Who are they and what do they need: Characterizing and supporting the early childhood assistant teacher workforce in a large urban district

Travis Cramer[1] and Elise Cappella[1]

[1] New York University

Author Note

Travis Cramer, PhD, Department of Applied Psychology, New York University; Elise Cappella, PhD, Department of Applied Psychology, New York University

Correspondence concerning this article should be addressed to Travis Cramer, Department of Applied Psychology, New York University, 246 Greene Street, Floor 8, New York, NY, 10003. E-mail: travis.cramer@nyu.edu

Manuscript published in the American Journal of Community Psychology.
https://onlinelibrary.wiley.com/journal/15732770

Citation:

Cramer, T. & Cappella, E. (2019). Who are they and what do they need: Characterizing and supporting the early childhood assistant teacher workforce in a large urban district. *American Journal of Community Psychology*, *63*, 312–323.

Acknowledgements: Many thanks to Cybele Raver, Pamela Morris, Rachel Abenavoli, LaRue Allen, and the early childhood education professionals who made this study possible.

Funding: this research was supported by the Institute of Education Sciences, U.S. Department of Education [grant number R305B140037] and the Foundation for Child Development [grant number NYU 10-2015].

Abstract

Scholarship and policy emphasize strengthening the early childhood education (ECE) workforce, but this work neglects a large segment of the workforce: assistant teachers. The present study responds to gaps in knowledge by examining the demographic characteristics, qualifications, professional supports, and workplace experiences of assistant teachers ($N = 120$) in a representative sample of ECE centers ($n = 35$) in a large urban district. In addition to studying assistant teachers' receipt of in-service training and coaching, we draw from social network theory to investigate the professional support assistant teachers provide and receive via their collegial networks. We use a variance decomposition approach to explore how on-the-job supports, such as training, coaching, and networks, contribute to assistant teachers' work-related stress and job satisfaction—two key predictors of ECE teacher attrition. Results indicate that few ECE staff members seek assistant teachers for work-related advice. Coaching is found to be an important contributor to assistant teachers' job satisfaction; professional advice via collegial networks is a meaningful but under-examined source of support for stress and job satisfaction. We consider implications for supporting and retaining assistant teachers and propose next steps for research on this understudied segment of the teaching workforce.

Keywords: Assistant teachers; Early childhood education; Professional development; Teacher retention; Teacher stress; Social networks

Across the U.S., 43 percent of 4-year-olds are enrolled in public early childhood education (ECE) programs (Barnett et al., 2016), a number that will only increase as jurisdictions around the country continue expanding their ECE programming. As such, the ECE workforce touches the lives of vast numbers of young children at a time when their brain architecture is primed for growth (Harvard Center on the Developing Child, 2007). For these reasons, considerable scholarship and policy initiatives have sought to strengthen the ECE workforce (Institute of Medicine and National Research Council, 2015). Yet, most of this work focuses exclusively on lead teachers, overlooking an immense component of the ECE workforce: assistant teachers. Across the U.S., at least one assistant teacher is typically staffed within each ECE classroom (Sosinsky & Gilliam, 2011), and evidence suggests that assistant teachers contribute to classroom quality alongside lead teachers (Curby, Boyer, Edwards, & Chavez, 2012). In addition, many assistant teachers aspire to become lead teachers and progress in the teaching hierarchy (Bullough, Hall-Kenyon, & MacKay, 2012; Wagner & French, 2010), indicating that they are an important contributor to the lead teacher pipeline. In order to maintain a strong assistant teacher workforce, it is critical to understand how to improve the quality of their practices and how to retain them within the ECE profession.

Research on lead ECE teachers indicates that stress and job satisfaction are key predictors of quality teaching practices and retention in the teaching profession (Curbow, Spratt, Ungaretti, McDonnell, & Breckler, 2000; Friedman-Krauss, Raver, Morris, & Jones, 2014; Saari & Judge, 2004). One mechanism toward improving job satisfaction and teaching effectiveness is professional development – i.e., in-service training and on-site coaching – which has been shown to contribute to high quality practices among ECE teachers. Yet, beyond a handful of studies (Domitrovich et al., 2009; Trivette, Raab, & Dunst 2012), little research has focused on the PD

experiences of ECE assistant teachers, and no known studies have linked PD to the workplace stress and satisfaction of ECE assistant teachers.

Although PD is a promising approach for workforce development, teachers' everyday interactions with their colleagues are also meaningful sources of professional support (Moolenaar, 2012; Parise & Spillane, 2010). Teachers receive regular on-the-job supports from their interactions with colleagues that can improve their teaching practices and workplace experiences (Hall-Kenyon, Bullough, MacKay, & Marshall, 2014; Hopkins, Lowenhaupt, & Sweet, 2015). We use the term *collegial supports* to encompass the exchange of professional information and personal support via direct interpersonal contacts with peers. Collegial supports may occur in structured contexts (e.g., regular meetings) or more spontaneously (e.g., visiting a colleague's classroom to ask a question). Increasingly, education research has utilized social network methods to examine teachers' collegial supports (Moolenaar, 2012). Specifically, these methods (1) ask teachers to report specific colleagues at their school from whom they seek assistance (e.g., advice, social support) and (2) aggregate these reports to identify patterns of support seeking across an entire school (i.e., a support network). To date, however, no known research has used social network methods to examine the collegial supports and experiences of ECE teachers. Leveraging social network methods would offer insights into assistant teachers' role within collegial networks and how the professional support they receive contributes to their workplace experiences.

The present study capitalizes on a representative sample of ECE sites in a large urban district to (a) describe ECE assistant teachers' demographic characteristics and professional experiences and (b) examine the contribution of ECE assistant teachers' in-service professional support (i.e., training, coaching, and collegial networks) to their work-related stress and job

satisfaction. Overall, we aim to advance understandings of the characteristics and experiences of ECE assistant teachers and to use this knowledge to inform professional development opportunities for this under-recognized workforce.

The ECE Workforce: Characteristics, Challenges, and Professional Development

Comparing the ECE teachers to K-12 educators highlights the unique needs and challenges around strengthening this workforce. In terms of demographics, ECE and K-12 educators are primarily women, but the proportion of ECE teachers of color is more than double that of K-12 teachers (Whitebook et al., 2006). Furthermore, whereas most K-12 teachers hold at least a bachelor's degree, the educational attainment of center-based ECE teachers is highly variable: 45 percent hold a bachelor's degree or higher, 17 percent have earned a two-year associate degree, and 37 percent have completed high school or less (U.S. Department of Health and Human Services, 2013a). In terms of compensation, ECE teachers earn a fraction of K-12 teachers' salaries—even when they have identical educational attainment (U.S. Department of Health and Human Services, 2013a; Whitebook, Phillips, & Howes, 2014). Because most research either fails to survey assistant teachers or does not disaggregate ECE teachers by type, it is unclear the extent to which these differences are observed in assistant teachers. Extant research suggests that, compared to lead teachers, assistant teachers are more likely to be younger in age and racial / ethnic minorities, and they also have smaller salaries and lower educational attainment (Whitebook et al., 2006). It is possible that assistant teachers' ethnic diversity represents a professional advantage, given that a match between teacher and family ethnicity may reduce barriers to school involvement that families face based on their race, language, and immigration status (Kim, 2009; Turney & Kao, 2009). Nuanced understandings of assistant teachers' demographic characteristics and professional qualifications could offer insight into who

these educators are, what skills they possess, and how to support them.

