-K classrooms in the current sample were located within public schools (as described in more detail below), we examine differences in our indicators by auspice as a means of exploring whether school-based pre-K classrooms show greater alignment to kindergarten than center-based classrooms.

3. The current study

There have been several attempts to define what it means to be aligned in terms of specific variables, most notably related to instructional content (e.g., Claessens et al., 2014). However, few studies have examined alignment comprehensively across structural, process, and teacher belief factors, and we currently lack a clear framework for defining what it means to be aligned or misaligned in terms of these factors. Furthermore, much of the research on alignment is limited to demographic information and teacher report data. There is a clear need for more comprehensive descriptive information about alignment in children's experiences from pre-K to kindergarten, and a better understanding of whether school-based classrooms provide children with more aligned experiences. The current study sought to provide a more detailed perspective on alignment by examining alignment across multiple classroom factors and drawing on observational data in addition to teacher reports. This study was conducted within a large, diverse school district engaging with challenges faced by urban and suburban school districts across the country: the need to provide high quality early education to families that represent many different backgrounds, home languages, and cultural norms, as well as substantial program decentralization.

Drawing from multiple perspectives on the proximal targets for alignment in children's experiences across pre-k and kindergarten, the current study focused on several key areas:

- *Structural elements:* including class size, child characteristics, teacher characteristics, and teacher education and experience;

- *Process elements:* including the quality of teacher–child interactions and the use of teacher-structured versus child-structured learning time; time spent on different content areas; and specific literacy and math concepts covered by pre-K and kindergarten teachers; and

- *Teacher beliefs and practices:* including teachers' data use, communication with parents, and child-centered versus adult-centered ideas about children.

The primary research question informing this work was: To what extent are pre-K and kindergarten classrooms aligned or misaligned on these factors? Based on prior research, we consider pre-K and kindergarten classrooms to be better-aligned in support of children's ongoing development if the indicators of alignment across structural elements, process elements, and teacher beliefs and practices suggest equal or greater quality of educational experiences in kindergarten compared to pre-K. As a secondary question, we explore whether alignment differs by program auspice, comparing school-based pre-K classrooms to center-based classrooms. In the discussion, we discuss how our definition of alignment applies to our results and some limitations of this approach, as well as how the results related to auspice can inform future discussions of alignment.

4. Method

4.1. Research setting

This research was conducted in a large school district that serves a mixed urban and suburban county. The school division is in a relatively affluent community but has substantial child poverty: 19.8% of children come from families with incomes less than twice the federal poverty rate; nearly 9% are food insecure; and 27.3% of children in public school qualify for free or reduced price lunch (Annie E. Casey Foundation, 2018; U.S. Department of Education, National Center for Education Statistics, 2017). The county blends local, state, and federal funding to provide public pre-K to eligible children, with classrooms located within public schools, standalone Head Start centers, and private centers. This large early childhood program is overseen by a governing office that coordinates across providers, holds trainings for caregivers, conducts community outreach, and oversees policies related to pre-K to kindergarten transitions.

4.2. Participants

Participants included 117 public pre-K teachers from 71 programs and 295 kindergarten teachers from 93 schools within a large, urban and suburban school district participating in a longitudinal study of children's experiences in pre-K and the early elementary grades. Children and parents were recruited when children were enrolled in pre-K: the parents of 1500 children enrolled in 138 pre-K classrooms consented to participate. In total, 71.7% of classrooms were located in public schools, 23.9% in private not-for-profit centers, and 4.3% in private for-profit centers. From those classrooms, 113 pre-K teachers returned demographic questionnaires and surveys and 117 consented to classroom observations. When children transitioned into kindergarten, they dispersed into 405 classrooms. From those classrooms, 295 provided demographic data and surveys and 289 consented to classroom observations. Of pre-K and kindergarten teachers who provided demographic information, 98% were female. Teachers had an average of 17.3 years of education, and 39% had completed an Early Childhood Education major. The majority of teachers where White (73.6%); the rest were

Black/African American (9.6%), Asian (4.7%), Hispanic/Latino (3.7%), and multiracial, Native American, or other ethnicities (8.4%).

Children in the cohort study were 50% female and 52.8 months old at the start of the study (SD = 3.5). The majority of children (55%) spoke Spanish at home, with smaller proportions speaking English (21%) and other languages (24%). Children were ethnically diverse (61% Hispanic/Latino, 16% Black/African American, 11% White, 10% Asian, and 3% multiracial, Native American, or other ethnicities). Income-to-needs ratios indicated that most families were living below the federal poverty line (mean = .86, SD = .53).

4.3. Measures

Demographic information about children was collected through a parent survey and from their schools. At the start of the school year, parents reported on their children's ethnicities and home languages, as well as the number of children and adults in the home and family income. The schools supplied information on children's date of birth and gender. Teachers completed questionnaires that included teacher and classroom demographic information.

