



RESEARCH REPORT

Associations between Early Care and Education Teacher Characteristics and Observed Classroom Processes

Strengthening the Diversity and Quality of the Early Care and Education Workforce Paper Series

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Executive Summary

The early care and education (ECE) research field has a long tradition of studying ECE teacher characteristics as policy-amenable features of classroom quality. The most frequently and longest studied ECE teacher characteristics are their qualifications—specifically education level, certification, and years of experience. Yet recent research suggests that interactions between ECE teachers and children are more predictive of children’s developmental outcomes than teacher education and credentials (Early et al. 2007; Hamre 2014).

This study dives into an underexplored set of teacher characteristics that likely shape the ways teachers interact with children. Rather than focusing on more distal teacher characteristics like education and certification, this study hones in on a range of proximal features, such as the workplace *supports* teachers have available, their personal *experiences* and challenges, and their physical and mental *well-being*, to understand whether and how these characteristics relate to the classroom quality dimensions that research has identified as most important for children’s early learning.

We focus on teacher characteristics that are theoretically or empirically linked to classroom processes and that are amenable to policy or program intervention. Specific characteristics of interest fall into three categories listed below:

- Teacher supports
 - » Supports in the workplace for teacher economic well-being and mental and physical wellness
 - » Quality of workplace life and teamwork among colleagues
 - » Opportunities and support in the workplace for teachers to try new teaching approaches
 - » Family provision of emotional and instrumental support for the teacher

- Teacher experiences
 - » Teachers’ own adverse childhood experiences (ACEs), including exposure to violence and parental absence
 - » Teacher report of current degree of household chaos
 - » Recent experience of household food insecurity
 - » Working another job
 - » Receiving public benefits

- Teacher well-being
 - » Mental health
 - » Going without needed medical treatment because of cost
 - » Physical health

Teachers who have more workplace and personal supports, fewer challenging experiences in their own lives, and who are in better physical and mental health would be expected to have more emotional reserves and patience, less stress, better concentration, and better self-regulation. These capacities should translate into better classroom management, more supportive emotional exchanges with students, better ability to scaffold peer interactions, and better instructional quality. However, to date no single study has included such a wide range of teacher characteristics or observed measures of classroom quality, leaving open questions about associations between teacher characteristics and classroom quality measures. This study pursues a central research aim, asking generally the following question: do teacher supports, experiences, and well-being relate to observed classroom quality, including classroom management, peer-interaction scaffolding, and classroom emotional and instructional support?

Our analyses capitalize on newly collected data on ECE teachers serving four-year-old children from families with low incomes in a mixed-delivery public pre-K system in Tulsa, Oklahoma. Public pre-K in Tulsa is administered in public schools, a handful of charter schools, and in Head Start and Educare centers. In Tulsa, school-based pre-K and Head Start teachers are paid on the same scale as elementary school teachers, but in reality the hourly pay differs because Head Start teachers work 12 months whereas school-based teachers earn a 9-month salary. Additionally, professional development opportunities, workplace culture, and demographics of teachers and students vary across the mixed-delivery sites in Tulsa. Therefore, this unique data source—the only one to our knowledge that captures this wide range of teacher characteristics and rich observations of classroom quality in a single study—is ideally suited for these analyses.

Our main analytic approach uses quantitative descriptive and multivariate regression analyses, which permit us to estimate associations between our key teacher support, experience, and well-being factors and observational measures of classroom quality, excluding potential confounding variables. Our findings are the following:

- Teacher supports in the workplace predict some features of classroom quality, although not always in expected ways.

- » Teamwork among colleagues supports classroom organization and emotional support for students.
 - » Wellness supports for teachers are related to greater social-emotional instruction and peer-interaction scaffolding.
 - » Teachers with a higher-quality work life and greater economic well-being, including dependable pay and benefits and limited economic concerns, exhibited less emotional support and peer-interaction scaffolding, respectively.
- Teacher well-being is related to classroom management and instructional quality.
 - » Teachers who reported depressive symptoms scored lower on measures of instructional support.

Though preliminary, the current study’s findings have the potential to inform allocation of resources to ECE teacher professional development and other teacher support and quality improvement efforts in ECE settings that serve children from families with low incomes. In particular, this descriptive study points to four actionable steps for administrators of public pre-K programs serving these children:

1. increase access to mental health resources by providing on-site wellness visits with mental health professionals and connections to mental health services in the community;
2. require ECE programs to provide information (e.g., self-screening) about depression to teachers;
3. expand existing professional wellness supports and ensure that all teachers have access to such supports in their workplace;
4. look for opportunities, through professional development time and other preservice and in-service training schedules, to prioritize and bolster teamwork in the workplace.

If our results are extended and replicated, such targeted efforts could not only enhance teacher well-being—which is valuable in its own right—but also elevate classroom quality and ultimately improve children’s early learning and readiness for school.

Associations between ECE Teacher Characteristics and Observed Classroom Processes

ECE teachers shape the environments in which young children learn, grow, and prepare for elementary school. These teachers instruct children in academic content, support the development of underlying capacities that enable children to learn, and foster a classroom environment characterized by supportive adult-child and peer relationships (Diamond et al. 2013; IOM and NRC 2015). In fact, recent research underscores the importance of interactions between ECE teachers and the children they serve as a critical dimension of classroom quality (Early et al. 2007; Hamre 2014). But what shapes teachers' interactions with children in the classroom? This study builds on existing work to explore underexamined teacher characteristics and their associations with observed measures of teacher-child interaction that constitute classroom quality.

Emerging research suggests that ECE teachers report low levels of economic security and high levels of stress, adverse experiences, poor physical health (Whitaker, Dearth-Wesley, and Gooze 2015), and depression (Jeon, Buettner, and Snyder, 2014; Roberts et al. 2016; Whitaker et al. 2015). Many studies have focused specifically on Head Start teachers, who report high workplace stress (Li-Grining et al. 2010) and poor physical and mental health (Whitaker et al. 2013; 2015). These conditions may be because Head Start teachers themselves often have low incomes (Whitaker et al. 2015) and have limited access to the personal and professional supports needed for their own well-being.

