Promoting a Person-Centered Approach to Strengthening Early Childhood Practices that Support

Social–Emotional Development

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This paper presents findings from an exploratory study to define associations between social–emotional teaching practices and teacher characteristics through a person-centered approach. The sample consisted of 97 teachers working in center-based early childhood education settings with young children ages 2–5 in the U.S. Pacific Northwest. We analyzed teachers' observed classroom social–emotional teaching practices and self-reported Professional Development (PD) experiences, job attitudes (e.g., job-related stress, satisfaction, and commitment), and disciplinary efficacy to identify profile membership of teachers. A latent profile analysis revealed 4 profiles: (a) higher practice quality, higher PD experience, higher job attitudes, and higher disciplinary efficacy, (b) higher practice quality, mixed PD experience, lower job attitudes, and lower disciplinary efficacy, (c) lower practice quality, mixed PD experience, higher job attitudes, and higher disciplinary efficacy, and (d) lower practice quality, mixed PD experience, mixed job attitudes, and lower disciplinary efficacy. The results suggest that a tailored and tiered professional development approach is needed that considers the complex connections between teachers' practices, beliefs, and job attitudes.

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High quality learning experiences for young children contribute to positive

developmental trajectories across domains, and many of these early learning experiences occur

outside of the home in center-based early care and education (ECE) settings (Child Care Aware

of America, 2019; Iruka & Carver, 2006; Mamedova et al., 2013). Research has consistently

demonstrated that high-quality ECE program have a positive impact on children's academic

outcomes (e.g., Phillips et al., 2017; Heckman, 2011; Vandell et al., 2020), and new research

continues to shed light on the nuanced ways ECE experiences impact social and academic

outcomes over time (Bassock et al., 2018). The benefits of high quality care are particularly

pronounced for children who are dual language learners, living in poverty, or who have

disabilities (Cash et al., 2019; Conger et al., 2019; Howes et al., 2008; Yazejian et al., 2015).

Despite convincing evidence of the importance of ECE, young children of color continue to

attend lower quality programs than their white peers (Ansari & Pianta, 2018), and they face

disproportionate exclusionary discipline practices including suspension and expulsion (Gilliam

& Shahar, 2006). The field must identify effective, equitable practices for promoting children's

social–emotional development, ensuring effective learning environments, and preventing

behavioral concerns.

It is hypothesized that positive classroom climate, and particularly teacher–child

relationships, are important protective factors for promoting social–emotional development and

preventing behavioral or mental health concerns (Rucinksi et al., 2018; Zatto & Hoglund,

2019). There is evidence that teachers' levels of emotional support predict children's behavioral

outcomes in preschool (Zinsser et al., 2013). Thus, classroom environment and practices that

support young children's social–emotional development must be included as indicators for high quality learning environments.

Comprehensive models exist to help ECE teachers establish and maintain predictable, nurturing, and emotionally supportive classrooms. Multi-level prevention and intervention models such as Early Childhood Mental Health Consultation (ECMHC) and Positive Behavior Interventions and Supports (PBIS) are recommended approaches to improve child and family social–emotional health and well-being (U.S. Department of Health and Human Services and Department of Education, 2015). One example of an approach consistent with an ECMHC and PBIS framework is the *Pyramid Model for Promoting Young Children's Social–emotional Competence* (Fox et al., 2003). It is a widely used framework for promoting social–emotional development and preventing challenging behaviors in ECE settings. Adapted from K–12 PBIS evidence-based three-tiered framework, the Pyramid Model offers ECE workforce a tiered system of universal supports for all children (e.g., consistent schedules and routines, clear expectations, supportive conversations, and intentional teaching of friendship skills and emotional competencies), secondary supports for children at-risk for social or emotional concerns (e.g., adapted materials, more frequent opportunities for skill practice), and systematic individualized plans for children with severe or persistent challenging behavior. Such models have been found to have positive associations with improvements in children's social skills and decreases in teacher reports of challenging behavior (Hemmeter et al., 2016). Pyramid Model has been evaluated in a recent multi-site randomized control trial which found that training and coaching lead to statistically significant increase in use of Pyramid Model practices and had significantly more emotionally supportive classrooms as measured by the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) than control group teachers. The use

of these strategies was also associated with positive child outcomes, including less challenging behaviors (Hemmeter et al., 2016). With the increased emphasis on the impact of social–emotional learning in ECE classrooms, measures that quantify classroom quality must shift its focus to reflect these social–emotional practices.

Given the importance of the social–emotional teaching focused measures, previous studies have utilized the Teaching Pyramid Observation Tool [TPOT; Fox et al., 2014]) in the study of Pyramid Model practices implementation to promote social–emotional learning in ECE classrooms (e.g., Artman-Meeker et al., 2014; Hemmeter et al., 2016; Luo et al., 2019; Steed & Roach, 2017). Most studies using the TPOT utilized variable-centered approaches (e.g., correlations, regression, etc.) that examine associations between variables to draw correlational interpretations (e.g., Hemmeter et al., 2016, Rakap et al., 2019). For example, previous studies have examined associations between TPOT and child outcomes (Hemmeter et al., 2016) or explore teacher characteristics as predictors of TPOT scores (e.g., Cunningham et al., 2020). In the current study, we will explore a set of teacher characteristics using a person-centered approach, a latent profile analysis, to understand a holistic picture of teaching practice. A person-centered approach identifies subgroups of teachers who share similar characteristics of indicators rather than looking at associations between variables (Lanza et al., 2007). This approach is beneficial in understanding how individuals' needs look different from each other when they attempt to improve social–emotional teaching (Author, 2016b).