4.4. Teacher surveys

Teachers responded to a series of items on literacy and math instructional content. Items were adapted from the Early Childhood Longitudinal Study – Kindergarten: 2011 Cohort (ECLS-K:2011) teacher questionnaires (Westat, 2013) following procedures similar to those used by Claessens and colleagues (2014). Literacy and math items were selected to represent a range of difficulty levels and content areas and were edited for clarity and to increase alignment to state standards and learning trajectories. The pre-K survey included 29 literacy items and 26 math items; the kindergarten version included 35 literacy items and 34 math items because additional, more difficult items were added to better cover a full range of instructional challenge in kindergarten. For each item, teachers indicated whether the content was taught as part of general classroom instruction. To assist in scoring, we asked literacy and math content experts to identify whether each item was most appropriate for pre-K, kindergarten, first, or second grade; we then cross-walked their responses with the state standards local to the school district and consulted again with the experts to resolve any discrepancies. For the current study, we created four composites using items that were common across both years: basic literacy (10 items), advanced literacy (7 items), basic math (4 items), and advanced math (7 items). The basic literacy and math subscales included items identified as most appropriate for pre-K; the advanced subscales included items identified as most appropriate for kindergarten. Internal consistency estimates ranged from low for the basic subscales (basic literacy, α = .35; basic math, α = .32) to acceptable for the advanced subscales (advanced literacy, α = .82, advanced math, α = .65). The low internal consistency estimates for the basic subscales were due to low variability on those items: most teachers endorsed most or all of the basic content areas (basic literacy, mean = .92, SD = .10; basic math, mean = .95, SD = .13). Because the purpose of the current study was descriptive, this low variability was not a major concern.

The Ideas About Children Scale (or caregiver modernity scale; Schaefer & Edgerton, 1985) is a measure of child-centered versus adult-centered beliefs about children (e.g., *Children should always obey the teacher; Children have a right to their own point of view and should be allowed to express it*). Sixteen items are rated on a 5-point scale from strongly disagree to strongly agree; lower scores indicate more child-centered beliefs, and higher scores indicate more adult-centered beliefs. The scale had good internal consistency in the current sample (α = .78).

Teachers also responded to items drawn from the Five Essentials scale, a measure of organizational climate in education settings (Ehrlich et al., 2018). For purposes of the current study, we examined two composites: data use (4 items, $\alpha = .71$) capturing the frequency of teachers' use of assessment and classroom observation data to inform practice; and parent communication (2 items, $\alpha = .66$) capturing the frequency of teachers' communication about home learning and child progress. Data use items were rated on a four- ('never' to '10 or more times') or five-point scale ('never' to 'weekly'). Parent communication items were rated on a six-point scale ('never' to 'daily'). Items were z-scored and averaged together to form composites.

4.5. Observations

The quality of teacher–child interactions was observed using the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, & Hamre, 2008). The CLASS is coded in multiple 25-min cycles which include 15 min to observe and record classroom interactions and 10 min to code the 10 CLASS dimensions. Codes from each cycle are averaged together to arrive at a single set of classroom scores. Dimensions are coded on a seven-point scale with detailed behavioral descriptors of interactions at the low (1–2), mid (3–5), and high (6–7) ranges of effectiveness. Dimensions are collapsed to form three domains: Emotional Support, capturing teacher sensitivity, promotion of autonomy, and climate; Classroom Organization, capturing the degree to which teachers manage behavior and use time and materials effectively to get the most out of the day; and Instructional Support, capturing teachers' promotion of higher order thinking and language. Double-coded observations indicated adequate to strong levels of agreement between coders (Emotional Support, ICC = .79; Classroom Organization, ICC = .73, Instructional Support, ICC = .59).

While observing classrooms using the CLASS, observers used the Classroom Snapshot to capture classroom-level activity settings (whole group, small group, individual time, free play/stations, routines/transitions, and meals) and content of instruction (e.g., language/literacy, math, science, social studies). Activity settings and content are recorded using a continuous timing feature within the CLASS coding application: coders select setting and content codes at the start of the observation and change them as the activity setting and/or content changes. Codes represent the proportion of each cycle that was dedicated to each setting or content area and are averaged across cycles to arrive at classroom averages. Intraclass correlations indicated good agreement between coders (ICCs ranging from .56 to .93, median = .76).

4.6. Procedure

The procedures for this study were approved by the university IRB and the school district's research review board. We worked with county-level early childhood administrators to recruit all eligible school and community-based preschool classrooms providing public preschool within the school district. Teachers were eligible to participate if they taught in classrooms with at least five publicly-funded preschool children enrolled. To recruit community-based programs, we identified a list of community childcare centers that were either publicly funded (e.g., Head Start) or included slots for publicly funded children. A flyer was sent to center directors describing the project, and we followed up by contacting centers individually. If center directors indicated that they were interested in participating, researchers and program staff contacted teachers to describe the project in more detail and obtain teachers' consent. For the public schools, project information was distributed to teachers by the district coordinator. Teachers who opted to participate returned consent forms to the research team.

Surveys were sent to teachers in the fall/winter and spring of each study year. School-based participants received and completed surveys electronically, while community-based participants completed paper versions. Teachers were given a small honorarium to thank them for their participation.

Classroom observations were conducted in the winter and spring of each year. In pre-K, each classroom was observed in the winter and spring for an average of 2.7 days (SD = .49, min/max = 1–4). In kindergarten, teachers were observed during consecutive weeks an average of 2.1 days (SD = .39, min/max = 2–4). Observation scores were averaged across days. During both years, observers arrived and began observations at the start of the school day and observed until the end of the day (around 2:30 pm for kindergarten classrooms, and up until nap time for pre-K classrooms). Classrooms were observed across all activity settings except for "specials" (art, music, physical education, library) led by a specials teacher in a separate classroom, outside free-play/recess, or meals in cafeterias. During the pre-K year, observers alternated between cycles of CLASS observation and cycles of another observation rubric (mean CLASS cycles = 10.9, SD = 2.0, min/max = 4–16). During the kindergarten year, observers coded continuously with the CLASS (mean CLASS cycles = 17.0, SD = 2.5, min/max = 7–24).

