Profiles of Teacher-Student Relationships and Classroom Management Practices: How They Relate to Self-Efficacy, Work Stress, and Classroom Climate

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Abstract: Teachers' classroom practice encompasses diverse facets of teacher behavior. Understanding teachers' classroom practice is important as the literature has been well documented its association with student, teacher, and classroom outcomes. Positive teacher-student relationships and proper classroom management, both are important aspects of teachers' classroom practices, have been empirically linked to increasing student academic performance and reducing problem behaviors. This study explored patterns of teacher classroom practices across teacher-student relationships and classroom management and validated them using a person-oriented approach, k-means clustering, on three sets of data with over 600 participants. Using indicators of classroom assessment scoring system (CLASS), three distinct teacher profiles were identified: supportive, intermediate, and detached. Supportive teachers demonstrated high levels of teacher-student relationships and classroom management, while detached teachers showed low levels of both. Intermediate teachers fell between these two groups. The study also compared these profiles based on teacher self-efficacy, work stress, and classroom climate. Supportive teachers had the highest classroom climate scores, followed by intermediate and detached. Work stress was comparable for intermediate and supportive teachers, but both were lower than detached. No group differences were found for self-efficacy. This study contributes to the understanding of teacher behaviors with students in the lower grades.

Keywords: *Classroom management, prosocial classroom model, teacher profile, teacher-student relationships, teacher wellbeing.*

Introduction

The crucial effects of teacher classroom practices on student social, emotional development, and academic achievement have been largely recognized. Teacher classroom practices is an umbrella term containing many elements and has tremendous effect on the social, emotional, cognitive, and physical environments where students learn, commonly termed as classroom climate (Ambrose et al., 2010; Djonko-Moore et al., 2018). Teacher-student relationships, an area of teacher classroom practices, has long been researched in literature. Research indicates that positive teacher-student relationships are linked to better student outcomes (Gage et al., 2018). Such relationships involve positive language and feedback, an understanding of students' emotional and academic needs, and consideration for their perspectives (Allen et al., 2013). Studies suggest that emotionally supportive teacher-student interactions can lead to increased autonomy development and peer relatedness among students (Ruzek et al., 2016). Classroom management is another important aspect of teacher classroom practices. Classroom management refers to teachers' management of students' off-task behaviors and student engagement (Emmer & Stough, 2001). Effective classroom management strategies also contribute to gains in social skills, self-regulation, and academic performance (Korpershoek et al., 2016).

The concurrent development of teacher-student relationships and classroom management is a dynamic process, prompting the inquiry: how do these integrated practices manifest in the classroom? Despite the extensive exploration of teacher-student relationships and classroom management as important components of classroom practices in

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literature, the predominant focus has been on their impact on secondary students. The unique nuances and challenges in lower grade classrooms require focused attention. To address this research gap, the present study adopts a person-centered approach to explore the potential presence of different teacher profiles from the combination of the two components - teacher-student relationships and classroom management practices. By concentrating on early childhood and elementary contexts, our aim is to contribute to the existing literature and provide insights tailored to the unique dynamics of these crucial developmental years.

Theoretical Perspective

This study uses Jennings and Greenberg's (2009) Prosocial Classroom Model (PCM) to frame the focus and analysis. PCM proposes that classroom process factors, including teacher-student relationships and classroom management, mutually affect classroom climate. A positive classroom, including respectful communication among agencies and effective classroom management characterized by low disruptive behavior, contributes to the constructive classroom climate (Arguedas et al., 2016; Ersay, 2007). Conversely, a deleterious classroom climate is reflected by the teachers' ignorance of individual students' interests and needs, and students' low performances (Mooij, 1999).

We adopt a person-centered perspective to investigate the potential behavioral patterns within the teacher population based on their classroom practices, and to examine how different behavioral patterns relate to teacher, student, and the classroom outcomes. Person-centered approaches, such as profile analysis, focus on capturing characteristics of sub-groups within a population, and describing the relationships among individuals (Masyn, 2017). This stands as a comparison to variable-centered approaches, such as factor analysis, which assume a homogeneous population and center on the relationships among variables (e.g., Padgett et al., 2022).

Another set of questions the current study investigates is whether teachers of different profiles vary in contextual factors, such as classroom climate, work stress and teacher self-efficacy (TSE). Based on the interconnected dynamics between teacher-student relationships and classroom management on affecting classroom climate, we expect that teachers' variations in their behavioral patterns of teacher-student relationships and management practices will result in differing classroom climate. We expect that when teachers are aware of students' needs, respect students, use distinct forms of instructional practices, and appropriately manage classroom behaviors, the classroom climate will demonstrate high engagement and low conflicts with teachers. Conversely, teachers' low level of engagement and scaffolding of students' learning would result in students' reduced motivation for learning. Consequently, such teachers may inadvertently contribute to a negative classroom climate, negatively impacting students' learning performance (Roorda et al., 2011). Furthermore, this negative climate potentially affects the teacher as well (**Error! Reference source not found.**). The PCM is used to guide our examination of teacher-differentiated classroom management and teacher-student relationship profiles and to interpret the characteristics of behavior patterns and associations with other teacher and classroom variables.
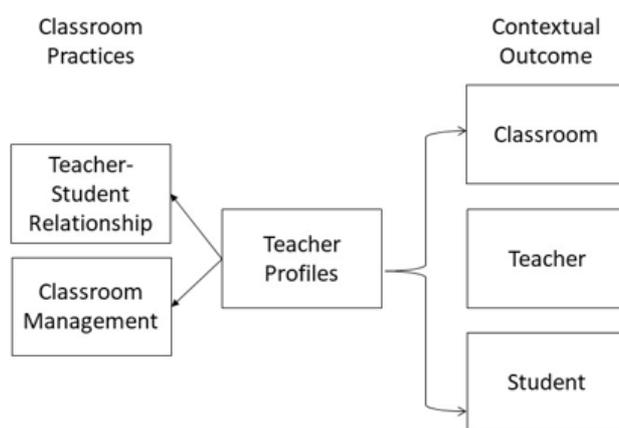

Figure 1. Theoretical Framework Based on the Prosocial Classroom Model

Despite the extensive exploration of teacher-student relationships and classroom management as important components of classroom practices in literature, the predominant focus has been on their impact on secondary students or high school teachers. The unique nuances and challenges in lower-grade classrooms require dedicated attention. To address this research gap, the current study concentrates on early childhood and elementary contexts, aiming to contribute to the existing literature and provide insights tailored to the unique dynamics of these crucial developmental years.