The ultimate goal this research is to develop a coaching model that matches teachers' needs and interests to available coaching and supports. To do so, it is necessary to have a clear understanding of the many sources of evidence that inform a teacher's or administrator's decision-making regarding professional development. The current study is phase one of a multi-

year research project. This paper describes the process of developing teacher coaching profiles. Two sources of data contribute to teacher coaching profiles: (a) observational classroom data from the Teaching Pyramid Observation Tool (TPOT; Fox et al., 2014) and (b) teacher-report data on their perspectives on professional development (PD), experiences and attitudes towards children's behavior (efficacy), job satisfaction. We use these data to identify behavioral and attitudinal profiles of teachers that ultimately inform their coaching preferences. These profiles will be used to develop and refine a decision-making process that weighs teachers' preferences, characteristics, and observed classroom practices (TPOT scores) for initial entry into a tiered coaching model (see Authors, 2020). Such an approach allows us to identify subgroups of teachers who need different types of resources and/or interventions that target different components.

**Measuring Social–emotional Teaching**

A number of observational tools exist to quantify early childhood classroom quality. Tools like the Environmental Rating Scales (ERS; Harms et al., 2014) have been described as measuring the structural quality of early learning environments, such as appropriate adult-child ratios, sufficient materials, and physical space. Tools like the CLASS have been described as measuring process quality associated with emotional support, classroom organization, and instructional support. While these tools capture global features of an early childhood classroom, they do not directly reflect the many specific ways early childhood educators promote young children's social–emotional development. They may also not detect nuanced differences in how adults guide young children's behavior, use positive approaches to behavior, or adapt their interactions to meet the needs of an individual child. While ECE quality measures such as CLASS and ERS provide valuable information about the learning experiences of children in a

classroom, they may not be sufficient for explaining the effects of quality care on child outcomes (Hong et al., 2019). Therefore, specific tools may be useful supplements for understanding aspects of quality interactions that enhance learning experiences for a broad range of children across a range of important learning outcomes.

A number of tools have been developed to describe and assess the quality of behavior support practices and social–emotional teaching in early learning classrooms (e.g., Preschool-Wide Evaluation tool [Pre-SET; Steed & Pomerleau, 2012]; Teaching Pyramid Observation Tool [TPOT; Fox et al., 2014]). These tools provide an important lens into early childhood classrooms, articulating the specific practices that promote children's social–emotional development (Hemmeter et al., 2017). The TPOT, for example, measures the extent to which adults use research-based approaches to design classroom routines, transition practices, and social and emotional learning opportunities in the classroom. It has been used as a tool to support program-wide adoption of positive behavior supports in preschool classrooms, and it has been used extensively to coach early educators as they take up social–emotional teaching practices in their own classrooms. The use of such social–emotional teaching practices and positive approaches to guiding behavior has been associated with improvements in classroom quality (Hemmeter et al., 2016) and decreases in suspension and expulsion from early learning programs (Vinh et al., 2016). TPOT has been used widely across childcare, Head Start, and preschool programs, and can be used to help programs take up the approaches recommended in a recent federal policy statement on early childhood inclusion (U.S. DHHS & DOE, 2015). Given the long history of using the TPOT to inform coaching approaches (Artman-Meeker et al. 2014; Hemmeter et al., 2015; Fettig & Artman-Meeker, 2016; , , it is a particularly valuable tool in the current study as we examine patterns that inform coaching decisions.

**Teacher Characteristics and Relations to Social–emotional Teaching**

To ensure that ECE classrooms promote social–emotional development of young children by focusing on preventative strategies and reduce suspension and expulsion, exploring classroom indicators and teacher characteristics associated with classroom quality that specifically promotes social–emotional learning is essential. Teacher characteristics such as job satisfaction, stress, and PD experiences could have significant linkages to quality of ECE classrooms and programs (Zinsser & Curby, 2014). For example, Jennings and Greenberg (2009) points out that teachers' abilities to maximize their social and emotional practices are based on their own social–emotional competence, which stems from their job satisfaction and job-related burnout and stress. In a previous study using a person-centered approach (Author, 2016a), it appeared that there are a group of early childhood teachers who perform on the CLASS well but have a high level of job-related stress; a group of teachers who did not perform well on the CLASS but also do not have any psychological well-being issues (low levels of stress). The findings suggest that different intervention approaches are needed for these two different groups. Our study attempts to replicate the previous study by using the TPOT as an important measure to capture teachers' social–emotional teaching instead of the CLASS. By considering the interactions of complex person-centered variables, discussions of social–emotional classroom practices and overall classroom quality can become more sophisticated and lead to more personalized professional learning recommendations.

**Teacher PD experiences and job attitudes.** Much of the research on the effectiveness of early childhood educators has focused on their preparation and credentials (Early et al., 2006, 2007). As policy changes have increased the level of education and formal training required of ECE workforce, recent research has begun to examine the ways contextual factors interact with

teachers' professional experiences and training (Author, 2016a; Author, 2019). For example,

teacher satisfaction with their work environment appears to be associated with the teaching

practices they implement. Denham and colleagues (2017) found that teachers who reported

more access to job resources and who reported feeling higher levels of appreciation at work

were more likely to use positive social–emotional teaching practices. Similarly, teachers who

perceived their work environments as supportive were less likely to report depressive

symptoms, exhaustion, or stress, which are often associated with lower quality teaching

practices (Author, 2018).

In addition to considering teachers' workplace satisfaction, there is emerging evidence

that teachers' personal characteristics impact their use of effective teaching practices. In

particular, teachers' stress, depressive symptoms, and self-efficacy seem to play a role. Stress

plays a role in teacher effectiveness in the early learning workforce. Although teacher stress is

not related to their beliefs about teaching practices or children (Author, 2019), stress does

appear to be negatively correlated with self-efficacy and teachers' relationships with students

(Yoon, 2002). In fact, Yoon found that teacher stress predicted the number of negative student

relationships a teacher reported; stress did not, however, predict positive relationships. This

indicates that teacher stress may amplify the ways teachers perceive negative interactions. This

has implications for the ways teachers and children interact on a daily basis, particularly for

children with disabilities or whose behavior teachers find challenging.