5. Results

Descriptive analyses include proportions or means, standard deviations, minimums, and maximums for study variables, presented by grade level. We conducted independent samples t-tests to test for differences in continuous variables and asymptotic Chi-square tests for differences in categorical variables. For all analyses, we used a significance level of $p < .005$ to adjust for the large number of comparisons and increase the likelihood that findings would replicate across similar samples (Benjamin et al., 2018). Findings in the range of $.005 > p < .05$ were considered suggestive evidence of a difference rather than a significant difference (Benjamin et al., 2018).

5.1. Structural features

Table 1 provides descriptive information on the structural features of pre-K and kindergarten classrooms. Compared to pre-K teachers, kindergarten teachers had significantly more years of education but fewer years of experience. Kindergarten teachers were less likely to be of minority race or ethnicity and were less likely to report that they or a teaching assistant in their classroom spoke Spanish. Pre-K and kindergarten classrooms did not differ in the proportion of teachers with degrees in early childhood education or in the proportion of teachers or teacher assistants who spoke languages other than English or Spanish. In terms of classroom characteristics, kindergarten class sizes were significantly larger than pre-K class sizes and had a marginally significant lower proportion of students with limited English proficiency ($p = .006$).

5.2. Process features

Table 2 provides descriptive information on the instructional features of classrooms. For teacher–child interactions, codes in both groups of classrooms were in the low to mid ranges across all domains; however, pre-K classrooms were coded significantly higher on Emotional Support and Instructional Support compared with kindergarten classrooms. Classrooms also differed substantially in the time spent in different activity settings: kindergarten classrooms spent significantly more time in teacher structured activities (whole group, small group, and individual work time) and less time in free play or centers.

Table 1
Structural features of pre-K and kindergarten classrooms.

	Pre-K (*n* = 112–113)			Kindergarten (*n* = 289–295)			*t*(df)	*p*
	Min–Max	Mean/Prop	SD	Min–Max	Mean/Prop	SD		
Teacher characteristics								
Years of education	12–18	16.9	1.6	16–20	17.4	0.9	−3.606(141.1)	<.001
Years of teaching experience	0–42	15.7	9.7	0–37	6.9	6.5	8.869(151.9)	<.001
Teacher or TA speaks English		0.98			0.96		1.354(301.5)	.255
Teacher or TA speaks Spanish		0.48			0.28		3.706(184.6)	<.001
Teacher or TA speaks other language		0.19			0.14		1.034(184.8)	.302
Early Childhood Education major		0.39			0.39		.118(405)	.906
Teacher is of minority ethnicity		0.42			0.16		4.984(160.1)	<.001
Classroom characteristics								
Proportion limited English proficient	0–1	0.56	0.37	0–1	0.46	0.24	2.790(147.9)	0.006
Classroom enrollment	9–23	16.9	1.85	15–48	21.8	3.82	−17.322(384.5)	<.001

Table 2
Process features of pre-K and kindergarten classrooms.

	Pre-K (*n* = 117)			Kindergarten (*n* = 289)			*t*(df)	*p*
	Min–Max	Mean	SD	Min–Max	Mean/Prop	SD		
Teacher–child interactions								
Emotional Support	3.23–6.38	5.35	0.61	2.54–6.73	4.93	0.70	6.033(244.8)	<.001
Classroom Organization	3.88–6.46	5.43	0.55	2.98–6.75	5.28	0.61	2.249(403)	0.025
Instructional Support	1.38–3.76	2.38	0.49	1.17–4.18	2.09	0.51	5.245(404)	<.001
Time in activity settings								
Whole group	.06–.62	0.29	0.11	.11–.81	0.40	0.11	−9.368(404)	<.001
Small group	0–.30	0.06	0.07	0–.83	0.12	0.13	−7.126(381.4)	<.001
Individual work	0–.20	0.02	0.04	0–.62	0.25	0.13	−26.014(376.7)	<.001
Free Play/Centers	.01–.67	0.33	0.13	0–.39	0.05	0.07	22.198(140.6)	<.001
Routines/Transitions	.04–.41	0.18	0.08	0–.36	0.14	0.06	4.766(175.2)	<.001
Time on content								
Language and Literacy	0–.48	0.11	0.09	0–.89	0.41	0.14	−25.846(323.6)	<.001
Math	0–.25	0.03	0.05	0–.82	0.21	0.11	−22.988(401.5)	<.001
Science	0–.14	0.03	0.03	0–.30	0.05	0.06	−5.290(362.2)	<.001
Social Studies	0–.23	0.05	0.06	0–.25	0.03	0.04	3.432(164.6)	.001
Specific literacy and math content								
Basic Literacy	.50–1.00	.90	.12	.60–1.00	.93	.08	−3.167(160.8)	.002
Advanced Literacy	0–1.00	.48	.22	.43–1.00	.95	.10	−21.942(132.1)	<.001
Basic Math	0–1.00	.91	.16	.25–1.00	.96	.11	−2.99(157.2)	.003
Advanced Math	.14–1.00	.65	.19	.43–1.00	.93	.10	−15.2(140.4)	<.001

Table 2 also provides information about instructional content: the proportions of time teachers were observed to spend on math, literacy, science, and social studies, as well as teacher reports of the specific content they taught. Compared with pre-K classrooms, kindergarten classrooms showed sharp increases in class time spent on math and literacy. Time spent on science was also slightly higher in kindergarten classrooms, but kindergarten classrooms spent slightly less time on social studies.

