Teacher Stress and Burnout in Urban Middle Schools: Associations with Job Demands, Resources, and Effective Classroom Practices

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Abstract

Stress and burnout are pervasive among public school teachers and amplified in urban schools, where job demands are often high and resources low. Relatively little is known about factors contributing to stress and burnout among urban school teachers specifically, or how these aspects of teacher occupational wellbeing relate to their use of effective classroom practices. Rather than utilizing objective measures, extant research has relied heavily on teacher report of antecedents and consequences, in addition to self-reporting stress and burnout, which have also rarely been examined together in tandem. To address this and other gaps in the literature, the current study examined the interplay of job demands and resources, stress and burnout, and effective classroom practices (operationalized as warm-demanding teaching). Two discrete observational measures, in addition to teacher self-report, were collected from a sample of 255 teachers in 33 low-income, urban middle schools. Findings indicated that White teachers, female teachers, and teachers in low-income schools reported higher stress and burnout. Teachers reporting more self-efficacy, affiliation with colleagues, and student emphasis on their academics (i.e., more resources) reported lower stress and burnout; furthermore, adding resources to the model attenuated associations between student disruptive behaviors and stress and burnout. In turn, stress was associated with lower levels of observed demanding teaching (instructional dialogue); however, surprisingly, burnout was related to higher levels of observed teacher warmth (sensitivity). We discuss these findings in light of prior research and consider implications for future research and professional development for teachers.

KEYWORDS: teacher stress; burnout; effective classroom practices; urban school

Understanding the Role of Job Demands and Resources in Teacher Stress and Burnout: Implications for Use of Effective Classroom Practices in Urban Middle Schools

Mounting accountability pressures, ever-tightening budgets, and the challenges of larger and increasingly diverse classes have made public school teaching one of the most stressful professions in the United States today. Nationally, an estimated 46% of teachers report "high daily stress," a rate matched only by nurses and physicians (Gallup, 2014). The problem is even more pronounced in urban and urban fringe schools. For example, one study found that 93% of teachers in their sample of urban, predominantly Black and low-income schools reported high levels of job stress (Herman, Hickmon-Rosa, & Reinke, 2018). Teachers' work stress and burnout is longitudinally associated with serious mental health problems, including suicidality, depression, and anxiety (Choi, 2018; Melchior et al., 2007) as well as intent to leave the profession (Johnson et al., 2005; Mearns & Cain, 2003; Montgomery & Rupp, 2005). In fact, as many as 40-50% of teachers leave the profession within their first five years (Darling-Hammond, 2010; Ryan et al., 2017).

High job stress and burnout among teachers in urban, low-income schools may be driven in part by their role in supporting students who disproportionately face serious stressors like poverty, trauma, chronic violence exposure (Dorado et al., 2016; Newell & MacNeil, 2010), in tandem with the demands of working in under-resourced schools (Kyriacou, 2001). Prior research on the Job Demands and Resources model informs our understanding of the interplay of job demands and resources contributing to stress and burnout (Bakker & Demerouti, 2007). This model is widely cited in occupational stress literature (Dicke et al., 2018); it asserts that when job demands outweigh the resources available, it may exacerbate teacher stress and burnout (Dicke et al., 2014; 2018; Lambert et al., 2009). Nonetheless, extant research largely relies on teachers'

perceptions of demands, rather than observable and *objectively* assessed demands in the classroom ecology (Larson et al., 2018). In addition, the research examining job resources has typically focused on personal resources (e.g., teaching self-efficacy; Dicke et al., 2018; Herman et al., 2018), overlooking institutional resources. Furthermore, little is known about the immediate impacts of teacher stress and burnout on the observed use of effective classroom practices. It is particularly important to understand factors that diminish teacher use of classroom practices known to be effective in supporting students of color in urban schools, who comprise the majority of student enrollment in many schools (U.S. Department of Education, 2016). Enhancing Black, Latinx, and other minoritized students' access to effective teaching is likely key to reducing racial and ethnic disparities in achievement and discipline (Bradshaw et al., 2018; Gregory, Hafen, Ruzek, Mikami, Allen & Pianta, 2016).

The present study considered a range of institutional, classroom-specific, and personal resources, as well as observed and otherwise objectively-assessed job demands and racial context factors, in relation to teacher-reported stress and burnout. We then examined the association of stress and burnout with two observed teacher practices theorized to be particularly effective for students of color, while still accounting for predictors of stress and burnout. Given the focus on urban educational settings with a high enrollment of students of color, we examined racial context variables in relation to stress, burnout, and these classroom practices. Our goal was to better understand potentially malleable factors that interventions can target to reduce teacher stress and burnout and, in turn, mitigate their effects on teachers' use of effective practices.

Stress and Burnout

Burnout has been defined as a combination of depersonalization (or cynicism), personal inefficacy, and most saliently, emotional exhaustion, which refers to feeling taxed and

overburdened by the emotional strain or affective intensity of one's daily responsibilities (Maslach, 1982; Maslach & Leiter, 2016). Burnout is conceptually similar to definitions of occupational stress in that it often is measured by symptoms and features of stress (e.g., fatigue, mental health concerns; see Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Yet burnout and stress are distinct in that stress measures often focus on stress appraisal (i.e., whether demands being made exceed the ability to cope, which presents a threat to wellbeing and activates reactive coping mechanisms; Kyriacou & Sutliffe, 1978). Thus, acute stress is more closely related to reactivity and urgency (as in fight-or-flight physiological responses; Cacioppo et al., 1998) and increased engagement as a coping response (Von Dawans, Fischbacher, Kirschbaum, Fehr, & Heinrichs, 2012). In contrast, burnout is characterized as a prolonged response to chronic job stressors over time (Maslach, Schaufeli, & Leiter, 2001), and related more to disengagement, detachment, helplessness, and feelings of depression (Leiter & Durup, 1994; Schaufeli & Bakker, 2004). Thus, burnout is not the same as too much stress (Antoniou, Polychroni, & Vlachaki, 2006); however, it has been associated with negative occupational outcomes like job dissatisfaction and desire to quit (Pines & Keinan, 2005). An important, yet often overlooked, gap in current research is the examination of these phenomena in tandem. Examining them simultaneously, rather than separately, may inform our understanding of the unique mechanisms driving each, as well as how they relate to teachers use of effective practices in the classroom.

Theoretical Model of Demands and Resources Related to Burnout

A series of studies has captured job-specific demands and resources within the ecological context of the school as key mechanisms underlying teacher burnout vis-à-vis the Job Demands and Resources model (Bakker & Demerouti, 2007; Demerouti et al., 2001; Dicke et al., 2014;

2018). Although this theoretical work has rarely focused on stress as an explicit outcome as we have conceptualized it, transactional models of stress (Lazarus & Folkman, 1984) apply a similar theoretical view of the interplay of stressors and resources. Thus, we have applied the Job Demands and Resources theoretical model to examine contributors to both burnout and stress.

Institutional demands and resources. At the institutional level, job demands have been theorized and empirically examined to include institutional supports and working conditions (e.g., class sizes), among other demands (Dicke et al., 2018; see Montgomery & Rupp, 2005 for meta-analysis). General organizational health of the school environment has also been studied extensively and is associated with burnout (e.g., Cox, Kuk, & Leiter, 1993; Sabanci, 2009). This construct includes sub-indicators of organizational health such as affiliation among fellow teachers and positive perceptions of school leadership.

Classroom demands and resources. In the classroom, teachers face additional demands in the form of student academic, behavioral, social, and emotional needs. Student behavioral problems are often conceptualized as a central job demand contributing to teacher stress (Martin, Sass, & Schmitt, 2012). In fact, challenges with behavior management are among the most commonly cited reasons that teachers leave the field (Skaalvik & Skaalvik, 2011). Further, student classroom misbehavior is associated negatively with sense of teaching efficacy (Klassen & Chiu, 2012). On the other hand, students' academic emphasis (i.e., students' engagement in classroom learning activities and motivation to learn) can function as a job resource boosting teachers' sense of efficacy and job satisfaction (Collie, Perry, & Shapka, 2012). Moreover, these processes are likely to be mutually reciprocal (Connell & Wellborn, 1991).

Personal demands and resources. Personal resources include self-efficacy, which broadly reflects one's general belief of being able to execute required (job) tasks. Important to

teachers' self-efficacy is a belief in one's ability to reach and teach students who have challenging behaviors or other known risk factors (Gibson & Dembo, 1984). High teacher efficacy is positively associated with effective classroom instruction, proactive and positive classroom management (Woolfolk, 2007), and better student academic performance (Skaalvik & Skaalvik, 2007, 2010; Tschannen-Moran & Woolfolk Hoy, 2001; Wolters & Dougherty, 2007). Self-efficacy can be intertwined with burnout and in fact, some call burnout a "crisis in efficacy" (Leiter, 1992, p. 110); further, the interrelatedness of burnout and efficacy is theorized to be a distinguishing feature of burnout, but not stress (Leiter, 1992).

Job stress and burnout as a hindrance to effective teaching practices. Even for teachers who are highly skilled and have a myriad of personal resources, decision making and teaching practices may be hindered by stress and burnout arising from high demands and low organizational resources. When teachers are stressed, lack coping skills and self-efficacy in the classroom, and are faced with difficult student behaviors, their interactions and relationships with their students are likely to suffer (Breeman et al., 2015). Further, stress impairs teachers' ability to implement innovative and effective classroom practices (Aarons, Fettes, Flores, & Sommerfield, 2009; Braun, Roeser, Mashburn, & Skinner, 2019; Larson, Cook, Fiat, & Lyon, 2018; Reinke et al., 2013) and provide high quality learning environments, resulting in more negative student social, emotional, behavioral and academic outcomes (Hoglund et al., 2015; McLean & Connor, 2015; Wentzel, 2010).

Considerations in Predominantly Black, Urban, and Low-SES Schools

A race-conscious lens is critical, yet lacking, in research examining teacher stress, burnout, and classroom practices. Critical race theory in education (Ladson-Billings & Tate, 1995) and integrative developmental theory focused on children and youth of color (García Coll

et al., 1996) emphasize that racial dynamics are complex, multifaceted, and endemic features of students' schooling experiences. Historical and present-day structural racism is evident in de facto segregation practices, whereby urban, low-income Black and Latinx students are zoned to low-quality schools (i.e., under-resourced, over-enrolled, taught by underqualified teachers) Bailey et al., 2017; Boozer, Krueger, & Walkon, 1992; Jackson, 2009; U.S. Department of Education, 2016). Schools where primarily Black and Latinx students are taught by primarily White teachers, as compared to schools where student and teacher demographics are more closely aligned, may be especially racially charged and stressful spaces for both teachers and students. For example, cross-racial trust may be particularly low in such schools (Stevenson, 2008), which may in turn lead to relational and behavioral problems in the classroom (Gregory & Ripski, 2008). Relatedly, one study reported lower levels of teacher trust in their students in schools with higher proportions of students of color (Goddard, Salloum, & Berebitsky, 2009), suggesting teachers' implicit racial biases may be primed in schools with higher proportions of students of color.