Literature Review

Teacher-Student Relationship

Previous literature has established the crucial effect of the teacher-student relationship on students' various outcomes, including motivation, stress, and academic adjustment (Ahnert et al., 2012; Claessens et al., 2017; Opdenakker et al., 2012). Teacher-student relationship could be broadly conceptualized into the areas of closeness and conflict. Closeness reflects the amount of emotional support and open communication, the positivity, in the relationship, whereas conflict indicates the level of the negativity within interactions (O'Connor et al., 2011). Both factors are unique predictors of student outcomes. High-quality relationships have been linked to language development and achievement, particularly for students with externalized problem behaviors and from low socioeconomic backgrounds (Baker et al., 2008; Burchinal et al., 2002). Closeness in relationships between teacher and student also positively influence students' working habits and social skills (Baker, 2006). Conversely, conflicted relationships can lead to poor school adjustment, particularly for students with internalizing problems (Baker et al., 2008).

While those previously discussed studies utilized variable-centered analyses, O'Connor et al. (2011) adopted group-based multi-trajectory modeling, an extension of the person-centered approach. This modeling was able to reveal the nuanced impact of teacher-student relationships on various student trajectories. They identified four types of longitudinal teacher-student relationship patterns on elementary school student-teacher dyads: strong, strong-worsening, poor-improving, and poor-worsening. Children with high levels of internalized problem behaviors were especially susceptible to the two detrimental patterns (strong-worsening and poor-worsening), as their internalized problem behaviors maintained high throughout the whole developmental period. In contrast, if children were in the strong teacher-student relationship pattern, their internalized problem behaviors decreased to low levels at fifth grade. Collectively, these previous studies emphasize the considerable influence of teacher-student relationships on varied student outcomes, underscoring the need for employing varied analytical methodologies to comprehensively understand these dynamics.

Classroom Management

Effective classroom management - clear expectations, consistent routines, and use of time efficiency - is an important aspect of classroom quality (Conroy et al., 2014). Establishing expectations and routines are essential for managing student behavior, and effective time management can optimize student opportunities to respond (OTRs). While many studies employ variable-centered methods to examine classroom management, several recent studies have identified a connection between patterns of teacher classroom management practices and student outcomes when adopting a person-centered approach. Gage et al. (2018) identified four patterns of teacher-student interactions in elementary classrooms, differing primarily in the frequency of positive feedback and OTRs. Above-average profile teachers provided the highest levels of positive feedback and OTRs, followed by typical profile teachers, low interaction profile teachers, and low rates profile teachers. The low rates profile teachers showed the least active teaching and were associated with students' low levels of engagement.

Pas et al. (2015) identified three patterns of student behaviors in high school classrooms based on levels of participation, compliance, and disruptive behaviors. Students with high participation and compliance and low disruptive behaviors were associated with teachers' significantly more OTRs and reactive behaviors, and less disapproval. These findings, spanning from elementary to high school classrooms, suggest the reciprocal nature of the relationship between teacher classroom management practices and student behaviors. They emphasize the significant impact teachers have on influencing student behavior and engagement in the learning process.

Teacher Characteristics Related to Classroom Practices

Research in teacher contextual characteristics, such as wellbeing and efficacy, associated with teacher classroom practices are also important to the discussion. Arens and Morin (2016) found a negative relation between teachers' emotional exhaustion and students' perceptions of teacher overall support in the classroom. Similarly, Shen et al. (2015) revealed a negative association between teachers' emotional exhaustion and students' perceptions of teacher autonomy support. Notably, recent research employing a person-centered approach has extended these insights to associate specific teacher profiles, based on classroom practices, with teacher well-being. In a study by Virtanen et al. (2019), job satisfaction and emotional exhaustion were investigated in relation to teacher-student interaction profiles across emotional support, instructional support, and classroom organization in middle and high school. The study revealed that teachers with the "Low in All" profile were associated with the least job satisfaction. According to Prilleltensky et al. (2016), work stress is a result of the combination of risk and protective factors. When risk factors such as exhaustion weight more than the protective factors such as satisfaction, teacher suffer from negative outcomes and may not have sufficient psychological and physical resources to establish positive teacher-student relationships and implement effective classroom management (Arens & Morin, 2016). A relationship between low classroom practices profile and decreased level of well-being are likely to be established, though a clear predictive relationship has not been empirically supported.

Existing literature has established a reciprocal relationship between teachers' self-efficacy and the two classroom practices – teacher-student relationships and classroom management (Zee & Koomen, 2016). Self-efficacy in teachers refers to the belief in capability to carry teacher responsibilities and is domain specific (Bandura, 1997). The most referred areas are the belief in capability and skills in classroom management, employment of adequate instructional strategies, and ability to enhance students' engagement (Klassen & Chiu., 2010). Teachers with higher self-efficacy tend to provide more support for students and positive reinforcement rather than punishment, which may enhance positive teacher-student relationships. Furthermore, teachers' self-efficacy was found to predict teachers' joy (Hagenauer et al., 2015), potentially serving as a protective factor against work stress. The literature employing a person-centered approach to investigate the connection between teacher-student relationships, classroom management, and self-efficacy is limited. Building upon PCM and previous studies, we expect that teachers with different profiles should exhibit varying levels of self-efficacy.

The Current Study

Taken together, teachers behave differently in the classroom, especially with regard to teacher-student relationships and classroom management practices. Existing research addressing the dynamics of teacher-student relationships and classroom management has predominantly centered on secondary students (e.g., Allen et al., 2013; Hagenauer et al., 2015). However, the generalizability of these findings to lower grades has yet to be explored. For example, Wubbels and Brekelmans (2012) categorized interpersonal teacher behaviors in secondary classrooms along a two-dimensional system of influence and proximity. However, low influence behaviors such as 'give freedom' may not be applicable in classrooms with younger children. Early childhood education and elementary stages necessitate teacher support to regulate students' behaviors and foster emotional development. Research on lower grade classrooms would extend our knowledge on teacher behaviors in those contexts and how it may relate to teacher, student, and classroom outcomes. This study emphasizes the early childhood and elementary grade level, aiming to make a contribution to the existing literature.

Our study first explores patterns of teachers' classroom management practices and relationships with students and second identifies how teachers varying in these two domains differ on their self-efficacy, classroom climate, and work stress. The study consists of two parts. In Part 1 we utilized two publicly accessible datasets to explore the profiles of teacher-student relationships and classroom management practices. The two datasets were selected based on their availability of teacher variables relevant to the study and comprised an early childhood sample and an elementary sample. Clustering analysis was used to identify potential groupings among teachers. In Part 2, we investigated the connections between those teacher profiles and a set of teacher and classroom outcomes including work stress, teaching-efficacy, and classroom climate. Multivariate analysis of variance (MANOVA) was used to examine whether significant group differences existed in those outcomes based on teacher profiles. A flow chart demonstrating the procedure is shown in **Error! Reference source not found.**. Our two-part study was designed to answer the following research questions:

- How many and what are the characteristics of teacher profiles with regard to their relationships with students and classroom management? How do the results compare between the two samples?

