

education policy analysis archives

A peer-reviewed, independent,
open access, multilingual journal



Arizona State University

Volume 28 Number 87

June 1, 2020

ISSN 1068-2341

Examining the Intersectionality among Teacher Race/Ethnicity, School Context, and Risk for Occupational Stress

Paul G. Fitchett

University of North Carolina at Charlotte

Jendayi B. Dillard

University of Texas-Austin

Christopher J. McCarthy

University of Texas-Austin

Richard G. Lambert

University of North Carolina at Charlotte



Kristen Mosley

University of Texas-Austin

United States

Citation: Fitchett, P. G., Dillard, J. B., McCarthy, C. J., Lambert, R. G., & Mosley, K. (2020). Examining the intersectionality among teacher race/ethnicity, school context, and risk for occupational stress. *Education Policy Analysis Archives*, 28(87). <https://doi.org/10.14507/epaa.28.4999>

Abstract: Combining secondary data from the National Center for Education Statistics National Teacher Principal Survey (NTPS) and Common Core of Data (CCD), this exploratory study examined the distribution of teacher race/ethnicity across the race/ethnicity of the schools in which they work and the extent that teacher and school race/ethnicity was associated with occupational stress. Findings indicate that teachers are

Journal website: <http://epaa.asu.edu/ojs/>
Facebook: /EPAAA
Twitter: @epaa_aape

Manuscript received: 8/22/2019
Revisions received: 3/17/2020
Accepted: 4/25/2020

more likely to work in schools with higher concentrations of students who match their own race/ethnicity. Both teacher and school race/ethnicity were unique predictors of a teacher being classified as at-risk for stress. Additional analyses suggested that teachers' reported race/ethnicity significantly moderated the school effect association with stress risk. These findings have policy implications for how school workplace surveys are used as well as staffing and professional development considerations.

Keywords: teacher occupational stress, teacher working conditions, teacher race/ethnicity, school race/ethnicity

Examinar la interseccionalidad entre la raza / etnia del maestro, el contexto escolar, y el riesgo de estrés laboral

Resumen: Combinando datos secundarios de la National Center for Education Statistics National Teacher Principal Survey (NTPS) y Common Core of Data (CCD), este estudio exploratorio examinó la distribución de la raza / etnia del maestro en la raza / etnia de las escuelas en las que trabajo y cómo esto se relaciona con el estrés laboral. Los resultados indican que es más probable que los maestros trabajen en escuelas con mayores concentraciones de estudiantes que coincidan con su propia raza / etnia. Tanto el maestro como la raza / etnia escolar fueron predictores únicos de que un maestro fuera clasificado como en riesgo de estrés. Análisis adicionales sugirieron que la raza / etnia informada por los maestros moderó significativamente la asociación del efecto escolar con el riesgo de estrés. Estos hallazgos tienen implicaciones políticas para el uso de encuestas en el lugar de trabajo escolar y consideraciones sobre la dotación de personal y el desarrollo profesional.

Palabras-clave: estrés laboral docente; condiciones de trabajo docente; docente raza / etnia; escolar raza / etnia

Examinando a interseccionalidade entre raça / etnia dos professores, contexto escolar, e risco de estresse ocupacional

Resumo: Combinando dados secundários da National Center for Education Statistics National Teacher Principal Survey (NTPS) e Common Core of Data (CCD), este estudo exploratório examinou a distribuição da raça / etnia dos professores na raça / etnia das escolas nas quais eles estudam. trabalho e como isso se relaciona ao estresse ocupacional. Os resultados indicam que é mais provável que os professores trabalhem em escolas com maiores concentrações de estudantes que correspondem à sua raça / etnia. Tanto o professor quanto a raça / etnia escolar foram preditores únicos de um professor sendo classificado como em risco de estresse. Análises adicionais sugeriram que a raça / etnia relatada pelos professores moderou significativamente a associação do efeito escola com o risco de estresse. Essas descobertas têm implicações políticas para o uso de pesquisas no local de trabalho da escola e considerações sobre pessoal e desenvolvimento profissional.

Palavras-chave: estresse ocupacional de professores; condições de trabalho dos professores; raça / etnia dos professores; raça / etnia escolar

Examining the Intersectionality among Teacher Race/Ethnicity, School Context, and Risk for Occupational Stress

Teaching is a demanding occupation, with many teachers suffering from high levels of stress (Kyriacou, 1998), reduced job satisfaction (Klassen & Chiu, 2010; Liu & Ramsey, 2008), and high occurrence of burnout (García-Carmona, Marín, & Aguayo, 2019). Among the many factors associated with teachers' well-being are the varying demographic contexts in which they work. Though student populations continue to grow in diversity, the teaching force remains overwhelmingly White (Hussar & Bailey, 2013; National Center for Education Statistics, 2018). Additionally, a legacy of structural inequalities and discriminatory policies in the United States have contributed to segregated student populations, resulting in schools with high concentrations of students who identify as the same race and/or ethnicity (Billingham, 2019; Rosiek, 2019). These demographic realities suggest that teachers are likely to teach in racially and ethnically homogenous contexts that may or may not match their own background, yet few studies have examined the frequency of (in)congruence and how such an environment might affect teachers' occupational well-being.

Similarly, as researchers continue to investigate ways to improve conditions for teachers and their students, examination of the early stages of the stress response are especially vital. Lazarus and Folkman's (1984) transactional theory suggests that before a person begins to feel stressed or burned out, they must first appraise their environmental demands and resources to determine whether the former outweighs the latter. Research indicates that teachers undergo the same process (Skaalvik & Skaalvik, 2017), and that the Classroom Appraisal of Resources and Demands scale can be used to quantify this appraisal process (Lambert, McCarthy, Lineback, Fitchett & Baddouh, 2016). Understanding teachers' appraisal of their school environment allows stakeholders to assess teachers' risk for stress and adopt early interventions for at-risk teachers, reducing job dissatisfaction and burnout, and ultimately turnover. The current study used national data from the National Center of Education Statistics' National Teacher and Principal Survey (NTPS) to investigate how likely teachers of different racial and ethnic backgrounds are to teach in racially or ethnically congruent schools and the association between the state of teachers' racial or ethnic congruence and their stress appraisal.

Literature Review

Distribution of Teachers in American Public Schools

Equitable access to quality teaching has remained a substantial policy goal in the United States. Studies have found that less qualified teachers are significantly more likely to be employed in schools with high percentages of low-income and minority students, even when considering a range of methods for measuring teacher quality (Adamson & Darling-Hammond, 2012; Goldhaber, Choi, & Cramer, 2007; Lankford, Loeb, & Wyckoff, 2002). In an effort to combat these documented race and socioeconomic achievement disparities, the Every Student Succeeds Act (formerly No Child Left Behind) has required that school districts ensured equal access to high quality teachers for low-income and non-white students (Klein, 2016; Mid-Atlantic Equity Center, 2009).