On the other hand, White teachers in schools with predominantly White students may also demonstrate lower racial stress tolerance due to less frequent intergroup exposure (DiAngelo, 2011), which could relate to racially stressful encounters involving and affecting Black and Latinx students (Anderson & Stevenson, 2019; Stevenson & Stevenson, 2014). Although considerable research has examined the effect of individual students' racial/ethnic match with their teachers on student outcomes (e.g., Bradshaw, Mitchell, O'Brennan, & Leaf, 2010; Downer, Goble, Myers, & Pianta, 2016), little attention has been given to teachers' racial/ethnic match with students in their classroom on teacher outcomes, such as stress and burnout. Such research is important given the potential for stress and burnout to generally hinder

effective teaching practices. Although research on teacher stress and bias in the classroom is limited, research outside of the classroom suggests the potential for stress and enactment of bias to be related (Kang, Gray, & Dovidio, 2013); researchers theorize that teacher stress may interact with biases to contribute to differential classroom practices with students of color or other minoritized student groups (McIntosh, Girvan, Horner, & Smolkowski, 2014). Beyond just reducing bias, culturally responsive and sustaining practices are necessary to ensure that teaching practices are optimal for students of color (Ladson-Billings, 1995). Salient features of culturally responsive practices typically include a balance of warmth and caring with rigorous academic expectations (Ware, 2006). Called "warm demanders" (Vasquez, 1988), effective teachers of students of color exhibit warmth through sensitivity and responsiveness to student academic, social, and emotional needs. Research has shown that increased teacher sensitivity mediated the effect of an evidence-based teacher coaching intervention that reduced racial gaps in discipline practices (Gregory et al., 2016). At the same time, warm demanders also hold high academic expectations for their students by engaging students in rigorous, higher-order thinking and extended discussion to develop deeper content understanding. Research suggests these are features of good teaching practice generally (Allen, Gregory, Mikami, Lun, Hamre, & Pianta, 2013), but are particularly important in supporting Black and Latinx students' positive developmental experiences of the classroom and school climate (Bottiani et al., 2016; Sandilos, Rimm-Kauffman, & Cohen, 2017), and fostering student engagement and achievement (Skinner & Pitzer, 2012).

The Current Study

The Job Demands and Resources model has been well-established empirically (Dicke et al., 2014, 2018); however, prior research has relied on self-report to measure most or all aspects

of the model. Although teacher perceptions are recognized as a crucial component of stress appraisal processes (Kyriacou, 2001; Lazarus & Folkman, 1984), extending this research to also examine objectively-assessed factors in the classroom ecology may help to refine and identify new intervention targets. Further, the Job Demands and Resources research has typically examined burnout (e.g., Demerouti et al., 2001) and emotional exhaustion (Dicke et al., 2018), rather than stress per se. Examining both simultaneously will inform our understanding of whether relations with other constructs emerge in distinct ways for each. Finally, little research has examined the Job Demands and Resources model in urban and low-income schools while taking into account urban-specific factors, including racial context, while also examining teacher practice outcomes.

The current study extends educational research on teacher stress by applying the Job Demands and Resources model and utilizing observed (rather than teacher-reported) classroom demands. Further, we examined how teacher-reported stress and burnout relate to their observed use of effective teaching practices, while accounting for the demands and resources known and theorized to contribute to teacher stress and burnout (Dicke et al., 2018).

Towards this end, we examined three specific research aims using a sequential model-building approach. Research Aim 1 examined whether job *demands* (i.e., observed student disruptive behaviors, observed class size, and the proportion of students with low-income status within the school) were positively associated with teacher-reported stress and burnout, while also examining the *racial context of the classroom* and relevant covariates as control variables. We first examined associations of job demands with teacher-reported stress and burnout on their own, then reassessed them in increasingly complex models focused on our subsequent aims. We hypothesized that student disruptive behaviors (Martin et al., 2012), class size, and low-income

school enrollment (Montgomery & Rupp, 2005) would relate positively to teachers' perceptions of stress and burnout. We also hypothesized that White teachers in classrooms with higher proportions of students of color would report higher levels of stress and burnout.

Research Aim 2 examined the addition of a comprehensive set of teacher-reported and observed *resources* (i.e., teacher self-reported behavior management efficacy, perceptions of students' emphasis on academics, affiliation with fellow teachers, collegiality of school leadership, and the observed number of adults in their classroom) to determine whether the resources were inversely associated with stress and burnout. We also assessed the change in job demands' associations with stress and burnout to determine whether the inclusion of resources in the model attenuated associations between demands and teacher-reported stress and burnout. For our second research aim, we hypothesized that each of these resources would be inversely associated with stress and burnout and that inclusion of resources in the model would attenuate the associations between demands and stress and burnout (Dicke et al., 2018).

Finally, research Aim 3 examined whether teacher-reported stress and burnout were associated with use of teaching practices, accounting for the association of demands and resources with stress and burnout. Teaching practices were measured as observed teacher sensitivity (i.e., warm and caring classroom practices) and instructional dialogue (i.e., demanding and academically rigorous classroom practices). We conceptualized these factors in tandem to constitute warm-demanding, effective teaching practices with students of color. We hypothesized that elevated levels of stress and burnout would be significantly and negatively associated with both observed effective teaching practices (e.g., see Aarons et al., 2009; Larson et al., 2018). Together, the findings of these three research aims were intended to inform a broader understanding of institutional, classroom, and personal factors related to teacher stress and

burnout in urban schools, and in turn, the potential negative association between teacher stress and burnout in relation to teachers' use of effective classroom practices.

Method

Participants

Participants included 255 middle (6^{th} to 8^{th}) grade teachers (Black 47%; White 42%; other race/ethnicity 11%) in 33 schools across two urban or urban fringe districts in a mid-Atlantic state. Schools were comprised of a predominantly Black student enrollment (72.6%) and of students from a low-income family, as indicated by archival data on the percent of students within the school who were eligible for free- and reduced-priced meals (FARMs = 63.7%). Approximately 50% of the teachers reported having taught in their school for 4 or more years. Trained assessors conducted classroom observations, which included a count of the total number of students in the classroom and the number of students they perceived to be White and not a racial or ethnic minority. Specifically, they documented that the observed classrooms had a mean of 22.5 students (SD = 4.9) and that on average, classrooms were comprised of 12% White students (SD = 19.9%), with a range from 0% to 94%. The proportion of observed students of color in the classroom, at the 50^{th} percentile, was 96%. See Table 1 for additional school, teacher, and classroom demographics.

Procedure

Schools were recruited to participate in a project called Double Check (Authors et al., 2018), which focused on professional development and support related to equity, culturally-responsive behavior management, and student engagement. Participation by schools and staff was voluntary. The participating school districts held principal meetings to identify interest and interested principals signed commitment letters outlining the study procedures. All classroom

teachers of Language Arts, Math, Science, and Social Studies were approached for active consent to participate in the study. Participation included 1) completion of self-report measures of teaching self-efficacy and organizational resources; 2) allowing a research team-trained observer to conduct classroom observations in their classroom on three occasions; and 3) participation in individualized coaching, should their school be assigned to the intervention status. Only data from the fall baseline data collection were analyzed in the current study in order to avoid potential influence of intervention effects. Participating teachers were provided a $15 gift card for completion of the online survey. The dates for the observational data collection were scheduled by the research team with school principals and observers then selected times within those scheduled days to visit specific classrooms. Observers were instructed to conduct the three observations for each teacher across at least two days (i.e., they could not all be completed in one day), of which at least one was conducted in the morning and one in the afternoon observation for each teacher. Observations were not conducted during testing (see additional details below on the specific observational measures and their administration). The researchers' Institutional Review Boards approved this project.

Measures

Job demands. Student disruptive behaviors, class size, and school-level percent of students receiving free- and reduced-price meals were included as job demands. Disruptive behaviors and class size were all assessed by independently trained observers using the Assessing School Settings: Interactions of Students and Teachers (ASSIST; Rusby et al., 2011) classroom observational measure. The ASSIST is an observational measure comprised of event-based tallies (i.e., counts of specific behaviors) and global ratings (i.e., scales and indices) as indicators of social processes occurring in classrooms (see Rusby, Crowley, Sprague, & Biglan,

2011). Observers spent approximately 3 minutes in the classroom acclimating and entering basic classroom information (i.e., a count of the number of adults and students in the classroom; a count of how many students were perceived to be White); these variables along with class size were modeled as indicators of classroom contextual demands (others appear in subsequent sections). The observer then began a 15-minute live tallying of teacher and student behaviors during classroom instruction. The current study focused on the *student disruptive behaviors* tally, which was operationalized as instances in which students initiated or extended a behavior that interfered with the classroom activity by taking one or more students or the teacher off task. Observers were extensively trained to reliably detect student disruptive behavior incidents consistent with the manualized definition through extended video and in-person coding practice and feedback cycles. Average inter-observer agreement across student and teacher tallies for initial in-school reliability assessment on the ASSIST was 87.1% and was 85.1% for field-based recalibration tests mid-way through data collection. Given that observations were conducted on three occasions per teacher, the three student disruptive behavior tallies were averaged across the three cycles for each teacher. Although not included in this model, ASSIST global ratings also demonstrated high inter-rater reliability, with intraclass correlations (ICC) ranging from .72 to .81 across three observations. Other information relevant to validity and reliability of the ASSIST has been previously published: see Authors et al. (2018) for additional details regarding the training process for ASSIST observations and Authors (2015); and Authors, (2015) and Authors (2018) for additional information on the psychometric properties of the measure. *Class size* was the observers' count of students in the classroom averaged across the three observations. In addition, the school-level percent of students receiving *free and reduced-priced meals* were collected from state-reported, publicly available data.