Teaching is a highly stressful profession (Curbow et al., 2000), and teaching in ECE is arguably the most trying teaching sector. In addition to facing work-related stresses, such as managing challenging child behaviors, ECE teachers face non-work stressors that have deleterious effects on their mental health (Friedman-Krauss et al., 2014; Li Grining et al., 2010). For example, receipt of low wages places many ECE teachers in circumstances of economic insecurity; many report difficulties with paying monthly bills, affording health care, and providing food for their families (Whitebook et al., 2014). The accumulation of these challenges likely makes ECE teaching especially stressful. Extant research offers little evidence concerning ECE assistant teachers' stress and what supports might be necessary to alleviate that stress.

In part due to stress, ECE teachers leave the profession at startling rates. Reports of annual ECE teacher turnover hover around 25 percent, approximately three times higher than the turnover rate of K-3 teachers (U.S. Department of Health and Human Services, 2013a; U.S. Department of Health and Human Services, 2013b). Scholars have described the immense challenge this level of turnover presents in maintaining a strong ECE workforce (see Phillips, Austin, & Whitebook, 2016). High rates of turnover disrupt children's attachment to educators, compromising their development (Hale-Jinks, Knopf, & Knopf, 2006). Furthermore, for ECE teachers who remain in ECE centers, turnover leads to often-unstable workplaces that produce high levels of stress (Hale-Jinks et al., 2006; Whitebook & Sakai, 2003), which are associated with lower quality teaching practices that compromise young children's development (de Schipper, Riksen-Walraven, Geurts, & de Weerth, 2009). Therefore, understanding and addressing the contributing factors to ECE teacher turnover is key to establishing high quality early education environments.

Although outside personal factors (e.g., family needs) influence ECE teachers' decisions to leave, ECE teachers' workplace stress and satisfaction are linked to their attrition (Curbow et al., 2000; Saari & Judge, 2004). Therefore, understanding how to promote job satisfaction and reduce stress has important implications for keeping ECE assistant teachers in the classroom and in the lead teacher pipeline. Some evidence suggests that teachers' professional qualifications (e.g., educational attainment) may contribute to their stress and job satisfaction (Hall-Kenyon et al., 2014). A larger body of research indicates that providing support through ongoing PD can increase job satisfaction and curb stress, ultimately reducing attrition and positioning ECE educators to foster children's positive development (Hale-Jinks et al., 2006; Manlove & Guzell, 1997; Wells, 2015). Because research on PD focuses almost exclusively on lead teachers, however, it is unknown how PD contributes to assistant teachers' stress and satisfaction.

In ECE, professional development is typically delivered through in-service trainings and on-site coaching. Trainings generally involve group-based learning about a specific topic (e.g., classroom management). Typically ECE trainings are short in duration, provide generalized information, and offer limited feedback to educators (Sheridan, Pope Edwards, Marvin, & Knoche, 2009). In contrast, coaching involves directed efforts of a trained professional – e.g., direct observation and feedback – to improve a trainee's learning and application of specific teaching strategies (Sheridan et al., 2009). Evidence indicates that high-quality, high-dosage trainings and coaching can support ECE teachers (Yoshikawa et al., 2013).

With respect to assistant teachers specifically, research suggests that PD can strengthen assistant teachers' practices (Domitrovich et al., 2009; Trivette et al., 2012); however, the extent to which PD alleviates assistant teachers' work-related stress and promotes job satisfaction remains unknown. Furthermore, although in-service training and coaching are the most

commonly discussed approaches for professional development, collegial supports can also strengthen teachers' practices and workplace experiences (e.g., Moolenaar, 2012; Parise & Spillane, 2010). Therefore, a full view of assistant teachers' professional supports requires consideration of their collegial supports as well as their PD experiences. Gaining clarity on assistant teachers' access to these professional supports and how they contribute to their stress and satisfaction offers guidance on both supporting and retaining the assistant teacher workforce.

ECE Teachers' Instrumental and Expressive Networks

Social network methods provide a rigorous approach for capturing a range of collegial supports within ECE centers. Social network methods have been used to study interpersonal interactions around work-related advice and collaboration, referred to as *instrumental ties*. In addition, social network methods have also been used to study social interactions (e.g., friendship, personal support) referred to as *expressive ties*. Importantly, we focus on how ECE staff members seek instrumental and expressive support from their colleagues, meaning that their ties are directed (i.e., they flow from one individual to another). *Outdegree* centrality is a measure that refers to the number of outward ties an individual has in the network (i.e., the extent she is seeking others in her network). For example, individuals seeking professional support from a larger number of their colleagues would have higher instrumental outdegree. In contrast, *indegree* centrality is a measure that refers to the number of inward ties an individual has in the network (i.e., the extent she is being sought by others in her network). For example, individuals who are sought for interpersonal support by a larger number of their colleagues would have higher expressive indegree. Individuals' indegree and outdegree therefore reflect the ways in which they are connected to others in their network and are referred to collectively as an individual's *position* within the network.

Importantly, teachers' position within instrumental and expressive networks may differ (Moolenaar, Sleegers, Karsten, & Daly, 2012). Teachers may have many instrumental ties and few expressive ties (or vice versa); or, teachers may have instrumental ties with certain individuals but not expressive ties with those individuals (or vice versa). Furthermore, teachers' position may differ from one aspect of instrumental support, such as collaboration, to another aspect, such as advice (Moolenar et al., 2012). Lastly, teachers may differ in terms of their indegree and outdegree for the same type of tie. For example, a teacher may be sought for professional advice but not seek professional advice from others. In these ways, social network approaches provide a concrete framework for examining the different types of connections individuals share within networks (i.e., instrumental and expressive ties) as well as the directionality of individuals' linkages within a network (i.e., indegree and outdegree).