Little is known, however, about the distribution of teachers in American public schools in relation to teachers' race and/or ethnicity. Yet, studies consistently show the racial and ethnic makeup of teachers in the United States is not reflective of the student population (Villegas, Strom, & Lucas, 2012). For example, in the 2014-2015 school year, White teachers were 80% of public school teachers, but White students were only about 50% of public school students (National Center

for Education Statistics, 2018). Proportions of students of color are projected to continue to grow in the coming years, now surpassing the proportion of White, non-Hispanic students (Hussar & Bailey, 2013). There are no indications of a similar shift among teachers. In fact, schools continue to struggle with the recruitment and retention of teachers of color (Ingersoll & May, 2011).

Of teachers of color who do enter into the workforce, there is evidence that they are not evenly distributed among all schools. Ingersoll and May (2011) found that in 2003, minority teachers comprised 29% of urban schools (compared to 13% of suburban schools), 35% of schools serving high concentrations of high poverty students (compared to 7% of low poverty schools), and an incredible 42% of schools serving high concentrations of minority students (compared to 2% of low minority schools). These figures are especially notable given that teachers of color comprised only about 17% of the teaching workforce nationally (National Center for Education Statistics, 2018).

The inequitable distribution of teachers among majority-minority and majority-White schools is also associated with uneven resource allocation. Less experienced teachers, larger class sizes, and fewer curricular resources consistently plague schools serving students of color (Clotfelter, Ladd, & Vigdor, 2005; Darling-Hammond, 2004; Kozol, 2005). Additionally, systemic inequalities that persist in the United States have resulted in disproportionately high rates of poverty among minority communities. Black and Hispanic students live in poverty at higher rates compared to their White peers (de Brey et al., 2019), which contributes to a number of challenging behaviors such as absenteeism (Gee, 2018) and low parent engagement (Redford, Huo, McQuiggan, & Ralph, 2019). Each of these presents as an extra demand for teachers.

It is unclear whether the unequal distribution of teachers in public schools is a result of structural factors or teacher choice. Research has suggested that teachers show a strong preference for teaching in schools geographically near and characteristically similar to the where they themselves grew up and went to school (Boyd, Lankford, Loeb, & Wyckoff, 2005; Haberman, 1995; Lortie, 1975). It is possible that teachers show a preference for schools that match aspects of their own identity as well, such as race and/or ethnicity. Investigations into the effects of racial/ethnic congruence on teachers can greatly expand this field of study.

Racial/Ethnic Congruence in Schools

One factor that teachers may consider when appraising where they teach is racial/ethnic congruence. Broadly, congruence refers to a state of matching or similarity among two or more entities (Glueck, 2016). Racial/ethnic congruence refers to a situation in which two or more people share racial or ethnic identities. The effect of racial and ethnic congruence on teachers has mainly been examined from the perspective of teacher-administration congruence (e.g., Brezicha & Fuller, 2019; Viano & Hunter, 2017) and teacher-student congruence (e.g., Fairchild et al., 2012; Mueller, Finley, Iverson, & Price, 1999; Renzulli, Parrott, & Beattie, 2011).

Despite differing and often conflicting definitions in the literature, many scholars agree on several key features of the construct of race. Race is a socially constructed manner of classifying people. Though tenuously linked to physiological features (such as skin color or facial shape/features), these categories lack a scientific basis (Cokley & Awad, 2008; Day-Vines et al., 2007). In the current study, race refers to teachers and students who self-identify as Black or African American, Asian, American Indian/Alaska Native, native Hawaiian/Pacific Islander, White, and multiple races. Ethnicity is similarly difficult to define. Broadly interpreted, ethnicity can be considered a manner of grouping people based on shared cultural values (Phinney, 1996). In the current study, ethnicity refers to teachers and students who self-identify as Hispanic or non-Hispanic. For the purpose of clarity, teachers of color (or TOC) can be understood to mean teachers

who do not identify as non-Hispanic White. “White” refers to teachers and students who self-identify as non-Hispanic White.

Racial congruence has consistently been associated with a wide range of positive outcomes for students, including increased scores on standardized tests (e.g. Dee, 2004; Egalite et al., 2015; Gershenson et al., 2018), teacher ratings of student behavior (Dee, 2005), increased rate of referral to gifted and talented programs (Grissom & Redding, 2016), and decreased use of exclusionary discipline (Lindsay & Hart, 2017). Associations between racial congruence and teacher outcomes are less clear. Researchers have found that separately, both teacher race and student body demographics are contributing factors to professional satisfaction and occupational mobility. Borman and Dowling (2008) conducted a meta-analysis of research on factors associated with teacher attrition and found significant effects of teacher race and student demographics. White teachers were 1.36 times more likely to leave the profession than non-White teachers. Similarly, analysis of the 15 studies found that teachers in schools with more diverse student bodies, especially those with majority Black and Latino students, had significantly higher odds of leaving the field.

Building on these results, several studies have found evidence that teachers’ racial/ethnic congruence or incongruence with students is associated with how they perceive their working conditions, albeit with varying outcomes (Dworkin, 1987; Fairchild et al., 2012; Mueller et al., 1999; Renzulli et al., 2011). For White teachers, teaching in schools with majority White students is associated with higher job satisfaction (Fairchild et al., 2012; Mueller et al., 1999; Renzulli et al., 2011), increased professional commitment (Mueller et al., 1999), lower rates of turnover (Renzulli et al., 2011), and lower rates of burnout (Dworkin, 1987). For non-White teachers, however, these effects were either greatly attenuated or entirely non-significant. Renzulli and colleagues (2013) labeled this phenomenon, in which White teachers are significantly more affected by working in racially incongruent settings compared to teachers of color, as the *nonsymmetry effect*.

A number of reasons potentially explain why racial/ethnic congruence may have a disproportionate effect on teachers of different races and ethnicities. First, unique demands experienced by White teachers in majority minority schools vary drastically from those experienced by non-White teachers in majority White schools. The former have reported difficulties primarily centered on relating to students, including student misbehavior and motivation (Camacho & Parham, 2019). Non-White teachers, on the other hand, have reported struggles with othering, micro-aggressions, and other expressions of discrimination (Bristol & Mentor, 2018; Endo, 2015; Kohli, 2018).

A second possible explanation may have to do with teachers’ differing levels of familiarity with cultures other than their own. Both White and non-White teachers in racially/ethnically incongruent settings contend with interacting with students who do not share the same cultural practices and background as themselves. For non-White teachers, this may not pose as an especially daunting demand given the ubiquity of White cultural values and practices in the U.S. schools. White teachers are likely to have relatively less experience with other cultures, and therefore experience a greater “culture shock” than other groups (Dworkin, 1987; Mueller et al., 1999).