Job resources. Teacher classroom management self-efficacy, teacher-perceived academic emphasis, two other school organizational health indicators (i.e., collegial leadership, teacher affiliation), and the number of adults observed in the classroom were modeled as job resources. Specifically, *teacher classroom management self-efficacy* was measured using the efficacy scale developed by Hoy and Woolfolk (1993); this measure focused on teachers' self-reported ability to handle student behavioral problems in their classroom (5 item $\alpha = .84$, e.g., "I can manage almost any student behavior problem"). Item scores were averaged to make a scale where higher scale scores were desirable, indicating teachers with a higher level of self-efficacy and thus a greater resource. Teachers also completed three scales from the Organizational Health Inventory (OHI; Hoy, Tartar, & Kottkam, 1991), including *academic emphasis* which assessed the teachers' perception that academic performance and achievement is valued among students within the school (5 item $\alpha = .67$, e.g., "Students respect others who get good grades" and "Students neglect to do homework" which was reverse coded); *collegial leadership* reflected teachers' positive views of their school principal's leadership approach (6 item $\alpha = .88$, e.g., "The principal conducts meaningful evaluations" and "The principal treats all faculty as his or her equal"); and *teacher affiliation* which assessed the relationships between staff members within the building with one another (6 item $\alpha = .84$, e.g., "There is a feeling of trust and confidence among the staff" and "Teachers identify with the school"). We also included the ASSIST observers' count of the *number of adults* in the classroom when conducting the classroom observation; this variable, averaged across the three observation cycles, was modeled as an indicator of a classroom-based job resource.

Racial context and control variables. The *proportion of students of color in the classroom* was assessed during the administration of the ASSIST; it was operationalized as the

number of observer-perceived White students in the classroom (i.e., average of three observation cycles) divided by the number of observer-counted total students in the classroom (i.e., average of three observation cycles), which was then subtracted from one to arrive at its inverse. That is, one minus the proportion of White students in the classroom was considered to equal the proportion of students of color in the classroom. Notably, this method of operationalizing observed race draws on independent observers' perceptions of students' visible, phenotypic racial/ethnic traits within the classroom; the measure does not purport to assess actual student race/ethnicity. Consistent with critical race theory (Solórzano, 1997), this approach conceptualizes race as a social construct indicative of one's potential for exposure to biased and racist treatment endemic in the U.S. based upon certain directly visible traits (e.g., skin tone); this method is also consistent with contemporary research examining perceptions of race based on phenotypic skin color ascribed to individuals by others as it relates to wellbeing outcomes (Perreira, Wassink, & Harris, 2018). In contrast, teacher race was collected through teachers' report of their own race/ethnicity on the teacher survey in one of seven categories (Black/African American, White/Caucasian, Hispanic/Latinx, Asian, Hawaiian/Pacific Islander, Alaska Native/American Indian, and Multi/Other). Since the majority of teachers reported themselves to be White (see Table 1), we dummy coded the teacher race variable, such that teachers who self-reported being White as 1, and those of color being the reference group (=0). To create the interaction term for *White teacher race* and *proportion of students of color in the classroom*, we multiplied the classroom proportion of students of color by teacher-reported White race. In addition, teachers self-reported their *gender*, which served as a control variable. Since the majority of teachers were female, this variable was dummy coded as *1* for female and *0* for male.

Teacher-reported stress and burnout. Teachers completed a brief assessment of work-related *stress* using five items from the Exposure to Job Stress measure (Hurrell & McLaney, 1988; 5-item α = .79; e.g., "In my job, I feel I am under great stress", "I regularly experience physical symptoms associated with stress", and "I am unable to cope with the stress of my job on a daily basis"). They also completed the emotional exhaustion scale of the Maslach and Jackson (1981) *burnout* measure, which comprised four items (e.g., "I feel emotionally drained from my work" and "I feel like I am at the end of my rope"; 4-item α = .87).

Warm-demanding teaching practices. Two teaching practices, *teacher* s*ensitivity* and *instructional dialogue*, were measured using the Classroom Assessment Scoring System – Secondary version (CLASS; Pianta et al., 2008). The CLASS-Secondary is a well-validated observational measure of classroom quality including overarching domains related to emotional climate, classroom organization, and instructional support. *Teacher sensitivity* is a dimension within the broader domain of positive emotional climate in the CLASS measure and reflects the teachers' responsiveness to academic, social, emotional, behavioral, and developmental needs of individual students and the class as a whole. *Instructional dialogue* is a dimension within the broader domain of instructional support on the CLASS; this indicates teachers' engagement of students in high-order thinking and extended discussion that is cumulative and chains ideas together in a way that leads to a deeper understanding of content. Each CLASS observation cycle takes approximately 30 minutes to administer (i.e., 15-minute timed observation during which the observer engages in notetaking and 10-15 minutes for scoring 11 dimensions). All CLASS observers were trained and had to meet reliability standards for certification, following the procedures outlined by the developers of the CLASS (Pianta, LaParo, & Hamre, 2008). Given that the CLASS was conducted on three separate occasions for each teacher, we computed

averages for each dimension across these three visits per teacher. As noted above, ASSIST and CLASS observers were cross trained in both measures. The data collection protocol specified that the observer first administered the ASSIST, then the CLASS for a subsequent cycle; as such, observers administered the measures sequentially (not simultaneously).

Overview of Analyses

*Checking analytic assumptions***.** Correlations of the independent variables are shown in Table 2. To detect the potential for multicollinearity among the independent variables, we performed diagnostic checks based on assessment of variance inflation factors (VIF) across all independent variables. The resulting VIF statistics averaged below 1.5, well below suggested cut-offs at 5 or 10 (James, Witten, Hastie, & Tibshirani, 2013), suggesting multicollinearity in this analysis was not a concern. We also conducted checks for outliers and multivariate normality. We identified three multivariate outliers using Mahalanobis distances. In order to discern whether these outliers influenced our results, we ran sensitivity analyses to observe whether modification or exclusion of these cases in our data/sample altered fit or produced different results (in terms of patterns of significance and of magnitudes of parameter estimates). Briefly, these models exhibited nearly identical fit and results as our main analytic models (see supplemental materials for more information), and so we are confident that these outliers did not influence our results and conclusions. Finally, Mardia's test (conducted using the mvn() function of the MVN package; Korkmaz, Goksuluk & Zararsiz, 2014) suggested our outcome variables exhibited multivariate normality (skewness = 19.82, p = .47; kurtosis = -0.37, p = .71).

Sequential model building. Our research aims addressed a series of three path models each building on the last, conducted in *R* version 3.5.3 (R Core Team, 2019) using the lavaan package, version 0.6-3 (Rosseel, 2012). See Figure 1 for a depiction of sequential modeling

approach, in which additional predictors and covariates were added to the model at each step, in alignment with our three research aims. To address our first aim, our Step 1 (Demands) model examined the direct relations from job demands to stress and burnout, while considering racial context and control variables (i.e., White teacher race, classroom proportion of students of color, the interaction of White race and proportion of students of color, and female teacher gender). The demands included: (a) student disruptive behavior tallies, (b) class size, and (c) percent of students receiving free and reduced-priced meals in the schools, all of which were examined for relations to stress and burnout. In our Step 2 model (Demands and Resources), we addressed our second research aim by examining job resources (i.e., teacher self-efficacy, academic emphasis, teacher affiliation, collegial leadership, and number of adults in the classroom) as they relate to stress and burnout in tandem with demands. Specifically, we assessed changes in the association of demands with stress and burnout when adding resources in Step 2. In our Step 3 model (demands, resources, and practices) we addressed our third research aim by testing whether stress and burnout were in turn related to teacher practices (i.e., teacher sensitivity and instructional dialogue), while still accounting for relations from the demands, resources, and racial context to stress and burnout as included in the first two models. One benefit of our step-by-step modeling approach was that it allowed us to identify which of our predictor variables were not strongly related to stress and burnout (i.e., in our first and second models). Including all predictor variables in our third, most complex model resulted in a model that was not identified. As a result, we identified predictor variables that were least related to stress and burnout prior to running our third model to obtain an identified model. This was necessary in order to avoid over-parameterization of our model. We based these decisions on the magnitude of the coefficient and *p*-values, such that coefficient sizes were less than 0.08 and *p*-values were .50 or more.

To perform our path models, we used the maximum likelihood estimator and full information maximum likelihood to account for missing data; the missing = "fiml.x" option in lavaan allowed us to retain all cases, even those missing on independent variables. We accounted for the clustering of classrooms/teachers within schools using Huber-White robust standard errors. We generated standardized coefficients as an effect size to allow readers to assess the strength of the associations identified and their practical meaning (Nieminen, Lehtiniemi, Vähäkangas, Huusko, & Rautio, 2013).

Results

Univariate descriptive statistics (Table 1) illustrate that White students constituted a numeric minority in the classrooms observed, with only 12% comprising more than half of White students. In contrast, 42% of classrooms were taught by a White lead teacher. Overall, bivariate correlations among analytic variables (Table 2) were as expected: with positive and significant correlations between teacher practices (i.e., teacher sensitivity and instructional dialogue; $r = .51$, $p < .001$), positive and significant correlations between stress and burnout ($r = .81$, $p < .001$), and student disruptive behaviors negatively relating to teacher sensitivity ($r = -.43$, $p < .001$) and instructional dialogue ($r = -.30$, $p < .001$), and positively relating to stress ($r = .15$, $p < .05$) and positively, though only marginally, relating to burnout ($r = .13$, $p = .06$). The teacher-reported constructs were generally correlated with each other in the expected direction(s).

Associations from Demands to Stress and Burnout (Step 1 Model)

Table 3 presents the estimates from the step-by-step models in which demands and resources predict teacher stress, burnout, and teaching practices. In the first step (Step 1: Demands Model), demands, racial context, and teacher gender variables were included in order

to understand their relations with stress and burnout without consideration of available resources. This model was fully saturated (i.e., had perfect fit) and explained 12% and 11% of variance in stress and burnout, respectively. Tallies of student disruptive behaviors were positively related to both stress ($\beta = 0.19$, $p < .01$) and burnout ($\beta = 0.17$, $p < .001$), as hypothesized. On the other hand, the proportion of school student enrollment eligible for FARMs was positively, but not significantly, related to stress ($\beta = 0.14$, $p = .07$) and was significantly related to burnout ($\beta = 0.18$, $p < .01$). Contrary to our hypotheses, the interaction of White teachers in classrooms with higher proportions of students of color was not significantly related to either stress or burnout, nor was class size. However, White teachers reported higher stress ($\beta = 0.37$, $p < .01$) and burnout ($\beta = 0.41$, $p < .001$) than teachers of color, and female teachers reported higher stress ($\beta = 0.54$, $p < .001$) and burnout ($\beta = 0.49$, $p < .001$) than male teachers.