Teachers' job-related stress has also been associated with depressive symptoms (Author,

2019). Across the early childhood workforce, it has been estimated that at least 24% of early

educators have clinical levels of depression (Whitaker et al., 2015). Teachers with depressive

symptoms are less likely to be professionally motivated; lower levels of professional

motivation, in turn, are associated with less child-centered beliefs and practices (Author, 2019).

There have also been associations between depression and less sensitive caregiving practices,

with depressed educators showing fewer positive verbal interactions with children (Hamre &

Pianta, 2004). Although the effect of teacher depression on classroom emotional climate is

unclear, there is evidence that teachers with depressive symptoms have classrooms of lower

organizational and instructional quality (Roberts et al., 2016; Sandilos et al., 2015).

       **Disciplinary efficacy.** Teacher self-efficacy, particularly in regards to classroom

management, has been theorized as a protective factor against burnout in K–12 teachers (e.g.,

Cherniss, 1993). Given that challenging behavior continues to be a frequent concern among

early childhood educators (Reinke et al., 2011; Snell et al., 2012), it stands to reason that

disciplinary efficacy, or an educator's beliefs about his or her ability to successfully guide

children's behavior, is also an important factor in ECE teacher retention and PD. Author and

colleagues (2016a) found that teachers' disciplinary efficacy was associated with more positive

interactions with children. Contrary to findings about job-related stress and teacher depression,

teachers who are confident in their ability to guide young children's behavior are less likely to

report emotional exhaustion (Author, 2018). Higher levels of teachers' self-perceived

competence have also been associated with more positive interactions with children (Breeman

et al., 2105) and communication with families about children's emotions (Ciucci et al., 2018).

These findings suggest that understanding teacher characteristics such as job-related stress and

disciplinary efficacy could shed light on resources necessary to improve the quality of ECE

programs.

**Purpose of the Current Study**

The present study utilizes a person-centered approach to identify subgroups of teachers who share similar characteristics on social–emotional teaching practices, professional background and experience, job attitudes, and disciplinary efficacy. A person-centered approach to examining classroom social–emotional practice quality has benefits over a variable-centered approach. A person-centered approach provides holistic information on individual teachers' various characteristics that help identify targeted areas that may benefit from tailored or individualized professional development strategies. Latent Profile Analysis (LPA) has been used recently as an analytic approach that promotes the inclusion of teacher variables beyond educational attainment. Rather than looking at one-way associations (e.g., teachers' stress predicts teachers' classroom quality), the LPA allows us to understand reciprocal influences of variables among different subgroups (Lanza et al., 2007).

LPA is a promising approach to analyze and understand more nuanced and sophisticated models of teaching practice and variables impacting classroom quality. Despite the benefit of a person-centered approach, not many studies in the literature explored teacher characteristics using the LPA. The current study builds upon the only available previous work by Author and colleagues (2016a) in which LPA was used to examine associations between teachers' professional background, instructional quality as measured by the CLASS (Pianta et al., 2008), and job attitudes in a person-centered model (Author, 2019). Author (2016a) latent profile analysis revealed three profiles of childcare providers: less experience/lower classroom quality/more positive attitudes, less experience/average quality/less positive attitudes, and more experienced/higher quality/mixed attitudes. They also examined the associations between program- and teacher-level characteristics in relation to teachers' membership within the latent profiles. Replicating this study with an intentional emphasis on social–emotional teaching and

disciplinary efficacy has the potential to inform important decisions regarding professional

learning experiences, resource allocation for professional development, and the emotional

supports needed by early educators.

Given the emerging associations between teachers' psychological well-being and their

social–emotional teaching practices, we hypothesize that different profiles would emerge when

measures of social–emotional teaching are included in the analysis, which would allow us to

suggest different intervention approaches for different subgroups of teachers. We also

hypothesize that teachers' own confidence (self-efficacy) in social–emotional teaching (i.e.,

disciplinary efficacy) is an important variable to consider in a person-centered approach. Author

et al. (2016a) did not include efficacy related variables in their LPA, however, we hypothesize

that disciplinary efficacy would create a distinctive profile to characterize teachers in our

analysis. This study seeks to replicate Author (2016a) analysis with a particular focus on creating

teacher profiles that address social–emotional wellbeing and reducing disruptive behaviors in the

classroom. Specifically, the current study includes social–emotional teaching practices, teachers'

professional background and job attitudes, disciplinary efficacy, and levels of teacher stress as

indicators of LPA.

## Method

### Participants

The sample consisted of 97 teachers working in early childhood education/preschool

settings with young children ages 25 in the Pacific Northwest region. Programs were identified

from the state registry of licensed childcare programs, as well as preschools listed on public

school district websites. The types of classrooms recruited for this project included private

childcare programs (e.g., community daycare programs, cooperative preschools, Montessori

schools, Waldorf schools) and public preschools enrolling children ages 2–5 with and without

disabilities. Invitation emails were sent to program directors to describe the study and to request

distribution of study information to teachers in their programs. Follow-up emails were sent and

phone calls were made to the directors and teachers to answer any questions related to the study.

Lead teachers from each classroom were eligible to participate in the study.