Theoretically, ECE teachers' capacities to provide high-quality early learning environments are affected by the professional and personal supports available to them and by their personal experiences and well-being. The larger, more general literature on workplace health and efficiency and productivity finds that workers who feel supported in the workplace and who have reduced stress are more efficient and better meet their job expectations (e.g., Cotton and Hart 2003; Maslach, Schaufeli, and Leiter 2001). Likewise, literature linking parent experiences and health to the quality of parent-child interactions finds, for instance, that parents who struggle with depression are less sensitive and responsive to their children (Goodman et al. 2011), and parents who live in chaotic households have more negative interactions with their children (Coldwell, Pike, and Dunn 2006). Therefore, we might expect teacher characteristics tapping their own supports, experiences, and well-being to relate to the quality of teachers' work, measured by interactions with children. Teachers—particularly of very young

children, who look to their caregivers as external sources of self-regulation—must regulate their own emotions, cope with frustration, and model appropriate emotional responses, all while responding sensitively and contingently to the children in their care and providing academic instruction. For example, teachers who lack workplace or personal supports, or who struggle with past or current adverse experiences or poor health and well-being, may have fewer emotional resources to draw upon in the classroom and may thus be challenged to provide high-quality emotional and instructional support (Buettner et al. 2016; King et al. 2016; Zinsser et al. 2013). Even more specifically, a teacher who reports a high degree of chaos in her own home may come to work distracted and depleted, which could translate into a poor ability to regulate her own emotions and respond to daily frustrations, provide predictable norms and routines in the classroom via classroom-management strategies, and prepare and deliver appropriate instructional content. Therefore, the current study is grounded in the expectation that ECE teacher experiences, supports, and well-being should impact teachers' abilities to perform their primary duties, just as lack of support, the presence of challenging experiences, and poor physical and mental health would be expected to interfere with job performance in other industries and disciplines.

The few studies that have tested this proposition, specifically among ECE teachers serving preschool-age children from families with low incomes in publicly funded programs, find evidence that these hypotheses may be supported—that workplace stress and poor mental health negatively influence teacher-child interaction quality in Head Start classrooms (Li-Grining et al. 2010; Roberts et al. 2016; Whitaker, Dearth-Wesley, and Gooze 2015). Questions remain, however, about whether and to what extent a broader set of ECE teacher support, experience, and well-being variables might relate to observed classroom quality. The current study addresses this gap in the literature by pursuing two related research aims: (1) to document the professional supports, personal experiences, and health and well-being of teachers in publicly funded ECE settings, and (2) to understand how those teacher factors might give rise to variation in classroom quality. In so doing, we aim to measure the specific ECE teacher variables most likely to influence teacher practices and quality across a range of publicly funded preschool settings serving our most vulnerable young children.

Data

Where Do the Data Come From?

Data for the present study were collected in Tulsa, Oklahoma, in Tulsa Public School (TPS) school-based pre-K classrooms, charter school pre-K classrooms, CAP–Tulsa Head Start center classrooms, and Educare classrooms. Participating classrooms were involved in a larger, seven-year longitudinal study of long-term pre-K effects.¹

The units of observation in the current study are the lead teachers in participating classrooms. The teachers were selected via a multistage sampling design in which we first selected centers or schools and then classrooms within each center or school. The teacher sample used in these analyses included 113 lead teachers (one per classroom): 79 TPS school-based pre-K teachers, 3 Tulsa charter school teachers, 25 CAP–Head Start teachers, and 6 Educare teachers.

Across all settings, data on ECE teacher supports, experiences, and well-being were collected using an online Qualtrics survey during spring 2018. In late winter through early spring 2018, we also conducted direct observations of ECE classroom quality in each of the participating teachers' classrooms. However, because of budget constraints, classroom quality observations were not conducted for classrooms with fewer than three study children, and thus four teachers lacking data on classroom quality were excluded from the multivariate regression analysis. For more details on study methods, see the appendix.

Sample

Tables 1, 2, and 4 present descriptive statistics on the 113 ECE teachers who completed surveys. Seventy percent of teachers worked for Tulsa Public Schools or charter schools and 27 percent worked for CAP or Educare. (Because of the small number of charter schools and Educare centers, respectively, we combined charter schools with TPS schools and Educare with Head Start. In other analyses not shown here, we did not combine groups but results were the same.) Regarding teacher compensation, all pre-K teachers in TPS schools are paid the same regardless of school, including charters. CAP Head Start teachers are paid the same annual salary as TPS teachers; however, Head Start teachers are typically 12-month employees (rather than 9-month employees like the TPS teachers) and therefore have lower daily pay. This is consistent with national data showing that the median hourly wage of *school-based* pre-K teachers is nearly double that of pre-K teachers across all settings (Whitebook et al. 2018).

All participating teachers were female, and about half were married. Regarding teacher race/ethnicity, responding teachers were 82 percent white, 8 percent black, 3 percent Latina, 2 percent Asian, 4 percent other races, and 1 percent multiracial. Most teachers had certificates in early childhood education (79 percent) and many had bachelor’s degrees or higher in early childhood education (75 percent), which is consistent with earlier research on TPS and CAP–Tulsa Head Start teachers collected in 2005–6 (Phillips, Gormley, and Lowenstein 2009) and with the agencies’ history of prioritizing high-quality ECE provision. On average, participating teachers reported working in classrooms where 18 percent of children had problem behaviors (as perceived by the teacher, but not necessarily diagnosed), 34 percent were dual-language learners (DLLs), and 72 percent were racial or ethnic minorities.

TABLE 1
Teacher Demographic Characteristics

	Frequency	Percent	n
Teacher education in ECE			
Some college in early childhood education	22	20%	111
AA/AS in early childhood education	1	1%	111
BA/BS in early childhood education	71	64%	111
Graduate degree in early childhood education	13	12%	111
Race/Ethnicity			
Asian	2	2%	112
Black	9	8%	112
Latina	3	3%	112
Multiracial	1	1%	112
White	93	82%	113
Other	5	4%	112
Married	58	52%	111
Age			
20–29	27	24%	113
30–39	22	19%	113
40–49	18	16%	113
50–59	23	20%	113
60–69	14	12%	113
70+	9	8%	113
Number of children at home			
0	69	62%	111
1	21	19%	111
2	14	13%	111
3	5	5%	111
4	2	2%	111
Income			
Below the federal poverty level	3	3%	97
Between 100% and 150% of the federal poverty level	3	3%	97
Between 150% and 200% of the federal poverty level	5	5%	97
Between 200% and 300% of the federal poverty level	31	32%	97
Over 300% of the federal poverty level	66	68%	97

Source: Tulsa SEED Study, Lead Pre-K Teacher Survey, 2017–18 academic year.