While the aforementioned studies have examined the confluence teacher-student race congruence on various workplace outcomes, little research has operationalized teachers’ appraisals as an antecedent of workplace stress. The transactional theory (Lazarus & Folkman, 1984) offers an alternative framework for operationalizing teachers’ appraisals with unique policy implications for the field.

Transactional Theory and Teachers' Risk for Stress

Typically, teachers' responses to working conditions surveys are conceptualized as objective reality (e.g., Béteille & Loeb, 2009; Ingersoll & May, 2011; Ladd, 2011). However, this logic belies the subjective experience that each teacher has in their own classroom: simply put, not all teachers working in a school environment perceive their workplace in the same way (McCarthy, Lambert, O'Donnell, & Melendres, 2007; Skaalvik & Skaalvik, 2019). In fact, research in different countries consistently finds that one out of every four or five teachers likely experiences excessive stress. Estimates from research range from 25% of teachers in Great Britain (Travers & Cooper, 1996) and Italy (Zurlo, Pes, & Capasso, 2013), to 20% - 22% in Malaysia (Moy et al., 2014) and Germany (Unterbrink et al., 2007), and from 25 - 26% in Australia (Garrick et al., 2014) and the U.S. (McCarthy et al., 2016).

Therefore, it may be more accurate to describe teaching as a highly stressful profession for many, but not all, teachers. How can we then understand the phenomena of teacher stress, in which some seem vulnerable than others, particularly given that research has typically focused on working conditions as the primary driver of occupational health (i.e., school administration, autonomy, and collegiality with colleagues; Béteille & Loeb, 2009; Ingersoll, 2001; Ladd, 2011)? Stress researchers maintain that it is our individual assessment of the magnitude and nature of demands that we face, and the sufficiency of our resources for coping with those demands, that determine our likelihood of experiencing stress (Stone & Han; 2007). This process has been labeled appraisal (Lazarus & Folkman, 1984); whereby risk for stress is hypothesized to result when perceived demands outweigh perceived resources for coping. In the context of teaching, when a teacher appraises the work environment as having more demands (i.e. student misbehavior, large class size, lack of parent involvement, etc.) than resources (i.e. supportive administration, ample textbooks and supplies, cooperative effort among staff, etc.), that teacher is more at-risk for experiencing stress symptoms. Comparatively, a teacher who appraises their demands as equal or less than the availability of resources is less at-risk for stress.

Leveraging previous work which operationalized Lazarus and Folkman's theory to develop the Classroom Appraisal of Resources and Demands (CARD; McCarthy et al., 2007), this study used an empirically supported framework to create a parsimonious classification system of teachers based on their stress appraisals (Authors et al., 2015; 2016). In line with Lazarus and Folkman's transactional theory, teachers can be categorized into three distinct groups according to their appraisals of resources and demands: Resourced teachers, who appraise their classroom resources as exceeding demands, Balanced teachers, who appraise their resources as roughly equal to their demands, and Demanded teachers, those who appraise resources as insufficient for their classroom demands. These three classifications also represent teachers' risk for stress, and it is this last group of teachers that are most vulnerable to experiencing stress (Lambert, McCarthy, Fitchett, Linebeck, & Reiser, 2015) and can therefore be classified as being most at-risk for stress. This classification system has been associated with a number of indicators of occupational well-being, such as burnout symptoms, job satisfaction, and occupational mobility (McCarthy et al., 2016), and serves as a tool that various actors within the education field can use to prognosticate which teachers are more at-risk for stress and associated vocational concerns.

Goals of Study

The current study sought to expand on our previous research, examining how teachers' appraisals of working conditions can be operationalized as an indicator of stress-vulnerability. We were especially keen to examine how teachers' appraisals of their workplace was associated with

their self-reported race/ethnicity as well as the student race/ethnicity of the schools in which they work. Three complementing hypotheses guided this research.

H₁: Teachers are more likely to work in schools with a student body that more closely resembles their own self-reported race/ethnicity. Research suggests that teachers are likely to choose work environments that more closely resemble their own schooling and lived experiences (Lorte, 1975; Boyd, et al., 2005). Previous studies have examined this phenomenon in terms of school mobility and teacher identity. Given this precedent, we hypothesized that teachers would be more likely to work in schools that match their own race/ethnic identities.

In addition, our exploratory study sought to examine the extent to which teachers' race/ethnicity and race/ethnicity of the student body was predictive of teachers' risk for stress (i.e., being categorized as Demanded per Lazarus and Folkman theory). Previous studies suggest that the race of the teacher, school demographics, and the confluence/match between the two (Grissom, Kern, & Rodriguez, 2015; Renzulli, et al., 2011) is associated with various workplace outcomes including job satisfaction and teacher turnover. These studies informed the following hypotheses.

H₂: Teachers' self-reported race/ethnicity and the predominant race/ethnicity of students in their school is predictive of risk for stress as determined by Demands group classification.

H₃: Teachers' self-reported race/ethnicity moderates the association between student race/ethnicity composition and risk for stress as determined by Demands group classification.

The following sections describe how our exploratory study sought to examine these hypotheses.

Method

Sample

The participants in this study were full-time, public school teachers who responded to the National Center for Education Statistics (NCES) National Teacher Principal Survey (NTPS). This survey replaces the Schools and Staffing Survey (SASS) as the largest and most comprehensive survey of the U.S. teaching workforce. NTPS employs a complex multistage sampling design, which includes using a systematic probability proportionate to size sampling strategy to select schools (Taie & Goldring, 2017). Some schools were oversampled due to urbanicity, charter school status, grade level in order to more accurately estimate a nationally representative sample. Teachers were then sampled within the selected schools. Because our study sought to examine the match between teachers from the largest representative racial/ethnic groups in the nation and their students, we purposefully limited our sample to White, Black, and Hispanic teachers.

NTPS does not provide specific racial/ethnic data on sample schools. Therefore, individual teacher data were merged with school level data provided by the Common Core of Data (CCD), a federal dataset collected by the U.S. Department of Education that provides demographic information about the student population for every public school in the United States. Unique NCES school identifiers were used to combine the NTPS teacher-level racial/ethnic demographic data with school-level racial/ethnic demographic data from the 2015-16 CCD. The CCD included data on the number of students in each school identified across various racial and ethnic categories. Using these counts, we calculated the percentage of White, Black, and Hispanic students in each school associated with NTPS teachers.

We intentionally selected teachers who worked in elementary and secondary schools because teachers who report working in combined schools are more likely to work in less common school settings (i.e., alternative schools that serve special populations). Furthermore, we selected teachers who identified as White (Non-Hispanic), Black (Non-Hispanic) and Hispanic. We intentionally selected out other race/ethnicity subgroups because initial screening of the data indicated that matching to high concentrations of students in schools was unattainable. We also selected teachers who responded to items associated with the subsequently described Demanded grouping. Finally, we selected teachers who were matched to schools. In total, approximately 14.9% of the initial survey sample was removed from the study. The final sample ($N=25,620$)¹ was compared against the initial dataset. No substantial differences among key variables of race or items associated with workplace appraisal were found.