Associations from Demands and Resources to Stress and Burnout (Step 2 Model)

Including resources in the second step (Step 2: Demands and Resources Model) more than doubled the amount of variance explained in stress and burnout: to 24% and 22%, respectively. As with the previous model, Step 2 was fully saturated and therefore had perfect fit. As hypothesized, teacher self-efficacy was negatively related to stress ($\beta = -0.24$, $p < .001$) and burnout ($\beta = -0.21$ $p < .001$). However, there was otherwise a differential pattern for stress and burnout in their associations with resources. Specifically, academic emphasis of students and teacher affiliation were both significantly inversely associated with burnout ($\beta = -0.13$, $p < .05$, $\beta = -0.19$ $p < .01$), but not stress. No other resources besides self-efficacy were significantly associated with stress in the Step 2 Model.

The addition of resource variables to the model reduced the magnitude and significance of associations between demands and teacher stress and burnout. In particular, the association of

student disruptive behaviors with both stress and burnout dropped by -0.10 (a tenth of a standard deviation) with the addition of resources to the model and became non-significant (whereas they previously were significant). This represented a reduction in the effect of 52.6% (from 0.19 to 0.09) for stress and 58.8% (from 0.17 to 0.07) for burnout. The association of percent FARMs (i.e., a proxy for the percent of students at the school who had low income) was also attenuated, though less so, such that for stress the standardized coefficient decreased by -.03 and for burnout it decreased by -.05, and for the latter the significance of the association became marginal (whereas previously the p-value was <.01). As in the previous model, higher proportions of students of color were not significantly related to either stress or burnout, nor was class size. White teacher race was only marginally associated with stress ($\beta = 0.21$, $p = .09$) but was still significantly associated with burnout ($\beta = 0.24$, $p < .02$). Stress ($\beta = 0.51$, $p < .001$) and burnout ($\beta = 0.46$, $p < .001$) were still significantly higher for female than for male teachers.

Demands, Resources, and Stress and Burnout with Warm-Demanding Teaching Practices (Step 3: Demands, Resources, and Practices Model)

As noted in the Method section, given consideration to sample size constraints at the teacher/classroom-level, we approached our analyses using a sensitive, model-building approach to maximize parsimony and avoid overparameterizing our models, while addressing our three research questions in sequential order. In this process, we calibrated Model 3 to exclude independent variables that exhibited weak associations with stress and burnout as observed in Step 2. Specifically, we applied a priori thresholds for coefficients of less than .08 and *p*-values greater than .50 to identify weak associations. As a result, we retained predictors that had standardized associations of at least .10 with either stress or burnout (or both) in Step 2 and relatively smaller *p*-values (i.e., less than $p = .27$). The four independent variables which were

dropped were proportion of students of color in the classroom, the interaction of the latter with White teacher race, class size, and collegial leadership. Dropping these predictors not meeting a priori thresholds allowed us to include teacher practices and retain an identified model (i.e., a model with fewer parameters than clusters).

Model 3 was not saturated. As such, we were able to examine the fit of the Step 3 model using root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and standardized root mean square residual (SRMR). Acceptable models are defined as those with values less than 0.08 for both RMSEA and SRMR, and greater than 0.90 for CFI and TLI (Bentler, 1990; Browne & Cudeck, 1993; Hu & Bentler, 1999). Our original Step 3 model had inadequate fit: RMSEA = .11, SRMR = .07, CFI = .87, and TLI = .69. Thus, we explored the modification indices as reported by the MODINDICES command in the R package lavaan. The three highest modification indices were associated with the addition of parameters relating tallies of student disruptive behaviors to teacher practices. Given the co-occurring measurement of student disruptive behaviors and teacher practices, and therefore the potential for direct relations between them, there was a conceptual rationale – in addition to the empirical rationale (i.e., improved model fit) – for including these parameters. The inclusion of regression paths from student disruptive behaviors to each teacher practice resulted in 32 freely estimated parameters for this model (the maximum allowed given sample size of 33 clusters) and improved fit to more-than-adequate: RMSEA = .03, SRMR = .02, CFI = 0.99, and TLI = 0.98. This indicates that our data are reasonably consistent with our path model. Thus, we retained these parameters in our Step 3 analytic model.

Note that the *r*-squared statistics in Step 3 model for teacher-reported stress and burnout are the same as those in the Step 2 Model (22 to 24%). The *r*-squared statistics for teacher

practices were 22% for teacher sensitivity and 11% for instructional dialogue. In the Step 3 model, stress was negatively related to both teaching practices, but only significantly related to instructional dialogue (β = -0.17, $p < .05$). Unexpectedly, burnout was *positively* related to both teaching practices, but only significantly related to teacher sensitivity (β = 0.29, $p < .05$). Student disruptive behaviors was negatively and significantly related to both teacher sensitivity (β = -.44, $p < .001$) and instructional dialogue (β = -.28, $p < .001$; see Table 3). Some shifts are noteworthy in the associations of demands and resources with stress and burnout in this model. Specifically, teacher affiliation was not significantly associated with stress in Step 2, but in the Step 3 model, teacher affiliation was significantly inversely associated with stress (β = -.14, $p < .05$). And, for both stress and burnout, FARMs was significantly associated in Step 3 (stress β = .10, $p < .05$, burnout β = .12, $p < .05$), whereas FARMs was only marginally or not significantly associated at all in Step 2. Notably, these changes in significance levels were largely the result of reduced standard errors (i.e., improved precision of estimates), as opposed to changes in the magnitudes of the coefficients (i.e., changes in the strength of relations among variables). Otherwise, no substantive changes in significance or direction of associations were altered in Step 3 by comparison to Step 2 models.

Sensitivity Analyses

In assessing our model's sensitivity to the presence of the three outliers, we capped two data points down to the next highest value and dropped one case prior to re-running our analyses to assess changes to model fit and parameter significance and magnitude. One outlier was primarily a univariate outlier – a teacher with a Student Disruptives Tally of 122, nearly 2 standard deviations above the next-highest Student Disruptives Tally of 87. Thus, we replaced the Student Disruptives Tally for this observation with 87. The second outlier was a univariate

outlier – a teacher with number of adults in the classroom of 7.67 (average across three observation cycles), nearly 12 standard deviations above the next-highest count of adults in the classroom of 3.33. Thus, we replaced the count of adults in the classroom for this observation with 3.33. The third outlier had maximum scores on some measures (e.g., Teacher Sensitivity) and minimum scores on others (e.g., Teacher Affiliation and Collegial Leadership), but was not a univariate outlier according to any of these variables. In other words, this teacher's scores did not lie outside the range of any particular variable in the remaining sample. Thus, we dropped this third outlier prior to running our sensitivity analyses.

For brevity, we discuss here only adjustments to our results as pertaining to Model 3. Model fit was not affected meaningfully by these adjustments to our data set: as in Model 3 analytic model with the full sample, the Chi-Squared statistic was not significant: $\chi^2(14) = 14.72$ ($p = .40$). Other fit statistics were also largely unaffected by this adjustment to the dataset: RMSEA = 0.02; SRMR = 0.02; CFI = 1.00; TLI = 0.99 Parameter estimates were, on the whole, very similar to the model we present in the results: only two of the 28 parameters of substantive interest (not including intercepts for dependent variables) changed in significance. Specifically, the parameter associated with stress regressed on student disruptive behaviors shifted: from positive but not significant ($\beta = 0.09$ ($p = .11$) to positive and marginally significant $\beta = 0.11$ ($p = .07$) after our handling of outliers. Similarly, the parameter associated with teacher sensitivity regressed on burnout changed from significant to marginally significant (i.e., from $\beta = 0.29$, $p = .048$ to $\beta = 0.28$, $p = .052$) after our handling of outliers. Together these additional sensitivity analyses regarding the potential influence of the few outliers suggested that the overall pattern of findings was generally consistent, but that two of the effects shifted in significance.

Discussion

The overarching goal of this study was to apply the Job Demands and Resources theoretical model to examine the association between teacher stress and burnout in relation to their use of warm-demanding teaching practices. We focused on these specific teaching practices because prior research indicates that warm-demanding teaching is effective in supporting learning and positive development among students of color. Novel relative to prior studies examining a model of job demands and resources on occupational burnout (Bakker & Demerouti, 2007), we analyzed data from multiple informants, including teachers via surveys and trained, independent observers, using two different validated classroom observational tools. Further, we included both stress and burnout and important immediate outcomes corresponding to warm-demanding teacher classroom practices. In addition, the step-by-step model-building approach produced convergent findings by incrementally considering how job demands (Step 1), then resources (Step 2), relate to stress and burnout, then examining how stress and burnout relate to teacher practices (Step 3).

Our findings broadly supported the theorized model of job demands and resources. Specifically, we found that certain job demands, such as student disruptive behavior and serving in schools with more low-income students, were associated with stress and burnout. We also found that, as hypothesized, the significance of these demands was mitigated by the inclusion of resources in the model; for example, student disruptive behavior was no longer significantly associated with stress and burnout when resources were included in the model, suggesting that student disruptive behavior as a demand relating to stress and burnout are not significant when considered in the context of personal, classroom, and institutional resources. This analysis also demonstrated how resource variables in particular differentially related to stress and burnout. In fact, only teacher self-efficacy and to some extent teacher affiliation (in Step 3 model only) were

associated with lower levels of stress, whereas teacher self-efficacy, teacher affiliation, and student academic emphasis were associated inversely with burnout in both Step 2 and Step 3 models. Nonetheless, there were also some unexpected findings; namely, we expected to see more of the associations between resources and stress to be significant, in particular. Surprisingly, collegial leadership was not associated with either stress or burnout. The way in which stress and burnout related to classroom practices also varied. Whereas we had hypothesized that teachers who were emotionally exhausted would be less able to sensitively respond to students' needs, burnout was associated with *more* teacher sensitivity. Although this effect fell to marginal significance (p =.052) when the outlier adjustment was taken into consideration, the trend of higher burnout linked to more teacher sensitivity remained. Further, stress, but not burnout, was inversely associated with instructional dialogue. These and other results are discussed in detail below.