Table 1 describes the 97 teacher participants' characteristics: 94.5% (n = 91) of teachers

were female; 67% (n = 61) of teachers were white, non-Hispanic; 7.7% (n = 7) were African-

American; 9.9% (n = 9) were Hispanic; and 15.4% (n = 14) were American Indian, Alaska

Native, Asian, Native Hawaiian or Pacific Islander, or multi-racial. Teachers' reported a median

total annual salary range (before taxes) of $40,000 to $50,000. Of the 97 teachers, 80.4% (n =

78) had at least a bachelor's degree, and, 42.2% (n = 41) had degrees in early childhood special

education or early intervention. 28.9% (n = 28) of teachers held professional certificates or

credentials (e.g., in-state/out-of-state teaching or educator certificate, Board Certified Behavior

Analyst certification, Infant Mental Health Certification, and/or administrator certificate). The

average years of experience in the field of early childhood education and/or special education

was 13.57 years (SD = 9.4). The state in which this study occurred had offered general trainings

on positive behavior support through its state childcare quality rating and improvement system,

but no teacher-level information was gathered about teachers' Pyramid Model experiences given

the purpose of our study was to derive profiles of teachers based on their social–emotional

teaching practices and characteristics at the time of observation.

**Data Collection Procedures**

The recruitment and data collection process took place over approximately six months.

Each participating teacher completed two data collection steps: (1) teacher survey and (2)

classroom observations using the Teaching Pyramid Observation Tool (TPOT; Fox et al., 2014). The research team sent teacher survey packets to each interested teacher. The teacher survey packet included one consent form, one teacher survey, and a prepaid return envelope. The teacher survey packet was sent to teachers at least two weeks prior to the scheduled classroom observation. Teachers were asked to complete the teacher survey packet and return materials via prepaid envelope prior to scheduled classroom observation. The classrooms were observed by trained members of the research team using the TPOT which included a 90–120 minute classroom observation, followed by a 15–20 minute teacher interview. As an incentive for participation, teachers were given a $45 gift card after completion.

**Data Collection Measures**

　　**Teacher survey.** Teacher characteristics were assessed using the teacher survey adapted from the Study of Preschool Teachers (Author, 2016b). The teacher survey is a 36-item survey, which addresses teachers' professional background and experiences, professional development preference, job attitudes, and disciplinary efficacy.

　　***Teachers' professional background and experiences.*** Teachers reported their basic demographic information, highest educational attainment, and types of teaching certificate/license held (e.g., special education, P–3 certification, Board Certified Behavior Analyst certification). In addition, teachers also answered questions about years of experience working in early childhood education/special education (EC/ECSE) fields, number of years working as a lead teacher in an EC/ECSE classroom, and general information about children currently enrolled in their classrooms (i.e., age groups of current enrolled children, number of children enrolled in the classroom, number of children with Individualized Education Plan or Individualized Family Service Plan).

**PD experience and satisfaction.** To measure teachers' professional development (PD) experience, we asked (a) whether teachers participated in professional development during the previous school year (1 = *yes*, 0 = *no*), and (b) whether teachers regularly received feedback from internal or external evaluators or coaches through classroom observations (1 = *yes*, 0 = *no*). We summed the two items to represent teachers' PD experience.

Teachers' satisfaction with PD was measured with a five-item likert-type scale. Teachers rated the extent to which they felt that PD activities were positive, useful, and readily available (e.g., "In general, professional development activities have been useful for increasing my teaching effectiveness"). Teachers' responses to items were averaged to achieve a PD satisfaction score (Cronbach's alpha = .79).

**Job attitudes.** Teachers' job attitudes were measured by job-related stress and job satisfaction, commitment, and work engagement. To measure job-related stress and job satisfaction, we asked teachers to respond on a 5-point Likert scale (i.e., 1 = strongly disagree, 5 = strongly agree) to 14 items from the Attitude toward Teaching as a Career scale (Evans & Johnson, 1990). Sample items for the job-related stress subscale (seven items) included "I feel a lot of uncertainty about my career as a teacher." Sample items for the job satisfaction subscale (7 items) included, "I feel that I experience a lot of autonomy in my work as a teacher." The means of each subscale were used in the analysis. Table 2 describes descriptive statistics of variables and Cronbach's alphas.

Teachers' job commitment was assessed with one item ("Knowing what I do now, if I could decide all over again, I would become an early childhood educator again") rated on a 5-point scale (1 = strongly disagree, 5 = strongly agree). In addition, we assessed teachers work engagement via the Work Engagement Scale (Schaufeli et al., 2006). Sample items included, "At

my work, I feel bursting with energy." Teachers rated eight items on a 7-point scale (1= never, 6
= always), and the mean of the eight items was used in the analysis.

*Disciplinary efficacy.* Teachers' disciplinary efficacy was assessed using 3 items from
the Teacher Self-Efficacy Scale (Bandura, 1997): "I can control disruptive behavior in my
classroom"; "I can prevent problem behavior on the playground"; and "If a child in my class
becomes disruptive and noisy, I feel assured that I know some techniques to redirect him/her
quickly". Teachers rated items on a 5-point scale (1 = strongly disagree, 5 = strongly agree). The
mean of the three items was used in the analysis.