TABLE 2

Participating Program and Classroom Characteristics

	Frequency	Percent	n
Program type			
Public or charter school	82	73%	113
CAP or Educare	31	27%	113
Classroom information			
<i>Percent of children in classroom who are racial/ethnic minorities</i>			
Less than 25%	2	2%	113
Between 25% and 50%	12	11%	113
Between 50% and 75%	52	46%	113
Greater than 75%	47	42%	113
<i>Percent of children in classroom who are DLLs</i>			
Less than 25%	42	37%	113
Between 25% and 50%	37	33%	113
Between 50% and 75%	27	24%	113
Greater than 75%	7	6%	113
<i>Percent of children in classroom with problem behaviors</i>			
Less than 25%	83	73%	113
Between 25% and 50%	27	24%	113
Between 50% and 75%	3	3%	113
Greater than 75%	0	0%	113

Source: Tulsa SEED Study, Lead Pre-K Teacher Survey, 2017–18 academic year.

Key Measures**TEACHER SUPPORTS, EXPERIENCES, AND WELL-BEING**

The key predictors of interest in the current study are variables that capture ECE teacher supports, experiences, and well-being. Teacher supports include items surrounding the professional and personal supports ECE teachers receive via the center or school in which they work. Teacher personal experiences include items measuring sources of possible stress from their own childhoods and in their homes. Teacher well-being includes items surrounding their own mental and physical health. A complete list of measures can be found in table 3. For more details on the included measures, see the appendix.

TABLE 3

Measures: Teacher Supports, Experiences, and Well-Being

Constructs	Tools	Details
Teacher Supports		
Support services for children and families		Agreement ratings on 6 items regarding the availability of resources for teachers to support the needs of children and families
Economic well-being		Agreement ratings on 22 items regarding financial concerns and the dependability of pay and benefits
Quality of work life	Supportive Environmental Quality Underlying Adult Learning (SEQUAL) survey (Whitebook and Ryan 2015)	Agreement ratings on 6 items regarding work culture and relationships
Teamwork		Agreement ratings on 5 items regarding the relationships of the teaching staff within a classroom
Wellness supports		Agreement ratings on 9 items regarding resources the program provides to enhance teacher well-being
Applying learning		Agreement ratings on 9 items regarding the culture of learning and improvement among the teaching staff
Family emotional support	Family Support Inventory for Workers (King et al. 1995)	Agreement ratings on 30 items regarding how family members support the teacher through encouragement, guidance, and attitudes toward the teacher's work
Family instrumental assistance		Agreement ratings on 14 items regarding family members' behaviors or attitudes toward helping the teacher with household or family obligations and responsibilities
Adverse childhood experiences	Adverse childhood experiences (ACES) questionnaire (Felitti and Anda 1998)	Response to a 10-item questionnaire about adverse experiences in the first 18 years of life
Household chaos	Confusion, Hubbub, and Order Scale (CHAOS; Matheny et al. 1995)	Agreement ratings on 15 items related to chaos and order in the teacher's home environment
Household food insecurity	USDA Core Food Security Module (CFSM; Economic Research Service 2012)	Agreement ratings on 10 items regarding experiences with financial strain and availability of food in the last year
Works another job	Study-created teacher survey	Response to the question "Do you work at another job?"
Receives public benefits	Study-created teacher survey	Responses to questions about whether the teacher receives any of the following benefits: the Supplemental Nutrition Assistance Program (SNAP), child care subsidy, Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), Medicaid for their children or themselves, Earned Income Tax Credit (EITC), subsidized housing, or Temporary Assistance for Needy Families (TANF)

Constructs	Tools	Details
Elevated depressive symptoms	Center for Epidemiologic Studies Short Depression Scale (CES-D; Radloff 1977)	Agreement ratings on 10 items about depressive symptoms (or lack thereof) in the past week; a binary variable of “elevated depressive symptoms” was created based on whether they met the cutoff for depression risk (10 points or more; Andresen et al. 1994).
Did not receive medical treatment because of cost	Study-created teacher survey	Response to the question “In the past few years, have you or someone in your household gone without medical treatment you thought was needed because of the cost?”
“Very good” or “excellent” health		Rating of “very good” or “excellent” as opposed to “very poor,” “poor,” or “good” on a self-report measure of overall health.

TABLE 4
Prevalence of Teacher Experiences and Well-Being

Variable	Frequency	Percent	<i>n</i>
Teacher experiences			
<i>Adverse childhood experiences</i>			
No ACEs	47	42%	113
1 ACE	31	27%	113
2 ACEs	11	10%	113
3 or more ACEs	24	21%	113
<i>Household CHAOS score</i>			
Very little chaos	76	67%	113
A little bit of chaos	37	33%	113
Some chaos	0	0%	113
A lot of chaos	0	0%	113
<i>Teacher's household is food insecure</i>			
Teacher works another job	28	25%	113
Teacher receives public benefits	29	26%	113
Teacher receives public benefits	30	32%	94
SNAP	0	0%	113
Child care subsidy	2	2%	110
WIC	1	1%	113
Medicaid for their children	5	4%	113
Earned Income Tax Credit (EITC)	27	29%	92
Medicaid for self	0	0%	113
Subsidized housing	0	0%	113
TANF	0	0%	113
Teacher well-being			
Teacher exhibits elevated levels of depressive symptoms (CES-D)	53	50%	106
Teacher or someone in her household has gone without medical treatment because of cost in the past year	40	36%	111
In very good/excellent health	47	42%	113

Source: Tulsa SEED Study, Lead Pre-K Teacher Survey, 2017–18 academic year.

Classroom quality observation data were collected by two trained observers on a single morning between January and March 2018. Classroom teachers were instructed to continue with their usual activities and not to alter their classroom processes because of researchers' presence. One trained observer completed the Adapted Teaching Style Rating Scale (ATSRS; Raver et al. 2012), and the other trained observer completed the Classroom Assessment Scoring System–Pre-Kindergarten version (CLASS–Pre-K). The ATSRS includes 12 items divided into three subscales: classroom management, social-emotional instruction, and peer-interaction scaffolding. The items are rated to capture frequency of observed teacher practices. The CLASS–Pre-K assesses three domains of teacher-child interaction quality: emotional support, classroom organization, and instructional support.² For more details on the measures of classroom quality, see the appendix.

COVARIATES

Covariates (see tables 1 and 2) were included to account for variables that could potentially confound the relationship between teacher supports, experiences, and well-being and observational measures of classroom quality. Such potential confounding variables include program (center or school) type, classroom information, and teacher demographics. Classroom information included teacher report of the percent of children in the teacher's classroom who were racial/ethnic minorities, the percent of children who were dual-language learners (measured by whether their household spoke a language other than English), and the percent of children with problem behaviors. Teacher demographic covariates included dummy variables for race/ethnicity, marital status, and education (whether they had a BA or higher in ECE) and continuous variables for number of children living in the teacher's household, teachers' gross self-reported household income in 2017, and teacher age. In multivariate analyses, race/ethnicity was collapsed into a single indicator of whether or not the teacher was non-Hispanic white, because of small cell sizes within race categories.