Demands Relating to Stress and Burnout (Step 1: Demands Model)

Consistent with our hypotheses, we found support in the Step 1 model for positive association between student disruptive behavior and teacher stress and burnout. This is consistent with research highlighting teachers' report of student disruptive behavior (Shernoff et al., 2011), yet extends evidence by documenting this association even with an independently-observed assessment of student disruptive behavior. We also found evidence to support the notion that teachers in schools with primarily low-income student enrollments are more stressed (Herman et al., 2018). Additional research is needed to understand why low-income student enrollment is associated with elevated teacher burnout and stress. This is possibly a result of low socioeconomic status being a risk factor for poor academic achievement (e.g., Sirin, 2005). Further, concentrated poverty within schools is associated with schools having fewer resources

to support a positive learning environment and students with more adverse childhood experiences.

Female teachers, in general, reported significantly higher levels of stress and burnout relative to males. The finding that female teachers reported higher stress is consistent with other literature finding that women are more stressed and emotionally exhausted in their work environments (e.g., O'Brennan, Pas, & Bradshaw, 2017), which may be due to the greater number of social roles they play, which in turn increase demands and sensitivity to stress (Bradshaw et al., 2012; Nazroo, Edwards, & Brown, 1998). Gender differences also have been shown to vary based across burnout domains, where females are more likely to report emotional exhaustion, but men are more likely to report depersonalization (Purvanova & Muros, 2010).

Further inspection of the significant negative correlation of White teacher race with percent of student enrollment eligible for FARMs indicates that White teachers in this sample more frequently taught in the schools comprised of students with relatively higher socioeconomic status. Despite this, White teachers self-reported higher levels of burnout and stress than their colleagues of color. The literature examining the association of race/ethnicity of teachers with their self-report of stress and/or burnout is relatively sparse. Literature in higher education suggests that there may be higher levels of emotional exhaustion in educators of color (especially Black and Latinx faculty) compared to White educators, however this finding was not significant (Lackritz, 2004). Another study focused on K-12 educators similarly found no significant race/ethnic difference in teacher report of burnout (Pas, Bradshaw, & Hershfeldt, 2012). More research is needed to understand the phenomenon of White teachers reporting higher levels of stress and burnout despite teaching in schools with lower levels of demands (e.g., White teacher status was correlated with lower proportions of low-income student

enrollments). Although being a White teacher was also correlated with teaching in classrooms with higher percentages of White students, the overall sample was predominantly comprised of classrooms with a majority of students of color (only 8% of classrooms were majority White students). Thus, it is possible that the higher report of stress and burnout reported among White teachers relates to navigating the racial dynamics within classrooms where there is greater student diversity (in this sample of schools with predominantly Black student enrollments, higher percentage of White students translates to greater racial heterogeneity). It is also possible the higher report of stress and burnout has to do with navigating racial dynamics in classrooms where their own race/ethnicity is not reflective of the majority of the students they are teaching.

We attempted to test the latter point in the present paper by examining the interaction of White teacher race and classroom racial composition and did not find a significant effect; however, this may have to do with limitations of our sample. Although our teacher sample was relatively diverse, the racial and ethnic match of the teachers with their students varied little. Specifically, in 58% of classrooms, teachers of color were matched to a classroom of primarily students of color. By comparison, 7% of classrooms had White teachers teaching White students, and 34% of classrooms had White teachers teaching classrooms with a majority of students of color, consistent with a national trend in which schools mainly composed of students of color have a high percentage of White teachers (U.S. Department of Education, 2016). In contrast, only one classroom of primarily White students was taught by a teacher of color. Thus, it is possible that the interaction of teacher race and classroom racial composition variables was null due to limited variability in the alignment of teacher racial/ethnic diversity and classroom racial composition. Further research is needed in a broader sample with a wider variety of teacher-student racial/ethnic alignment. It is also possible that race-related dynamics operate more on the

school-level, rather than the classroom-level analyzed here, which represents a research question for future studies with more power at the school/institutional-level to investigate.

Counter to our hypotheses, observed class size did not function as a significant demand related to stress and burnout in these models. It is possible that shared variance between class size and student disruptive behavior accounts for the null class size findings. The large, significant negative correlation between percent FARMs and class size also suggests the possibility that null findings arose from the more nuanced and interrelated nature of our demands variables. Smaller class sizes within lower-income schools could be further explored as a potential mediating factor to explain why teachers of color report lower levels of burnout and stress than White teachers; it is also possible that unmeasured district-level factors explain this pattern of findings but requires a much larger district sample than this study offered.

Demands and Resources Relating to Stress and Burnout (Step 2: Demands and Resources Model)

When adding resources to the demands model of stress and burnout, we found that demands were less salient, as hypothesized. In particular, whereas disruptive behaviors were significantly associated with nearly a fifth of a standard deviation effect size in Step 1, when including resources in the Step 2 model, student disruptive behaviors became non-significant for burnout and stress. Teacher-reported personal, classroom, and institutional resources such as self-efficacy, academic emphasis, and teacher affiliation all were at least marginally, and often significantly, associated in the expected negative direction with teacher-reported burnout and to a lesser extent, stress. This finding suggests that even in the presence of disruptive behaviors, efforts to improve teachers' personal, relational, and organizational resources may mitigate the impact of problem behaviors on experiences of stress and burnout. In other words, enhancing

resources could mitigate teacher stress and burnout, even in contexts where challenging student behavior is a job demand.

Consistent with past research, we found that teacher self-efficacy was negatively related to burnout (Leiter, 1992). In addition, this study provides evidence that efficacy was negatively related to stress as well. As noted in the Introduction, a distinction between burnout and stress is that stress comprises the perceived ability to cope (Kyriacou & Sutliffe, 1978). The definition and measurement of self-efficacy similarly assesses one's abilities; the assessment that one can reach and teach students with challenging behaviors (Gibson & Dembo, 1984). This overlap may explain the association of efficacy with both burnout and stress.

Teachers' perceptions of affiliation with colleagues was a hypothesized resource that was found to significantly associate inversely with stress and burnout with relative consistency across models. This finding suggests that peer support and relationships serve to protect against stress and burnout. However, these relationships may be important to examine longitudinally, which was not possible here. A prior study reported that higher teacher affiliation was associated with lower burnout at a single time point, but that over time, these differences in burnout did not persist (Pas, Bradshaw, & Hershfeldt, 2012). Surprisingly, teacher reported collegial leadership and the observed number of adults in the classroom were not significantly associated with stress or burnout. The non-significant finding for collegial leadership could be the result of correlations with other measured resources; the medium-size correlation between collegial leadership and teacher affiliation could indicate that peer relationships are just relatively more important than the perceptions of principal leadership. The increased number of adults may be the result of a co-teaching set up, whereby a greater proportion of students receiving special education has resulted in more adults present. Thus, while the ratio of adults-to-students has decreased, the students

may present with greater academic, social, and emotional needs. Future research should consider the student service receipt and overall performance as variables of interest.

Demands, Resources, and Stress and Burnout with Warm-Demanding Teaching Practices (Step 3: Demands, Resources, and Practices Model)

Teacher-reported stress and burnout were significantly associated with observed warm-demanding teaching practices, but with a distinct pattern of findings, such that stress was associated with *less* use of instructional dialogue and burnout was associated with *more* teacher sensitivity. Instructional dialogue is characterized by depth of exchanges and engagement of students' higher-order thinking through asking open-ended questions and building on students' exchanges. Given research indicating that stress can have neurobiological impacts on cognition (Lupien et al., 2007), it is interesting to see that stress uniquely related to a teaching practice requiring higher-order thinking and memory, while not associating with teacher sensitivity. In contrast, we found that burnout, using a measure focused on emotional exhaustion domain of burnout, uniquely related to teacher sensitivity, but not instructional dialogue. Teacher sensitivity reflected the extent to which the teacher is checking in with students, anticipating emotional, behavioral, and academic problems, adjusting pacing and providing individualized support, and extent to which students appear comfortable participating freely and seeking the teachers support and guidance. It may be that teachers who are responsive to students at a higher level become more emotionally exhausted, which is consistent with research indicating that implementation of desired teacher practices is associated with elevated emotional exhaustion (Berg, Bradshaw, Jo, & Ialongo, 2017). This interpretation suggests a directionality of the relationship inconsistent with our theoretical model, however given the cross-sectional nature of these data, we cannot confirm the direction of these relations. Future research should explore this finding

incorporating other domains of burnout, as it is possible that depersonalization (cynicism), another aspect of burnout reflecting psychological withdrawal from relationships (Hartney, 2008), may relate differently to teacher sensitivity. In addition, future studies examining these relations should attend to the role of racial context as it affects teacher practices, which was not done here. Some studies suggest that teacher authority to effectively utilize the warm-demander pedagogical approach with students of color is based on a foundation of trust (Gregory & Weinstein, 2008); however, this association is less clear when it comes to cross-racial relationships between students of color and White teachers (Ford & Sassi, 2014).

Limitations and Strengths

A significant limitation of this study is its cross-sectional design, which limits our inferences regarding the directional of associations found in this analysis, including our interpretation of some of the more surprising findings. Relatedly, due to the cross-sectional nature of the data, we were careful to not to conduct mediation analyses or make inferences regarding indirect effects in this study. Although we could have estimated indirect effects, we opted not to in light of some of the surprising findings and interpretations in the reverse direction of what was expected. Instead, we suggest future research with longitudinal data be employed to explore whether stress and burnout mediate the effects of job demands and resources on teachers' use of effective classroom practices.

Another limitation of the current study was sample size constraints on inclusion of comprehensive school-level contributing factors in a multilevel model. For example, students in middle schools are disciplined at higher rates than students in the same grade levels in K-8 configurations (Arcia, 2007), suggesting the potential importance of grade configuration (i.e., K-8 or middle school) as it relates to job demands (e.g., student disruptive behaviors), stress,

burnout, and teacher practices. Given constraints of our school-level sample size, as well as very low intra-class correlations of stress and burnout (i.e., 0.01), we opted for a more parsimonious single-level model. Similarly, we lacked a comparison to a broader and more generalizable sample with suburban and rural schools with higher percentages of students who were not black. For example, it may have been more informative to have had a subset of classrooms comprised of majority White students taught by a Black lead teacher in this analysis; however, we found there was only one such classroom in the entire sample. Nonetheless, this study makes a needed contribution to the literature, given the pervasive experience of stress and burnout in urban, low-resource settings (e.g., see Herman et al., 2018). Despite the broad set of variables included to measure demands, resources, and racial context, this was not an exhaustive set. There were additional measures that would have been beneficial to incorporate, including richer measurement of student race (e.g., self-report) for racial context, student need/performance (e.g., academic achievement, information on service needs) for demands, and additional resources (e.g., spending per student); unfortunately, these data were not available.

