The Impact of Demographic Representation on Absences and Suspensions

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Representative bureaucracy theory is central to public administration scholarship due to the likely relationship between the demographic composition of the public workforce and both the actual and perceived performance of public organizations. Primary school classrooms provide an ideal context in which to test the predictions of representative bureaucracy theory at the micro (student) level. Specifically, as parents have at least some agency over primary school students' daily attendance, absences partially reflect parental assessments of their child's school, classroom, and teacher. Ensuring students attend school each day represents an effort at coproduction on the part of parents. The representativeness of the teacher workforce, and specifically that of the student's classroom teacher, is therefore likely to influence student absenteeism. Similarly, student suspensions reflect students' relationships with their teacher, students' comfort level in the classroom, and teachers' discretion in the referral of misbehavior. These academically and socially important outcomes provide convenient, objective measures of behaviors that are likely influenced by street-level representation. Using longitudinal student-level administrative data from North Carolina, we use a two-way (student and classroom) fixed effects strategy to identify the impact of student–teacher demographic mismatch on primary school students' absences and suspensions. We find that representation among street-level bureaucrats significantly decreases both absenteeism and suspensions and that these effects can be given a causal interpretation. This pushes literature forward by establishing the importance of demographic representation in shaping productive relationships between individual bureaucrats and clients.

KEY WORDS: representative bureaucracy, student absences, elementary education, teacher workforce

　　由于公务人员的个人背景特征与公共组织的实际表现和观察绩效之间可能存在关系, 代表性官僚制理论可被视为公共管理研究的核心。小学教室提供了一个理想环境, 可以用于验证微观（学生）层面上的代表性官僚制理论。具体来说, 由于家长在一定程度上代理了小学生的日常出勤, 缺席情况部分反映出家长对孩子的老师和所在学校的评价。学生能够保证每天出勤, 还需要来自学生家长的努力。因此, 教师队伍的代表性可能会影响学生的缺勤情况。同样, 学生的暂时停学也反映出了学生与老师的关系, 学生在课堂上的舒适程度, 以及老师面对不当行为时的自由裁量。以上结果对于客观地考量那些可能受到街头代议制影响的行为有重要的学术和社会意义。我们采用双向（学生和教室）的固定效应策略来确定学生与教师之间的个人背景特征差异对小学生缺勤和停学的影响。我们发现, 街头官僚的代表性可以大大减少缺勤和停学, 并且二者具有因果关系。

Introduction

Representative bureaucracy theory considers the relationship between demographic representation in public bureaucracies and demographically similar citizens' outcomes resulting from discretionary decisions made by street-level bureaucrats and public managers. Public administration scholarship on representative bureaucracies focuses on theoretical mechanisms through which bureaucratic decisions that shape policy outcomes respond to the interests and needs of all subgroups in society (Grissom, Kern, & Rodriguez, 2015; Krislov, 1974; Mosher, 1968). Scholarship on representative bureaucracy theory consistently demonstrates a link between passive and active representation through systematically improved outcomes for same-race or same-gender citizens in areas subject to bureaucratic discretion in a variety of public service contexts (e.g., Grissom & Keiser, 2011; Hong, 2016; Keiser, Wilkins, & Meier, 2002; Meier & Stewart, 1992; Pitts, 2007; Resh & Marvel, 2012; Riccucci, Van Ryzin, & Lavena, 2014; Roch, Pitts, & Navarro, 2010; Selden, 1997; Theobald & Haider-Markel, 2009). More recently, scholars have begun to examine the symbolic effects of demographic representation on public responses to interactions with bureaucrats (e.g., Andrews, Ashworth, & Meier, 2014; Gade & Wilkins, 2013; Meier & Nicholson-Crotty, 2006; Riccucci et al., 2014; Riccucci, Van Ryzin, & Li, 2016; Theobald & Haider-Markel, 2009; Wilkins & Williams, 2008, 2009). Symbolic effects of demographic representation increase the public's perceived legitimacy of bureaucrats' decisions (Riccucci et al., 2014; Theobald & Haider-Markel, 2009) and facilitate the coproduction of public services (Andrews et al., 2014; Riccucci et al., 2016).