- Do teachers with different teacher profiles vary in their self-efficacy, classroom climate, and work stress?
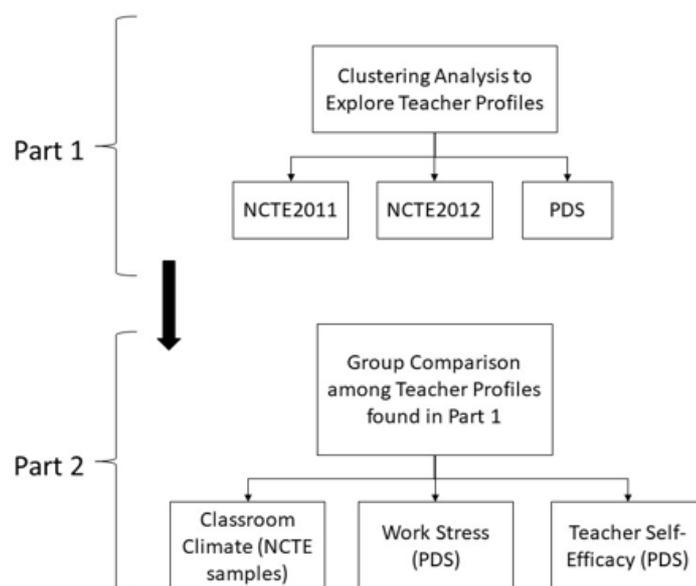

Figure 2. Analysis Procedure

Part 1

Methodology

Sample 1

Our first sample was drafted from the first two years of data from the National Center for Teacher Effectiveness (NCTE; Kane et al., 2022)[†], which collected observational and self-reported data from 4th and 5th-grade teachers across several Northeast states from Fall 2010 to Spring 2013. The third year was not included in the analysis due to missing data on nearly half of the participants. A total of 317 teachers participated in the study, and 298 teachers with complete data on the measures of interest were included in our analysis. Of these, 247 participated in the first year (NCTE-2011) and 211 participated in the second year (NCTE-2012). Specifically, 160 teachers participated in both years. The third year was not included due to missing data on nearly half of the participants.

Sample 2

The second sample was drafted from the pre-course data of National Center for Research on Early Childhood Education Teacher Professional Development Study (PDS; Pianta & Burchinal, 2016)[‡]. PDS evaluated the effect of two forms of professional development - course and coaching - on teachers' various skills. PDS was conducted between 2008 to 2011 and contained two cohorts. The pre-course data, including teacher-reported questionnaires and observations, which was collected before or at the beginning stage of the primary professional development and thus ruling out the professional development effect as it was not the focus of this study, was utilized in the analysis. The recruitment and sample information for the primary phase of PDS could be found in B. K. Hamre et al. (2012). Among those teachers, 296 (68.41%) were selected in this study, as they had complete data on the indicators on teacher-student relationships and classroom management practices.

Measures

Teacher Profile Indicators

Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) is an observational instrument capturing the quality and quantity of teacher-student interactions in pre-K to 12 classrooms. CLASS for Early Childhood and Elementary Classroom contains eleven dimensions. Positive climate and negative climate consider the warmth and negativity aspects of the emotional environment of a classroom. Teacher sensitivity considers awareness of students' academic and emotional needs. Regard for student perspectives considers the degree that teachers take account of students' interests and attitudes in activities. Behavior management considers setting and maintaining routines and order. Productivity and instructional learning formats consider the degree to which teachers maximize time and formats to increase student engagement. Concept development, quality of feedback, language modeling and literacy focus are four dimensions related to teachers' instructional practices (B. K. Hamre et al., 2012; B. Hamre et al., 2014). Trained raters rate teachers' behaviors based on the eleven dimensions using a 7-point Likert scale format. Item scores were averaged with total scores ranging from 1 to 7, with higher scores indicating a stronger orientation in that dimension.

The current study used seven dimensions of CLASS to measure teacher-student relationships and classroom management in both samples. Four dimensions – positive emotional climate, negative emotional climate, teacher sensitivity, and regard for student perspectives – were indicators for teacher-student relationships. Three dimensions – behavioral management, productivity, and instructional learning formats – were indicators for classroom management.

Several research studies have utilized CLASS to document teacher profiles over classroom practices. For example, LoCasale-Crouch et al.'s (2007) discovered five ordered teacher profiles based on CLASS. Virtanen et al. (2019) presented a four-profile finding - one high in all, one low in all, and two in the middle with one high in dimensions related to classroom management and one high in regard for students' perspectives. Based on those studies, in the current study we expect to find ordered profiles on teacher-student relationships and classroom management.

NCTE Samples

Teachers in the study were video recorded during a mathematics lesson three times per academic year. Each entire video-recorded lesson was further broken into 2 or 3 15-minute segments for scoring by a single trained CLASS rater using Upper Elementary version of CLASS. Therefore, a lesson may receive several CLASS scores, depending on the number of segments. To generate composite CLASS scores, segments were first aggregated by lesson to generate a lesson score. Teachers had up to three lesson scores per year, with scores of lessons aggregated by the academic year to generate a yearly CLASS score for each teacher. The first two years' scores (NCTE-2011 and NCTE-2012) were used in the current study.

[†] Accessed at https://www.icpsr.umich.edu/web/ICPSR/studies/36095/datadocumentation in December 2023
[‡] Accessed at https://www.icpsr.umich.edu/web/ICPSR/studies/34848/datadocumentation in December 2023

PDS Sample

Teachers were video recorded for 30 minutes at the beginning of the pre-course phase in their regular classrooms. Those 30-minute videos were further broken into two 15-minute segments. Each segment was coded by two randomly assigned trained CLASS raters using the Pre-K version of CLASS. The average scores of the two segments were used as CLASS scores for each teacher.

Data Analysis

To explore the variations on teacher patterns of relationships with students and classroom management practices, cluster analysis was carried out using the *k*-means algorithm. Individual cluster analysis was performed for NCTE-2011, NCTE-2012 and PDS, respectively. The *k*-value of clustering (number of cluster) was selected using the elbow method (within cluster sums of squares; WSS). Because the elbow method is arguably arbitrary, testing the clustering solution's validity is suggested and was also conducted (Kodinariya & Makwana, 2013). The internal cluster validity was examined by the Silhouette coefficient (Rousseeuw, 1987). It estimates the average distance between clusters, with the positive values indicating correct clustering.

Results

The results of cluster solution on WSS of the three samples demonstrated a consistent elbow pattern at k = 3 (**Error! R eference source not found.**). This consistent pattern indicates the presence of three district profiles across samples. Consequently, the *k*-mean clustering was carried out with three clusters on NCTE-2011, NCTE-2012, and PDS samples.