Conclusions and Implications

The findings of this study broadly point to the role of job demands and resources in stress and burnout, and the implications of stress and burnout for teachers' use of warm-demanding classroom practices, which are considered to be effective practices with students of color in urban, low-income schools (Sandilos et al., 2017). Another important contribution of this study is the finding that observed student disruptive behavior, and not only teachers' perceptions of student misbehavior, were related to teachers' levels of stress and burnout (in Step 1 model). However, this association diminished in both magnitude and statistical significance when

personal, classroom, and organizational resources were taken into account (as seen in Step 2 model results).

Taken together, the overall pattern of findings highlights the importance of not only reducing the actual level of student disruptive behaviors in the classroom, but also improving teachers' perceptions of resources available to them. Specifically, enhancing some aspects of school organizational health (i.e., teacher affiliation), classroom students' academic emphasis, and personal self-efficacy may mitigate the impact of disruptive behavior on stress and burnout. Notably, resources of particular relevance in this study pertained to teacher views of their own self-efficacy, affiliation with teacher colleagues, and academic emphasis of their students; yet, relatively few interventions have been shown to improve these aspects of the school's organizational health (for a notable example in the context of Positive Behavioral Interventions and Supports see Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008). More broadly speaking, a few randomized controlled trials of school-based programs (e.g., social-emotional learning, classroom management, Positive Behavioral Interventions and Supports) provide further causal evidence of such an effect of preventive interventions, on both students' disruptive behaviors and teachers perceptions (Bradshaw et al., 2008; Bradshaw, Waasdorp, & Leaf, 2012; Domitrovich et al., 2016; Ialongo et al., 2019). However, these findings suggest that preventive interventions that focus more specifically and directly on teacher stress (see Jennings et al., 2017) in conjunction with student misbehavior may be useful in both reducing demands leading to stress and burnout while enhancing teachers' perceived resources.

References

Anderson, R. E., & Stevenson, H. C. (2019). RECASTing racial stress and trauma: Theorizing the healing potential of racial socialization in families. *American Psychologist*, *74*(1), 63.

Antoniou, A. S., Polychroni, F., & Vlachakis, A. N. (2006). Gender and age differences in occupational stress and professional burnout between primary and high-school teachers in Greece. *Journal of Managerial Psychology*, *21*(7), 682-690.

Aarons, G. A., Fettes, D. L., Flores, L. E., & Sommerfeld, D. H. (2009). Evidence-based practice implementation and staff emotional exhaustion in children's services. *Behaviour Research and Therapy, 47*(11), 954–960.

Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., & Pianta, R. (2013). Observations of effective teacher–student interactions in secondary school classrooms: Predicting student achievement with the classroom assessment scoring system—secondary. *School Psychology Review*, *42*(1), 76.

Arcia, E. (2007). A comparison of elementary/K-8 and middle schools' suspension rates. *Urban Education*, *42*(5), 456-469.

Bailey, Z. D., Krieger, N., Agénor, M., Graves, J., Linos, N., & Bassett, M. T. (2017). Structural racism and health inequities in the USA: evidence and interventions. *The Lancet*, *389* (10077), 1453-1463.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology*, *22*(3), 309-328.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Quantitative Methods in Psychology, 107*, 238-246. doi: 10.1037/0033-2909.107.2.238

Berg, J., Bradshaw, C.P., Jo, B., & Ialongo, N. S. (2017). Using complier average causal effect estimation to determine the impacts of the Good Behavior Game preventive intervention on teacher implementers. *Administration and Policy in Mental Health and Mental Health Services Research*, *44,* 558-571. doi:10.1007/s10488-016-0738-1

Boozer, M. A., Krueger, A. B., & Wolkon, S. (1992). *Race and school quality since Brown vs. Board of Education* (No. w4109). National Bureau of Economic Research.

Bradshaw, C.P., Koth, C.W., Bevans, K.B., Ialongo, N., & Leaf, P.J. (2008). The impact of school-wide Positive Behavioral Interventions and Supports (PBIS) on the organizational health of elementary schools. *School Psychology Quarterly, 23*(4), 462-473. doi:10.1037/a0012883

Bradshaw, C.P., Rebok, G., Zablotsky, B., La Flair, L., Mendelson, T., & Eaton. W. (2012). Models of stress and adapting to risk. In W. Eaton (Ed.). *Public mental health* (pp. 269-302). New York: Oxford.

Bradshaw, C. P., Mitchell, M. M., O'Brennan, L. M., & Leaf, P. J. (2010). Multilevel exploration of factors contributing to the overrepresentation of black students in office disciplinary referrals. *Journal of Educational Psychology*, *102*(2), 508-520.

Bradshaw, C. P., Waasdorp, T. E. & Leaf, P. J. (2012). Effects of School-Wide Positive Behavioral Interventions and Supports on child behavior problems. *Pediatrics, 130*(5), e1136-e1145. doi:10.1542/peds.2012-0243

Bradshaw, C. P., Pas, E. T., Bottiani, J. H., Debnam, K. J., Reinke, W. M., Herman, K. C., & Rosenberg, M. S. (2018). Promoting cultural responsivity and student engagement through Double Check coaching of classroom teachers: An efficacy study. *School Psychology Review*, *47*(2), 118–134. https://doi.org/10.17105/SPR-2017-0119.V47-2

Braun, S. S., Roeser, R. W., Mashburn, A. J., & Skinner, E. (2019). Middle School Teachers' Mindfulness, Occupational Health and Well-Being, and the Quality of Teacher-Student Interactions. Mindfulness, 10(2), 245-255.

Breeman, L. D., Wubbels, T., Van Lier, P. A. C., Verhulst, F. C., van der Ende, J., Maras, A., ... & Tick, N. T. (2015). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral classroom adjustment in special education. *Journal of School Psychology*, *53*(1), 87-103.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). New Bury Park, CA: Sage.

Cacioppo, J. T., Berntson, G. G., Malarkey, W. B., Kiecolt-Glaser, J. K., Sheridan, J. F., Poehlmann, K. M., ... & Glaser, R. (1998). Autonomic, Neuroendocrine, and Immune Responses to Psychological Stress: The Reactivity Hypothesis. *Annals of the New York Academy of Sciences*, *840*, 664-673.

Choi, B. (2018). Job strain, long work hours, and suicidal ideation in U.S. workers: A longitudinal study. *International Archives of Occupational and Environmental Health, 91*(7), 865-875.

Collie, R. J., Shapka, J. D., & Perry, N. E. (2012). School climate and social–emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of Educational Psychology*, *104*, 1189.

Cox, T., Kuk, G., & Leiter, M. P. (1993). Burnout, health, work stress, and organizational healthiness. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Series in applied*

psychology: Social issues and questions. Professional burnout: Recent developments in theory and research (pp. 177-193). Philadelphia, PA, US: Taylor & Francis.

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education*, *61*(1-2), 35-47. doi:10.1177/0022487109348024

Demerouti E., Bakker A. B., Nachreiner F., & Schaufeli W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*, 499-512.

DiAngelo, R. (2011). White fragility. *The International Journal of Critical Pedagogy*, *3*(3).

Dicke, T., Parker, P. D., Marsh, H. W., Kunter, M., Schmeck, A., & Leutner, D. (2014). Self-efficacy in classroom management, classroom disturbances, and emotional exhaustion: A moderated mediation analysis of teacher candidates. *Journal of Educational Psychology*, *106*(2), 569- 583. doi:10.1037/a0035504.

Dicke, T., Stebner, F., Linninger, C., Kunter, M., & Leutner, D. (2018). A longitudinal study of teachers' occupational well-being: Applying the job demands-resources model. *Journal of Occupational Health Psychology*, *23*(2), 262-277.

Dorado, J. S., Martinez, M., McArthur, L. E., & Leibovitz, T. (2016). Healthy Environments and Response to Trauma in Schools (HEARTS): A whole-school, multi-level, prevention and intervention program for creating trauma-informed, safe and supportive schools. *School Mental Health*, *8*(1), 163-176.

Downer, J. T., Goble, P., Myers, S. S., & Pianta, R. C. (2016). Teacher-child racial/ethnic match within pre-kindergarten classrooms and children's early school adjustment. *Early Childhood Research Quarterly*, *37*, 26-38.

Ford, A. C., & Sassi, K. (2014). Authority in cross-racial teaching and learning (re) considering the transferability of warm demander approaches. *Urban Education*, *49*(1), 39-74.

Gallup (2014). State of American Schools. Retrieved from http://www.gallup.com/services/178709/state-america-schools-report.aspx

Gibson, S., & Dembo, M. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology, 76*, 569-582.

Goddard, R. D., Salloum, S. J., & Berebitsky, D. (2009). Trust as a mediator of the relationships between poverty, racial composition, and academic achievement: Evidence from Michigan's public elementary schools. *Educational Administration Quarterly*, *45*(2), 292-311.

Gregory, A., Hafen, C. A., Ruzek, E., Mikami, A. Y., Allen, J. P., & Pianta, R. C. (2016). Closing the racial discipline gap in classrooms by changing teacher practice. *School Psychology Review*, *45*(2), 171-191.

Gregory, A., & Ripski, M. B. (2008). Adolescent trust in teachers: Implications for behavior in the high school classroom. *School Psychology Review*, *37*(3), 337-353.

Gregory, A., & Weinstein, R. S. (2008). The discipline gap and African Americans: Defiance or cooperation in the high school classroom. *Journal of School Psychology*, *46*(4), 455-475.

Herman, K. C., Hickmon-Rosa, J. E., & Reinke, W. M. (2018). Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *Journal of Positive Behavior Interventions*, *20*, 90-100.

Hoglund, W. L., Klingle, K. E., & Hosan, N. E. (2015). Classroom risks and resources: Teacher burnout, classroom quality and children's adjustment in high needs elementary schools. *Journal of School Psychology*, *53*, 337-357.

Hoy W.K., Tarter C.J., Kottkamp R.B. (1991). *Open schools/healthy schools: Measuring organizational climate*. Beverly Hills, CA: Sage.

Hoy, W. K., & Woolfolk, A. E. (1993). Teachers' sense of efficacy and the organizational health of schools. *The Elementary School Journal*, *93*(4), 355-372.

Hurrell, J.J., & McLaney, M.A. (1988). Exposure to job stress: A new psychometric instrument. *Scandinavian Journal of Work Environment and Health, 14,* 27-28.