Previous studies vary in what constitutes a racial majority (ranging as low as 40% to over 75% ; Fairchild, et al., 2012; Mueller et al., 1999; Renzulli et al., 2011); for the purpose of the current study, we used several different racial/ethnic compositions. Schools were classified into one of seven categories: majority White students (>51% to 74%, >75%), majority Black (>51% to 74%, >75%), majority Hispanic (>51% to 74%, >75%), and similar to Stearns et al. (2014) a pluralistic composition with no predominant racial group greater than 50% of the student body (i.e., No Majority). We also used a continuous variable, school percentage of free/reduced lunch eligible students, as a proxy for socioeconomic status in schools.

Instrumentation

NTPS includes numerous workplace climate items identical to items found in the SASS. Similar to analyses using SASS (Lambert et al., 2015) we constructed categories for stress-vulnerability based on teacher appraisal of their workplace. A difference score was created to measure teachers' risk for stress, which operationalizes Lazarus and Folkman's (1984) theory that stress risk increases when demands outweigh resources. Specifically, teachers were classified using the difference score between their appraisals of the demands and resources in the classroom (Demands score minus Resources score).

NTPS includes an inventory of items in which teachers self-appraise their working conditions. These items (see Table 1) were used to construct the Demands and Resources scales. Using WINSTEPS software package, the Rasch rating scale model was used to combine the NTPS responses on items related to teachers' appraisals of working conditions into interval level scale scores and to estimate ability parameters for each teacher. These standardized scales (mean=500, $SD=100$) were created separately for elementary and secondary schools because research suggests that teachers across different grade bands appraise their workplace differently (Authors, 2019). The Classroom Demands ($\alpha_{\text{elementary}} = .876$, $\alpha_{\text{secondary}} = .898$) and Resources ($\alpha_{\text{elementary}} = .852$, $\alpha_{\text{secondary}} = .853$) scales yielded scores with adequate internal consistency reliability.

Interpreting the scale scores is complex and lacks practical usefulness for policy makers and other educational stakeholders (e.g., administrators). Categorizing the teachers based on their appraisal patterns into Resourced, Balanced, and Demanded groups provides a useful framework that is more easily interpretable as well as aligns with the transactional theory (Lazarus & Folkman, 1984). These classifications were created by first creating an Appraisal Index (Demands - Resources). Higher index scores suggest incrementally greater risk for stress. However, as the transactional theory notes, individuals most at-risk for stress appraise demands that substantially outweigh their resources.

¹ All sample sizes were rounded to the nearest 10 per NCES data disclosure guidelines.

Table 1
NTPS Items Contributing to Stress Group Classification

Resources Scale	Demands Scale
<i>Resources (recoded strongly disagree 1 to strongly agree 4)</i>	<i>Demands (recoded strongly disagree 1 to strongly agree 4)</i>
The school administration's behavior toward the staff is supportive and encouraging	The level of student misbehavior in this school interferes with my teaching
I receive a greater deal of support from parents for the work I do	The amount of student tardiness and class cutting in this school interferes with my teaching
Necessary materials such as textbooks, supplies, and copy machines are available as needed by the staff	<i>Demands (serious problem 1 to not a problem 4)</i>
My principal enforces school rules for student conduct and backs me up when I need it	Student tardiness
Rules for student behavior are consistently enforced by teachers in this school, even for students who are not in their classes	Student absenteeism
Most of my colleagues share my beliefs and values about what the central mission of the school should be	Teacher absenteeism
The principal knows what kind of school he/she wants and has communicated it to the staff	Students cutting class ^{Sec}
There is a great deal of cooperative effort among the staff members	Students dropping out ^{Sec}
In this school, staff members are recognized for a job well done	Student apathy
I am given the support I need to teach students with special needs	Lack of parental involvement Poverty Students come to school unprepared to learn Poor student health

^{Sec} denotes items used in the Secondary Demands scale only.

The standard error of measurement for the difference score was used to form a 95% confidence interval around an Appraisal Index score of 0, which represents no difference between Demands and Resources. Teachers with difference scores above the confidence interval were labeled in the Demands group, indicating a 95% confidence that their perceived classroom Demands outstrip perceived Resources. Teachers were classified in the Resourced group if their scores fell below the 95% confidence interval, meaning we are 95% confident that their perceived classroom Resources are greater than their perceived Demands. Teachers with difference scores within the confidence intervals were classified as Balanced, suggesting that their perceived Demands were

within measurement error of their perceived Resources score. The three categories, Resourced, Balanced, and Demands, followed previous transactional theory scoring protocol (Fitchett, McCarthy, Lambert & Boyle, 2018; Lambert et al., 2015). Figure 1 illustrates the distribution of Resourced, Balanced, and Demands first-year teachers. For the purpose of this exploratory study, we focused our analyses on Demands Group representation (i.e., most at-risk for stress). Table 2 provides descriptive statistics for the variables used in this study.

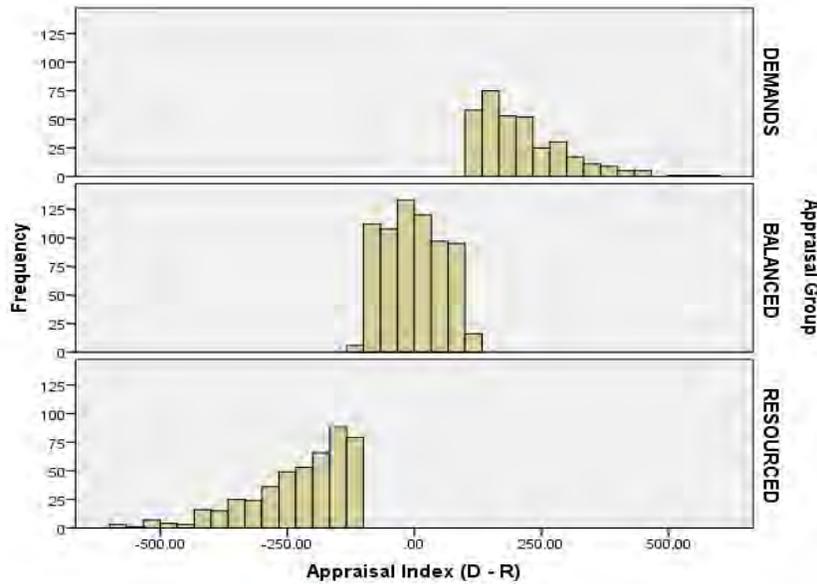


Figure 1. Distribution of appraisal group classification

Table 2
Descriptive Statistics (n=25,620)