Cluster Analysis

NCTE Samples

The means and standard deviations of indicators for each cluster of 2011 and 2012 were presented in **Error! Reference s ource not found.** and **Error! Reference source not found.**. For 2011, the three clusters of teacher profiles demonstrated the following patterns: (a) teachers were high on every indicator (n = 105), (b) teachers were high on behavioral management and productivity, but low on other areas (n = 133), (c) teachers were low on every indicator (n = 9). The between-group differences accounted for 46.72% of the total variance. The average silhouette s_i = .28, indicating appropriate clustering among participants.

For 2012, the characteristics of the three profiles were similar to 2011: (a) teachers were high on all indicators (n = 83), (b) teachers were high on behavioral management and productivity with other indicators averaged in the middle of the scale (n = 93), (c) teachers were low on all indicators (n = 35). The between-group difference accounted for 51.40% of the total variance. The average silhouette width s_i = .25, indicating correctness for clustering.
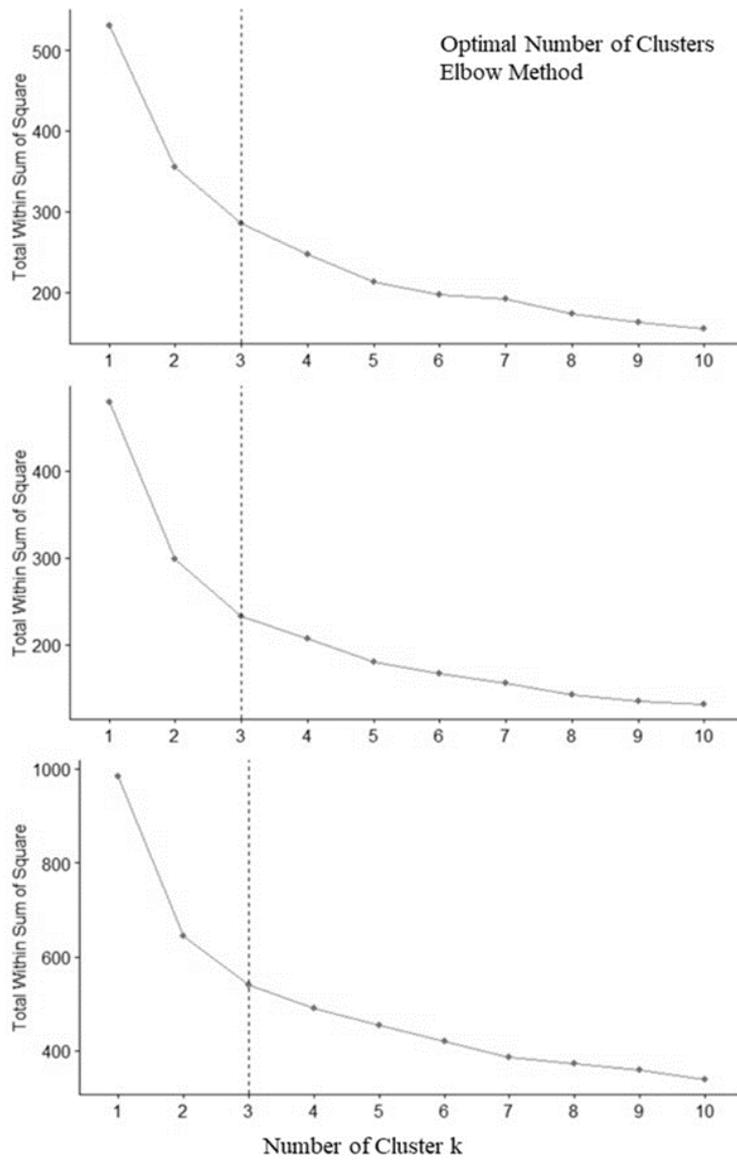
Figure 3. Optimal Number of Clusters by Elbow Method for NCTE-2011(Top), NCTE-2012(Middle), and PDS(Bottom)
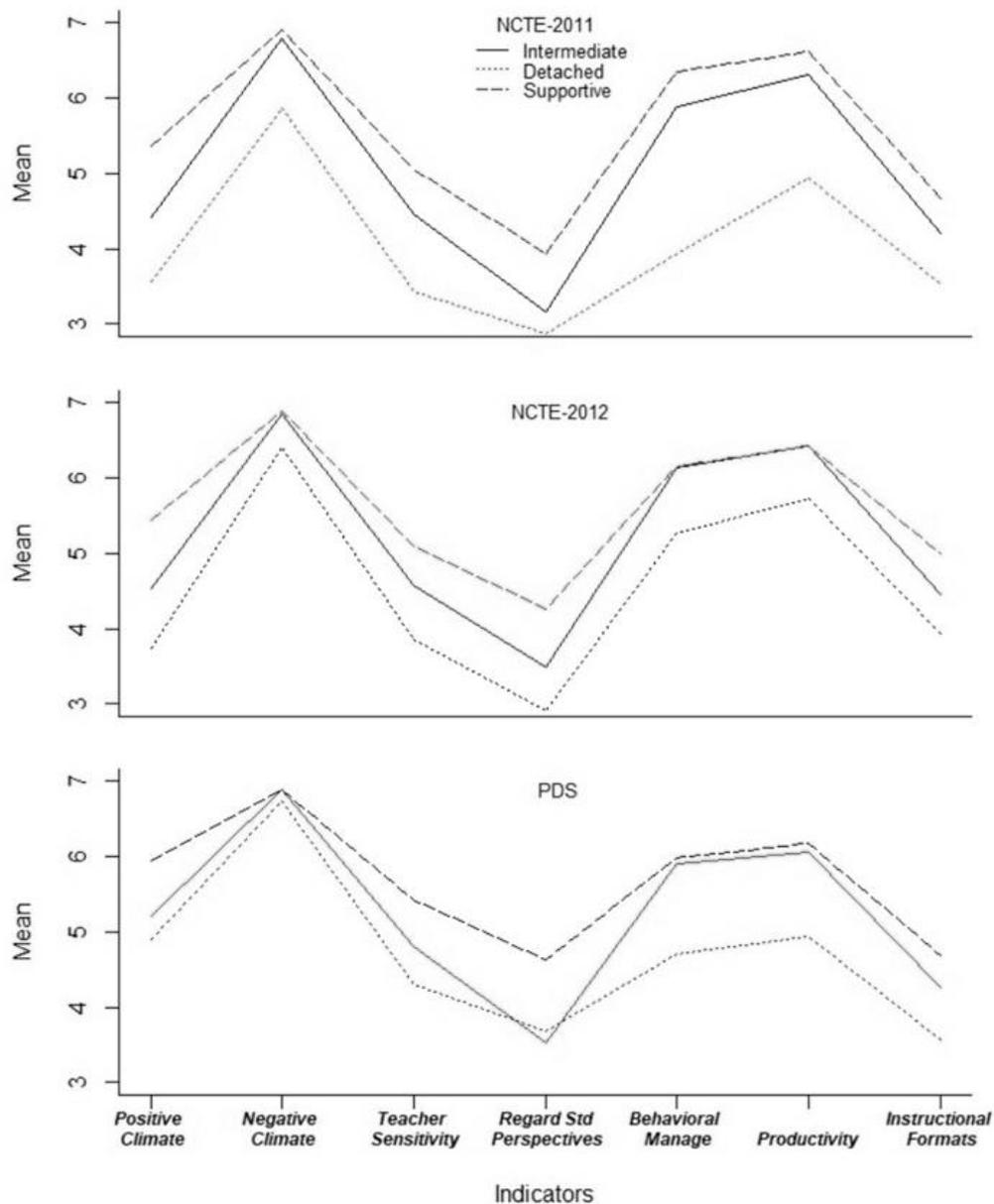
Figure 4. Mean Values of Indicators for Three Teacher Profiles