ANALYTIC APPROACH

To address our first research aim, which was to document the distribution of teacher supports, experiences, and well-being in a sample of ECE teachers serving four-year-olds from families with low incomes in center-based ECE settings, we computed simple descriptive statistics (see table 4). To address our second research aim, which was to explore associations between those ECE teacher characteristics and observational measures of classroom quality, we first generated Pearson correlations among teacher variables and classroom quality measures. To formalize those bivariate results, we then estimated ordinary least squared (OLS) regression models in which we predicted classroom quality scores on each of the three subscales of the CLASS and then the ATSRS, respectively,

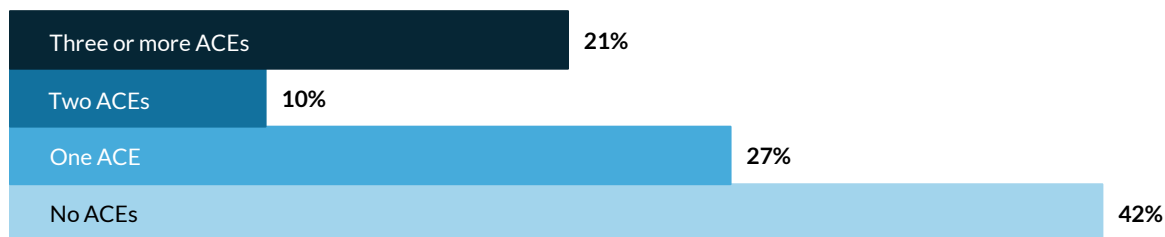
from the ECE teacher support, experience, and well-being variables while controlling for covariates.³ Separate regression models were run for each classroom quality subscale (six models in total), and each regression included all ECE teacher variables and covariates. All regression coefficients were standardized to have a mean of zero and a standard deviation of one, to ease interpretation and comparison across outcomes; thus coefficients can be interpreted as effect sizes.

Results

Describing the Teachers in Our Study

Our sample of teachers had relatively high rates of elevated depressive symptoms (50 percent), compared, for instance, with data from a study of Head Start teachers in which 24 percent of respondents reported being depressed (Whitaker, Dearth-Wesley, and Gooze 2015). **The rates of teacher-reported household food insecurity were also high (27 percent)**, though not as high as those in other ECE settings: specifically, another study of ECE teachers found lower rates of food insecurity for teachers in public settings (18 percent) but higher rates for ECE teachers overall, including for-profit and nonprofit settings (48 percent), suggesting that ECE teachers in Tulsa may be more disadvantaged than other teachers in public preschool settings but less disadvantaged than ECE teachers overall (Whitebook, Phillips, and Howes 2014). Rates of teachers reporting no adverse childhood experiences (ACEs; 42 percent; figure 1) were similar to reported rates for US women overall (CDC 2015). Consistent with prior research (e.g., Felitti and Anda 2010), ACEs and elevated depressive symptoms were significantly correlated in our sample, suggesting that more ACEs predicted more elevated depressive symptoms.

FIGURE 1
Teachers Reporting Adverse Childhood Experiences

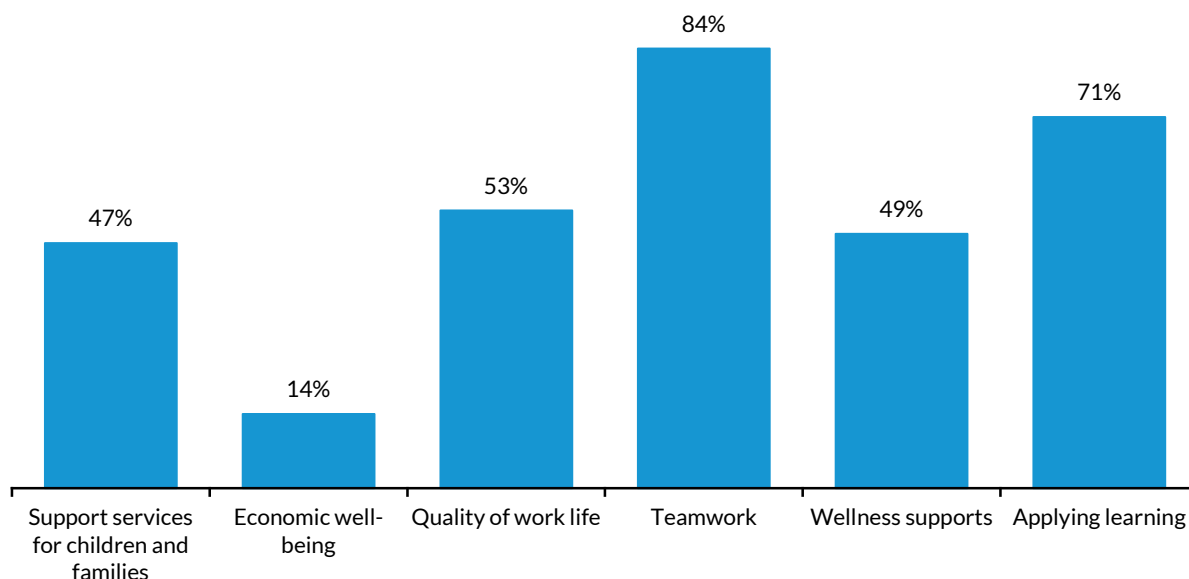


Source: Tulsa SEED Study, Lead Pre-K Teacher Survey, 2017–18 academic year.

How Do Teacher Supports Predict Observational Measures of Classroom Quality?

On average, teachers reported relatively high levels of support from their programs (figure 2). However, teachers typically reported lower scores for economic well-being, which includes equitable pay and employee benefits in addition to measures of teachers' financial concerns, than for collegial supports such as teamwork and quality of work life.

FIGURE 2
Teachers Reporting High Levels of Program Supports



Source: Tulsa SEED Study, Lead Pre-K Teacher Survey, 2017–18 academic year.

In general, indicators tapping work-related supports correlated with each other and with observed measures of classroom quality. For instance, *applying learning* is highly correlated with *quality of work life* and *teamwork*, and both subscales on the *family support inventory for workers* are highly correlated with each other and with *economic well-being*. These teacher supports were only inconsistently correlated with measures of classroom quality—most notably, *wellness supports* correlated with the *ATSRS social-emotional instruction* and *peer-interaction scaffolding* subscales, as well as the *CLASS instructional support* subscale.