**Teaching Pyramid Observation Tool (TPOT)**. The Teaching Pyramid Observation
Tool was used as the primary source for classroom and teacher practices in this study. The TPOT
measured the fidelity of implementation associated with the *Pyramid Model* practices. The
TPOT consists of three subscales: (1) key teaching practices (14 items), (2) red flags (17 items),
and (3) effective strategies to respond to challenging behaviors (3 items). The 14 key practices
are associated with the *Pyramid Model* (e.g., teaching friendship skills, providing directions,
scheduled transitions). Red flag items reflect practices that conflict with the implementation of
the *Pyramid Model* (e.g., many children are not engaged during group activities, children are
reprimanded for expressing their emotions, teacher restrains a child who engages in challenging
behavior). Immediate coaching is recommended when red flag items are present. The strategies
for responding to challenging behavior item include three essential strategies that teachers should
use to address any behavior incidents (e.g., teacher implements developmentally appropriate
strategies in response to challenging behavior). Each participating teacher was observed once in
his/her classroom with the TPOT during a 90–120 minute observation. This was followed by a
15–20 minute teacher interview using the TPOT protocol. The psychometric properties of the

Pearson product–moment correlation coefficients between total TPOT key practice scores and composite domain scores for the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) were .70 for emotional support, .73 for classroom organization, and .76 for instructional support (Snyder et al., 2013).

**Data Collector Training and Reliability**

We engage in extensive data collector training and reliability checking throughout the data collection process. TPOT observers were doctoral students as well as PhD level researchers in the field of early childhood special education. Each TPOT observer completed a 2-day TPOT training and met at least 80% agreement with a master coded video. Each observer then completed a live observation with the research team's master coder to establish at least 80% agreement before gathering data for the study. During the study, in-vivo reliability checks were conducted by a second independent coder on 30% of all 97 observations. The average TPOT percent agreement was 81.5% (RANGE=64.4 – 90.2). All teacher survey and TPOT data were double entered to ensure accuracy of data entry prior to analysis.

**Data Analysis**

We used eight variables that represent classroom quality (observed TPOT score and TPOT red flag), PD experience (educational attainment, PD participation experience and perceived satisfaction with PD experience), job attitudes (job-related stress, job satisfaction, work engagement, and job commitment), and disciplinary efficacy to estimate latent profiles. The latent profile analysis (LPA) was conducted using Mplus 7.0 (Muthén & Muthén, 1998–2012) to identify underlying membership of teachers' practice, experience, and perceptions. All variables were standardized to compare scores across the variables, except that teachers' educational attainment (holding a bachelor's degree or not) was entered as a binary variable.

We estimated models with different numbers of latent profiles (2-profile, 3-profile, 4-profile model, and 5-profile models) and compared the model fit to identify the model that has theoretical justification, interpretability and implications, and statistical parsimony. We used multiple fit indices to determine the best latent profile model: lower values of the Akaike information criterion (AIC) and Bayesian information criterion (BIC); $p < .05$ values of the bootstrap likelihood ratio test (BLRT) and Lo-Mendell-Rubin likelihood ratio test (LMR; Lo et al., 2001), which indicates a better fit of estimated model than the model with one less group. We also examined entropy that indicates clear delineation of profiles when the values approach 1 (greater than .80 entropy is considered to be good; Celeux & Soromenho, 1996). In Dziak et al. (2014)'s simulation of a three-class hypothetical model using difference sample sizes of 50, 100, and 150, they found that the sample size of 100 would provide a power of .72 at the .05 alpha level for the BLRT.

After we identified the latent profile model that best fits, we assigned individuals into a profile that shows the highest posterior probabilities of being in the profile. Then, we conducted a series of analysis of variance (ANOVA) to compare means of each variable between profiles. We used the Bonferroni and Scheffe post-hoc tests to compare profiles.

## Results

The purpose of the study is to utilize LPA to derive teacher profiles based on social–emotional teaching practices and teacher characteristics. The results are presented below.

### Correlations and Model Decision Procedure

Table 2 presents bivariate correlations between variables and Table 3 presents the results of the LPA model fit comparisons for two- to five-profile models. The results indicated that the three-profile model and the four-profile model presented the best fit compared to other models.

Although the five-profile model has the smallest AIC, the difference between the four-profile model and five-profile model was small and the four-profile model had smaller BIC values. Comparing the three-profile and four-profile models, the four-profile model produced theoretically more meaningful and distinguishable grouping of teachers. Although only 3% of the teachers belong to the fourth profile, this group had a significantly lower disciplinary efficacy than other groups, which has important implications for practice. Collins and Lanza (2010) points out that the best number of latent profiles should be determined by meaningful interpretability along with multiple fit indices. We, therefore, chose the four-profile model as our final model.

**Four-Profile Model**

We present the four-profile model as our primary result given its best fit. Figure 1 shows the final standardized estimates of the four-profile model and Table 4 provides descriptive statistics of each profile across indicators. We did not include teachers' educational attainment in Figure 1 because the binary variable could not be standardized.

The first profile was labeled as *higher practice quality, higher PD experience, higher job attitudes, and higher disciplinary efficacy* (Profile 1). This profile was characterized by teachers with generally higher scores on every indicator, compared to teachers in other profiles. Teachers demonstrated higher scores on the TPOT total score and lower scores on the TPOT red flag, representing higher observed classroom practices. Teachers in this profile also had the most various PD experiences and their satisfaction with PD was higher than the average. In addition, 86% of teachers in this group had at least a bachelor's degree. Teachers also had job-related stress lower than the average and job satisfaction, work engagement, and commitment higher than the average. The group had the highest job satisfaction and commitment scores. In addition,

the profile included teachers reporting the highest disciplinary efficacy. Using the posterior probabilities, 48 teachers (48.1%) were assigned to this profile.

The second profile was labeled as *higher practice quality, mixed PD experience, lower job attitudes, and lower disciplinary efficacy* (Profile 2). Teachers in this profile had statistically similar high TPOT scores as teachers in Profile 1, however, their PD experience was somewhat mixed. Although the teachers had the average PD experience, they reported the lowest score of satisfaction with PD. Most of teachers in this group (92%) had a bachelor's degree. In addition, Compared to Profiles 1 and 3, Profile 2 had less positive job attitudes, such as significantly higher job stress and lower job satisfaction, work engagement, and commitment. Although self-reported disciplinary efficacy was also lower than the average for the teachers in this profile, it was not significantly different from Profiles 1 or 3. Among the sample, 29 teachers (29.4%) were included in this group.