For teacher-reported literacy content, both pre-K and kindergarten teachers endorsed the majority of the basic items, but kindergarten teachers endorsed significantly more basic items than did the pre-K teachers. For the more challenging advanced literacy items, kindergarten teachers endorsed significantly more of the items by a much larger margin.

The same pattern was apparent for teacher-reported math content. For both the basic and advanced item sets, kindergarten teachers reported teaching significantly more of the content, but the difference was relatively small for the basic item set and much more substantial for the advanced item set.

To illustrate this further, Fig. 1 shows the proportion of pre-K and kindergarten teachers who endorsed specific literacy and math items drawing from the mechanics of reading, numeracy, and operations subscales as examples. While nearly all teachers endorsed the easier content items, the more challenging items were differentially endorsed by kindergarten teachers.

5.3. Teacher beliefs and practices

Pre-K and kindergarten teachers did not differ significantly in their self-reports of child-centered ideas about children or parent communication practices (Table 3). There was a significant difference in data-use practices, with pre-K teachers reporting less data use compared with kindergarten teachers.

5.4. Auspice

We used one-way ANOVAs to examine differences between school-based pre-K, center-based pre-K, and kindergarten classrooms. Post hoc tests were considered significant at *p* < .005. For structural features (Table 4), both pre-K auspices had smaller class sizes and greater teacher experience, but center-based pre-K classrooms differed from the other two groups in having fewer years of education, more Spanish-speaking adults, and more ethnic minority teachers. In terms of process features (Table 5), both pre-K auspices spent less time in teacher-structured activities (whole group, small group, individual work time) and more time in free play and routines. In addition, center- and school-based pre-K endorsed fewer of the advanced literacy and math content areas. For teacher beliefs and practices (Table 6), both pre-K auspices reported less frequent data use than kindergarten classrooms, but center-based pre-K teachers reported significantly more adult-centered beliefs compared with school-based pre-K and kindergarten.

Table 3
Teacher beliefs and practices in pre-K and kindergarten classrooms.

	Pre-K ($n = 115$)			Kindergarten ($n = 287$)			t(df)	p
	Min–Max	Mean	SD	Min–Max	Mean	SD		
Ideas about children	1.06–4.00	2.19	0.61	1.13–3.50	2.19	0.51	ns	
Parent communication	−2.06–2.81	−.09	.84	−2.06–2.42	−.08	.88	ns	
Data use	−2.44–1.44	−.65	.80	−1.98– 1.44	.05	.67	−8.27(180.271)	<.001

Table 4
Comparisons of structural features across classrooms by auspice.

		School-based Pre-K	Center-based Pre-K	Kindergarten	p
	n	86	27	294	
Teacher					
Years of education	M	17.34[a]	15.33[b]	17.44[a]	<.001
	SD	1.19	1.80	0.92	
Years of teaching experience	M	16.30[a]	13.70[a]	6.90[b]	<.001
	SD	10.27	7.59	6.45	
Teacher or TA speaks English	M	0.99	0.96	0.96	0.255
	SD	0.11	0.19	0.20	
Teacher or TA speaks Spanish	M	0.43[a]	0.63[b]	0.28[a]	<.001
	SD	0.50	0.49	0.45	
Teacher or TA speaks other language	M	0.20	0.15	0.14	0.278
	SD	0.40	0.36	0.35	
Early Childhood Education major	M	0.42	0.31	0.39	0.594
	SD	0.50	0.47	0.49	
Teacher is of minority ethnicity	M	0.27[a]	0.89[b]	0.16[a]	<.001
	SD	0.45	0.32	0.37	
Classroom					
Proportion limited English proficient	M	0.67[a]	0.25[b]	0.46[c]	<.001
	SD	0.33	0.33	0.24	
Classroom enrollment	M	16.79[a]	17.07[a]	21.76[b]	<.001
	SD	1.30	3.03	3.82	

Note: Significance for the post hoc tests was set to $p < .005$. Across the rows, means with the same superscript were not significantly different from each other in post hoc tests; means with different superscripts were significantly different.

Table 5
Comparisons of process features across classrooms by auspice.