Ialongo, N.S., Domitrovich, C.E., Embry, D., Greenberg, M., Lawson, A., Becker, C., & Bradshaw, C.P. (2019). A randomized controlled trial of the combination of two school-based universal preventive Interventions. *Developmental Psychology.* 10.1037/dev0000715

Jackson, C. K. (2009). Student demographics, teacher sorting, and teacher quality: Evidence from the end of school desegregation. *Journal of Labor Economics*, *27*(2), 213-256.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). *An introduction to statistical learning* (Vol. 112, p. 18). New York: springer. https://www-bcf.usc.edu/~gareth/ISL/ISLR%20First%20Printing.pdf

Jennings, P. A., Brown, J. L., Frank, J. L., Doyle, S., Oh, Y., Davis, R., ... & Greenberg, M. T. (2017). Impacts of the CARE for Teachers program on teachers' social and emotional competence and classroom interactions. *Journal of Educational Psychology*, *109*(7), 1010.

Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology, 102*(3), 741-756. http://dx.doi.org/10.1037/a0019237

Korkmaz, S., Goksuluk, D., & Zararsiz, G. (2014). MVN: An R package for assessing multivariate normality. *The R Journal*, *6*(2), 151-162.

Kyriacou, C. (2001). Teacher stress: Directions for future research. *Educational Review*, *53*(1), 27-35.

Kyriacou, C., & Pratt, J. (1985). Teacher stress and psychoneurotic symptoms. *British Journal of Educational Psychology*, *55*, 61-64.

Lackritz, J. R. (2004). Exploring burnout among university faculty: incidence, performance, and demographic issues. *Teaching and teacher education*, *20*(7), 713-729.

Ladson-Billings, G. & Tate, W.F. (1995). Toward a critical race theory of education. *Teachers College Record*, 97, 47-68.

Lambert,R. G., McCarthy, C., O'Donnell, M., & Wang, C. (2009). Measuring elementary teacher stress and coping in the classroom: Validity evidence for the classroom appraisal of resources and demands. *Psychology in the Schools*, *46*, 973-988.

Larson, M., Cook, C. R., Fiat, A., & Lyon, A. R. (2018). Stressed teachers don't make good implementers: Examining the interplay between stress reduction and intervention fidelity. *School Mental Health*, *10*, 61-76.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer Publishing Company.

Leiter, M. P. (1992). Burn-out as a crisis in self-efficacy: Conceptual and practical implications. *Work & Stress, 6*, 107-115. doi: 10.1080/02678379208260345

Leiter, M. P. & Durup, J. (1994). The discriminant validity of burnout and depression: A confirmatory factor analytic study. *Anxiety, Stress, and Coping*, *7*(4), 357-373.

Lupien, S. J., Maheu, F., Tu, M., Fiocco, A., & Schramek, T. E. (2007). The effects of stress and stress hormones on human cognition: Implications for the field of brain and cognition. *Brain and Cognition*, *65*(3), 209-237.

Martin, N. K., Sass, D. A., & Schmitt, T. A. (2012). Teacher efficacy in student engagement, instructional management, student stressors, and burnout: A theoretical model using in-class variables to predict teachers' intent-to-leave. *Teaching and Teacher Education*, *28*(4), 546-559.

Maslach, C. (1982). Understanding burnout: Definitional issues in analyzing a complex phenomenon. *Job Stress and Burnout*, 29-40.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, *52*(1), 397-422.

Maslach, C., & Leiter, M. P. (2016). Chapter 43 - Burnout. In G. Fink (Ed.), *Stress: Concepts, Cognition, Emotion, and Behavior* (pp. 351-357). San Diego: Academic Press.

McIntosh, K., Girvan, E. J., Horner, R. H., & Smolkowski, K. (2014). Education Not Incarceration: A Conceptual Model for Reducing Racial and Ethnic Disproportionality in School Discipline. *Journal of Applied Research on Children*, *5*(2), 1-22.

McLean, L., & Connor, C. M. (2015). Depressive symptoms in third-grade teachers: Relations to classroom quality and student achievement. *Child Development*, *86*, 945-954.

Mearns, J., & Cain, J. E. (2003). Relationships between teachers' occupational stress and their burnout and distress: Roles of coping and negative mood regulation expectancies. *Anxiety, Stress & Coping*, *16*(1), 71-82.

Melchior, M., Caspi, A., Milne, B. J., Danese, A., Poulton, R., & Moffitt, T. E. (2007). Work stress precipitates depression and anxiety in young, working women and men. *Psychological Medicine*, *37*(8), 1119-1129.

Montgomery, C., & Rupp, A. (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Canadian Journal of Education*, *28*, 458‑486.

Nazroo, J., Edwards, A.C., & Brown, G.W. (1998). Gender differences in the prevalence of depression: artefact, alternative disorders, biology or roles? *Sociology of Health & Illness, 20, 312–330*. Doi: 10.1111/1467-9566.00104

Newell, J. M., & MacNeil, G. A. (2010). Professional burnout, vicarious trauma, secondary traumatic stress, and compassion fatigue. *Best Practices in Mental Health*, *6*(2), 57-68.

Nieminen, P., Lehtiniemi, H., Vähäkangas, K., Huusko, A., & Rautio, A. (2013). Standardised regression coefficient as an effect size index in summarising findings in epidemiological studies. *Epidemiology, Biostatistics and Public Health*, *10*(4), 1-15. https://doi.org/10.2427/8854

O'Brennan, L., Pas, E. T.**,** & Bradshaw, C. P. (2017). Multilevel examination of burnout among high school staff: Importance of staff and school factors. *School Psychology Review, 46,* 165-176. doi: 10.17105/SPR-2015-0019

Pas, E. T., Bradshaw, C. P., & Hershfeldt, P. A. (2012). Teacher-and school-level predictors of teacher efficacy and burnout: Identifying potential areas for support. *Journal of School Psychology*, *50*, 129-145.

Perreira, K. M., Wassink, J., & Harris, K. M. (2018). Beyond Race/Ethnicity: Skin Color, Gender, and the Health of Young Adults in the United States. *Population Research and Policy Review*, 1-29.

Pines, A. M., & Keinan, G. (2005). Stress and burnout: The significant difference. *Personality and individual differences*, *39*(3), 625-635.

Purvanova, R. K., & Muros, J. P. (2010). Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior, 77*, 168-185. doi: 10.1016/j.jvb.2010.04.006

R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Rosseel, Yves (2012). lavaan: An R Package for Structural Equation Modeling. *Journal of Statistical Software, 48*(2), 1-36.

Rusby, J.C., Crowley, R., Sprague, J., & Biglan, A. (2011). Observations of the middle school environment: Context for student behavior beyond the classroom. *Psychology in the Schools, 48*, 400-415.

Ryan, S. V., Nathaniel, P., Pendergast, L. L., Saeki, E., Segool, N., & Schwing, S. (2017). Leaving the teaching profession: The role of teacher stress and educational accountability policies on turnover intent. *Teaching and Teacher Education*, *66*, 1-11.

Sabanci, A. (2009). The effect of primary school teachers' burnout on organizational health. *Procedia - Social and Behavioral Sciences, 1*(1), 195-205. doi: https://doi.org/10.1016/j.sbspro.2009.01.036

Sandilos, L. E., Rimm-Kaufman, S. E., & Cohen, J. J. (2017). Warmth and demand: The relation between students' perceptions of the classroom environment and achievement growth. *Child development*, *88*(4), 1321-1337.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational, and Organizational Psychology and Behavior*, *25*(3), 293-315.

Shernoff, E. S., Mehta, T. G., Atkins, M. S., Torf, R., & Spencer, J. (2011). A qualitative study of the sources and impact of stress among urban teachers. *School Mental Health*, *3*(2), 59-69.

Sirin, S. (2005). Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research. *Review of Educational Research, 75*(3), 417-453. Retrieved from http://www.jstor.org/stable/3515987

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of Relations. *Teaching and Teacher Education, 26,* 1059-1069.

Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology, 99*, 611-625.

Skaalvik, E. M., & Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion. *Teaching and Teacher Education*, *27*(6), 1029-1038.

Skinner, E. A., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In *Handbook of research on student engagement* (pp. 21-44). Springer, Boston, MA.

Solórzano, D. G. (1997). Images and words that wound: Critical race theory, racial stereotyping, and teacher education. *Teacher Education Quarterly*, 24(3), 5–19.

Stevenson, J., & Stevenson, H. C. (2014). *Promoting racial literacy in schools: Differences that make a difference*. Teachers College Press.

Stevenson, H. C. (2008). Fluttering around the racial tension of trust: Proximal approaches to suspended Black student-teacher relationships. *School Psychology Review*, *37*(3), 354-358.

Tschannen-Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783-805.

U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service. (2016). *The State of Racial Diversity in the Educator Workforce*, Washington, D.C. Retrieved from https://www2.ed.gov/rschstat/eval/highered/racial-diversity/state-racial-diversity-workforce.pdf

Vasquez, J. A. (1988). Context of learning for minority students. *Educational Forum*, 56, 6−11.

Von Dawans, B., Fischbacher, U., Kirschbaum, C., Fehr, E., & Heinrichs, M. (2012). The social dimension of stress reactivity: acute stress increases prosocial behavior in humans. *Psychological science*, *23*(6), 651-660.

Ware, F. (2006). Warm demander pedagogy: Culturally responsive teaching that supports a culture of achievement for African American students. *Urban Education*, *41*(4), 427-456.

Wentzel, K. R. (2010). Students' relationships with teachers. In J. L. Meece & J. S. Eccles (Eds.), *Handbook of research on schools, schooling, and human development* (pp. 75‑91). New York, NY: Routledge.

Wolters, C. A., & Dougherty, S. G. (2007). Goal structures and teachers' sense of efficacy: Their relation and association to teaching experience and academic level. *Journal of Educational Psychology, 99*, 181-193.

Woolfolk, A. (2007). *Educational psychology* (10th ed.). Boston: Pearson Education Inc.