While family supports were not predictive of classroom quality, numerous workplace supports were. Teachers who reported more *wellness supports* led classrooms with statistically significantly higher scores on social-emotional instruction ($\beta = 0.17, SE = 0.08$) and peer-interaction scaffolding ($\beta = 0.05, SE = 0.02$). Teachers who reported more teamwork led classrooms that were rated as having

significantly better classroom organization ($\beta = 0.06, SE=0.03$) and emotional support ($\beta = 0.06, SE = 0.03$).

Surprisingly, teachers' reports of economic well-being and positive relationships at work (i.e., higher quality of work life scale scores) were significantly or marginally inversely related to peer-interaction scaffolding in the classroom ($\beta = -0.03, SE = 0.01$) and emotional support scores ($\beta = -0.04, SE = 0.02$), respectively.

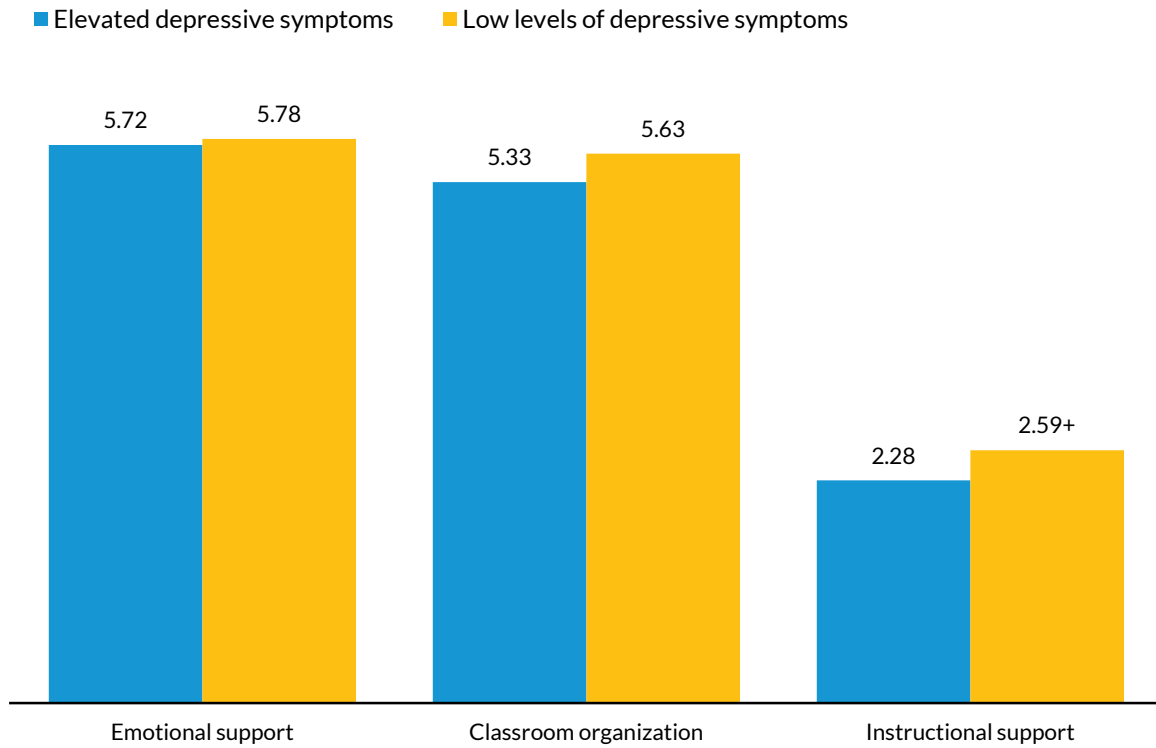
How Do Teacher Personal Experiences Predict Observational Measures of Classroom Quality?

Beyond teacher supports, measures of teacher experience with economic and food insecurity were also significantly related, such that *household food insecurity* was highly related to *household CHAOS*. *Household food insecurity* was also highly and positively correlated with numerous teacher well-being variables, including teacher depression, poor health, and going without medical treatment because of cost. Surprisingly, only one correlational relationship between teacher personal experiences and classroom quality was significant: household CHAOS was negatively correlated with the ATSRs social-emotional instruction and peer-interaction scaffolding subscales. Similarly, although teacher physical and mental health were related to each other, only physical health was correlated with any measure of classroom quality (ATSRs peer-interaction scaffolding). In multivariate analyses, none of the personal experiences were significantly related to classroom quality, after controlling for all other measures and covariates.

How Does Teacher Well-Being Predict Observational Measures of Classroom Quality?

Finally, with respect to teacher well-being, teachers who were depressed led classrooms that scored lower on instructional support, as measured by the CLASS, at the marginal level of significance ($\beta = -0.32, SE = 0.18, p < 0.10$; see figure 3).

FIGURE 3
CLASS Scores by Depressive Symptoms (Average Ratings)



Source: Tulsa SEED Study classroom observations using CLASS instrument.
Notes: Depressive symptoms were measured using the CES-D. A binary variable of “elevated depressive symptoms” was created based on whether they met the cutoff for depression risk (10 points or more; Andresen et al. 1994).
 + Group difference is marginally significant at $p < 0.10$.

Discussion

Summary of Results

This study is the first to document a wide set of ECE teacher support, experience, and well-being variables across a range of public ECE settings and to link those characteristics to multiple observed classroom quality measures. The teachers in our sample reported relatively high levels of strain and stress, possibly because they themselves are more likely to have low incomes (Whitaker et al., 2013; Whitebook et al., 2018) and have limited access to professional and personal supports for their own well-being. The fact that nearly half our sample reported elevated depressive symptoms—which is higher than a sample of Head Start teachers in Pennsylvania (Whitaker et al., 2015), is notable. Nearly one-third of ECE teachers in our sample also reported working a second job, being food insecure, and

receiving public benefits, suggesting that despite being paid on the same scale as elementary school teachers, the ECE teachers in our sample in Tulsa may be especially economically disadvantaged.

Turning to the results from the regressions predicting classroom quality from teacher variables, our findings suggest that, in general, teachers who reported more professional supports for wellness and more teamwork among colleagues in their classrooms led classrooms that scored higher on measures of social-emotional instruction, peer-interaction scaffolding, emotional support of students, and classroom organization. If having professional supports for wellness and supportive relationships with in-classroom colleagues (e.g., assistant teachers) reduces workplace stress—which we do not measure directly but which other studies have found relate to classroom quality (e.g., Li-Grining et al. 2010; Whitaker, Dearth-Wesley, and Gooze 2015)—this could partially explain the relationship observed in our study.