		School-based Pre-K	Center-based Pre-K	Kindergarten	p
	n	86	30	289	
Emotional Support	M	5.36[a]	5.37[ab]	4.93[b]	<.001
	SD	0.6	0.58	0.7	
Classroom Org.	M	5.45	5.38	5.28	0.055
	SD	0.55	0.57	0.61	
Instructional Support	M	2.44[a]	2.24[ab]	2.09[b]	<.001
	SD	0.48	0.51	0.51	
Whole Group	M	0.30[a]	0.25[a]	0.40[b]	<.001
	SD	0.11	0.13	0.11	
Small Group	M	0.06[a]	0.04[a]	0.12[b]	<.001
	SD	0.07	0.06	0.13	
Individual	M	0.02[a]	0.01[a]	0.25[b]	<.001
	SD	0.04	0.03	0.13	
Free Play	M	0.32[a]	0.35[a]	0.05[b]	<.001
	SD	0.11	0.17	0.07	
Routines/Transitions	M	0.18[a]	0.18[a]	0.14[b]	<.001
	SD	0.07	0.11	0.06	
Language and Literacy	M	0.12[a]	0.09[a]	0.41[b]	<.001
	SD	0.09	0.08	0.14	
Math	M	0.03[a]	0.02[a]	0.21[b]	<.001
	SD	0.05	0.04	0.11	
Science	M	0.02[a]	0.03[ab]	0.05[b]	<.001
	SD	0.03	0.04	0.06	
Social Studies	M	0.05[a]	0.04[ab]	0.03[b]	<.001
	SD	0.06	0.05	0.04	
Basic Literacy	M	0.91[a]	0.86[b]	0.93[a]	<.001
	SD	0.11	0.15	0.08	
Advanced Literacy	M	0.46[a]	0.52[a]	0.95[b]	<.001
	SD	0.11	0.15	0.08	
Basic Math	M	0.93[a]	0.87[b]	0.96[a]	<.001
	SD	0.14	0.22	0.11	
Advanced Math	M	0.65[a]	0.67[a]	0.93[b]	<.001
	SD	0.18	0.22	0.10	

Note: Significance for the post hoc tests was set to $p < .005$. Across the rows, means with the same superscript were not significantly different from each other in post hoc tests; means with different superscripts were significantly different.
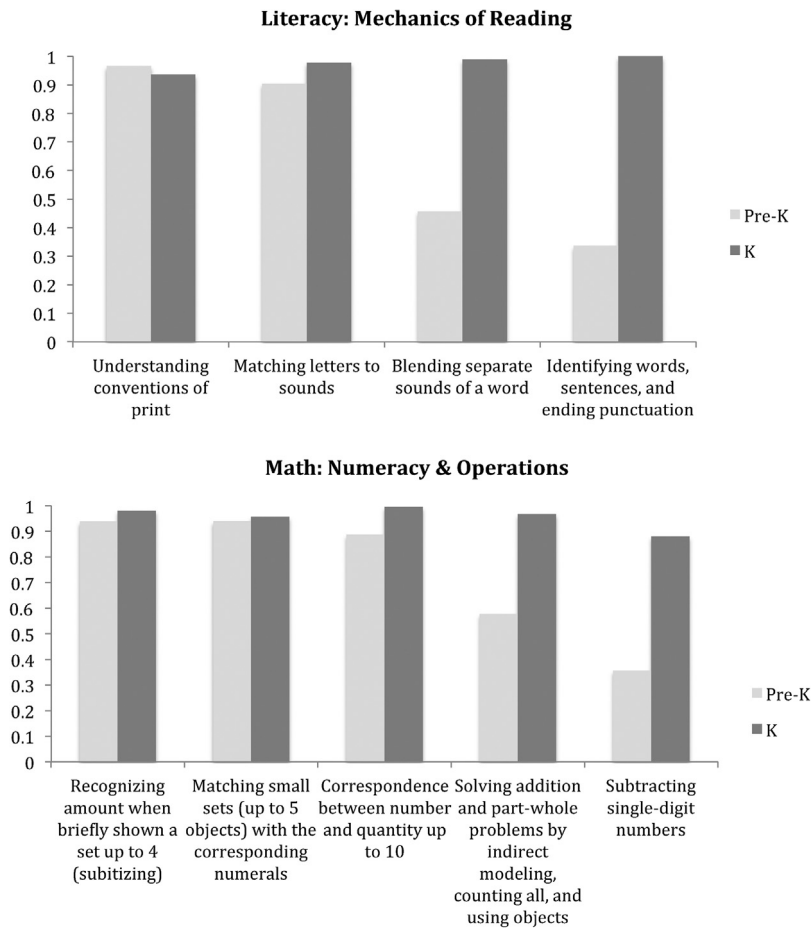
Literacy: Mechanics of Reading

Math: Numeracy & Operations

Fig. 1. Sample items from the literacy and math content scales.

Table 6
Comparisons of teacher beliefs and practices across classrooms by auspice.

		School-based Pre-K	Center-based Pre-K	Kindergarten	p
	n	86	28	287	
Ideas about children	M	2.05[a]	2.65[b]	2.19[a]	<.001
	SD	.51	.68	.51	
Parent communication	M	−.19	.16	−.08	0.169
	SD	.76	1.00	.88	
Data use	M	−.67[a]	−.57[a]	.05[b]	<.001
	SD	.70	1.07	.67	

Note: Significance for the post hoc tests was set to $p < .005$. Across the rows, means with the same superscript were not significantly different from each other in post hoc tests; means with different superscripts were significantly different.

6. Discussion

Evidence supports the argument that high quality, targeted pre-K can boost academic and social-emotional skills among children at risk for poor developmental outcomes. In most studies, though, these effects do not last through third grade (Camilli et al., 2010), raising a series of follow-on questions: What do children experience as they exit the early childhood system and enter public schools? What aspects of their experiences are aligned in ways that may support and carry forward developmental benefits gained in pre-K? Drawing on data that provide a detailed case study of a large, diverse school district, the current study found areas of alignment and misalignment across pre-K and kindergarten classrooms, as well as patterns of difference across pre-K auspices that warrant further investigation.