Note. This figure presents the characteristics of three teacher profiles – intermediate, detached, and supportive – in areas of classroom practices. The x-axis are indicators of classroom practices across two areas: teacher-student relationships and classroom management. The y-axis shows that indicator's mean values. Three different lines are used to indicate teachers of different profiles. The figure contains results of three samples. Top figure: NCTE-2011: First-year data (Fall, 2010 – Spring, 2011) of National Center for Teacher Effectiveness. Middle figure: NCTE-2012: Second-year data (Fall, 2011 – Spring, 2012) of National Center for Teacher Effectiveness. Bottom figure: PDS: Early Childhood Education Teacher Professional Development Study; Std = Student.

Table 1. Means and Standard Deviations for CLASS Indicators of Teacher Profiles.

| | NCTE-2011 | | | | | | | | | NCTE-2012 | | | | | | | | | PDS | | | | | | | | |
| | Supportive | | Intermediate | | Detached | | Supportive | | Intermediate | | Detached | | Supportive | | Intermediate | | Detached | | Supportive | | Intermediate | | Detached | | | | |
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
PEC	5.37	1.10	4.42	1.32	3.56	1.57	5.44	0.96	4.54	1.25	3.74	1.28	5.95	0.81	5.22	1.18	4.90	1.22
NEC	6.92	1.06	6.79	1.20	5.86	0.98	6.90	0.85	6.85	1.20	6.40	1.34	6.90	0.80	6.90	1.08	6.74	1.06
TS	5.06	1.05	4.46	1.27	3.42	1.16	5.10	0.93	4.57	1.14	3.85	1.20	5.43	0.89	4.80	1.19	4.30	1.20
RSP	3.93	1.13	3.17	1.31	2.87	0.75	4.26	0.97	3.50	1.27	2.90	1.14	4.64	0.97	3.54	1.26	3.69	1.18
BM	6.35	1.18	5.88	1.32	3.93	1.52	6.16	0.96	6.14	1.23	5.27	1.50	5.99	0.93	5.90	1.15	4.70	1.26
Pro	6.61	1.16	6.31	1.26	4.94	0.80	6.42	0.91	6.42	1.28	5.72	1.40	6.18	0.86	6.07	1.09	4.93	1.18
ILF	4.68	1.11	4.20	1.26	3.54	1.19	5.01	0.94	4.45	1.22	3.93	1.28	4.68	0.91	4.25	1.16	3.57	1.18

Note. CLASS: Classroom Assessment Scoring System, NCTE-2011: First-year data (Fall, 2010 – Spring, 2011) of National Center for Teacher Effectiveness; NCTE-2012: Second-year data (Fall, 2011 – Spring, 2012) of National Center for Teacher Effectiveness; PDS: Early Childhood Education Teacher Professional Development Study. PEC: positive emotional climate, NEC: negative emotional climate (reversed-coded; high scores indicate less negativity), TS: teacher sensitivity, RSP: regard for students' perspectives, BM: behavioral management, Pro: productivity, ILF: instructional learning formats.

PDS Sample

Please see the means and standard deviations of indicators for clusters in **Error! Reference source not found.** and **Error! Reference source not found.**. The three teacher profiles demonstrated similar patterns as the NCTE samples, with (a) teachers were high on all indicators (n = 116), (b) teachers were high on behavioral management and productivity, but low in regard to student perspectives (n = 95), and (c) teachers were low on all indicators (n = 85). The between-group difference accounted for around 45.24% variance. The average silhouette width s_i = .20, indicating correct clustering among participants.

The results of NCTE-2011, NCTE-2012, and PDS all supported three clusters of teacher profiles, and these three profiles demonstrated large similarly across samples – a high profile, a low profile, and a profile in the middle with high classroom management and low regard for student perspectives. We named the three profiles as (a) supportive, (b) detached, and (c) intermediate. Descriptive statistics regarding teachers' ethnicity, gender, and years of teaching based on their profiles were presented in **Error! Reference source not found.**. There were no noticeable disparities in gender, ethnicity, years of teaching experience, and education among teacher profiles. The demographic distribution within each profile closely aligned with that of the overall sample.

Part 2

The purpose of Part 2 was to support the cluster solution of teacher behavior patterns among teacher-student relationships and classroom management practices by investigating variations on external variables using group comparisons on profiles discovered in Part 1. Classroom climate was compared in the NCTE samples, and TSE and work stress were compared in the PDS sample as of data availability. We expected variations would be found among teacher profiles on TSE, work stress and classroom climate.

Table 2. Descriptive Statistics Regarding Teacher Profiles for NCTE-2011 (N = 247), NCTE-2011 (N = 211) and PDS (N = 296)