While prior research on the symbolic effects of demographic representation uses survey data to establish the importance of demographic alignment with street-level bureaucrats for positive citizen perceptions of a public organization (e.g., Riccucci et al., 2014, 2016), the literature has yet to consider citizens' coproduction-related behavioral responses to demographic representation.[1] Specifically, we posit that demographic representation within public bureaucracies engenders trust and induces additional effort from citizens to coproduce public services. Moreover, in addition to changing policy outputs in the aggregate at pubic organizations, demographic representation directly shapes the relationships between individual street-level bureaucrats and the citizens they serve. Public primary schools provide ideal environments in which to test this extension of representative bureaucracy theory because parents and students primarily interact with one teacher and, given the importance of parents' participation for early educational outcomes, public education is a public service that encompasses numerous opportunities for coproduction to boost productivity (i.e., achievement) (Bifulco & Ladd, 2005). To test the effects of demographic representation on the relationship between individual bureaucrats and the citizens they serve, this study uses student-level data to test for systematic differences in student suspension and attendance patterns attributable to the racial mismatch between primary school students and their classroom teachers.

Teachers are street-level bureaucrats who serve as the contact point between families and schools, and exercise a great deal of discretion that plays an important role in the educational process (Pitts, 2007). The relationship between teachers, school

staff, and families can have large effects on student absenteeism (Epstein & Sheldon, 2002). As students in elementary school lack complete agency over their attendance decisions, elementary students' absenteeism may provide an indicator of parents' assessments of a school's or teacher's effectiveness (Morrissey, Hutchison, & Winsler, 2014; Zanoni, 2015). Coproduction in the effective provision of education services relies on parental involvement (Bifulco & Ladd, 2005), and absences in elementary school represent a behavioral measure of parental willingness to coproduce with teachers and schools in response to demographic representation. Moreover, highlighting the importance of coproduction in educational outcomes, research shows that student absences reduce academic achievement (e.g., Gershenson, 2016; Goodman, 2014; Gottfried, 2009) and put students at risk for future truancy (e.g., Alexander, Entwisle, & Horsey, 1997; Ensminger & Slusarcick, 1992; Rumberger, 1995). Marginal absences in elementary school directly attributable to racial mismatch between teachers and students represent a partial measure of the symbolic effects of demographic representation in the school workforce. That is, within-student changes in absenteeism attributable to changing from a same-race to an other-race teacher reflect a change in parental engagement with the school driven, in part, by parents' perceptions of the school's legitimacy decreasing in response to interactions with an unrepresentative teacher (i.e., symbolic effects).

Suspensions also measure the relationship between teachers and students. Suspensions arise in response to student infractions. Infractions may occur, in part, in response to racial mismatch between a teacher and student. Because teachers exercise some discretion in the referral of punishment for student infractions (Bradshaw, Mitchell, O'Brennan, & Leaf, 2010; Kinsler, 2011; Rocque, 2010; Skiba et al., 2014), scholars studying representative bureaucracy have often used suspensions to test the correlation between teacher workforce demographics and the exercise of discretion in punishment (e.g., Grissom, Nicholson-Crotty, & Nicholson-Crotty, 2009; Meier, 1993; Meier & Stewart, 1992; Roch et al., 2010; Rocha & Hawes, 2009). In addition to providing a useful measure of teacher and student classroom dynamics, research has shown that, similar to students with more absences in elementary school, students who are suspended from school early in their academic lives, particularly via out-of-school suspensions (OSS), show patterns of increased truancy and lower academic achievement (Arcia, 2006; Costenbader & Markson, 1998; Mendez, 2003; Mendez, Knoff, & Ferron, 2002) and may become alienated from their classmates and teachers in ways that cause them to further disengage from school (Finn, 1989).