The third profile was labeled as *lower practice quality, mixed PD experience, higher job attitudes, and higher disciplinary efficacy* (Profile 3). This profile was characterized by teachers with a lower total score on TPOT and a higher score on TPOT red flag, representing lower classroom quality. Although teachers in this profile did not have a variety of PD experience and only 51% held a bachelor's degree, their satisfaction with PD experience was greater than the average. In addition, they reported positive job attitudes: lower job-related stress, higher job satisfaction, higher work engagement, and higher commitment than the average. The teachers in this profile also reported similarly high levels of self-perceived disciplinary efficacy as teachers in Profile 1. The results from the post-hoc ANOVA revealed that Profile 3 did not significantly differ from Profile 1 in job attitudes, however, Profile 3 had significantly lower TPOT and higher

red flag scores than Profile 1.  Among the sample, 16  teachers (16.5%) were included in this group.

The fourth profile was labeled as *lower practice quality, mixed PD experience, mixed job attitudes, and lower disciplinary efficacy* (Profile 4). Teachers in this profile had the highest TPOT red flag among four profiles and the overall TPOT score lower than Profiles 1 and 2. Interestingly, although they did not have rich PD experience and only 33% of teachers had a bachelor's degree, their satisfaction with PD was the highest. The group of teachers in this profile also demonstrated mixed job attitudes. Teachers reported the lowest job-related stress (significantly lower than Profile 2); however, their job satisfaction, work engagement, and professional commitment were not statistically higher than other profiles. In other words, they felt less stressed in their job, however, at the same time, they were not professionally engaged in the job compared to other profiles. Teachers in this profile also reported the lowest disciplinary efficacy among the entire sample of teachers. Although only 3 teachers (3%) in the sample were included in this group, due to the meaningful interpretability, we retained this fourth profile.

## Discussion

The results provide insights into an innovative person-centered approach to analysis of teacher and classroom characteristics that expands beyond traditional variable-centered approaches. The LPA yielded 3- and 4- profile models in describing associations between social–emotional teaching practices, teachers' professional background and job attitudes, disciplinary efficacy, and levels of teacher stress after controlling for individual demographics. This approach moves us beyond simply utilizing teachers' professional background such as educational attainment and specialized training and classroom performance indicators as demonstrated on an observational measure to assess classroom quality. The results of the LPA also yielded similar

profile characteristics as previous research (Author, 2014). This provides additional support in

the use of LPA to understand classroom quality through person-centered teacher profiles. The

LPA revealed four distinct subgroups: (a) higher practice quality, higher PD experience, higher

job attitudes, and higher disciplinary efficacy (Profile 1); (b) higher practice quality, mixed PD

experience, lower job attitudes, and lower disciplinary efficacy (Profile 2); (c) lower practice

quality, mixed PD experience, higher job attitudes, and higher disciplinary efficacy (Profile 3);

and (d) lower practice quality, mixed PD experience, mixed job attitudes, and lower disciplinary

efficacy (Profile 4). While similar teacher characteristics appear in multiple profiles, it is

important to note that each profile represents distinct patterns of responding. For example, when

comparing Profiles 1 and 2, it is important to note that although their TPOT scores were similar,

they demonstrated statistically significant differences in satisfaction with PD, job attitudes, and

disciplinary efficacy.

       When comparing Profiles 1 and 3, both groups demonstrated positive job attitudes and

lower job-related stress. However, the two groups had starkly different classroom practice

scores, with Profile 3 scoring significantly below Profile 1 on the TPOT. We predict both groups

of teachers have a high likelihood to remain in their current teaching positions given their high

levels of job satisfaction and commitment. However, the classroom practices used by teachers in

Profile 3 are not consistent with recommended practices in child guidance and social–emotional

learning, which perhaps contributes to the inequitable outcomes noted by other researchers (e.g.,

Ansari & Pianta, 2018; Gilliam & Shahar, 2006). It is unclear whether this represents a lack of

knowledge about best practice or a belief in classroom behavior management practices that are

more controlling or authoritarian. More targeted coaching and dialog could be beneficial to

support teachers in identifying areas for improvement and to help teachers strike a balance

between perceptions and practices. For teachers in Profile 3, it may be important to focus on

motivational issues and readiness for change. Because these teachers are confident in their ability

to guide children's behavior, they may be less responsive to PD on Pyramid model practices.

Appropriate coaching and support are necessary for Profile 3 teachers to cultivate their

classroom practices to better support young children's social–emotional development.

Teachers in Profile 4 represent the lowest classroom quality and lowest engagement.

However, they do not feel overly stressed by their experiences. Although only 3% of the current

sample was placed in this group, this group revealed interesting patterns of low disciplinary

efficacy and limited PD experiences that may be related to the highest TPOT red flag scores.

These teachers may benefit from a very focused intervention around teaching practices. Given

their low ratings of self-efficacy related to guiding children's behavior, teachers in Profile 4 may

feel particularly eager to learn new strategies related to classrooms supports and may show

higher levels of buy-in to PD interventions.

It is important to note that our decision to fit the four-profile model was balanced with the

simplicity of the three-profile model. Though meaningful and simple, the three-profile model hid

potentially important variability affecting teachers' job satisfaction and PD needs. The four-

profile model provides meaningful and distinguishable groups with clear implications for future

considerations and professional development to improve classroom quality.