Table 1
School, Classroom, and Teacher Characteristics

	n(%)	Mean(SD)
Middle School (6-8)	14(42)	
K-8 School	19(58)	
Total Student Enrollment		573.8(44.5)
% Black Students (Enrollment)		72.6(5.0)
% Latinx Student (Enrollment)		11.5(16.9)
% FARMs		63.7(3.6)
% Math Proficiency		24.5(18.7)
% Reading Proficiency		35.5(28.5)
Classroom Observed Characteristics ($N = 255$)		
Classroom Size (Number of Students)		22.51(5.0)
Student-Teacher Ratio		19.53(6.0)
Student Disruptive Behavior (Tally)		19.03(17.6)
Majority Students of Color	215(92)	
Majority White Students	19(8)	
Missing Class Size or Racial Composition	21(8)	
Teacher Race x Classroom Racial Composition		
White Teacher w. Majority Students of Color	73(34)	
Teacher of Color w. Majority White Students	1(<1)	
Teacher of Color w. Majority Students of Color	125(58)	
White Teacher w. Majority White Students	16(7)	
Missing Either Teacher or Classroom Race	40(16)	
Teacher Self-Reported Characteristics ($N = 255$)		
Gender		
Male	64(27)	
Female	172(73)	
Missing	19(7)	
Race and ethnicity		
Black	107(47)	
White	97(42)	
Other, Asian/Pacific Islander, or Latinx	26(11)	
Missing	25(10)	
Tenure at Current School		
First Year	51(22)	
1-3 Years	64(28)	
4-8 Years	69(30)	
9+ Years	44(19)	
Missing	27(11)	

Note. FARMs = Free and reduced-priced meals, a proxy for the socioeconomic status of the school's student enrollment, where higher percentages indicate lower socioeconomic status. Missing data percentages are out of $N = 255$; all other percentages are calculated based on number of available observations.

Table 2

Matrix of Zero-Order Correlations (J = 33 schools, N = 255 classrooms/teachers)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Teacher Sensitivity													
2. Instructional Dialogue	.53***												
3. Stress	-.02	-.14*											
4. Burnout	.08	-.10	.81***										
5. Student Disruptives	-.43***	-.31***	.16*	.14+									
6. Class Size	-.07	.02	-.04	-.02	.16*								
7. School % FARMS	-.02	-.14*	.10	.12+	.09	-.40***							
8. Number of Adults	-.05	.00	-.13+	-.15*	.01	-.02	-.14*						
9. Teacher Self-Efficacy	.19**	.12+	-.32***	-.31***	-.28***	.10	-.08	.01					
10. Academic Emphasis	.11	.16*	-.29***	-.33***	-.20**	.13+	-.16*	.13+	.52***				
11. Teacher Affiliation	-.01	.01	-.16*	-.22**	-.06	-.10	-.01	.02	.03	.16*			
12. Collegial Leadership	.03	.08	-.19**	-.20**	-.07	-.16*	.03	.07	.10	.21**	.56***		
13. Classroom % White	.10	-.01	-.01	-.02	-.17**	.16*	-.55***	.04	.04	-.08	.12+	-.01	
14. Teacher is White	.10	-.07	.13+	.15*	-.04	-.02	-.17**	-.09	-.13+	-.17*	-.06	-.18**	.37***

Note. r = Pearson's Correlation. † $p < .10$, * $p < .05$, ** $p < .01$, ** $p < .001$. FARMs = Free and reduced-priced meals eligibility.

Table 3

Step-by-Step Models of Demands, Resources, Stress, Burnout, and Teacher Practices

	Step 1: D Model			Step 2: D-R Model			Step 3: D-R-P Model		
Stress ON	β	(SE)		β	(SE)		*β*	(SE)	
Female†	0.54	(.12)	***	0.51	(.12)	***	0.49	(.11)	***
White†	0.37	(.13)	**	0.21	(.12)	+	0.21	(.10)	*
Classroom % SoC	0.02	(.25)		0.00	(.20)				
T-White X % SoC	-0.02	(.23)		-0.01	(.18)				
Class Size (# Students)	-0.01	(.10)		0.01	(.09)				
Student Disruptives	0.19	(.06)	**	0.09	(.06)		0.09	(.06)	
School % FARMS	0.14	(.08)	+	0.11	(.08)		0.10	(.05)	*
Self-Efficacy				-0.24	(.05)	***	-0.24	(.05)	***
Academic Emphasis				-0.08	(.06)		-0.08	(.06)	
Collegial Leadership				-0.02	(.09)				
Teacher Affiliation				-0.13	(.08)		-0.14	(.06)	*
Num adults†				-0.14	(.13)		-0.14	(.12)	
Burnout ON									
Female†	0.49	(.11)	***	0.46	(.10)	***	0.43	(.09)	***
White†	0.41	(.10)	***	0.24	(.10)	*	0.21	(.10)	*
Percent SoC	0.05	(.21)		0.05	(.14)				
Classroom % SoC	-0.07	(.20)		-0.08	(.13)				
T-White X % SoC	0.01	(.07)		0.02	(.07)				
Student Disruptives	0.17	(.05)	***	0.07	(.05)		0.07	(.04)	
School % FARMS	0.18	(.07)	**	0.13	(.07)	+	0.12	(.05)	*
Self-Efficacy				-0.21	(.05)	***	-0.21	(.05)	***
Academic Emphasis				-0.13	(.05)	*	-0.14	(.05)	**
Collegial Leadership				0.01	(.09)				
Teacher Affiliation				-0.19	(.07)	**	-0.19	(.06)	**
Num adults†				-0.17	(.14)		-0.16	(.13)	
Sensitivity ON									
Stress							-0.19	(.14)	
Burnout							0.29	(.15)	*
Student Disruptives							-0.44	(.09)	***
Instructional Dialogue ON									
Stress							-0.17	(.08)	*
Burnout							0.07	(.08)	
Student Disruptives							-0.29	(.06)	***
Stress WITH Burnout	0.69	(.07)	***	0.58	(.06)	***	0.58	(.06)	***
Sensitivity WITH									
Instructional Dialogue							0.39	(.08)	***
Stress R^2	12.0%			21.7%			21.7%		
Burnout R^2	11.2%			23.8%			23.6%		
Sensitivity R^2							21.7%		
Instructional Dialogue R^2							11.2%		

Notes: Estimates are standardized. Intercept estimates for dependent variables not shown. FARMs = Free and reduced-priced meals eligibility. SoC = Students of Color. D = Demands, R = Resources, P = Teacher Practices. ***$p < .001$; **$p < .01$; *$p < .05$; +$p < .10$. "†" indicates parameters are standardized for the outcome variable only.

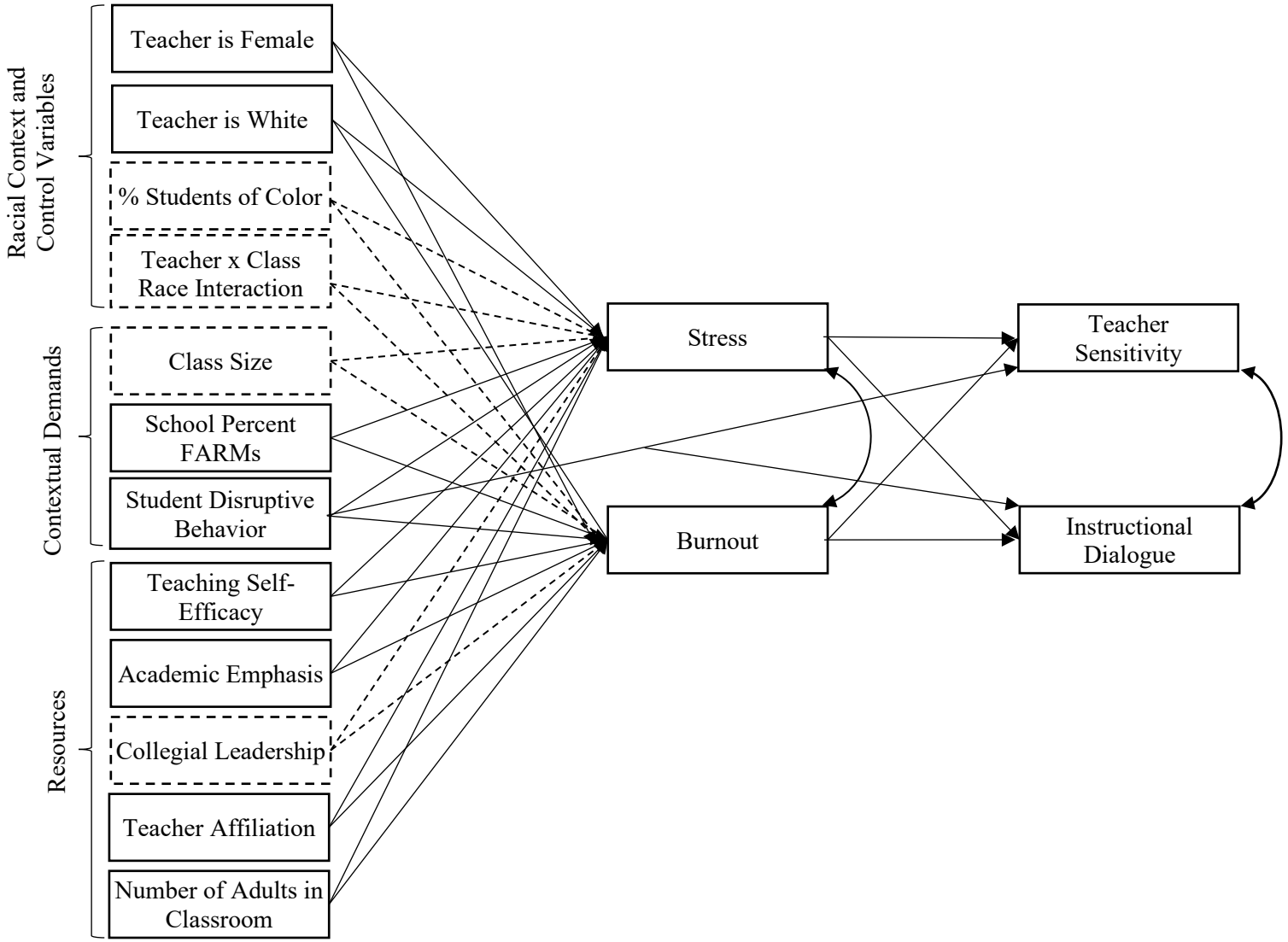

*Figure 1***.** Conceptual and analytic model. FARMs = Free- and reduced-priced meals. All variables are manifest. Dash-outlined boxes and arrows show originally conceptualized and examined variables (see Step 1-2 models) that were removed from the Step 3 model based on significance of associations, adequate model fit, and sample size constraints. CFI = 0.99; TLI = 0.98, RMSEA = 0.03, SRMR = .02.