The current study contributes to the extant representative bureaucracy literature, which generally documents a strong relationship between district-level demographic representation among teachers and student achievement (e.g., Meier, 1993; Meier & Stewart, 1992; Pitts, 2007), in several ways. First, we expand representative bureaucracy theory to include personal relationships between bureaucrats and individual citizens as a mechanism by which demographic representation affects the performance and outputs of public organizations. We argue that the organization-level correlation between demographic representation and beneficial outcomes for represented subgroups can be explained, in part, by improved relationships between individual teachers and the students and parents they serve. Further, as a function of

improved relationships between students, parents, and teachers, demographic representation will lead parents to expend more effort in coproduction with schools. Our focus on the relationship between individual citizens and street-level bureaucrats extends representative bureaucracy theory by suggesting that increased representation in public workforces affects decision making both "upward," through aggregate decision making in the exercise of discretion throughout the organization, and "outward," through improved relationships and coproduction with the broader community.

Second, we test these theoretical extensions of representative bureaucracy theory by examining a novel outcome, student attendance, to test the theoretical symbolic effects of demographic representation and citizen coproduction of public services. Student attendance is a useful outcome in this context because, in addition to established links between attendance and achievement, attendance in elementary school partly reflects parents' assessments of their child's school and their relationship with their child's teacher. Moreover, while previous work on willingness-to-coproduce uses survey data concerning public intentions regarding a hypothetical program (Riccucci et al., 2016), attendance captures a quantifiable action on the part of parents and students, observable in administrative data. Using data on student attendance allows us to investigate the mechanisms through which representation affects public organizations' performance suggested by representative bureaucracy theory, such as perceived legitimacy and public support (Andrews et al., 2014; Krislov, 1974; Riccucci et al., 2014), by examining households' coproduction-related responses to racially mismatched teachers.

Third, we introduce two-way fixed effects (FE) estimators, which are now a commonly used tool in labor economics (e.g., Abowd & Kramarz, 1999), to the study of representative bureaucracy. This approach is useful in that it can frequently identify causal estimates in observational studies by simultaneously controlling for multiple sources or dimensions of unobserved heterogeneity (omitted variables) and has many potential applications in public management and public administration research. For example, simultaneously controlling for employee and agency FE that control for unobserved, time-invariant individual characteristics that affect sorting into agencies and agency-specific cultures and missions, respectively, would potentially facilitate the estimation of causal effects of management initiatives and other interventions on public employee motivation, performance, and turnover.

Finally, we use student-level data to study representative bureaucracy in the context of education, which reduces concerns about potential aggregation bias (Burstein, 1980; Hanushek, Rivkin, & Taylor, 1996) and provides new evidence on the microprocesses that undergird results from previous analyses conducted at the school (Grissom et al., 2009; Keiser et al., 2002; Roch et al., 2010) and district (Meier, 1993; Meier & Stewart, 1992; Pitts, 2007) levels. Organization-level measures capture potential multiplier effects attributable to proportional representation. That is, as minority groups become more represented among staff in schools and districts, decision making throughout these organizations shifts in response to the inclusion of a wider range of views, perspectives, and values. Although school-level, district-level, and aggregate factors influence the effect size of demographic representation on policy

outcomes, we focus on the micro-level interactions between street-level bureaucrats and the citizens they serve. Focusing on individual-level effects of demographic alignment allows us to estimate the causal effect of demographic alignment on both the bureaucrat's and citizen's decision making. Individual-level data reflect the manner in which the public engages with a public organization and vice versa at the street level and allows us to examine the extent to which demographic mismatch with individual bureaucrats contributes to higher-level patterns.

The current study relies on longitudinal administrative data on all primary school (grades K–5) students and teachers in North Carolina's public schools between the 2006 and 2010 academic years.[2] Causal effects of student–teacher racial mismatch on student outcomes are identified via a two-way student and classroom FE strategy (e.g., Fairlie, Hoffman, & Oreopoulos, 2014). The main results indicate that students assigned to an other-race teacher have significantly more absences and suspensions, and are more likely to be chronically absent and to be suspended at least once, than their counterparts who were assigned to a same-race teacher. These effects are slightly larger for male students, and particularly non-white male students, though these differences are rarely statistically significant. A "sorting test" suggests that these results are unlikely to be driven by nonrandom sorting of students to other-race teachers, further supporting a causal interpretation of the main results. Together, these results provide robust support for the prediction of representative bureaucracy theory that representation directly affects relationships between street-level bureaucrats and the public they serve.