Regarding instrumental relationships, research demonstrates that teachers learn and share expertise through their interactions with colleagues (Moolenaar, 2012). As such, the extent to which teachers seek advice from their colleagues (i.e., their instrumental outdegree) is an important source of professional support and has been linked to their likelihood of changing their practices as well as their implementation and sustainment of educational reforms (e.g., Parise & Spillane, 2010). Scholarship on teachers' expressive relationships is less developed, but evidence suggests that collegial social support may reduce teachers' stress and improve their job satisfaction (e.g., Hall-Kenyon et al., 2014).

To date, however, research has yet to examine instrumental and expressive networks in ECE centers, and the significance of these networks remains an open question. Furthermore, the extent that education professionals seek and are sought for support varies by their job position and by their professional qualifications, such as their years of experience (Hopkins et al., 2015).

As a result, it is important to examine how assistant teachers may have a unique position within their networks and how their social network position may vary based on their professional qualifications. Overall, deepening our understanding of assistant teachers' social networks has important implications for how these ECE professionals can learn, be supported, and serve as resources for their colleagues.

Study Aims

This descriptive study examines the characteristics, professional supports, and workplace experiences of assistant teachers in a representative sample of ECE centers within a large urban district. First, we describe the demographic and professional characteristics of assistant teachers. Second, we identify the network position (i.e., indegree, outdegree) of assistant teachers in instrumental and expressive networks and how their network position varies by their professional qualifications (e.g., experience, education). Third, we examine whether assistant teachers' stress and job satisfaction vary by their professional qualifications. Fourth, we explore how different forms of professional support – in-service training, coaching, and collegial networks – relate to assistant teachers' work-related stress and job satisfaction using a variance decomposition approach. Our focus on three forms of professional support highlights different approaches through which assistant teachers can receive on-the-job supports that may directly relate to their work-related stress and job satisfaction. Thus, the current study addresses outstanding questions regarding how assistant teachers may benefit from in-service training and coaching—two widely studied approaches for supporting lead teachers in ECE; and, this study illuminates how ECE assistant teachers' collegial networks may contribute to their workplace experiences, an aspect of on-the-job support that, to our knowledge, has not been studied in ECE. As a whole, we aim to provide the groundwork for future research and PD intervention to support assistant teachers and

retain them in the ECE workforce—both of which are critical for strengthening classroom quality and for maintaining assistant teachers in the ECE lead teacher pipeline.

Method

The current study involves analysis of surveys completed in the fall of 2016 by ECE assistant teachers working in a large urban district. Data are derived from a larger study of ECE professionals across 43 ECE centers. Any staff member who contributed to the educational mission of the ECE center was invited to participate in the research study (e.g., assistant teachers, lead teachers, administrators, family/social workers, office workers).

Setting and Participants

The analytic sample is comprised of 120 assistant teachers from 35 centers where at least one assistant teacher completed a survey. For centers with available data, the consent rate for assistant teachers was 89 percent, suggesting that our sample largely reflects the assistant teachers working within the ECE centers in the school district. Including all staff members, the median staff response rate for ECE centers was 75 percent (range 28% to 100%). ECE centers in the sample are distributed across nine strategically sampled communities. Community poverty level was a primary sampling criterion; communities were designated as high-poverty (i.e., > 50% of population), moderate-poverty (i.e., < 30% of population), and low-poverty (i.e., < 15% of the population), and an equal number of communities was drawn from each of the three levels. Additional sampling criteria included the income-to-needs ratio of families in the community, the number of ECE centers and seats in the community, the child ethnic composition served by ECE centers, and passing rates on an English Language Arts assessment of public schools in the community. Any ECE center within one of these nine communities that was involved in the district's universal public preschool program met inclusion criteria for the study, and all ECE

staff in these centers were eligible to participate. In the analytic sample, 78% of ECE centers were community-based (e.g., Head Start, childcare, preschool) and 22% were school-based (e.g., public schools, charter schools), which reflects the distribution of ECE centers in the broader school district. At the median, 5 (14.2%) ECE centers were from each community with a range of 1 to 6 ECE centers per community (2.9% to 17.1%, respectively). Ultimately, this approach yielded a sample representative of the ECE centers and communities within the district.

On average, at ECE centers in the analytic sample, 51.2% of children are Latino (range 2.3% to 100%), 23.0% are Black (range 0.0% to 70.6%), 6.0% are Asian (range 0.0% to 40.7%), 18.4% are White (range 0% to 57%), and 3.0% are another ethnicity (range 0.0% to 11.1%). On average, 26.9% of children speak a language other than English (range 0.0% to 69.0%).

Procedures

During the fall of the 2016, assistant teachers completed surveys electronically or on paper, based on their preference. For social network questions, center directors were asked to provide a list of staff members who contributed to the educational mission of the ECE center, and survey respondents were able to select any of these staff members when completing the social network questions. Based on available data from respondents, in the average ECE center, a network included at least 3 lead teachers (range 1 to 14), 4 assistant teachers (range 1 to 14), 1 administrator (range 1 to 4), 1 social/family worker (range 0 to 4), and 1 other support professional, such as an office, kitchen, or custodial worker (range 0 to 4). As such, the networks reflected close to the full collegial support system within an ECE center.

Measures

Work-Related Stress. Assistant teachers completed a modified version of the Child Care Worker Job Stress Inventory (Curbow et al., 2000) to capture their work-related stress. Four

items were rated on a five-point Likert scale ranging from "Rarely" to "Most of the Time" (Cronbach's α = .72). Items include "Children with behavior problems are hard to deal with," and "There are major sources of stress in the children's lives that I can't do anything about," and "My classroom becomes so noisy that I feel very irritated." The measure has been used in previous studies of ECE teachers and was selected given its purpose of capturing stresses related to working with children in the classroom, an aspect of stress that is a key contributor to turnover (e.g., Ingersoll, 2001) and is likely to influence ECE teachers' classroom practices (e.g., Friedman-Krauss, Raver, Neuspiel, & Kinsel, 2014).

Job Satisfaction. Assistant teachers completed a version of the teacher job satisfaction questionnaire for ECE teachers (Wells, 2015). Sixteen items were rated on a seven-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree" (Cronbach's α = .88). Items in the scale include "Happy at work," "Workload is manageable," and "Positive impact on children." The measure was developed for use with ECE teachers and included questions about their personal feelings, classroom experiences, and working conditions. The measure has been found to be predictive of ECE teachers' turnover (Wells, 2015).

Demographic Questions. Assistant teachers reported on their age, gender, ethnicity, nativity, and family composition (i.e., married, children) as well as whether they spoke a second language in class and whether they were the primary financial earner for their families. Assistant teachers also reported the number of hours they worked at their ECE center using a seven-point Likert scale ranging from "Less than 6 hours" to "More than 10 hours." Yearly income was reported on a seven-point Likert scale ranging from "$10,000 to $19,999" to "$70,000+."