**Limitations**

Although this study provided additional evidence towards a person-centered approach to

understanding classroom quality, it is important to highlight some key limitations to this

exploratory study. First, defining classroom quality with characteristics beyond teachers'

educational attainment and global classroom observation measures is still in its infancy and

results should be interpreted with caution. We used theory and previous research to identify

variables for our model, but additional variables likely influence features of classroom quality.

Future research should continue using sophisticated analytic approaches to examine the interplay

of teacher characteristics, program characteristics, and classroom practices. Second, the

generalizability of the finding is limited given the relatively small sample size in this exploratory

study. Although the Monte Carlo tests performed by Dziak and colleagues (Dziak et al., 2014)

indicate that a sample size of 100 is sufficient to detect moderate differences between latent

profiles, a larger sample size would benefit the literature to confirm the results. This study

included teachers across most program types in early childhood (childcare, Head Start, public

preschool, private preschool), but the sample was limited to one geographical region of the U.S.

It is unclear the extent to which these classrooms represent the "typical" preschool classroom or

teacher. For example, there were 10 cooperative preschools in this sample in which parents

participated in daily activities. Such a program structure may not be common or representative,

and teachers who teach in these types of programs may have very different experiences (job

satisfaction, professional support) from those who teach in more traditional programs. Future

analyses should control for program type.

The sample also was limited to center-based programs; no family childcare providers

were represented. Given that family childcare is an important sector in the early education

landscape, future research should focus intentionally on this population. Third, given the small

sample size, we could include only a limited number of variables in the latent profile analysis.

Incorporating teachers' educational background or classroom characteristics into the latent

profile analysis might produce additional profiles or different patterns of profiles. Future

research with a larger sample size is necessary to fully account for the range of teacher

characteristics that contribute to a person-centered approach. Fourth, we used a classroom

observation measure (TPOT) that specifically examined social–emotional teaching practices.

Therefore, we cannot draw conclusions about overall classroom quality. However, the current

study provides important nuanced information regarding potential variations in child guidance

and social–emotional teaching practices. This exploratory study suggests that there are

distinctive groups of teachers when it comes to understanding their social–emotional practices

and related teacher characteristics. This indicates that early childhood teachers may need more

individualized supports to learn new approaches to guiding behavior. Specifically, teachers with

similar profiles and characteristics can be convened in small groups to engage in conversations

that address similar challenges. Additionally, appropriate resources can be allocated to provide

individualized coaching and supports to individual teachers who would benefit from this

extensive support. The findings of this study might provide a helpful lens regarding how the

classroom specifically promotes young children's social–emotional development. Lastly, this

exploratory study did not gather child outcomes. Future research should consider child outcome

variables as they could present opportunities to understand how social–emotional teaching

practices (and teachers' beliefs about those practices) impact young children's outcomes and

experiences with disproportionate exclusionary discipline practices (Gilliam & Shahar, 2006).

**Implications for Practice and Research**

As the number of young children entering EC/ECSE increases each year, it is critical to

consider effective and efficient ways to improve classroom quality and promote positive child

outcomes. A person-centered approach to understanding classroom quality provides multiple

dimensions to consider for quality improvement. First, it offers insights into ways coaching and

PD supports can be differentiated for adult learners. The early learning workforce has a

documented need for professional development suited to different levels of education and

program structure (Pianta et al., 2011), so it is imperative that we consider professional

development approaches that match the needs of individual teachers. The identification of four

teacher profiles has direct implications for designing and delivering such professional

development. It offers a potential decision making model for administrators and coaches to

consider individual differences in job commitment, disciplinary efficacy, and classroom

practices. Based on this information, teachers can receive individualized support in the areas that

will most impact their job performance. The decision making model could consider areas of need

specific to teachers' implementation practices (e.g. classroom routines, social–emotional

teaching strategies) as well as ways the professional supports can be delivered (e.g.

individualized targeted coaching, small group community of practice, distance support).

A person-centered approach to understanding classroom quality is a promising direction

for future research. This study builds on the emerging line of research supporting the utility of

this approach in early learning settings. As the sophistication of such analyses grows, future

research will deepen our understanding of the specific teacher characteristics as well as support

and resources necessary to impact child outcomes.

Acknowledgments & Declaration of Interest Statement

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Table 1

*Descriptive Statistics*

|  | n | Mean or % | SD |
|---|---|---|---|
| *Demographics* | | | |
| Sex (1 = female) | 91 | 94.5% | |
| Race/Ethnicity | 91 | | |
| White, Non-Hispanic | 61 | 67.0% | - |
| Black, Non-Hispanic | 7 | 7.7% | - |
| Hispanic | 9 | 9.9% | - |
| Other Race | 14 | 15.4% | - |
| *Professional Background* | | | |
| Educational Attainment | 97 | | |
| Less than an Associate | 11 | 11.3% | - |
| Associate Degree | 8 | 8.3% | - |
| Bachelor's Degree | 78 | 80.4% | - |
| Held teaching-related certificate | 28 | 28.9% | - |
| Majored in ECSE | 41 | 42.2% | - |
| Years experience in ECE | | 13.57 | 9.40 |
| Annual Salary Range | | $40,000-$50,000[a] | |
| *Program/Classroom Characteristics* | | | |
| Number of children in classroom | | 17.38 | 6.70 |
| Private child care | 72 | 74.23% | |
| Public preschools | 25 | 25.77% | |

*Note*. ECSE = Early Childhood Special Education; ECE= Early Childhood Education.
[a]Median selection on Likert-type scale