Prior research on demographic mismatch and representative bureaucracy in the education context uses test scores and punishments to make inferences about the relationship between mismatch, student and teacher interactions, and effort in the classroom. However, in addition to hypothesizing about how representation directly affects performance, representative bureaucracy theory also suggests that more representative public organizations will engender broader public support. Absenteeism in elementary school at least partially reflects the relationship between parents, teachers, and students: when parents view their child's school and teacher positively, they invest more effort in facilitating regular school attendance. Using absenteeism as a novel measure of public behavioral response to representation among street-level bureaucrats in schools, we show that, in the context of education, representation and coproduction are positively linked and serve as a mechanism through which representation affects performance.

Literature Review and Theoretical Framework

Representative Bureaucracy Theory

First postulated by Kingsley (1944), representative bureaucracy theory has received a great deal of attention from public administration scholars. Dolan and Rosenbloom (2003) and Keiser (2010) provide general reviews of the literature. Grissom et al. (2015) articulate representative bureaucracy theory's implications for research on education policy and practice. Since Kingsley (1944), representative

bureaucracy theory has evolved to explicitly draw empirically testable links between the representativeness of a given bureaucracy and policy outputs from the bureaucracy itself (e.g., Long, 1952; Van Riper, 1958).

Mosher (1968) distinguished between passive representation (i.e., the degree of demographic match between a bureaucracy and its constituents) and active representation (i.e., the degree to which a bureaucrat exercises discretionary authority to directly benefit the demographic group with which the bureaucrat most closely identifies). Further, Mosher argued that passive representation can provide important symbolic signaling that legitimizes bureaucrats' decision-making authority (i.e., symbolic effects). Others have suggested that passive representation is more likely to transition into active representation as a particular subgroup's proportion increases within an organization (Krislov, 1974; Meier, 1975; Rosenbloom & Featherstonhaugh, 1977). Empirical research has demonstrated that active representation is more likely when an organization's actions can benefit the standing of a specific underrepresented or disadvantaged subgroup (e.g., the provision of education, loans at favorable rates, access to cash benefits, or punitive actions from law enforcement) (Keiser et al., 2002; Meier & Stewart, 1992; Selden, 1997; Thompson, 1976). The influence of demographic representation on policy outcomes becomes particularly salient when implementation of the policy involves bureaucratic discretion (Andrews et al., 2014; Hindera, 1993; Meier & Bohte, 2001; Pitts, 2005, 2007; Resh & Marvel, 2012; Roch et al., 2010; Selden, 1997), and the cultural context heightens racial or gender identities associated with the policy (Grissom et al., 2009; Keiser et al., 2002; Wilkins, 2007; Wilkins & Keiser, 2006).

Of particular relevance to the current study are the symbolic effects of the representativeness of the public workforce on citizen interactions with government officials. Specifically, representative bureaucracy theory postulates that a more demographically representative bureaucracy sends symbolic signals of equal opportunity for social advancement. Such symbolic effects could in turn lend legitimacy to, and acceptance of, bureaucratic decisions and openness to coproducing public goods and services (Gade & Wilkins, 2013; Krislov, 1974; Riccucci et al., 2014, 2016; Theobald & Haider-Markel, 2009). The link between symbolic representation and public trust in public organizations has been empirically tested in a variety of contexts. For instance, Marschall and Ruhil (2007) found that African-American citizens had more positive views of public services in cities where African-Americans had greater representation in city hall and on school boards. Meier and Nicholson-Crotty (2006) found that police forces with more female officers received more reports of sexual assault and made more arrests related to sexual assault crimes (Riccucci et al., 2014). Theobald and Haider-Markel (2009) also examined police officers and found that respondents are more likely to view police sanctions as legitimate if a same-race officer is present during the incident (Wilkins & Williams, 2008, 2009). These findings suggest a reciprocal relationship between passive and active representation at the street level of public organizations. When public servants look like the citizens they represent, citizens' trust in public services increases and public servants are more responsive to citizens' concerns. More importantly, applying these insights to the context of coproducing education, parents interacting with a same-race teacher

(passive representation) may trust that teacher more (symbolic effects) and invest more effort in coproductive behavior, such as ensuring their child's attendance.