Consistent with prior literature, the bulk of which has focused on relationships between teacher stress and mental health and classroom quality (e.g., De Schipper et al. 2009; Whitaker et al. 2015), we found that teachers who were depressed led classrooms that scored lower on measures of instructional support. Just as research links maternal stress and depression to reductions in maternal responsiveness and sensitivity (Goodman et al. 2011; Lovejoy et al. 2000; Wachs, Black, and Engle 2009), ECE teachers who experience stress, depression, and other challenges struggle to build healthy relationships with their students and have lower-quality teacher-child interactions (e.g., Jeon et al. 2014; Roberts et al. 2016). This is especially true of ECE teachers in publicly funded programs for children from families with low incomes, many of whom themselves come from stressful environments as our and other data show (e.g., Aikens et al. 2010). In this context, our results add to a small but growing body of literature and should intensify calls to support the mental health and reduce the psychosocial stress of ECE teachers.

Yet our study also produced some null and counterintuitive findings. Specifically, teacher food insecurity, public benefits receipt, and health status were statistically unrelated to observed classroom quality while teachers who reported higher quality of work life supports and more economic well-being supports had lower classroom quality scores. Given the cross-sectional nature of our data, these counterintuitive findings may reflect offsetting or reverse directionality of associations. Regarding food insecurity and public benefit receipt, for instance, it is possible that benefits receipt offsets any negative association between food insecurity and observed quality. Unfortunately, without knowing whether food insecurity preceded benefit receipt, or vice versa, this is impossible to test. Regarding reverse directionality, it may be that low emotional support scores contribute to greater reliance on quality of work life supports and not the other way around. The quality of work life scale emphasizes support at

work for personal issues, such as being able to complain, sharing personal issues with coworkers, and not having to tolerate bullying among adults at the program. Teachers who endorse high quality of work life may be seeking their coworkers' support for challenges in providing emotional supports in the classroom, or they may be distracted by personal issues and conflicts, which could reduce their capacity to provide emotional support. The current study's cross-sectional design precludes our ability to untangle these associations.

Similarly, in this study we are unable to parse the negative correlation between better economic well-being supports (e.g., benefits, paid time off, fewer financial concerns about bills, retirement, etc.) and lower peer-interaction scaffolding. In supplementary analyses, we explored associations between component items that make up the economic well-being scale and the peer-interaction scaffolding outcome. Two component items of the economic well-being scale ("I worry about having a large enough savings for my retirement" and "I worry about having my hours reduced at work") were both negatively and significantly ($p < .01$) associated with teachers' peer-interaction scaffolding. It is possible that a teacher who is very concerned with saving for retirement and about future work hours could be more future focused and planful, which may actually help them scaffold peer interactions in the classroom. It could also be that larger agencies have more resources to support economic well-being, for instance, but also have a more "institutional" approach to early childhood education, such that the quality of peer-interaction scaffolding is less developmentally appropriate (Desimone et al. 2004; Johnson, Finch, and Phillips 2019).

Each of these explanations are highly speculative, and more research is needed to understand these puzzling patterns of results. Regardless of the nature of these associations in the current study, as the landmark Institute of Medicine report states: "The early care and education workforce is at risk financially, emotionally, and physically" (IOM & NRC, 2015, 478). Thus, ongoing efforts to increase teachers' pay and benefits and overall economic well-being are worthy goals from equity and human rights perspectives.

Limitations

As mentioned above, the cross-sectional nature of this study—the measurement of teacher experiences, supports, and well-being simultaneously, and around the same time that classroom quality was measured—precludes any conclusions about the directionality of our findings. We cannot draw causal conclusions, nor can we parse whether and to what extent certain "stressors" like food insecurity or chaos may be reduced or eliminated by some of the supports we measured. A longitudinal study

design would allow for a more nuanced understanding of whether supports for teachers—like pay and benefits—could buffer against stressful personal experiences like food insecurity, chaos, or depression, suppressing each other’s impacts. Repeated measures of teacher experiences, supports, well-being, and observed classroom quality would also help clarify the directionality of the associations reported here. For instance, as suggested earlier, perhaps teachers with lower classroom emotional support scores report better quality of work life because they seek the counsel of coworkers and supervisors to improve emotional supports in the classroom.

Additionally, the self-reported nature of the data in this survey, despite being anonymous, could still be subject to a social-desirability bias. If true, this would lead to underreports of sensitive data on topics like ACEs and public benefits receipt, which could suppress true associations. Lack of awareness of workplace supports could also lead to an underestimation of these constructs in our data. We are also limited in our ability to analyze the size of potential nonresponse bias. As mentioned earlier, at this time we lack data on teachers who did not complete surveys, which prevents us from comparing respondents to nonrespondents. Therefore, the present study may not be generalizable to all ECE teachers in public and charter schools and Head Start and Educare centers, in Tulsa and elsewhere.

Implications for Policy, Practice, and Future Research

Though preliminary, the current study’s findings have the potential to inform ECE policy and practice. With respect to policy, characterizing teacher supports, experiences, and well-being across publicly funded center-based ECE settings serving children from families with low incomes can help pinpoint dimensions of teachers’ professional and personal lives most in need of assistance and the nature of the assistance needed. Agencies and program administrators should seek to increase access to mental health services including on-site stress management and mindfulness training to reduce teachers’ depressive symptoms. Inviting local mental health professionals to speak on-site, making literature available to teachers that can connect them with local resources, and providing self-screening tools can help identify problems and solutions for teachers struggling with stress and depression. On the practice side, shoring up and expanding existing workplace wellness supports and ensuring that all teachers have access to such supports, as well as building opportunities for prioritizing and bolstering teamwork and connection among staff at professional development and training sessions, are other outlets for administrators and directors to consider when enhancing teacher supports and well-being and classroom practice.

Future studies would ideally collect data on teacher supports, experiences, and well-being repeatedly over time, perhaps beginning with a sample of new ECE teachers and then following them to observe the onset and trajectory of stressful experiences (e.g., depression) and well-being in the face of supports. Repeated measures of observed classroom quality would also be ideal, despite their hefty cost and time requirements.