		NCTE-2011			NCTE-2012				PDS		
		Supportive (*N* = 105)	Transitional (*N* = 133)	Detached (*N* = 9)	Supportive (*N* = 83)	Transitional (*N* = 93)	Detached (*N* = 35)		Supportive (*N* = 116)	Transitional (*N* = 95)	Detached (*N* = 85)
Female		91(86.7%)	108(81.2%)	5(55.6%)	65(78.3%)	74(79.6%)	29(82.9%)		106(91.38%)	91(95.8%)	76(89.4%)
Ethnicity											
	White	68(64.8%)	95(71.4%)	5(55.6%)	56(67.5%)	64(68.8%)	22(62.9%)	Black	51(44%)	49(51.6%)	45(52.9%)
	Black	23(21.9%)	20(15%)	4(44.4%)	14(16.9%)	17(18.3%)	8(22.9%)	White	39(33.6%)	31(32.6%)	31(36.5%)
	Hispanic	2(2%)	5(4%)	0(0%)	4(4.8%)	3(3.3%)	0(0%)	Hispanic	8(6.9%)	5(5.3%)	5(5.9%)
	Asian	3(3%)	4(3.8%)	0(0%)	1(1.2%)	1(1.1%)	1(2.9%)	Puerto Rican	10(8.6%)	3(3.2%)	2(2.4%)
Years of Teaching Experience											
	0-3	10(9.5%)	24(18%)	2(22.2%)	9(10.8%)	10(10.8%)	3(8.6%)		11(9.5%)	5(5.3%)	9(10.6%)
	3-10	54(51.4%)	55(41.4%)	4(44.4%)	34(41%)	42(45.2%)	15(42.9%)		39(33.6%)	33(34.7%)	19(22.4%)
	Above 10	38(36.2%)	53 (39.8%)	3(33.3%)	39(47%)	41(44.1%)	17(49.6%)		63(54.3%)	57(60%)	54(63.5%)
Educational Attainment[a]								Highest Degree			
	Bachelor's in education	62(59%)	70(52.6%)	5(55.6%)	48(57.8%)	46(49.5%)	16(45.7%)	Below Associate	12(10.3%)	14(14.7%)	8(9.4%)
	Master	79(75.2%)	101(75.9%)	6(66.7%)	60(72.3%)	77(82.8%)	30(85.7%)	Associate	31(26.7%)	21(22.1%)	28(32.9%)
	Alternative	6(5.7%)	9(6.8%)	2(22.2%)	5(6%)	7(7.5%)	2(5.7%)	Bachelor	51(44%)	46(48.4%)	36(42.4%)
Certification Program											
								Master and above	18(15.5 %)	14(14.7%)	12(14.1%)

Note. Some teachers did not respond to some demographic questions. NCTE-2011: First-year data (Fall, 2010 – Spring, 2011) of National Center for Teacher Effectiveness; NCTE-2012: Second-year data (Fall, 2011 – Spring, 2012) of National Center for Teacher Effectiveness; PDS: Early Childhood Education Teacher Professional Development Study.

a. Participants were asked to check all apply

Methodology

Measures

Classroom Climate (NCTE samples)

Classroom Climate is a comprehensive concept covering the social, emotional, cognitive, and physical environments within which students learn. A teacher-reported, eight-item scale assessing teacher-student interactions, student behavior, and the overall tone of the classroom environment (Kane et al., 2022) was used to measure classroom climate. Two subscales, positive and negative, each consisted of four items using a 5-point Likert response format. The positive subscale assessed warmth and support, while the negative subscale assessed conflict and tension. A sample item in the positive scale was 'Students and I have a friendly rapport'. A sample item in the negative scale was 'I have to reprimand students to control the class'. Items in the negative scale were all reversed-coded, with higher scores indicating lower negativity. Each subscale's score was calculated by averaging scores across items. Higher scores indicated more positivity and less negativity within the classroom. Cronbach alpha coefficients for positive scale were α = .79 and α = .78, and for negative scale were α = .89 and α = .85 for 2011 and 2012, respectively. CFA supported a two-factor structure with CFI = .97, RMSEA = .08 and SRMR = .04 of NCTE-2011 and CFI = .99, RMSEA = .03, SRMR = .03 of NCTE-2012.

Teacher Self-Efficacy (PDS Sample)

Teachers' self-efficacy refers to the belief in capability to carry teacher responsibilities and is domain specific (Bandura, 1997). The most referred areas are the belief in capability and skills in classroom management, employment of adequate instructional strategies, and ability to enhance students' engagement (Klassen & Chiu., 2010). TSE was assessed by the Ohio State Teacher Efficacy Scale – Short Form (Tschannen-Moran & Hoy, 2001) for the PDS study. The scale consists of three subscales, teacher efficacy on student engagement, instructional strategies, and classroom management. The internal consistency was α = .85, α = .85, α = .87 for the three subscales, respectively. Sample items include, 'How much can you do to get children to believe they can do well on activities?', 'How much can you use a variety of assessment strategies?', and 'How much can you do to get children to follow classroom rules'. Items were rated on a 9-point Likert scale. Subscale scores were calculated by averaging scores across items. The model fitting for a three-factor structure was acceptable, CFI = .93, RMSEA = .09 and SRMR = .05.

Work Stress (PDS Sample)

Teacher stress could be perceived as the negative physical and psychological outcomes from imbalance between protective factors and risk of teachers' jobs (Prilleltensky et al., 2016). The Teacher Stress Inventory (Fimian & Fastenau, 1990) - a validated self-reported measurement to assess teachers' work stress in ten aspects - was utilized. Two subscales of the inventory, (a) work-related stressors and discipline, and (b) motivation, were adopted for their relevancy to the current study. Both subscales consist of six items and use a 5-point Likert response format. Sample items include 'My class is too big.' and 'I feel frustrated having to monitor pupil behavior.' The internal consistency was αs = .80 for both subscales. CFA supported a two-factor structure in the current sample with CFI = .98, RMSEA = .09, SRMR = .08.

Data Analysis

To validate differences between teacher profiles on the two sets of classroom practices, we performed multivariate analysis of variance (MANOVA) to compare teachers of different profiles on other teacher and classroom variables as an approach to examine the external validity of the cluster solution. MANOVA helps to control the occurrence of Type I errors associated with multiple comparisons. Prior to the analysis, assumptions of MANOVA were checked and the results indicated no violations of normality, multicollinearity and homoscedasticity. In the event of a significant MANOVA result, which indicated group differences in at least one dependent variable, analysis of variance (ANOVA) were carried out as follow-up analyses to examine the level of group differences for every independent variable. Pairwise group comparisons using Tukey HSD would be performed if a result of ANOVA was significant.

Results

NCTE

Descriptive statistics are presented in Tables 3. For the NCTE-2011 sample, the differences in two external variables (positive classroom climate and negative classroom climate) based on teacher profiles were found to be significant, $F(2, 235)$ = 3.95, Pillai's Trace V = 0.07, $p < .01$, partial η^2 = .07. A follow-up analysis using ANOVA showed that both variables were significant, negative classroom climate, $F(2, 239)$ = 7.80, $p < .001$, η^2 = .06, and positive classroom climate, $F(2, 236)$ = 5.42, $p < .001$, η^2 = .05. Post hoc pair-wise comparisons between teacher profiles (**Error! Reference source not found.**) indicated that teachers with detached profiles had significantly more negativity (M = 3.56) and less positivity (M = 3.19) in their class as compared to teachers with intermediate (M = 3.74 for negativity, M = 4.19 for positivity) or supportive profiles (M = 4.44 for negativity, M = 3.92 for positivity). Pearson correlations between positive and negative classroom climate were r = .67, $p < .001$.