Table 2

*Descriptive Statistics and Correlations between Latent Profile Analysis Indicators*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. TPOT | 1.00 | | | | | | | | | |
| 2. TPOT red flag | 0.54*** | 1.00 | | | | | | | | |
| 3. Bachelor's degree | -0.32** | 0.35*** | 1.00 | | | | | | | |
| 4. PD experience | 0.19+ | -0.28** | 0.10 | 1.00 | | | | | | |
| 5. PD satisfaction | -0.21* | 0.14 | -0.23* | 0.11 | 1.00 | | | | | |
| 6. Job Stress | 0.30** | -0.25* | 0.17+ | 0.06 | -0.44*** | 1.00 | | | | |
| 7. Job Satisfaction | 0.03 | -0.06 | 0.08 | 0.13 | 0.22* | -0.40*** | 1.00 | | | |
| 8. Work Engagement | -0.05 | 0.07 | -0.23* | 0.13 | 0.42*** | 0.37*** | 0.35*** | 1.00 | | |
| 9. Commitment | 0.12 | 0.01 | -0.04 | 0.20* | 0.22* | -0.17+ | 0.18+ | 0.50*** | 1.00 | |
| 10. Disciplinary Efficacy | 0.22* | -0.29** | 0.13 | 0.09 | -0.04 | -0.02 | 0.22* | 0.29** | 0.26** | 1.00 |
| Mean or % | 55.76 | 7.82 | 80% | 1.64 | 3.72 | 2.20 | 3.86 | 4.53 | 4.07 | 4.22 |
| SD | 15.44 | 8.97 | - | .56 | .82 | .81 | .69 | .80 | 1.04 | .56 |
| Minimum | 24.89 | 0 | 0 | 0 | 1 | 1 | 1.29 | 2.38 | 1 | 2 |
| Maximum | 93.00 | 41.18 | 1 | 2 | 5 | 4.57 | 5 | 6 | 5 | 5 |
| Cronbach's Alpha | .89 | - | - | | .79 | .82 | .77 | .91 | - | .77 |

Note. PD = professional development.
+$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Table 3

*Model Fit Comparisons*

| # of latent profiles | # of free | Log likelihood | AIC | BIC | Entropy | % of membership |
|---|---|---|---|---|---|---|
| 2-class | 30 | -1504.487 | 3068.974 | 3146.215 | .83 | 29.6%;67.4% |
| 3-class | 41 | -1465.450* | 3012.899 | 3118.463 | .86 | 4%;38.2%;54.8% |
| **4-class** | **52** | **-1447.685*** | **2999.370** | **3133.255** | **.85** | **3%; 48.2%;29.5%; 16.3%** |
| 5-class | 63 | -1434.587* | 2995.174 | 3157.381 | .88 | 4%;15.6%;38%;34.6%;4.8% |

*Note.* AIC = Akaike information criterion; BIC = Bayesian information criterion. The model that best fit is bolded.

Table 4
*Standardized Means and Standard Errors by Profiles*

| | Profile 1. Higher practice quality, higher PD experience, higher job attitudes, higher disciplinary efficacy | Profile 2. Higher practice quality, mixed PD experience, lower job attitudes, lower disciplinary efficacy | Profile 3. Lower practice quality, mixed PD experience, higher job attitudes, higher disciplinary efficacy | Profile 4. Lower practice quality, mixed PD experience, mixed job attitudes, lower disciplinary efficacy | ANOVA *F* statistics |
|---|---|---|---|---|---|
| | Mean (SE) or % | Mean (SE) or % | Mean (SE) or % | Mean (SE) or % | |
| Membership | 48.10% | 29.40% | 16.50% | 3.00% | |
| *Classroom Practice Quality* | | | | | |
|   TPOT | 0.25 (.19) | 0.24 (.18) | −0.90 (.22)[a,b] | −1.43 (.04)[a,b] | 8.50*** |
|   TPOT red flag | −0.38 (.14) | −0.31 (.15) | 1.27 (.31)[a,b] | 2.19 (.78)[a,b,c] | 34.98*** |
| *PD Experience & Perceptions* | | | | | |
|   Bachelor's degree | 86% | 92% | 51% | 33% | - |
|   PD experience | 0.30 (.11) | −0.07 (.21) | −0.41 (.45) | −1.73 (.48)[a,b,c] | 8.47*** |
|   PD satisfaction | 0.35 (.12) | −0.78 (.27) | 0.27 (.22) | 1.56 (.01) | 8.89*** |
| *Job Attitudes* | | | | | |
|   Job Stress | −0.21 (.19) | 0.83 (.18)[a] | −0.72 (.24)[b] | −0.89 (.13)[b] | 6.37*** |
|   Job Satisfaction | 0.35 (.16) | −0.46 (.18)[a] | −0.04 (.28)[b] | −0.95 (1.14) | 3.22* |
|   Work Engagement | 0.48 (.16) | −0.99 (.19)[a] | 0.58 (.19)[b] | −1.28 (.39) | 9.05*** |
|   Commitment | 0.42 (.10) | −0.74 (.35)[a] | 0.27 (.20) | −1.03 (.01) | 4.93** |
| *Disciplinary Efficacy* | 0.29 (.13) | −0.23 (.15) | 0.19 (.22) | −3.37 (.49)[a,b,c] | 3.90* |

Note. PD = professional development. *$p < .05$, **$p < .01$, ***$p < .001$.
The Bonferroni and Scheffe post hoc methods were used to compared profiles. [a]significantly different from Profile 1; [b] significantly different from Profile 2; [c]significantly different from Profile 3 at the p-value of .05.

Figure 1
*Four-Profile Model*



Profile 1. Higher practice quality, higher PD experience, higher job attitudes, higher disciplinary efficacy

Profile 2. Higher practice quality, mixed PD experience, lower job attitudes, lower disciplinary efficacy

Profile 3. Lower practice quality, mixed PD experience, higher job attitudes, higher disciplinary efficacy

Profile 4. Lower practice quality, mixed PD experience, lower job attitudes, lower disciplinary efficacy