Prior research has suggested that pre-K effects may fade out when children's pre-K gains are not adequately supported by their kindergarten experiences (Ansari & Pianta, 2018). Based on this, we would consider the pre-K and kindergarten classrooms to be better aligned when kindergarten classrooms provided an equal or greater level of quality as the pre-K classrooms. There are several caveats to note before discussing the results in these terms. First, evidence suggests that multiple years of high-quality experiences are better for children (Cash et al., 2018), so we would not consider classrooms to be aligned in ways that would support their growth if pre-K and kindergarten indicators were both low. Second, it is not straightforward to use our definition of alignment in examining how class time is spent in different activity settings or on content areas because there is no clear consensus on how time should be spent at either grade level. Third, for specific literacy and math content we were looking for a progression from easier to more challenging skills rather than similarity across grades. Despite the limitations, using these very rough definitions provides us with a preliminary framework for discussing what these descriptive data

may mean for children and identifying next directions for work on alignment. We begin by discussing the overall pre-K versus kindergarten results and follow with a discussion of how the auspice results could inform future research.

6.1. Alignment of classrooms' structural features

Results suggested a mixed picture in terms of structural alignment. Differences in structural features were consistent with prior research, which has also found higher teacher education and larger class sizes in kindergarten as compared to pre-K (Abry et al., 2018). Interestingly, pre-K teachers tended to have less education but more experience in the field. Prior research suggests that teachers past their third year of teaching are already at, or close to, their peak effectiveness, so differences in experience beyond that may not be very relevant to child outcomes (Rice, 2010). It is also somewhat encouraging that equal proportions of teachers had majored in early childhood education, although the overall proportion (39%) was low.

Ultimately, the debate around structural features of classrooms comes down to whether or not they matter for children beyond any indirect effects they may have through classroom processes. In early childhood research, it is not clear that education, experience, or even having an early childhood degree are consistently associated with better classroom experiences or stronger child outcomes (Early et al., 2006; Lin & Magnuson, 2018; Pianta et al., 2005). Two features examined in the current study may have direct implications for children: class size and class diversity. Studies have consistently shown that smaller class sizes are associated with stronger achievement over time, with larger effects in the early grades (Mosteller, 1995; Whitehurst & Chingos, 2011). One potential mechanism is that children are less actively engaged in learning when class sizes are large (Blatchford et al., 2011). On the basis of this research, it seems possible that transitioning from a slightly more intimate pre-K setting to a less intimate kindergarten setting may pose challenges for some children.

In terms of classroom diversity, a large proportion of children entering kindergarten from public pre-K were of minority ethnicity and/or were Spanish-speaking dual language learners. These children transitioned into classrooms that were less likely to be led by a teacher of minority ethnicity and were less likely to include a Spanish-speaking teacher or TA. Suggestive evidence further indicated that kindergarten classrooms had lower concentrations of children who were limited English proficient. Several studies have suggested that racial and ethnic match between teachers and students can support positive development among children of color, albeit with small effects (Egalite, Kisida, & Winters, 2015). Additional research suggests that having a language match between adults and children in the classroom supports the development of dual language learners (Downer et al., 2016). Consistent with prior research on public pre-K (e.g., Downer et al., 2016), most children in this study were of minority ethnicities and most came from dual language backgrounds, while teachers were mostly white and spoke only English. These differences in demographic characteristics between teachers and the student body were more pronounced in kindergarten than in pre-K. In kindergarten, therefore, children of color and dual language learners were more likely to experience an ethnic or linguistic mis-match with their teachers compared to white peers, and compared to their own prior experiences in pre-K.

6.2. Alignment of classrooms' process features

There were very clear differences in instructional practices between kindergarten and pre-K. Teacher–child interactions in the Emotional Support and Instructional Support domains were rated lower in kindergarten, with a trend toward lower Classroom Orga-

nization as well. This is the area that we can most clearly state was misaligned (or not aligned in ways that might support continued strong development), because ample research indicates that higher-quality teacher–child interactions (irrespective of grade level) are associated with greater gains across achievement and social domains, and are especially potent when children experience multiple, consecutive years of interactions of high quality (Cash et al., 2018; Hamre et al., 2014; Leyva et al., 2015). Because teacher–child interactions are malleable, it is important to better understand why they were lower in kindergarten and whether kindergarten teachers can be supported to engage in better interactions with children.

There were also sharp differences in the use of teacher-directed versus child-directed activity settings, with much more time in teacher-directed settings when children were in kindergarten. This is consistent with prior research (Abry et al., 2018; Ritchie et al., 2010) and with the observation that kindergarten has become more academic over time (Bassok, Fitzpatrick, et al., 2016; Bassok, Latham, et al., 2016). Evidence on the value of child-directed versus teacher-directed class time is mixed. Some evidence suggests that more time in child-directed activities is beneficial for vocabulary growth, while other evidence suggests that more time spent in child-directed free play is associated with *lower* literacy and math gains (Chien et al., 2010; Lippard, Choi, & Walter, 2019). In kindergarten, providing more child choice and autonomy is associated with greater growth in children's interest in reading and math, which may have long-term implications for children's perceptions of themselves as learners (Lerkkannen et al., 2012). There is clearly a need for more research delving into these issues and relating them to children's learning. Future work should examine how different uses of child-directed time are associated with children's motivation and learning gains, whether there are developmental changes in the utility of child-directed versus teacher-directed time, and what a good balance between the two would look like in practical terms.