Table 3. Means and Standard Deviations for Teacher Self-Efficacy, Classroom Climate, and Work Stress

Profiles	Supportive		Intermediate		Detached			Supportive		Intermediate		Detached	
	M	SD	M	SD	M	SD		M	SD	M	SD	M	SD
			NCTE-2011					**PDS**					
CC-P	3.92a	0.98	3.74a	0.68	3.19b	0.91	TSE-IS	7.37a	1.12	7.45a	1.01	7.36a	1.02
CC-N	4.44a	0.64	4.19b	0.79	3.56c	1.11	TSE-SE	7.74a	1.16	7.70a	1.03	7.64a	0.91
			NCTE-2012				TSE-CM	7.44a,b	1.21	7.65a	1.04	7.24b	1.15
CC-P	4.07a	0.52	3.86a	0.65	3.59b	0.73	WS-WRD	1.99a	0.69	2.11a,b	0.71	2.29b	0.74
CC-N	4.48a	0.53	4.22b	0.74	4.16b	0.82	WS-M	1.64a	0.57	1.72a,b	0.64	1.92b	0.69

Note. NCTE-2011 = First-year data (Fall, 2010 – Spring, 2011) of National Center for Teacher Effectiveness; NCTE-2012 = Second-year data (Fall, 2011 – Spring, 2012) of National Center for Teacher Effectiveness; PDS = Early Childhood Education Teacher Professional Development Study. TSE-SE: Teacher self-efficacy in Student Engagement, TSE-IS: Teacher self-efficacy in instructional strategies, TSE-CM: Teacher self-efficacy in classroom management, CC-P: Positive Classroom Climate, CC-N: Negative Classroom Climate (Reversed-coded, high scores means low negativity), WS-WRD: Work Stress-Work-related Stressors and Discipline, WS-M: Work Stress-Motivation.

Teacher profiles sharing the same superscript for a variable within the sample are not statistically different at adj. *p* < .05 using Tukey HSD.

The NCTE-2012 sample showed similar patterns as in 2011. The MANOVA on the two external variables was significant, $F(2, 205) = 4.32$, Pillai's Trace V = 0.08, $p < .01$, partial $\eta^2 = .08$. The follow-up ANOVA showed that teacher profiles showed significant differences on both variables, negative classroom climate, $F(2, 206) = 4.22$, $p = .02$, $\eta^2 = .04$, and positive classroom climate, $F(2, 206) = 7.52$, $p < .001$, $\eta^2 = .07$. Post hoc pair-wise comparisons (**Error! Reference source not found.**) showed that supportive teachers had less negativity ($M = 4.48$) than intermediate ($M = 4.22$) and detached teachers ($M = 4.16$). For classroom positivity, teachers with detached profiles ($M = 3.59$) were significantly lower than teachers with supportive profiles ($M = 4.07$), whereas teachers with Intermediate profiles ($M = 3.86$) showed similar means to the other two profiles. Pearson correlations between positive and negative classroom climate was $r = .70$, $p < .001$.

PDS

The MANOVA on external variables, including work stress and TSE, was significant, $F(2, 285) = 2.12$, Pillai's Trace V = 0.07, $p < .05$, partial $\eta^2 = .07$. The follow-up ANOVA showed both aspects of work stress, (a) work-related stress and discipline, $F(2, 290) = 4.07$, $p = .02$, $\eta^2 = .03$ and (b) work stress–motivation, $F(2, 290) = 4.80$, $p < .01$, $\eta^2 = .03$ were significantly different for the three teacher profiles. Pairwise differences (**Error! Reference source not found.**) show that detached teachers ($M = 2.29$) reported more work stress on work-related stressors and discipline than supportive teachers ($M = 1.99$). Intermediate teachers ($M = 2.11$) sat in the middle and did not demonstrate significant differences in work-related and discipline stressors compared to the other two profiles. On work stress-motivation, detached teachers ($M = 1.92$) again reported the highest and were significantly higher than supportive teachers ($M = 1.64$). Intermediate teachers' work stress-motivation ($M = 1.72$) was not significantly different from the other profiles. No significant differences were found on any aspect of TSE based on teacher profiles, with TSE-student engagement, $F(2, 287) = 0.22$, $p = .80$, instructional strategies, $F(2, 287) = 0.22$, $p = .80$, and classroom management, $F(2, 287) = 2.88$, $p = .06$. Correlations between variables are presented in **Error! Reference source not found.**. As expected, positive correlations were found among TSE aspects and among work stress aspects. However, aspects of TSE and aspects of work stress were found to be negatively correlated, indicating high work stress was related to low TSE.

Table 4. Zero-Correlations Between Variables

	TSE-IS	TSE-SE	TSE-CM	WS-WRD
			PDS	
TSE-SE	.78***			
TSE-CM	.70***	.70***		
WS-WRD	-.14*	-.10	-.16**	
WS-M	-.10	-.16**	-.20***	.56***

Note. PDS = Early Childhood Education Teacher Professional Development Study; TSE-IS: Teacher self-efficacy in instructional strategies, TSE-CM: Teacher self-efficacy in classroom management, TSE-SE: Teacher self-efficacy in Student Engagement, WS-WRD: Work Stress-Work-related Stressors and Discipline, WS-M: Work Stress-Motivation.
***$p < .001$, **$p < .01$, *$p < .05$.

Discussion

Teacher Profiles Characteristics

Three distinct patterns of teacher-student relationships and classroom management practices - supportive, intermediate, and detached - were discovered from two independent data sets. The discovery and characteristics of the three teacher profiles are in accordance with previous studies (e.g., Gaias et al., 2019) that state that teacher profiles of classroom practices are largely ordered. The three profiles are distinct in their relationships with teacher practices, as well as in their relationships to classroom and teacher outcome measures.

Supportive teachers exhibit warmth, respect, and strong relationships with students. They tailor activities to students' interests and implement effective behavioral management strategies. Conversely, detached teachers are distant from students, provide low emotional support, and lack awareness of students' needs. Intermediate profile teachers display patterns of both supportive and detached profiles, with moderate teacher-student relationships and strong classroom management skills to maximize instructional time.

The profiles discovered in this study closely resemble teaching styles commonly observed in secondary classrooms (e.g., Dever & Karabenick, 2011). Teaching styles are distinguished by their levels of teaching care and academic pressure. The authoritarian style involves high academic pressure but low levels of solicitude, while the permissive style is characterized by high levels of solicitude but low or no academic pressure. The authoritative style, on the other hand, balances high levels of academic pressure and solicitude, while the neglectful style exhibits neither.

When applied to the lower grade context, in the current study, teaching care is closely linked to teacher-student relationship, while academic pressure is closely linked to classroom management. We discovered that the supportive profile aligns with the authoritative style, while the intermediate profile aligns with the authoritarian style. However, we

did not find the corresponding profile of the permissive style in the two samples, which should have low classroom management and high teacher-student relationships. The detached profile, which is characterized by low levels in both areas, is seldom found in secondary education but was present in both samples. One hypothesis for these differences is the variations between secondary classrooms and lower grade classrooms. Another possible explanation is the limitation of the sample. It is feasible that teachers who prioritize relationships over management are rare in the samples.