Variable	%	SE	95% Conf. Interval	
Stress Classification				
Resourced	25.25	0.42	24.41	26.09
Balanced	46.59	0.36	45.88	47.30
Demanded	28.16	0.42	27.33	28.99
Teacher Race/Ethnicity				
White	82.99	0.36	82.28	83.70
Black	7.49	0.25	7.00	7.97
Hispanic	9.53	0.25	9.04	10.01
School Race/Ethnicity Concentration				
No Majority	24.52	0.62	23.30	25.74
White 51-74%	21.68	0.61	20.47	22.89
White >=75%	28.94	0.59	27.77	30.10
Black 51-74%	3.94	0.30	3.34	4.54
Black >=75%	4.20	0.27	3.67	4.74
Hispanic 51-74%	7.50	0.40	6.71	8.30
Hispanic >=75%	9.22	0.47	8.29	10.15
% of Sch. Free/Red. Lunch Eligibility	52.83	0.54	51.77	53.90

Analytical Procedures

With Stata software, we used replicate weights within the jackknife estimation method to adjust standard errors for the actual sampling plan and to more accurately calculate statistical significance levels. Sampling weights were also applied to create nationally representative results adjusting for differential rates of non-response and oversampling among subgroups of respondents. Weights were applied to each level of analyses. To explore the first hypothesis, we conducted a chi-square in order to examine the distribution of teachers across the seven-group school type. In addition to the chi-square, a designed-based F-test was calculated to determine statistical significance.

To examine the second and third hypotheses, we conducted another chi-square test—examining the distribution of Demands Group teachers across race/ethnicity by school race/ethnicity concentration. Additionally, we conducted a hierarchical logistic regression. In model one of the regression, we included teacher/race ethnicity with White acting as the comparison category. In model two, we included the school race/ethnicity concentrations, whereby the comparison category was No Majority schools. In model 3, we included an interaction term of teacher race by school race/ethnicity concentration, whereby the comparison category was White teachers working in schools. Across each of the models, we also included the school percentage of free/reduced lunch students as a covariate as a proxy for socioeconomic status of the school.

Results

Teachers More Likely to Work in Same Race/Ethnic Schools

Table 3 (see Appendix for cell counts) indicates that the highest percentage of teachers worked in schools that matched their racial/ethnic identity [$\chi^2(12) = 1.07e^{04}$, $F(10.11, 2012.59) = 520.00$, $p < .001$]. Over a third of all White teachers worked in schools with the highest concentrations of White students ($\geq 75\%$). Similarly, over 30% of Black teachers reported working in schools with the highest concentration of Black students, while almost half of Hispanic teachers worked in schools with the highest concentration of Hispanic students. The distribution of TOC across predominantly White schools was substantially lower. Black and Hispanic teachers comprised 7.5% of the total workforce in $\geq 75\%$ White schools and only 26% of the White majority schools ($\geq 50\%$). In No Majority schools, the distribution of teachers varied substantially, suggesting no clear racial/ethnic majority.

Table 3
Percentage of Teachers by Racial Concentration of the School

RACE	Race/Ethnicity Concentration of School							
	No Majority	White 51-74%	White $\geq 75\%$	Black 51-74%	Black $\geq 75\%$	Hispanic 51-74%	Hispanic $\geq 75\%$	Total
White	24.5%	23.8%	35.0%	3.2%	2.1%	6.3%	5.1%	100.0%
Black	25.7%	9.3%	3.0%	15.3%	30.5%	8.9%	7.3%	100.0%
Hispanic	22.8%	9.5%	4.5%	1.3%	2.0%	15.6%	44.3%	100.0%
Total	24.4%	21.4%	29.8%	3.9%	4.2%	7.4%	8.9%	100.0%

Table 4
Percentage of Demanded Teachers (Most At-Risk for Stress) by Race/Ethnicity and School Racial Concentration

<u>Demands Group</u>	<u>White Teacher</u>		<u>Black Teacher</u>		<u>Hispanic Teacher</u>	
	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>Yes</u>	<u>No</u>	<u>Yes</u>
<u>School</u>						
<u>Race/Ethnicity</u>						
<u>Concentration</u>						
No Majority	66.8%	33.2%	71.3%	28.8%	70.2%	29.8%
White 51-74%	77.4%	22.7%	85.2%	14.8%	85.7%	14.3%
White $\geq 75\%$	83.3%	16.7%	86.3%	13.7%	81.7%	18.3%
Black 51-74%	46.0%	54.0%	62.9%	37.1%	58.7%	41.3%
Black $\geq 75\%$	42.8%	57.3%	60.0%	40.0%	45.7%	54.3%
Hispanic 51-74%	56.5%	43.6%	70.3%	29.7%	64.6%	35.4%
Hispanic $\geq 75\%$	55.9%	44.1%	67.4%	32.6%	65.5%	34.5%
Total	72.6%	27.4%	67.9%	32.1%	68.5%	31.5%

Teachers' Race and School Racial/Concentration Associated with Risk for Stress

In Table 4, we calculated the percentage of teachers who fall into the Demanded category (i.e., most at-risk for stress) within each subset race/ethnicity category and across racial/ethnicity concentration of the school in which they work. We then conducted a chi-square test with sampling and replicate weights to determine if each subset of teachers significantly varied in their appraisal (stress-risk) by school race/ethnicity. Among White teachers, the percentage of teachers' categorized as Demanded varied significantly across school racial/ethnicity concentration [$\chi^2(6) = 1344.62$, $F(5.52, 1097.81) = 111.3577$, $p < .001$]. Only 22.7% of the White teachers in 51-74% White schools and 16.7% of the White teachers working in $\geq 75\%$ White schools appraised as Demanded. Conversely, in schools populated by Black students, over 50% of White teachers were categorized as Demanded. In Hispanic schools, White teachers appraised as Demanded over 40% of the time. Hispanic teachers also reported significant variability in their Demands appraisal across school race/ethnicity concentration [$\chi^2(6) = 58.031$, $F(5.33, 1061.60) = 7.67$, $p < .001$]. Within this subset, teachers more likely appraised as Demanded in high Black-concentrated schools ($\geq 75\%$). Among Black teachers, the percentages of Demanded teachers varied significantly across school type [$\chi^2(6) = 53.87$, $F(5.66, 1127.26) = 8.21$, $p < .001$]. Results suggest substantially different appraisal patterns. For example, in schools with the highest concentration of Black students ($\geq 75\%$), 40% of the Black teachers appraised as Demanded compared to over 50% for White and Hispanic teachers. Among the totals within Table 4, results evidence Black and Hispanic teachers more likely report as Demanded compared to their White counterparts, suggesting increased stress vulnerability.