Professional Qualifications. Assistant teachers' education was measured on a six-point Likert scale ranging from "Some high school" to "Doctoral degree." Assistant teachers reported

their years of experience by answering "How many years have you worked with children or families in any school or community-based organization, not counting this year?" Assistant teachers reported their tenure at their ECE center by answering "How many years have you worked at this site/school, not counting this year?" Assistant teachers indicated the certifications they had completed, and if any of their certifications satisfied district requirements (e.g., a CDA), they were indicated as certified on our binary variable.

Training and Coaching. Assistant teachers reported the training and coaching they received in four content areas: "Classroom/Behavior Management," "Family Engagement," "Instructional Curriculum and Instructional Practices," and "Assessments of Children and Use of Data." Assistant teachers reported days of in-service training received in the past six months on a six-point Likert scale ranging from "No training" to "More than 4 full days." Because the school district's in-service training for the year began in the summer, this six-month timespan encompassed the training received to date for the current school year. Assistant teachers indicated the frequency of coaching received in the past three months on a five-point Likert scale ranging from "Never" to "Once a week or more." In contrast to in-service training, coaching began after the start of the school year in the fall, meaning that this three-month period encompassed the coaching received to date during the current school year.

Social Network. For the instrumental network questions, respondents received a full list of their ECE center colleagues and identified from whom they sought advice in four content areas: "managing children's behavior," "engaging families," "the instructional curriculum and instructional practices," and "assessments of children and use of data." We included these topics given their relevance to ECE and expectations for varying levels of expertise and need across content areas (e.g., Sosinsky & Gilliam, 2011). For the expressive network questions, assistant

teachers indicated whom they "socialize with at school (e.g., talk regularly about family, health, interests, and/or other personal topics)." Using UCINET software (Borgatti et al., 2002), we calculated outdegree as a proportion of the number of colleagues identified by the participant divided by the total number of available colleagues (i.e., the size of the network minus one because participants cannot have ties to themselves). We calculated indegree using a modified approach that adjusts for varying levels of missing network data. Specifically, we divided the number of colleagues who indicated a participant for a topic by the number of colleagues who could have indicated that participant (i.e., the total number of respondents minus one).

Missing Data

The mean level of missingness for the variables was 4%, ranging from 0-8%. To preserve our full sample, we use STATA's mi impute chained equations subroutines (MICE; Royston & White 2011) to create 20 imputed datasets. The imputation model was specified for each type of variable (binary, categorical, or continuous); the MICE procedure is flexible as the model allows for different types of distributions. Ordered categorical variables with five or more categories were treated as continuous. Imputations were conducted stochastically to accommodate existing variation in dataset. As discussed in our analytic strategy, variance decomposition analyses were computed on each of the 20 datasets and pooled (Schomaker & Heumann, in press). All other analyses were conducted using STATA's mi estimate routine.

Analytic Strategy

Using Stata 15 (Statacorp, 2017), we first examine the means and standard deviations of assistant teachers' demographic characteristics and professional qualifications, as well as their work-related stress and job satisfaction. Second, we examine the means and standard deviations of assistant teachers' in-service training and coaching across content areas, as well as indegree

and outdegree with respect to their instrumental and expressive networks. Third, we calculate bivariate correlations between assistant teachers' professional qualifications and (a) their network position and (b) their work-related stress and job satisfaction.

Fourth, we use Shapley value variance decomposition and Owen values (Shorrocks, 2013) to explain the observed variation in assistant teachers' work-related stress and job satisfaction that is explained by different aspects of teachers' professional support. Shapley value decomposition is an econometric approach to variance decomposition that calculates the marginal R^2 change of each of each predictor as it is eliminated in succession and averages these marginal R^2 changes over all the possible elimination sequences, treating each elimination sequence as equally probable. In this manner, Shapley value decomposition effectively accounts for the interrelations between predictors for a given outcome (Huettner & Sunder, 2012). In addition, we used an extension of Shapley values called Owen values, which allows for conceptually related *groups* of predictors to be included in the decomposition calculation rather than individual predictors (Shorrocks, 2013). Owen values therefore represent a rigorous approach for estimating the R^2 contribution of different conceptual groupings of predictors.

Specifically, we calculated 90% bootstrapped confidence intervals with 10,000 replications for the Owen values of assistant teachers' (a) in-service training; (b) coaching; (c) instrumental support sought from their network (i.e., outdegree); and, (d) expressive support sought from their network. In addition, we calculated bootstrapped confidence intervals for Shapley values of the predictors within each conceptual grouping. A single estimate is calculated by pooling confidence intervals across the 20 imputed data sets (Schomaker & Heumann, in press). In addition, we provide bivariate correlations between each of the outcomes and each of the variables within these conceptual groups to aid the interpretation of the variance explained by

each conceptual group. As a whole, these analyses aim to describe the assistant teacher workforce and to explore different pathways for supporting assistant teachers, setting a foundation for future work focusing on these critical members of the ECE workforce.

Results

Below, we present descriptive results for demographic and professional characteristics, workplace experiences, professional supports, and social network position. This is followed by results from variance decomposition analysis to explain variation in stress and job satisfaction.

Demographic and professional characteristics. Descriptive results of demographic characteristics, professional qualifications, and workplace experiences are presented in Table 1. We found that the majority (53.3%) of assistant teachers in our sample identify as Latino and nearly a third (30.8%) identify as Black; a small proportion identify as White (9.2%) or Asian (6.7%). On average, assistant teachers report working between 7 and 8 hours a day and earning between $20,000 and $30,000 a year; over a third of these teachers (37.5%) report being the primary earner for their family on this salary. On average, assistant teachers report being 36 years old (range 19 years old to 66 years old). Lastly, over 40 percent of assistant teachers are immigrants to the United States and speak a second language in the classroom.

In terms of professional qualifications, on average, assistant teachers report 8 years of experience (range 0 years to 30 years). A majority of assistant teachers report being certified (56.5%) and having earned a bachelor's degree or an associate's degree (55.8%). On average, assistant teachers report working at their current ECE center for 4 years (range 0 years to 30 years); 19 percent report being new to their ECE centers. In terms of workplace experiences, assistant teachers report an average of 2.45 (SD = 0.86) on a four-point stress scale, indicating moderate levels of work-related stress and report an average of 4.78 (SD = 1.00) on a seven-point

job satisfaction scale, indicating moderate levels of job satisfaction.