Unique to the PDS sample is the finding that the intermediate profile teacher also demonstrated the lowest respect for students' autonomy among the three profiles, which was not observed in the NCTE samples. This inconsistency could be due to the difference in student ages between the two samples. The NCTE sample included 4th and 5th-grade teachers, while the PDS sample consisted of early childhood teachers. Given the developmental differences in their students, these groups of teachers may employ different autonomy-granting strategies. Young children typically require more external guidance, while upper elementary students do not need the same level of support. Therefore, early childhood teachers may not prioritize autonomy support. Further research is needed to examine if similar behavior patterns can be discovered.

In accordance with Comprehensive Teacher Quality model (Rimm-Kaufman & Hamre, 2010), teacher practices are influenced by personal factors (e.g., teacher psychological attributes, family relationships) and contextual factors (e.g., learning opportunities, professional development, policies). While the current study corroborates that teachers with supportive profiles are related to optimal classroom and teacher outcomes, the specific reasons behind why certain teachers have supportive profiles remain unclear. It could be that personality characteristics may play a role in cultivating teachers with supportive profiles (Jiang & Guo, 2023), and it is also possible that a positive school climate contributes to the development of teachers with supportive profiles. Nevertheless, the comprehensive model serves as inspiration, suggesting potential ways to foster supportive profile teachers, such as targeted efforts through professional development.

Profiles and Outcomes

Our findings support that the three teacher profiles demonstrate meaningful differences on classroom outcomes - positive classroom climate and negative classroom climate, and teacher outcomes - work stress. Classroom climate reflects the tone of the classroom system's dynamic interactions. In the context of the prosocial classroom model (Jennings & Greenberg, 2009), a healthy classroom climate plays a crucial role in between teacher behaviors and student outcomes. Previous research has established associations between a positive classroom climate and reduced problem behaviors, as well as between a negative classroom climate and increased disruptive behavior (Brophy-Herb et al., 2007; Buyse et al., 2008; Thomas et al., 2011). Building on this literature, the present study adopts a person-centered perspective and seeks to contribute to the field by examining the association between teacher profiles and the healthiness of the classroom climate. Our findings affirm the Prosocial Classroom Model in delineating the relationship between teacher practices and classroom climate within the lower grade context.

Our study corroborates the findings by Martínez-Monteagudo et al. (2019) and Ferradás et al. (2019) that low profiles, manifested as low levels of teacher-student relationships and few classroom management practices in the current study, are linked to decreased teacher well-being. Poor classroom management is associated with increased student misbehavior, a major contributor to teacher burnout (Aloe et al., 2014). Additionally, low-quality interpersonal relationships between teachers and students add to the negativity buildup and eventually augments occupational distress (Aldrup et al., 2018). Although the direction of the relationship between work stress and a detached profile is unclear in our study, our findings suggest that addressing teacher work stress may improve teacher-student relationships and promote a positive classroom environment.

The relationship between teacher behaviors and TSE has yielded inconsistent results in the literature. While some studies have found a positive link between TSE and teachers' ability to manage classroom behavior (e.g., Almog & Shechtman, 2007; Yoon, 2004), other studies have failed to recover this relationship (e.g., de Jong et al., 2014; Jimmieson et al., 2010). In our study, teacher-student relationships and classroom management profiles do not differ meaningfully on three aspects of TSE: student engagement, instructional strategies, and classroom management.

One hypothesis is that the TSE survey used in current study was originally developed for a secondary teacher sample and thus may not capture the contexts of lower grades. Another hypothesis is that since no previous study has examined teacher-student relationships (or its subareas, closeness and conflict) and classroom management simultaneously, there may be some underlying variables that mediate or moderate the relationship between TSE and these variables, causing the relationship to be insignificant. This hypothesis corresponds to Zee et al. (2016)'s review that mixed results between TSE and teacher behaviors may be due to various variables, such as students' age and aspects of TSE. Future research is needed to examine those underlying variables to gain more insights on the direct and indirect relationships between TSE and teacher behaviors.

Conclusion

This study has shed light on distinct patterns of teacher-classroom practices in terms of teacher-student relationships and classroom management. Employing a person-oriented approach, *k*-means clustering, this method was applied to

three samples from two independent datasets, encompassing over 600 early childhood and elementary teachers. The results consistently revealed three discernible teacher profiles across samples: supportive, intermediate, and detached.

Supportive teachers exhibited high levels of both teacher-student relationships and classroom management, whereas detached teachers demonstrated lower levels in both domains. Intermediate teachers, occupying a middle ground, also demonstrated sample-dependent characteristics. Specifically, in all samples, intermediate teachers demonstrated comparable levels of classroom management to supportive teachers. However, in the early childhood sample, intermediate teachers displayed a lower level of teacher-student relationships, whereas in the elementary sample, they displayed a moderate level of teacher-student relationships. These three profiles resemble the authoritative, authoritarian, and neglectful teaching styles found in secondary classrooms.

Comparative analysis of teacher self-efficacy, work stress, and classroom climate among the three identified teacher profiles showed that supportive teachers obtained the highest classroom climate scores, followed by intermediate and detached. Work stress was comparable for intermediate and supportive teachers, both lower than detached. Surprisingly, no group differences were found for self-efficacy. This study contributes to understanding teacher behaviors in early childhood and elementary education, offering insights into the nuanced dynamics between teacher-student relationships, classroom management, and broader teacher- and classroom-related factors.

Recommendations

Future studies may consider validating the generalization of the three teacher profiles. It could be performed on independent samples with similar characteristics but with a larger sample size. Another perspective is to carry out similar analyses on samples with other characteristics, such as teachers of other grades, and examine the pattern consistency. Future studies may also consider extending the relationship between teacher profiles to student outcomes. It will help generate a whole picture of teacher well-being, classroom processes, classroom environment, and student development.

Limitations

Researchers should be cautious in the interpretation beyond the scope of the current findings. The two datasets used, NCTE and PDS, were not drawn from national representative samples, thus restraining the generalization of the findings to the teacher population. Though results support that the three behavioral patterns are largely consistent across early childhood teachers and upper-grade elementary teachers, more evidence is needed before assuming the three teacher profiles reflect teacher-student relationships and classroom management practices across a larger group of teachers. The group differences between teacher profiles and work stress, classroom climate, and similar patterns in self-efficacy need to be examined in other samples as well. Also, the cross-sectional design hinders any causal conclusion from being drawn from the findings. For example, the mechanism between teacher classroom practices and work stress is unclear.

Authorship Contribution Statement

Jiang: Conceptualization, design, analysis, writing. Guo: Conceptualization, interpretation, drafting manuscript, reviewing. Tomek: Critical revision of manuscript, editing/reviewing, supervision.

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