Together, these emerging findings underscore the need to continue exploring the importance of allocating resources toward ECE teacher professional development, compensation, and other teacher support and quality improvement efforts in ECE settings that serve children from families with low incomes. Even those teacher characteristics that were unrelated to classroom quality, such as whether the teacher receives public benefits or works another job, are worthy of continued attention simply from a human rights and equity perspective (Whitebook, Phillips, and Howes 2014). If our results are extended and replicated, such targeted efforts could not only enhance teacher well-being but also elevate classroom quality with the potential to ultimately enhance children's early learning and readiness for school.

Appendix. Methods

Sampling Strategy

The observation units in the current study are lead teachers in center-based ECE classrooms serving 4-year-olds from families with low incomes in Tulsa, Oklahoma (TPS school-based pre-K, charter schools, CAP–Head Start, and Tulsa Educare). The teachers that are the focus of this study, which is embedded in a larger, seven-year longitudinal study of long-term pre-K effects (School Experiences and Early Development (SEED) Study),⁴ were selected via a multistage sampling design in which we first selected centers or schools and then classrooms within each center or school.

Because a very high proportion of 4-year-olds in Tulsa attend TPS pre-K (approximately 75 percent), we started our sampling strategy with TPS. Of the 52 TPS elementary schools that included a pre-K program, we selected a subset of 48 schools that (1) served a low-income population (defined as schools in which a substantial proportion (~80 percent) of the student body qualified for free or reduced-price lunch) and (2) enrolled at least five CAP–Head Start graduates in kindergarten or were located within three miles of a CAP–Head Start or Educare program (to maximize the chances of retaining CAP–Head Start/Educare graduates for follow-up in kindergarten, for the aims of the larger longitudinal Tulsa SEED study). Once these 48 TPS schools were identified, we selected all CAP–Head Start centers ($n = 6$) and all Tulsa Educare centers ($n = 3$) within three miles of the TPS schools included in the sample. (Included in these 48 schools are 4 charter schools that house pre-K classrooms, serve majority low-income populations, and enroll substantial CAP-Head Start and Educare graduates in kindergarten. These charter schools technically operate separately from, though are supported in part by, TPS.)

Once all the schools and centers were identified, we then selected classrooms within the schools and centers. From the 48 TPS schools with pre-K classrooms (including four charter schools), we included all pre-K classrooms in schools that had one or two pre-K classrooms and randomly selected two pre-K classrooms in each of the schools that had three or more pre-K classrooms. This yielded a possible sample of 102 TPS school-based pre-K classrooms and 4 charter school pre-K classrooms. We selected all classrooms serving 4-year-old children across all CAP–Tulsa Head Start sites ($n = 28$ classrooms) and in Tulsa Educare ($n = 8$ classrooms) in our sample. In total, we recruited 142 eligible 4-year-old classrooms across all the center-based ECE settings described above. Of the 142 teachers recruited, 113 (approximately 80 percent) completed surveys: 79 of 102 TPS school-based pre-K teachers, 3 of 4 Tulsa charter school teachers, 25 of 28 CAP–Head Start teachers, and 6 of 8 Educare

teachers. However, because of budget constraints, classroom quality observations were not conducted for classrooms with fewer than three study children, and thus four teachers lacking data on classroom quality were excluded from the multivariate regression analysis. Teachers were permitted to decline participation in the survey and the classroom observation.

Measures

Teacher Supports, Experiences, and Well-Being

The key predictors of interest in the current study are variables that capture ECE teacher supports, experiences, and well-being. Teacher supports include items surrounding the professional and personal supports ECE teachers receive via the center or school in which they work. Teacher experiences include items surrounding sources of possible stress in their own childhoods and homes. Teacher well-being includes items surrounding their own mental and physical health.

TEACHER SUPPORTS

Most items related to work supports were drawn from the Supportive Environmental Quality Underlying Adult Learning (SEQUAL) survey (Whitebook and Ryan 2015). The six subscales used for this study include *support services for children and families*, *economic well-being*, *quality of work life*, *teamwork*, *wellness supports*, and *applying learning*. For each subscale, participants were asked to rate their agreement with each item on a six-point Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” *Support services for children and families* is a six-item subscale ($\alpha = .89$) that captures the availability of resources for teachers to support the needs of children and families, including resources to find outside help (e.g., consultants), availability of support from supervisors or coworkers, and training on supporting families and children. The *economic well-being* subscale ($\alpha = .85$) includes 22 items about whether teachers can depend on certain pay and benefits from their program (e.g., taking paid time off for holidays, vacation, or sick leave; being paid for planning time; receiving a raise upon completing a degree) and teachers’ financial worries (e.g., concerns about being laid off, not getting a raise, paying bills—reverse-coded). The *quality of work life* subscale ($\alpha = .90$) includes six items that capture the work culture and relationships in the program, such as support among colleagues and fair treatment of staff (e.g., bullying is not tolerated in the program; teachers feel supported by colleagues if they have personal issues). The *teamwork* subscale ($\alpha = .92$) includes five items focused on the relationships of teaching staff within a classroom, including whether they consider themselves a team, share responsibilities, and consider all staff’s opinions when making decisions. The *wellness supports*

subscale ($\alpha = .81$) is composed of nine items related to program resources for enhancing teacher well-being, such as a safe place to store personal belongings, a break room, and training on healthy living. Finally, the *applying learning* subscale ($\alpha = .70$) is composed of nine items about the culture of learning and improvement among the teaching staff, such as whether the teacher feels comfortable trying new teaching approaches and whether staff talk about new ways to teach.

The *family support inventory for workers* was also used to assess teachers' emotional support and instrumental assistance from their families as it relates to their professional life (King et al. 1995). The *emotional support* subscale captures how family members support the teacher through encouragement, guidance, and attitudes toward the teacher's work ($\alpha = .96$). The *instrumental assistance* subscale focuses more on family members' behaviors or attitudes toward helping the teacher with household or family obligations and responsibilities ($\alpha = .92$)