Professional supports. Descriptive results of professional support are presented in Table 2. In regards to in-service training received through the fall of the current school year, assistant teachers report an average of 3.78 (*SD* = 1.45) and 3.78 (*SD* = 1.47) for trainings related to instructional curriculum/practices and assessments of children/use of data respectively, which corresponds to approximately 1 to 2 full days of in-service training. Assistant teachers indicate an average of 3.55 (*SD* = 1.52) for in-service trainings related to classroom/behavior management, which translates to approximately 1 full day of in-service training on our measure. Assistant teachers report an average of 3.14 (*SD* = 1.48) for family engagement in-service training, which corresponds to a half day to 1 full day of in-service training. In terms of coaching received through the fall of the current school year, assistant teachers report receiving a range of 2.81 to 3.20 (*SD* range 1.33 to 1.42) across content areas, which corresponds to receiving coaching approximately once a month. Across content areas, there is considerable variability in the amount of in-service training and coaching assistant teachers report receiving (see Table 2)

Social network position. In terms of *instrumental* social network position, on average, a small percentage of an ECE center's staff (indegree mean range 11% to 16% of staff) sought assistant teachers for advice across content areas, with some variability (indegree *SD* range 15% to 18%). The average size of ECE networks in our sample is 15 staff members, and these percentages correspond to approximately 1 staff respondent seeking assistant teachers for instrumental support (note: indegree numbers reflect staff who completed the survey rather than the full network). Assistant teachers were sought for advice most commonly for classroom management and least around instruction and assessments/data use. Assistant teachers sought a larger percentage of colleagues in their ECE center for advice across content areas (outdegree

mean range 20% to 25%) also with variability (indegree *SD* range 22% to 23%). These percentages correspond to assistant teachers seeking between 2 and 3 staff members for instrumental support on average. In terms of *expressive* social network position, on average 39 percent of an ECE center's staff sought assistant teachers to socialize (i.e., between 3 and 4 staff member respondents). On average, assistant teachers report socializing with 37 percent of staff in their ECE center (i.e., between 4 and 5 staff members).

We find that assistant teachers are sought by a larger proportion of their colleagues for advice around behavior management if they have more experience and longer tenure at their ECE center, with the strength of the relationship being larger and more robust for the latter (r = .19, $p < 0.05$ and $r = 0.27$, $p < 0.01$, respectively). Similarly, a marginally significant relationship was found between length of tenure and being sought for advice around instruction (see Table 3).

Explaining variation in work-related stress and job satisfaction. Results for how job satisfaction and work-related stress relate to professional qualifications are presented in Table 4. Longer tenure at an ECE center is marginally associated with higher work-related stress. Other professional qualifications have small associations that do not reach statistical significance.

We also examined the contribution of professional support via in-service training, coaching, and instrumental and expressive support seeking (i.e., outdegree) to assistant teachers' work-related stress and job satisfaction. Bivariate correlations between predictors (i.e., types of professional support) and assistant teachers' stress and job satisfaction are presented in Table 5. Correlations for predictors within content areas (e.g., family engagement) are largely in the same direction. For example, across content areas, higher levels of coaching are associated with higher levels of job satisfaction.

Variance decomposition results for work-related stress and job satisfaction are presented

in Table 6 for each type of professional support as well as breakdowns by content area. Looking at the variance of job satisfaction explained by each type of professional support, coaching explains the most variation (R^2 = 0.14). In-service training and instrumental support explain comparable amounts of variation in job satisfaction (R^2 = 0.06 in both predictors). In terms of work-related stress, in-service training, coaching, and instrumental support explain comparable amounts of variation (R^2 range 0.07 to 0.08). Expressive support explains minimal variance in stress and job satisfaction (R^2 = 0.01 and R^2 = 0.02, respectively), but its single predictor is comparable to the variance explained by most other single predictors (i.e., a single content area) within other types of professional support. Overall, each type of professional support explains small amounts of variance in stress and job satisfaction. Looking at content-specific predictors, within coaching and instrumental support, classroom/behavior management appears to explain the largest amount of variance related to higher job satisfaction and lower work-related stress.

Discussion

The current study builds upon recent initiatives to strengthen the ECE workforce (Institute of Medicine and National Research Council, 2015) by examining the characteristics and experiences of a representative sample of assistant teachers within a large urban district. Our study raises several directions for supporting the needs and leveraging the strengths of this large but under-examined group of ECE professionals.

Despite the fact that a majority of our sample is certified and has earned at least an associate's degree, most assistant teachers report earning between $20,000 and $30,000 a year for their full-time work. Given that more than a third of our sample also report having children and being the primary earner in their family, a large number of assistant teachers and their children likely face economic insecurity. Past research indicates that ECE teachers often leave

the profession because of strains on family obligations (Manlove & Guzell, 1997). As such, stresses related to providing for a family on an insufficient salary may compel assistant teachers to exit the profession. Acute stresses from assistant teachers' lives outside the classroom may also detract from their ability to provide quality education services (see Schwartz, Cappella, & Aber, in press). Future research that examines other contributors to assistant teachers' stress and how these stressors influence their teaching practices and turnover may offer insights into supporting and retaining this workforce.

Our demographic results also indicate that assistant teachers in our sample are primarily Black and Latino with a small minority being White and Asian. In addition, more than a third immigrated to the United States and speak a language other than English in the classroom. These characteristics closely align with the diverse demographic characteristics of children served by the ECE centers in our sample. Because a considerably larger proportion of lead ECE teachers in our sample are White and native-born (Cramer, Cappella, & Raver, 2017), assistant teachers' alignment with the demographics of the children and families they serve may represent a professional strength. For example, closer alignment between educator and family demographics may help remove barriers to school involvement that families face on the basis of their race, language, and immigration status (Kim, 2009; Turney & Kao, 2009). Identifying approaches to removing these barriers is critical given the links between preschool parental involvement and children's scholastic and social-emotional development (Mendez, 2010; Serpell & Mashburn, 2012). As such, researchers and practitioners should explore how assistant teachers might be resources toward this end.

Despite assistant teachers' potential as a resource, our social network results indicate that only 10 percent of staff members in an ECE center seek assistant teachers for instrumental

support across content areas. For reference, in the same sample, staff sought instrumental support from ECE lead teachers at nearly three times this rate and from ECE directors at nearly five times this rate (Cappella, Cramer, Quirola, Rojas, & Raver, 2017). As such, assistant teachers are utilized for instrumental support considerably less than other ECE professionals in our sample. With respect to outdegree, however, assistant teachers seek about a quarter of their colleagues for instrumental support. As a whole these results indicate that assistant teachers seek colleagues for instrumental support but few colleagues seek them for support.

This discrepancy is not likely to be driven by colleagues' lack of familiarity with assistant teachers because assistant teachers are sought by a high proportion of colleagues for expressive support. Moreover, we find evidence that assistant teachers with longer tenure at their ECE center are utilized for instrumental support by more of their colleagues, which suggests that assistant teachers may eventually become seen as a source of instrumental support as they establish themselves within their centers. Collegial networks can support staff by providing regular access to information and other resources (Moolenaar, 2012), but the full potential of collegial networks to strengthen ECE quality remains unfulfilled if human resources are underutilized. Considering that assistant teachers make up a large portion of the ECE workforce, their low utilization suggests that collegial networks could be harnessed more effectively. Initiatives that strengthen assistant teachers' expertise and leverage them as resources would likely enhance ECE quality.