As a final analysis, we ran a hierarchical logistic regression examining the extent to which teacher and school race/ethnicity were predictive of a teacher's odds of being classified as Demanded. Prior to running our model with the covariate (i.e., % free/reduced lunch students), we ran a simplified logistic regression with only race as the predictor variable. Results indicated that Black and Hispanic teachers were more likely classified as Demanded compared to White teachers [$F(2,198) = 12.04$, $p < .001$]. The odds of appraising as Demanded were 1.27 times higher for Black teachers and 1.22 times higher for Hispanic teachers compared to White teachers.

Table 5 reports results from hierarchical logistic regression with the covariate. Model 1 indicates that when accounting for school contexts, the odds of appraising as Demanded were .891 times for Black teachers and .893 higher for Hispanic teachers compared to White teachers.

Interestingly, the directionality of the coefficients changed. When controlling for race/ethnicity of the school (model 2), Black and Hispanic teachers were associated with lower odds of being appraised as Demanded compared to White teachers, with a decrease of approximately 43% and 28% respectively. Further examination of school main effects indicates that teachers working White schools were significantly associated with a decrease in the odds of appraising as Demanded compared to teachers working in No Majority schools. Teachers working in schools of color, however, were associated with an increase in the odds of classifying as Demanded. Among the most pronounced effects, teachers working in schools with between 51-74% Black students were associated with 86% increase in stress vulnerability. In schools with 75% or more Black students, teachers were associated with a 77% increase in stress vulnerability.

In model 3, we accounted for the interaction between teacher and school as a form of racial congruence. The comparison category included No Majority schools, White teachers, and by extension White teachers in No Majority and White majority schools. Results indicate that teacher race/ethnicity remained statistically significant predictors in the same direction of Demands group classification. School-level main effects also remained statistically significant and in the same direction. For example, teachers' working in the highest concentration of Black students were over two times more likely to appraise as highly-stress vulnerable. As an exception, teachers working in schools with high concentrations of Hispanic students were no longer statistically significantly associated with stress-vulnerability. Interactions between building and school yielded interesting findings. For example, Black teachers working in highly concentrated Black Schools were significantly less likely to appraise Demanded compared to the comparison category. Hispanic teachers working in the highest concentration of White schools reported significantly higher odds of being classified as Demanded.

As a final step, we conducted a sensitivity analysis to determine whether the results of the statistical models were a function of the weighting and variable selection (see supplemental Appendix). First, we ran the aforementioned current statistical models without weights. Results indicated from these analyses mirrored findings from the weighted models. Then, we examined the cell counts for Tables 3 and 4. Finally, we used the appraisal score index as the dependent variable, described above as the continuous variable measuring teachers' stress vulnerability, and ran OLS regressions with and without weights (see Appendix). The statistical models yielded similar results in terms of the directionality of the coefficients and statistical significance. These analyses led us to conclude that our models were sufficient given our stated hypotheses.²

² See the Supplemental Appendix for unweighted analyses, counts associated with Tables 3 and 4, and OLS regression results using the Appraisal Index as the dependent variable.

Table 5
 Log-Odds of Identifying as Demanded when Controlling for Teacher and School Race/Ethnicity

	(1)		(2)		(3)	
	Coefficient	Exp(B)	Coefficient	Exp(B)	Coefficient	Exp(B)
% Eligible, F/R Lunch	0.0163*** (0.000741)	1.016*** (0.000753)	0.0111*** (0.000811)	1.011*** (0.000820)	0.0111*** (0.000806)	1.011*** (0.000815)
<u>Teacher Race/Ethnicity</u>						
Black	-0.115* (0.0655)	0.891* (0.0583)	-0.556*** (0.0677)	0.574*** (0.0388)	-0.293** (0.127)	0.746** (0.0952)
Hispanic	-0.114** (0.0556)	0.893** (0.0496)	-0.331*** (0.0617)	0.719*** (0.0443)	-0.212* (0.121)	0.809* (0.0982)
<u>School Race/Ethnicity</u>						
White 51-74%			-0.402*** (0.0655)	0.669*** (0.0438)	-0.367*** (0.0680)	0.693*** (0.0471)
White >=75%			-0.744*** (0.0623)	0.475*** (0.0296)	-0.726*** (0.0645)	0.484*** (0.0312)
Black 51-74%			0.621*** (0.111)	1.862*** (0.206)	0.703*** (0.129)	2.019*** (0.261)
Black >=75%			0.574*** (0.0990)	1.776*** (0.176)	0.692*** (0.124)	1.997*** (0.248)
Hispanic 51-74%			0.255*** (0.0842)	1.290*** (0.109)	0.299*** (0.0887)	1.348*** (0.120)
Hispanic >=75%			0.119 (0.0967)	1.126 (0.109)	0.181 (0.122)	1.199 (0.147)
<u>Teacher * School</u>						
Black* White 51-74%					-0.335 (0.224)	0.715 (0.160)
Black* White >=75%					-0.00471 (0.405)	0.995 (0.403)
Black* Black 51-74%					-0.443** (0.191)	0.642** (0.123)
Black* Black >=75%					-0.444** (0.193)	0.641** (0.124)
Black* Hispanic 51-74%					-0.400 (0.245)	0.670 (0.164)
Black* Hispanic >=75%					-0.150 (0.254)	0.861 (0.218)
Hispanic* White 51-74%					-0.306 (0.223)	0.736 (0.164)
Hispanic* White >=75%					0.447* (0.235)	1.564* (0.368)
Hispanic* Black 51-74%					-0.184 (0.446)	0.832 (0.371)
Hispanic* Black >=75%					0.0592 (0.427)	1.061 (0.453)
Hispanic* Hispanic 51-74%					-0.145 (0.197)	0.865 (0.170)
Hispanic* Hispanic >=75%					-0.209 (0.173)	0.811 (0.141)
Constant	-1.812*** (0.0473)	0.163*** (0.00773)	-1.294*** (0.0645)	0.274*** (0.0177)	-1.321*** (0.0674)	0.267*** (0.0180)
Pseudo R-Squared	.01		.05		.06	

Note: SE in parenthesis, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Discussion and Policy Implications

Results from our study offer evidence in support of our hypotheses. Namely, teachers tend to work in schools with racial/ethnic student compositions similar to their own. Findings also indicate an interesting pattern of workplace appraisals—whereby race, school, and their intersectionality are associated with teachers' risk for occupational stress. The following sections highlight these findings, offering suggestions for how they might inform education policy and practice

A Student Like Me: Teacher Workplace Patterns in the United States

In a seminal study, Dee (2005) found that a marginalized student who had “a teacher like me”—sharing the same race, ethnic, and/or gender—was perceived more favorably and associated with higher learning outcomes than peers with racially incongruent teachers. More recently, Gershenson and colleagues (2018) found that not only were Black students assigned to at least one Black teacher during elementary school more likely to enroll in college, but also that these results were likely attributable to a “role model effect” in which experiences with successful, professional individuals who share their background provide Black students with “a ‘signal’... about the true returns to effort that leads students to update their beliefs and increase their effort” (Gershenson et al., 2018; p. 3). Building upon these results, our study would suggest that students in racially and ethnically homogeneous schools are more likely to have a “like” teacher, who is able to provide such a vital role as a role model.