In the context of education, several studies suggest that the representativeness of the teacher workforce creates both symbolic and active representation. Meier and Stewart (1992) used data from Florida to test whether black students in districts with more representative teacher workforces experienced different rates of tracking, suspensions and expulsions, and academic achievement. The authors found that an increase in the proportion of black teachers in the district led to fewer severe disciplinary actions, more tracking into gifted programs, and higher achievement for black students. These results suggest a positive correlation between passive and active representation. Similarly, Keiser et al. (2002) used data on Texas school districts to examine the relationship between student–teacher gender congruence and student achievement. The authors found a positive relationship between a high school's proportion of math teachers who are female and female students' performance on math standardized tests.

The evidence described above documents a clear association between demographic representation and student achievement, and a similar relationship for the preponderance of empirical analyses examining academic tracking, suspensions, and expulsions. The relationship between street-level bureaucrats and the public they serve may be a mechanism through which representation affects performance. In the context of primary schools, the relationship between teachers, parents, and students likely shapes student absenteeism. We introduce student absenteeism as a novel behavioral measure of teacher relationships with the families they serve.

Absences

As parents have at least some control over primary school students' attendance, parents' attitudes and beliefs about education likely affect student absenteeism in elementary school (Alexander et al., 1997; Morrissey et al., 2014). For example, children in low-income households and the children of young mothers are more likely to be chronically absent than their more advantaged counterparts (NCES, 2006; Romero & Lee, 2008). A disproportionate share of the absences of low-income students and students with behavioral problems are unexcused absences (Gottfried, 2009). Finally, Zanoni (2015) demonstrates that parental involvement shapes absences through fifth grade, at which point students begin to develop more agency over their school participation and attendance. Together, these descriptive patterns suggest that household characteristics, particularly parents' educational background and involvement, influence student absences in primary school and that at least some student absences are discretionary. That is, to the extent that parents' educational attainment reflects attitudes and beliefs toward education, these studies provide some evidence that discretionary absences in elementary school will be shaped by parents' assessments of the importance of education for their child. These assessments may be influenced, in part, by parents' relationships with teachers.

Factors outside the household may influence student attendance as well. Teachers likely influence students' noncognitive development, behavior, and attitudes toward education as well (Gershenson, 2016; Jackson, 2013). Specifically, teachers might influence student attendance by promoting student engagement, creating a sense of community in the classroom, and directly imparting the importance of regular attendance (Baker et al., 2010; Kelly, 2012; Ladd & Sorensen, 2017; Monk & Ibrahim, 1984). Particularly in the primary school context, teachers may actively contact parents to either proactively or reactively address attendance concerns (Epstein & Sheldon, 2002; Sheats & Dunkleberger, 1979). Indeed, as Zanoni (2015) notes, interventions designed around teachers contacting parents show more success in primary school when parents have more control over student attendance, underscoring the importance of teacher relationships with parents in shaping student attendance. A growing body of evidence supports these hypotheses: Ladd and Sorensen (2017) and Gershenson (2016) show that primary and middle school teachers in North Carolina affect student attendance and Jackson (2013) shows that ninth grade teachers affect a "noncognitive skill index" of which student absences are an element. However, these studies do not identify the mechanisms through which such effects operate.

Representative bureaucracy theory suggests that demographic representation among street-level bureaucrats improves the relationship between street-level bureaucrats and citizens and engenders a willingness to coproduce. Thus, representation among the teacher workforce, specifically student–teacher demographic match, may be one mechanism through which teachers affect student attendance.