TEACHER EXPERIENCES

Items related to teacher experiences were based on existing measures of adverse childhood experiences, household food insecurity, and household chaos, as well as questions about teachers' current employment and public benefits receipt. *Adverse childhood experiences* were assessed using the Adverse Childhood Experiences (ACES) questionnaire (Felitti and Anda 1998). For this study, a 10-item version of the questionnaire was used to assess whether participants had adverse experiences in their first 18 years of life. Sample items include "Did a household member go to prison?" and "Were your parents ever separated or divorced?" The total numbers of experienced ACEs were summed to create an ACE score for each participant ($\alpha = .77$). *Household food insecurity* was measured using the USDA Core Food Security Module (CFSM; Economic Research Service 2012). For this study, we used the CFSM's 10-item household index, which is arguably the preferred index (see Johnson and Markowitz 2018a). Items in the 10-item household index capture food insecurity in the last 12 months through questions such as "In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?" and "How true is it for you that in the last 12 months: We couldn't afford to eat balanced meals." Items were rated on a three-point Likert scale indicating whether the statement was never, sometimes, or often true. To construct the food insecurity scale, we created binary variables for each item by coding responses of "sometimes true" and "often true" as one point and "never true" as zero points. The total score was created by summing the total across items, with higher scores indicating greater household food insecurity ($\alpha = .82$). For descriptive results, a binary variable of household food insecurity was created to indicate if the respondent endorsed at least three of the statements as sometimes or often true. *Household chaos* was assessed using the Confusion, Hubbub, and Order Scale (CHAOS; Matheny et al. 1995). The CHAOS includes 15 items regarding the

home environment, such as “There is very little commotion in our home,” “It’s a real zoo in our home,” and “No matter what our family plans, it usually doesn’t seem to work out.” Each item is scored on a four-point Likert scale from “Very much like your own home” to “Not at all like your own home.” The total CHAOS score was created by summing the points (0–3) for each item, with positive items reverse coded. A higher score indicates more household chaos ($\alpha = .74$).

Teachers were also asked whether they worked another job in addition to their lead ECE teacher position (1 = yes). Additionally, teachers indicated whether they have received any public benefits in the past three years. We constructed a binary indicator (1 = yes) if respondents reported using any of the following public programs: SNAP (Supplemental Nutrition Assistance Program), WIC (Women, Infants, and Children), TANF (Temporary Assistance for Needy Families), Medicaid, subsidized housing, child care subsidies, or the Earned Income Tax Credit.

TEACHER WELL-BEING

Items related to teacher well-being include teacher depression and physical health. *Teachers’ depressive symptoms* were measured using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977), Short Form (10 items versus 16). Participants were asked to rate how often items were true for them in the past week on a four-point Likert scale ranging from “Rarely or none of the time (less than 1 day)” to “All of the time (5–7 days).” Items included depressive symptoms such as “I felt that everything I did was an effort” and “I felt fearful,” as well as lack of depressive symptoms (e.g., “I felt happy”), which were reverse coded. Total scores were calculated using a scale of 0–3 for each item. A categorical variable of elevated depressive symptoms was created based on whether they met the cutoff for depression (10 points or more; Andresen et al. 1994; $\alpha = .85$).

Teachers’ physical health was assessed with a widely used single Likert-scaled item asking participants how they would rank their overall health (1 = poor to 5 = excellent). Following prior studies (e.g., Johnson and Markowitz 2018b), participants were classified as having good health (= 1) if they reported “very good” or “excellent” health. Additionally, teachers were asked whether they or someone in their household had to go without medical treatment because of cost within the past year (1 = yes).

Classroom Quality

Classroom quality observation data were collected by two trained observers on a single morning between January and March 2018. Classroom teachers were instructed to continue with their usual activities and not to alter their classroom processes because of researchers’ presence. One trained

observer completed the Adapted Teaching Style Rating Scale (ATSRS), and the other trained observer completed the Classroom Assessment Scoring System—Pre-Kindergarten version (CLASS-Pre-K). Both observers were trained and achieved reliability at 80 percent or greater, following guidelines recommended by each tool's authors.

ADAPTED TEACHING STYLE RATING SCALE

The 12-item *Adapted Teacher Style Rating Scale* (ATSRS; Raver et al. 2012) captures teacher practices around classroom structure and behavior management, emotional communication and support, and social awareness and problem-solving. Using items with response options ranging from 1 to 5, observers rated lead teachers' classroom routines, preparedness, behavior management, attention and engagement, emotion modeling and expression, social awareness and problem-solving, and scaffolding over a two-hour session. Factor analyses replicating results from those conducted in previous studies (e.g., Morris et al. 2014) identified three overarching constructs. The *classroom management* subscale summed items measuring teachers' use of a consistent routine, preparedness, classroom awareness, positive behavior management, negative behavior management (reverse-coded), and teachers' attention and engagement during the observation period ($\alpha = .88$). The *social-emotional instruction* subscale summed items capturing teachers' emotion-modeling techniques, support of children's emotional expression, social problem-solving, and social awareness ($\alpha = .92$). We refer to the remaining five-level item capturing the extent to which teachers scaffold interactions between peers as the *peer-interaction scaffolding* subscale.

CLASSROOM ASSESSMENT SCORING SYSTEM—PRE-K VERSION

Classroom observers assessed teacher-child interactions across four cycles of 15-minute observations using the widely employed Classroom Assessment Scoring System—Pre-K Version (CLASS; Pianta et al. 2008). The CLASS uses direct observation to assess three domains of teacher-child interaction quality: emotional support, classroom organization, and instructional support. Following standard practice, we constructed one score for each domain by averaging its component items. The *emotional support* scale captures positive and negative emotional climate, teacher sensitivity, and teachers' regard for student perspectives ($\alpha = .81$). The *classroom organization* subscale captures teachers' management of children's behavior and teachers' productivity and instructional learning formats used to maximize child learning through classroom routines ($\alpha = .84$). Finally, the *instructional support* subscale assesses the quality of teachers' feedback to students, techniques used to develop learning concepts, and teachers' modeling of language and higher-order thinking skills ($\alpha = .91$).

Notes

- ¹ For more about the Tulsa SEED Study, visit “School Experiences and Early Development (SEED) Study,” Early Childhood Education Institute, accessed March 1, 2019, <http://www.ou.edu/tulsa/early-childhood-education-institute/current-projects/seed>.
- ² Average CLASS Pre-K scores in the sample (Emotional Support [ES] – $M = 5.77$, $SD = .86$; Classroom Organization [CO] – $M = 5.52$; $SD = .93$; Instructional Support [IS] – $M = 2.43$; $SD = .81$) were comparable with, although slightly lower than, national averages among Head Start preschool classrooms (ES – $M = 6.07$; $SD = .30$; CO – $M = 5.83$; $SD = .40$; IS – $M = 3.00$; $SD = .53$; Office of Head Start 2018).
- ³ All analyses were conducted using Stata version 15. To account for nesting of teachers within centers or schools, all regressions were estimated with the inclusion of robust standard errors, and data were multiply imputed to address item-level nonresponse. Multiple imputation in Stata 15 relied on the “ice” command to create 10 imputed datasets, and the “mim” command to combine estimates across imputed datasets.
- ⁴ “School Experiences and Early Development (SEED) Study,” Early Childhood Education Institute.

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