While disparities between aggregate numbers of teachers of color and students of color are well-documented (Ingersoll & May, 2011; Sutchter, Darling-Hammond, & Carver-Thomas, 2016), fewer studies have sought to obtain a nuanced account of the distribution of teachers and students of color among U.S. public schools. It was not particularly surprising that our study found that teachers more frequently situate in schools where the student body was more likely to match their self-reported race/ethnicity. This conclusion follows naturally from research indicating that teachers tend to choose to teach schools that reflect their own schooling experiences (Boyd, Lankford, Loeb, & Wycoff, 2005; Haberman, 1995; Lortie, 1975). Additionally, previous studies confirm that minority teachers tend to work in majority minority schools.

What was surprising, however, was the magnitude of congruence across school type. Over half of all White and Hispanic teachers in the sample worked in schools where over 50% of the student body aligned with their respective race/ethnicity. The percentages were not much different for Black teachers. This finding extends previous results indicating that the majority of minority teachers tend to work in majority minority schools (Ingersoll & May, 2011). On a more granular level, we found that all teachers, regardless of race, concentrated in schools that match their actual racial and ethnic identity, rather than just their minority status.

The proportional size of this finding is worrying because it signals that, in addition to the prevalence of student segregation (Boger & Orfield, 2005; Mickelson, Smith, & Nelson, 2017), there is also a substantial pattern of racial homogeneity among teachers, which poses troubling consequences for students' schooling experiences. While Dee (2005) and others (Egalite & Kisda, 2018; Renzulli et al., 2011) found racial congruence correlated with better learning opportunities for students of color, there is a substantial educational threat from the inverse: students unexposed to teachers from diverse backgrounds. When schools fail to represent the cultural pluralism within our society there is an acute risk that individuals will lack contact with others not like them, which can perpetuate stigmas and unsubstantiated biases (King, 1993; Villegas & Irvine, 2010). Teachers are more likely to choose their workplace; whereas students are unlikely to choose their teacher.

Therefore, it is important to explore the underlying professional motivations of teachers if cultural heterogeneity among staff and students is a desired policy end. Examining how teachers perceive their workplace environments and the extent that their appraisals and corresponding risk for stress coincide with the racial/ethnicity of their students offers one way to understand how teachers make sense of their professional lives.

Among other surprising results, the analysis revealed relative positive appraisals in schools in which no single racial or ethnic group constituted 75% or more of the student body, or No Majority schools. First, we found that White, Black, and Hispanic teachers were represented in relatively equal numbers in No Majority schools (24.5%, 25.7%, and 22.8% respectively). To compare, White teachers made up as much as 35% of teachers in schools with 75% or more White students and as little as 2.1% in schools with 75% or more Black students. Additionally, our analysis found that No Majority schools tend to fall squarely in the middle in terms of teacher appraisals. Without accounting for the interaction between teacher and student race/ethnicity, teachers in No Majority schools were more likely to be demanded than teachers in Majority White schools, but less likely to be demanded than teachers in Majority Black and Majority Hispanic schools.

While findings from our study cannot determine why teachers' appraise less risk-adverse in Non-Majority schools, these findings do offer potential exploration in future studies: namely, how and to what extent do racially and ethnically cosmopolitan schools benefit teachers? Research has highlighted the multitude of ways in which students of color benefit from contact with others who share their background (e.g. Egalite & Kisida, 2018; Gershenson et al., 2018; Grissom & Redding, 2016) as well as, exposure to teachers and peers of different backgrounds. Where possible, racially pluralistic schools only serve to broaden teachers (and students) understanding of the world.

A Teacher-to-Workplace Racial Intersectionality: Policy and Ethical Considerations

It is well documented that TOC have both individual (Griffin & Tackie, 2016) and collectively (Achinstein, Ogawa, & Freitas, 2010) different experiences and expectations of teaching. Our study expands upon this research, suggesting that when these experiences are operationalized toward examining the workforce stress, there are substantial variations across race/ethnic lines. Analyses (re: Tables 4 and 5) illustrate significant difference in workplace risk for stress across teacher and student composition. Interestingly, when student composition is not taken into account, TOC report higher levels of Demand group classification compared to White teachers. When accounting for student composition, the pattern shifts and TOC report higher levels of stress. Though this study is not designed to explore the reasoning behind these patterns, qualitative studies of TOC offer substantiating narratives. Scholarship suggests that TOC report feeling undervalued in their positions (Achinstein, et al., 2010) and stigmatized in their roles (Kelly, 2007; Kohli, 2009). Teachers of color frequently experience an extra burden while serving as de facto cultural role models or hamstrung by extra, stigmatizing disciplinarian roles (Kohli & Pizzaro, 2016). Thus, it is not surprising that recruiting and retaining non-White teachers continues to challenge the field.

When accounting for student composition, the pattern flips. TOC are less likely to classify as at-risk for stress. In addition, all teachers working in schools with substantially higher proportion of students of color were significantly more at risk for stress compared to teachers working in White schools. One justification for these dramatic turn in main effects might lie in recent studies of school funding disparity. Figures indicate a \$23 billion gap in per pupil revenue between largely White and largely Non-White school districts (EdBuild, 2019). These gaps largely persist after controlling for student poverty levels. Recognizing that perceptions of workplace environments are subjective appraisals, it still stands that appraisals are aligned with teachers' access to instructional materials and

other professional supports. As such, providing more equitable access to funding and greater tangible resources to teachers might shift teachers' dispositions toward their workplace

Findings also indicate that teachers' racial/ethnicity potentially moderates the teachers' risk for stress by building type. Specifically, Black teachers working in highly concentrated Black schools were less likely to succumb to stress compared to White teachers and No Majority schools—what we refer to as a *teacher-to-workplace racial intersectionality*. This intersectionality manifests, as Black teachers working in increasingly racial/ethnic congruent settings were less likely to appraise at-risk for stress compared to their peers. Turning again to qualitative studies in order to potentially explain this phenomenon, research suggests that Black teachers seek employment in schools similar to their own experiences, often due to what Achinstein and colleagues (2010, p. 82) refer to as “humanistic commitments,” a desire to give back to the community. This line of analysis suggests nurturing and civic obligation draw individuals of color to teaching (Fare, 2006; Lewis, 2006).