Our variance decomposition results suggest assistant teachers' receipt of coaching may be a key contributor to job satisfaction. This finding aligns with scholarship in ECE that highlights coaching as an effective support mechanism given its more individualized, scaffolded approach (Sheridan et al., 2009; Yoshikawa et al., 2013). In contrast, in-service training

frequently involves didactic workshops that are more generalized in nature and often fail to produce transfer of skills to the classroom (Sheridan et al., 2009). In addition, our results suggest the importance of behavior management coaching for stress and job satisfaction, aligning with research that links behavior management challenges to burnout (Spilt, Koomen, & Thijs, 2011).

Our study's novel examination of collegial supports within ECE centers suggests that assistant teachers' instrumental networks represent a promising source of professional support; in contrast, we do not find strong evidence that assistant teachers' professional qualifications are linked to their stress and job satisfaction. Although relational support accounts for small amounts of variance in our examined outcomes, instrumental support accounts for similar amounts of variance as coaching and in-service training with respect to work-related stress and similar amounts of variance as in-service training with respect to job satisfaction. As with coaching, instrumental support related to classroom/behavior management seems most consequential. Overall, on-the-job supports appear to be a promising pathway for improving assistant teachers' work experiences.

As enrollment in public ECE programs expands, the need for effective, low-cost PD also grows; leveraging collegial support networks may be a promising avenue to pursue. Rather than paying for external trainers or coaches, collegial support networks harness resources already present: the expertise of staff. Evidence has found that peer coaching, a formalized form of collegial support, can strengthen ECE classroom quality (Johnson, Finlon, Kobak, & Izard, 2017). Our study extends this work, offering evidence that informal collegial supports via instrumental networks are relevant to ECE assistant teachers' stress and job satisfaction.

The current study has several limitations. First, we use a self-report measure of in-service training and coaching, reflecting assistant teachers' perceived receipt of these supports, which is

important but may not precisely capture their actual receipt of these supports. Second, although we examine four key aspects of professional support, our measures capture *quantity* not *quality* of support, which may be important to understanding improvements in teachers' practices and experiences (Sheridan et al., 2009). The small amounts of variance explained by the professional supports we examined could stem from variable quality in these supports. Third, although job satisfaction and work-related stress contribute to ECE teachers' attrition, we do not measure attrition directly. Fourth, we acknowledge that our predictors of assistant teachers' network position and workplace experiences are not exhaustive; other individual or contextual features may contribute to teachers' work-related stress, job satisfaction, and network position. Lastly, the study's single time point design prevents us from investigating how professional supports explain changes in assistant teachers' workplace experiences. In addition to the topics previously discussed, future research could build upon our findings by addressing these limitations.

Our examination of assistant teachers illuminates the particular needs and strengths of this workforce, highlighting heterogeneity within the ECE workforce as well as the need for strong descriptive work that advances our knowledge of understudied child-serving professionals. From a social network perspective, the ultimate capacity of an ECE center depends on the ways in which staff are connected. Therefore, leveraging the strengths of staff across different roles (e.g., assistant teachers, lead teachers, family workers) offers a pathway toward improving the collective work and experiences of ECE professionals. Research that advances our ability to recognize the strengths and to meet the needs of various ECE professionals will advance the field toward more comprehensive, efficient, and effective workforce development.

References

Barnett, W. S., Friedman-Krauss, A. H., Weisenfeld, G. G., Horowitz, M., Kasmin, R., & Squires, J. H. (2017). *The State of Preschool 2016: State Preschool Yearbook*. New Brunswick, NJ: National Institute for Early Education Research.

Borgatti, S., Everett, M., & Freeman, L. (2002), UCINET for Windows: Software for Social Network Analysis. Harvard, MA: Analytic Technologies.

Bullough, R. V., Jr., Hall-Kenyon, K. M., & MacKay, K. L. (2012). Head Start teacher well-being: Implications for policy and practice. *Early Childhood Education Journal, 40*(6), 323-331. doi: 10.1007/s10643-012-0535-8

Cappella, E., Cramer, T., Quirola, C., Rojas, N., & Raver, C. C. (April, 2017). *Implementation of Pre-K for All in NYC: Role of Teachers' Advice Networks*. Paper presented at the biennial conference of the Society for Research in Child Development, Austin, TX.

Cramer, T., Cappella, E., & Raver, C. (November, 2017). *Assistant and Lead Teachers in Early Childhood Education: Examining Workforce and Social Network Characteristics within a Large Urban District*. Paper presented at the fall conference of the Association for Public Policy Analysis and Management, Chicago, IL.

Curbow, B., Spratt, K., Ungaretti, A., McDonnell, K., & Breckler, S. (2000). Development of the child care worker job stress inventory. *Early Childhood Research Quarterly, 15*(4), 515-536. doi: 10.1016/S0885-2006(01)00068-0

Curby, T. W., Boyer, C., Edwards, T., & Chavez, C. (2012). Assistant teachers in Head Start classrooms: Comparing to and working with lead teachers. *Early Education and Development, 23*, 640–653. doi: 10.1080/10409289.2011.607361

de Schipper, E. J., Riksen-Walraven, J. M., Geurts, S. A. E., & de Weerth, C. (2009). Cortisol

levels of caregivers in child care centers as related to the quality of their caregiving. *Early Childhood Research Quarterly, 24*(1), 55-63. doi: 10.1016/j.ecresq.2008.10.004

Domitrovich, C. E., Gest, S. D., Gill, S., Bierman, K. L., Welsh, J. A., & Jones, D. (2009). Fostering high-quality teaching with an enriched curriculum and professional development support: The head start REDI program. *American Educational Research Journal, 46*, 567–597. doi: 10.3102/0002831208328089

Friedman-Krauss, A. H., Raver, C. C., Morris, P. A., & Jones, S. M. (2014). The role of classroom-level child behavior problems in predicting preschool teacher stress and classroom emotional climate. *Early Education and Development, 25*(4), 530-552. doi: 10.1080/10409289.2013.817030

Friedman-Krauss, A. H., Raver, C. C., Neuspiel, J. M., & Kinsel, J. (2014). Child behavior problems, teacher executive functions, and teacher stress in Head Start classrooms. *Early education and development*, *25*(5), 681-702. doi: 10.1080/10409289.2013.825190

Hale-Jinks, C., Knopf, H., & Knopf, H. (2006). Tackling teacher turnover in child care: Understanding causes and consequences, identifying solutions. *Childhood Education, 82*(4), 219-226. doi: 10.1080/00094056.2006.10522826

Hall-Kenyon, K. M., Bullough, R. V., MacKay, K. L., & Marshall, E. E. (2014). Preschool teacher well-being: A review of the literature. *Early Childhood Education Journal, 42*(3), 153-162. doi: 10.1007/s10643-013-0595-4

Harvard Center on the Developing Child (2007). *The science of early childhood development: Closing the gap between what we know and what we do.* Cambridge, MA: Author.