By our rough standards, instructional content appeared fairly well-aligned across pre-K and kindergarten. Kindergarten teachers spent significantly more time on academic topics, consistent with the research outlined above (Bassok, Fitzpatrick, et al., 2016; Bassok, Latham, et al., 2016). They also covered more of the specific math and literacy content overall, and in particular endorsed more of the "advanced" math and literacy items compared to pre-K teachers.

Prior studies on specific math and literacy content have been limited to kindergarten and higher grades (Claessens et al., 2014; Engel et al., 2013; Engel, Claessens, Watts, & Farkas, 2016), but show that more time on basic literacy and math skills is negatively associated with children's gains, while more time on advanced content is associated with greater gains. Studies that have examined class time spent on academic content more generally suggest that greater exposure to content is associated with larger learning gains (Connor, Son, Hindman, & Morrison, 2005; Fuligni, Howes, Huang, Hong, & Lara-Cinisomo, 2012). Given these studies, it seems likely that the larger amount of time on content (and the focus on more advanced content) will support children's achievement gains in kindergarten. It is important to note, though, that many have questioned whether large amounts of time on teacher-structured academic learning is developmentally appropriate for young children (Miller & Almon, 2009) or whether the increasing demands on kindergarteners actually undermines motivation to learn in the long term (Katz, 2015).

6.3. Alignment of teacher beliefs and practices

Again, our rough definition of alignment suggests that pre-K and kindergarten classrooms were fairly well-aligned in terms of

the teacher beliefs and practices we measured. We are not aware of prior studies that have examined these factors across grades. A study on home-school match during pre-K indicated that children's school readiness outcomes were better when parents and teachers were aligned in holding child-centered beliefs (Barbarin, Downer, Odom, & Head, 2010). The same may be true across pre-K and kindergarten classrooms, but to our knowledge this research has not yet been done. For parent communication, teachers indicated fairly high rates of communication about children's performance across both grade levels, but it would be interesting to examine parents' perceptions of the quality and frequency of communication and whether perceptions and satisfaction change over the transition.

The finding that kindergarten teachers make greater use of data is not surprising given the strong emphasis on data-driven instruction in K-12 education (Park & Datnow, 2017). Greater attention to child data, in particular, may help teachers differentiate the instruction they provide to children – very important given the wide range of skills that entering kindergarten children display and the need for all children reach certain benchmarks by third grade. In theory, this could reduce the amount of re-teaching that children experience upon school entry and support gains across diverse initial skill levels (Abry, Latham, Bassok, & LoCasale-Crouch, 2015; Claessens et al., 2014). Greater reliance on data may also be a response to the amount of time kindergarten classrooms spend in teacher-directed instruction: in pre-K, children may have more autonomy to follow their own interests and work at their own levels, but in kindergarten the higher degree of structure may dictate a greater need for activities that are matched to children's skills.

6.4. Results by auspice

We first acknowledge that the results by pre-K program auspice must be interpreted very cautiously, because the sample size was limited and programs were recruited from a single community. Despite these limitations, the results by auspice raise interesting questions for future research.

There were three broad patterns in the findings. For some indicators, school-based pre-K and kindergarten classrooms were more alike than were center-based pre-K and kindergarten classrooms. For another set of indicators, school-based and center-based pre-K were more like each other than they were like kindergarten classrooms. And for a third set of indicators, center-based pre-K was right in the middle: not significantly different from school-based pre-K or kindergarten, although school-based pre-K and kindergarten differed from each other.

On indicators in the first category, school-based pre-K and kindergarten had higher teacher education, fewer Spanish-speaking adults, fewer teachers of minority ethnicity, more teaching of basic literacy and math, and less adult-centered (more child-centered) ideas about children. Several of these factors point to greater alignment between school-based pre-K and kindergarten classrooms: specifically, higher teacher education and more child-centered ideas about children. The other indicators as not so clear. Prior research suggests that racial and language match can be beneficial for language minority children and children of color (Egalite et al., 2015), so experiencing a match in pre-K may be more important than having continuity in teacher race, ethnicity, or language from pre-K to kindergarten if that means having a white, English-speaking teacher for both years. Regarding the teaching of basic literacy and math, this academic focus may be a key to the greater effectiveness of school-based pre-K compared with other auspices (Bassok, Fitzpatrick, et al., 2016; Bassok, Latham, et al., 2016), but it may also lead to fade-out if kindergarten teachers are covering similar material (Engel et al., 2013).

For the second category of indicators, school-based and center-based pre-K classrooms had teachers with more years of experience, smaller class sizes, less time in teacher-structured learning activities, less time on literacy and math, less focus on advanced literacy and math, and less frequent use of data to drive instruction. Most of these indicators point to *mis*alignment with kindergarten classrooms, but they may signify some ways in which pre-K is better-aligned with children's developmental capacities than is kindergarten (Parker & Neuharth-Pritchett, 2006; Yelverton & Mashburn, 2018): it is possible that more time for free play and less structured time on content do less to prepare children academically for kindergarten but support other skills, like creativity and motivation (Hirsh-Pasek, Hyson, & Rescorla, 1990).