From a policy perspective, these findings illustrate differences in teachers' race, school composition and workplace appraisal. Stakeholders at local and state levels frequently use workplace surveys, akin to the NPTS, for the purpose of measuring teacher working conditions and associated outcomes such as turnover and job satisfaction (Ladd, 2011; Sedivy & Boden McGill, 2012). Our findings suggest that when these instruments are used to measure workplace appraisals and operationalized to measure occupational well-being, it is important to consider teacher race/ethnicity as well as school context. In other words, it would benefit school leadership (including principals) to consider how teachers across race/ethnicity appraise their environments. If they observe variability in responses across race, it is worth having critical conversations with faculty to determine why these discrepancies exist. Administrators and other education stakeholders might not readily perceive micro-aggressions and implicit biases within schools. Opening dialogue with faculty to discuss differences in workplace climate is one potential approach toward minimizing risk for stress.

From a staffing perspective, the teacher-to-workplace racial intersectionality suggests that Black teachers are less likely to appraise as Demanded when working in highly concentrated Black schools compared to their peers. Given the continued perpetuation of de facto school re-segregation and substantial turnover in high non-White schools, an inescapable solution would be to aggressively recruit Black teachers to work in predominately Black schools, rationalizing that they would more likely appraise their workplace positively and remain in the classroom. However, this approach fails to consider that approximately 80% of current classroom teachers are White females. Hiring large numbers of Black and Hispanic teachers might narrow the gap, but it ignores the large White teaching force already in classrooms. Thus, promoting culturally-responsive teaching practices and dispositions must remain a top priority at both the pre-service and in-service level.

Such work, admittedly, calls for political courage among policymakers and other education actors. It requires difficult discussions on the educational implications of privilege, race, and biases (Kay, 2018; Paris, 2012). Such commitment necessitates policies, perhaps human resource policies, which disrupt inequitable behaviors and unfavorable micropolitics in schools buildings (i.e., challenging prescribed disciplinarian roles often associated with Teachers of Color). It also requires teacher education programs to imbue the skills for culturally responsive practice as well as promoting dispositions that acknowledge bias and seek to promote social justice (Gorski 2017). None of this is easy work, which is evidenced by the lack of substantive current exemplars from which to draw (Kavanaugh and Danielson, 2019). However, acknowledging the power of race/ethnicity to shape teachers' professional outlook is an important step.

Strengths, Limitations, and Future Directions

Our study employed a large, national data set that used self-reported data. Though our research relied upon self-reported survey items, we operationalized these data as self-appraisals within an established theoretical framework. Thus, we believe it was not a limitation to our study, but rather an asset. This research explores an under-analyzed area, the association between teacher- and school- race/ethnicity compositions on teachers' risk for stress. Our findings aligned with our hypotheses.

However, additional analysis is warranted. We were limited by the data in our ability to examine the racial composition of the students directly instructed by the teachers, which inhibits looking more pointedly at racial congruence. School and classroom demographics are not precisely correlated. Even within diverse schools, students of color continue to be underrepresented in more rigorous courses (Klopfenstein, 2004; Whiting & Ford, 2009). This inequity creates an opportunity for some teachers to experience classrooms that are more skewed racially and ethnically than others and therefore to experience racial and ethnic congruence effects in a way that cannot be captured through school-level aggregates. Future studies should examine the specifics of classroom congruence and its effects of teachers appraisals.

Future studies should also examine teachers' workplace appraisals toward different ends. Specifically, to what extent are risk for stress and racial (in)congruence between teachers /students antecedents for other vocational concerns. As an example, research might examine the extent that the teacher-to-workplace racial intersectionality is predictive of job satisfaction, burnout, and teacher attrition. Furthermore, more complex research designs could seek to isolate the intersectionality match in more precise ways, including using multilevel analyses or quasi-experimental designs. Specifically, future studies could examine to what extent teachers who self-identify differently on race/ethnicity, and work within the same building, vary in their appraisal of the school environment.³ Additionally, studies might use propensity score matching (similar to Grissom et al., 2015) to determine the extent that the level of congruence serves as a unique effect on teachers' stress appraisal while controlling for other teacher background characteristics.

Conclusion

Race/ethnicity and education remain inextricably tied. Our study adds further evidence that teachers continue to work in "like" environments. Associated with these phenomena, TOC appraise their workplace differently and demonstrate varying risk for stress compared to their White peers. From a policy perspective, these findings suggest that teachers do not universally perceive workforce demands and resource allocations the same way. Rather, educators bring their own lens, which is also informed by the students they teach, to their appraisals. As such, policymakers and education stakeholders should be wary of making decisions without considering the context of their schools and the demographics of their teachers. Furthermore, understanding the why and the how of teacher-to-workplace racial intersectionality should remain an important area of policy analysis. Only then, can we begin to disrupt biases and better inform teachers and other education professionals working with our increasingly diverse student populations.

³ Our initial analyses found that over 50% of the sample would be lost if the sample was limited to teachers nested in buildings with at least 4 other respondents.

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About the Authors

Paul G. Fitchett

University of North Carolina at Charlotte

Paul.Fitchett@uncc.edu

<http://orcid.org/0000-0003-3793-4029>

Paul G. Fitchett is a Professor and Assistant Dean for Teaching and Innovation at the Cato College of Education at the University of North Carolina at Charlotte. He studies the intersections among teacher working conditions, student learning outcomes, and educational policy.

Jendayi B. Dillard

University of Texas at Austin

jbdillard@utexas.edu

<http://orcid.org/0000-0001-9121-4191>

Jendayi B. Dillard is a Doctoral Student in the Department of Educational Psychology at the University of Texas at Austin and studies teacher working conditions and the ways in which race and ethnicity affects relationships and achievement in the classroom.

Christopher J. McCarthy

University of Texas at Austin

cjmccarthy@austin.utexas.edu

<http://orcid.org/0000-0001-6675-5818>

Christopher J. McCarthy is a Professor in the Department of Educational Psychology at the University of Texas at Austin. His scholarly focus is on researching factors that cause stress for K – 12 teachers and developing interventions to help teachers thrive.

Richard Lambert

University of North Carolina at Charlotte

rglamber@uncc.edu

<http://orcid.org/0000-0002-5791-962X>

Richard Lambert is a Professor in the Department of Educational Leadership in the Cato College of Education at the University of North Carolina at Charlotte, Director of the *Center for Educational Measurement and Evaluation*, and Editor of the *Journal of Applied Educational Policy Research*. His research interests include formative assessment for young children, applied statistics, and teacher stress and coping.

Kristen Mosley

University of Texas at Austin

k.mosely@utexas.edu

<http://orcid.org/0000-0002-3125-3540>

Kristen Mosley is a PhD Student in the Department of Educational Psychology at the University of Texas at Austin. She studies teacher stress and coping and is particularly interested in early career teachers' experiences with stress.

education policy analysis archives

Volume 28 Number 87

June 1, 2020

ISSN 1068-2341



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