Hopkins, M., Lowenhaupt, R., & Sweet, T. M. (2015). Organizing English learner instruction in new immigrant destinations: District infrastructure and subject-specific school practice.

American Educational Research Journal, 52(3), 408-439. doi: 10.3102/0002831215584780

Huettner, F., & Sunder, M. (2012). Axiomatic arguments for decomposing goodness of fit according to Shapley and Owen values. *Electronic Journal of Statistics, 6*, 1239-1250. doi: 10.1214/12-EJS710

Ingersoll, R. M. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, *38*(3), 499-534.

Institute of Medicine and National Research Council. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation*. Washington, DC: National Academies Press. doi: 10.17226/19401

Johnson, S. R., Finlon, K. J., Kobak, R., & Izard, C. E. (2017). Promoting student–teacher interactions: Exploring a peer coaching model for teachers in a preschool setting. *Early Childhood Education Journal, 45*(4), 461-470. doi: 10.1007/s10643-016-0790-1

Kim, Y. (2009). Minority parental involvement and school barriers: Moving the focus away from deficiencies of parents. *Educational Research Review*, *4*(2), 80-102. doi: 10.1016/j.edurev.2009.02.003

Li Grining, C., Raver, C. C., Champion, K., Sardin, L., Metzger, M., & Jones, S. M. (2010). Understanding and improving classroom emotional climate and behavior management in the "real world": The role of Head Start teachers' psychosocial stressors. *Early Education and Development, 21*(1), 65-94. doi: 10.1080/10409280902783509

Manlove, E. E., & Guzell, J. R. (1997). Intention to leave, anticipated reasons for leaving, and 12-month turnover of child care center staff. *Early Childhood Research Quarterly, 12*(2),

145-167. doi: 10.1016/S0885-2006(97)90010-7

Mendez, J. L. (2010). How can parents get involved in preschool? Barriers and engagement in education by ethnic minority parents of children attending Head Start. *Cultural Diversity and Ethnic Minority Psychology*, *16*(1), 26. doi: 10.1037/a0016258

Moolenaar, N. M. (2012). A social network perspective on teacher collaboration in schools: Theory, methodology, and applications. *American Journal of Education, 119*(1), 7-39. doi: 10.1086/667715

Moolenaar, N. M., Sleegers, P. J. C., Karsten, S., & Daly, A. J. (2012). The social fabric of elementary schools: A network typology of social interaction among teachers. *Educational Studies, 38*(4), 355-371. doi: 10.1080/03055698.2011.643101

Parise, L. M., & Spillane, J. P. (2010). Teacher learning and instructional change: How formal and on-the-job learning opportunities predict change in elementary school teachers' practice. *The Elementary School Journal, 110*(3), 323-346. doi: 10.1086/648981

Phillips, D., Austin, L. J. E., & Whitebook, M. (2016). The early care and education workforce. *The Future of Children, 26*(2), 139-158. doi: 10.1353/foc.2016.0016

Royston, P., & White, I. R. (2011). Multiple imputation by chained equations (MICE): implementation in Stata. *Journal of Statistical Software, 45*(4), 1-20. doi: 10.18637/jss.v045.i04

Saari, L. M., & Judge, T. A. (2004). Employee attitudes and job satisfaction. *Human Resource Management, 43*(4), 395-407. doi: 10.1002/hrm.20032

Schomaker, M., & Heumann, C. (in press). Bootstrap inference when using multiple imputation. *Statistics in Medicine*.

Schwartz, K., Cappella, E., & Aber, J. L. (in press). Teachers lives' in context: A framework for

understanding barriers to high quality teaching within resource deprived settings. *Journal of Research on Educational Effectiveness*.

Serpell, Z. N., & Mashburn, A. J. (2012). Family–school connectedness and children's early social development. *Social Development*, *21*(1), 21-46. doi: 10.1111/j.1467-9507.2011.00623.x

Sheridan, S., Edwards, C. P., Marvin, C. A., & Knoche, L. L. (2009). Professional development in early childhood programs: Process issues and research needs. *Early Education and Development, 20*(3), 377-401. doi: 10.1080/10409280802582795

Shorrocks, A. F. (2013). Decomposition procedures for distributional analysis: a unified framework based on the Shapley value. *The Journal of Economic Inequality, 11*(1), 99-126. doi: 10.1007/s10888-011-9214-z

Sosinsky, L. S., & Gilliam, W. S. (2011). Assistant teachers in prekindergarten programs: What roles do lead teachers feel assistant play in classroom management and teaching. *Early Education and Development, 22*, 67–706. doi: 10.1080/10409289.2010.497432

Spilt, J. L., Koomen, H. M. Y., & Thijs, J. T. (2011). Teacher wellbeing: The importance of teacher-student relationships. *Educational Psychology Review, 23*(4), 457-477. doi: 10.1007/s10648-011-9170-y

StataCorp. 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC

Trivette, C. M., Raab, M., & Dunst, C. J. (2012). An evidence-based approach to professional development in Head Start classrooms. *National Head Start Dialog, 15*, 41–58. doi: 10.1080/15240754.2011.636489

Turney, K., & Kao, G. (2009). Barriers to school involvement: Are immigrant parents disadvantaged? *The Journal of Educational Research*, *102*(4), 257-271. doi:

10.3200/JOER.102.4.257-271

U.S. Department of Health and Human Services (2013a). *Number and Characteristics of Early Care and Education (ECE) Teachers and Caregivers: Initial Findings from the National Survey of Early Care and Education (NSECE).*

U.S. Department of Health and Human Services (2013b). *Head Start Program Information Report (PIR) 2013*.

Wagner, B. D., & French, L. (2010). Motivation, work satisfaction, and teacher change among early childhood teachers. *Journal of Research in Childhood Education, 24*(2), 152-171. doi: 10.1080/02568541003635268

Wells, M. B. (2015). Predicting preschool teacher retention and turnover in newly hired head start teachers across the first half of the school year. *Early Childhood Research Quarterly, 30(Part A)*, 152-159. doi: 10.1016/j.ecresq.2014.10.003

Whitebook, M., Sakai, L., Kipnis, F., Lee, Y., Bellm, D., Almaraz, M., & Tran, P. (2006). *California early care and education workforce study: Licensed child care centers Statewide 2006*. Berkeley, CA: Center for the Study of Child Care Employment, and San Francisco, CA: California Child Care Resource and Referral Network

Whitebook, M., Phillips, D., & Howes, C. (2014). *Worthy work, STILL unlivable wages: The early childhood workforce 25 years after the National Child Care Staffing Study.* Berkeley, CA: Center for the Study of Child Care Employment.

Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W., . . . Zaslow, M. J. (2013). *Investing in our future: The evidence base on preschool education.* Washington, DC and New York, NY: Society for Research in Child Development and Foundation for Child Development.

Conflict-of-Interest Statement

The authors declare that they have no conflict of interest.

Table 1

Descriptives of demographics, professional qualifications, and workplace experiences

	Mean/Percentage	*SD*
Demographics		
Age	35.67	11.90
Income	2.01	0.75
Work Hours	3.48	1.22
White	9.2%	—
Latino	53.3%	—
Black	30.8%	—
Asian	6.7%	—
Immigrant	41.3%	—
Speaks Second Language	42.2%	—
Female	91.7%	—
Primary Earner Parent	37.5%	—
Professional Qualifications		
Experience	7.76	6.79
Tenure at ECE Center	3.97	5.71
New at ECE Center	19.0%	
Bachelor's Degree	28.3%	—
Associate's Degree	27.5%	—
High School Degree or GED	40.8%	—
Certification	56.5%	—
Workplace Experiences		
Stress	2.46	0.86
Job Satisfaction	4.76	1.01

Table 2
Descriptives of professional support

	Mean	*SD*
In-service Training		
Classroom/Behavior Management In-service Training	3.55	1.52
Family Engagement In-service Training	3.14	1.48
Instructional Curriculum/Practices In-service Training	3.78	1.45
Assessments of Children/Use of Data In-service Training	3.78	1.47
Coaching		
Classroom/Behavior Management Coaching	3.05	1.33
Family Engagement Coaching	2.81	1.41
Instructional Curriculum/Practices Coaching	3.08	1.38
Assessments of Children/Use of Data Coaching	3.20	1.42
Outdegree Social Network Position		
Classroom/Behavior Management Outdegree	0.25	0.23
Family Engagement Outdegree	0.23	0.22
Instructional Curriculum/Practices Outdegree	0.22	0.23
Assessments of Children/Use of Data Outdegree	0.20	0.23
Socialize Outdegree	0.37	0.30
Indegree Social Network Position		
Classroom/Behavior Management Indegree	0.16	0.18
Family Engagement Indegree	0.13	0.17
Instructional Curriculum/Practices Indegree	0.11	0.16
Assessments of Children/Use of Data Indegree	0.11	0.15
Socialize Indegree	0.39	0.24

Notes. For in-service training, 3 refers to "A half day to a full day" and 4 refers to "1 to 2 full days." For coaching, 2 refers to "Once in the past 3 months" 3 refers to "Once a month," and 4 refers to "Once every 2 or 3 weeks."

Table 3
Bivariate correlations between social network position and professional qualifications

	Education	Certification (Cohen's *d*)	Experience	Tenure at ECE Center
Outdegree Social Network Position				
Outdegree: Behavior	0.06	0.06	-0.06	0.02
Outdegree: Family Engagement	0.14	0.19	-0.04	0.08
Outdegree: Instruction	0.09	0.01	-0.01	0.03
Outdegree: Data	0.11	0.02	-0.04	0.05
Outdegree: Social	0.10	-0.07	-0.10	0.08
Indegree Social Network Position				
Indegree: Behavior	0.07	-0.03	0.19*	0.27**
Indegree: Family Engagement	0.11	-0.04	0.06	0.13
Indegree: Instruction	0.15	-0.01	0.08	0.16†
Indegree: Data	0.09	-0.22	0.03	0.07
Indegree: Social	0.11	-0.06	0.03	-0.02

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$

Table 4

Bivariate correlations between workplace experiences and professional qualifications

	Job Satisfaction	Work-Related Stress
Experience	0.03	0.04
Tenure at ECE Center	0.04	0.17†
Education	-0.05	0.06
Certification (Cohen's *d*)	0.15	0.05

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$

Table 5

Bivariate correlations between workplace experiences and professional support

	Job Satisfaction	Work-Related Stress
In-service Training		
In-service Training: Behavior	0.03	0.04
In-service Training: Family Engagement	0.14	-0.08
In-service Training: Instruction	0.12	0.07
In-service Training: Data	0.08	0.04
Coaching		
Coaching: Behavior	0.30***	-0.19*
Coaching: Family Engagement	0.21**	-0.09
Coaching: Instruction	0.15	-0.15
Coaching: Data	0.24**	-0.14
Instrumental Support		
Outdegree: Behavior	0.19*	-0.12
Outdegree: Family Engagement	0.11	-0.02
Outdegree: Instruction	0.16†	-0.07
Outdegree: Data	0.17†	-0.01
Expressive Support		
Outdegree Social	0.20*	-0.12

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.10$

Table 6

R^2 estimates and 90% bootstrapped CIs for professional support domains

	Job Satisfaction	Work-Related Stress
In-service Training	***0.06 [0.02, 0.13]***	***0.07 [0.02, 0.15]***
In-service Training Behavior	0.01 [0.00, 0.04]	0.01 [0.00, 0.05]
In-service Training Family Engagement	0.02 [0.00, 0.07]	0.02 [0.00, 0.07]
In-service Training Instruction	0.01 [0.00, 0.04]	0.02 [0.00, 0.07]
In-service Training Data	0.01 [0.00, 0.03]	0.01 [0.00, 0.04]
Coaching	***0.14 [0.06, 0.25]***	***0.08 [0.03, 0.17]***
Coaching Behavior	0.06 [0.02, 0.14]	0.03 [0.00, 0.08]
Coaching Family Engagement	0.02 [0.00, 0.05]	0.01 [0.00, 0.03]
Coaching Instruction	0.02 [0.01, 0.05]	0.02 [0.00, 0.06]
Coaching Data	0.03 [0.01, 0.09]	0.01 [0.00, 0.04]
Instrumental Support	***0.06 [0.03, 0.11]***	***0.07 [0.03, 0.15]***
Outdegree Behavior	0.02 [0.00, 0.05]	0.03 [0.01, 0.08]
Outdegree Family Engagement	0.01 [0.00, 0.03]	0.01 [0.00, 0.04]
Outdegree Instruction	0.01 [0.00, 0.04]	0.01 [0.00, 0.03]
Outdegree Data	0.01 [0.00, 0.03]	0.01 [0.00, 0.05]
Expressive Support	***0.02 [0.00, 0.07]***	***0.01 [0.00, 0.05]***
Outdegree Social	—	—