The last category is the most interesting because it highlights two indicators (CLASS Emotional and Instructional Support) on which center-based pre-K and kindergarten classrooms are more similar to each other than to school-based pre-K but are actually not aligned in ways that would best support children's development. Both scored lower on teacher–child interactions than school-based pre-K (not a significant difference across pre-K auspices) but did not differ significantly from each other. Alignment often means that two things are similar to each other, and alignment efforts in pre-K often seek to get programs engaging in similar types of practices. This is clearly not the case for the quality of teacher–child interactions: robust evidence supports the idea that higher quality interactions are better for children even when children subsequently transition into a lower-quality classroom (Ansari & Pianta, 2018; Li, Farkas, Duncan, Burchinal, & Vandell, 2013). The contexts for these low interactions – and the reasons why they are low – may be very different between center-based pre-K and kindergarten classrooms. Kindergarten classrooms have more children, are more structured, and spend more time covering math and literacy content, while center-based pre-K is less structured and less academic. It may be that children in centers spend less time overall interacting with teachers while kindergarten children are in more constant contact with teachers, but that contact is more directive. This is another area for future research, but altogether these findings underscore the need for a more nuanced understanding of alignment.

6.5. Limitations and future directions

There are several limitations to this work worth noting. First, the observation protocol changed slightly from the pre-K year to the kindergarten year, resulting in more CLASS observation cycles in kindergarten classrooms. Although analyses used proportions of time in different settings/content areas instead of overall minutes of content, it is possible that these differences in protocol affected our results in some way.

We also note as a limitation that this study represents an in-depth case study of a single large school district and is therefore not nationally representative. This clearly limits the degree to which the findings may be generalizable to other locations. However, because this school district makes a concerted effort to strengthen alignment across pre-K and kindergarten settings and to serve as many children as they can within neighborhood elementary schools, this community represents something of an upper bound on estimates of alignment. Many other communities are likely to have less coordination and therefore lower alignment.

A third limitation is that some teachers in the school district did not consent to participate or did not return surveys, which may have biased our sample. In conversations with principals and teachers, we heard that some teachers did not feel that they had time to participate in the study. Overall, our response rate was over 70% and we saw a full range of variability on our constructs of interest. However, results must be interpreted cautiously, and future

studies should examine these constructs using larger samples or corroborate the results with archival data sets.

A fourth limitation is that the internal consistency of several composites was low. For the basic instruction composites, Pre-K and kindergarten teachers endorsed these items at such high rates that there was little variability in scores. Future work with similar measures should include a wider range of items to increase the measure's discrimination between teachers and improve internal consistency. Internal consistency was also low for the parent communication composite, which included only two items. Future work should use more items on this important topic to improve internal consistency.

In terms of next steps, it is very important to better understand which aspects of alignment have implications for children's development. How does misalignment in structural features, process features, and teacher beliefs and practices affect children as they transition into kindergarten, and what are the short- and long-term implications of these different factors on children's development? One study has documented a decline in teacher perceptions of child competence upon school entry (Barbarin, 2013), but more research is needed in this area, especially research that explicitly examines how alignment and misalignment are associated with key child outcomes. This is particularly important as interest in alignment is high but efforts to increase alignment may require costly interventions and professional development.

Relatedly, it is critically important to think about and study what should be aligned and how. Taking teacher-structured time and academic content as examples: is it better for children that pre-K programs become more academic? Or that kindergarten programs be less structured or less academic? What pre-k and kindergarten classroom features and experiences are best for children's academic growth, but also for their growth as competent, self-confident learners and for their social well-being? These questions are often applied to experiences within a single academic year. The descriptive results of the present study suggest that they have not been adequately framed across years to better understand how to produce more coherent educational experiences with presumably a cumulative impact on children's learning.

It is also important as a research community to examine other types of alignment. Many schools are adopting schoolwide behavioral interventions that provide teachers with a common framework and language for encouraging positive behavior (Spaulding, Horning, May, & Vincent, 2008). Other school systems are adopting curricula to teach values and character (Greenberg et al., 2003). Having a common set of behavioral expectations and common language around community values might make transitions easier for children. We do not currently know much about how alignment on these deeper levels may support children's comfort during the transition into school.

Lastly, some of these areas of misalignment, especially in terms of structural features, may be unavoidable or hard to remedy. For example, school funding levels largely dictate class sizes, and a combination of state and federal regulations, funding levels, and teacher workforce characteristics influence the race and education levels of pre-K teachers (Whitebook & McLean, 2017; Whitehurst & Chingos, 2011). Changing alignment along these dimensions could be very costly and we need to better understand the potential benefits to children.

6.6. Conclusions

Despite much research and thought on alignment from pre-K to kindergarten, this area of research is still in an early phase. The current descriptive study took a more comprehensive look at pedagogical alignment than have prior studies, measuring alignment across multiple dimensions and using data from a mix of classroom observations and teacher reports. The results show distinct areas of alignment and misalignment but raise important questions for future research regarding how these factors affect children as they enter school and how different pre-K auspices may be supporting children in different ways.

Conflict of interests

None declared.

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