Coproduction focuses on the means by which administrators can elicit voluntary cooperation from the public and active participation in public services (Brudney & England, 1983). Because attendance in elementary school is mandated by state law in North Carolina and reflects a smaller direct contribution of parents to their children's education than volunteering or parent–teacher association involvement, student attendance is an imperfect proxy for coproduction. For instance, volunteering at a school requires that parents become an active input in the production of education. However, more active forms of coproduction, such as volunteering, may also be confounded by parents' work schedules and resources. Conversely, in elementary school, ensuring consistent student attendance requires modest levels of active participation on the part of parents and, prior to sanctionable levels of absenteeism, reflects a voluntary participation in educational services. Thus, unexcused absences reflect, in part, parents opting to reduce voluntary, active participation in their child's schooling. While attendance likely reflects a minimum level of coproduction, it avoids other potential confounders inherent in more intensive coproduction behaviors.

Suspensions

Black students receive suspensions, particularly OSS, at higher rates than their white peers (Losen & Skiba, 2010; Mendez et al., 2002; Skiba, Michael, Nardo, & Peterson, 2002; U.S. Department of Education, Office for Civil Rights, 2014).

Moreover, black students frequently receive longer suspensions for the same type of infraction than their white peers (Kinsler, 2011; Skiba et al., 2014). Black students also disproportionately receive classroom referrals for suspension, indicating that classroom environments may influence both the frequency and duration of suspensions (Bradshaw et al., 2010; Rocque, 2010). These patterns highlight the fact that, unlike student absences, teachers and principals have discretion in both whether, and how severely, to use suspensions as a disciplinary tool. Rocha and Hawes (2009) note that suspensions, particularly OSS, may be used as a "second-generation discrimination" tool to exclude certain students from educational services (see also Meier & Stewart, 1992). The authors demonstrate that Latino/a and black students receive fewer suspensions as the socioeconomic status (SES) gap between races declines and argue that families with more resources can offer firmer resistance to discriminatory policies and punishments. The relationship between a student's race, family resources, and suspensions implies teachers and principals exercise some discretion over suspension decisions and may exercise that discretion strategically.

A small but growing literature investigates the schooling inputs and interventions that affect student suspensions. The noncognitive skill index studied by Jackson (2013) is based in part on student suspensions, and again Jackson finds significant variation in teachers' effects on students' noncognitive skills, as measured by this index. Guided by the predictions of representative bureaucracy theory and the two-way FE empirical strategy of Fairlie et al. (2014), the current study contributes to this literature by documenting the causal relationship between student–teacher racial mismatch and suspensions on both the intensive and extensive margins, as well as testing for heterogeneity in such relationships by student race and gender.

There are several reasons, many of which are motivated by representative bureaucracy theory, to expect that individual student–teacher racial mismatch might affect student suspensions. Skiba et al. (2014) demonstrate that although poverty and racial and ethnic differences in disruptive behavior frequently receive mention as potential drivers of the disproportionate suspension rates of black and Latino/a students, race remains the most consistent predictor of OSS even after accounting for student SES and type of behavioral infraction. The authors note that the persistent, strong correlation between race and OSS is consistent with the cultural mismatch hypothesis, which argues that implicit biases and racial stereotypes among teachers lead to more punitive responses to mild disruptions. The underrepresentation of minority teachers leads minority students to endure greater exposure to racial mismatch and potential bias in interactions with teachers. Indeed, research finds evidence of effects of student–teacher demographic mismatch on teacher behaviors in a variety of contexts. For example, black secondary school teachers have higher expectations for black students' educational attainment than do white teachers (Gershenson, Holt, & Papageorge, 2016). Demographically matched teachers also have more frequent positive individual interactions with students (Casteel, 1998; Meier, Stewart, & England, 1989). These studies exemplify active representation in the classroom and suggest that teachers' more positive dispositions toward same-race students might induce better behavior from same-race students and result in more lenient punishments for same-race students.

While previous work in the representative bureaucracy literature highlights the role that representation likely plays in the educational process, the extant literature's empirical analyses are largely conducted at the school- or school-district level (for a recent exception, see Nicholson-Crotty, Grissom, Nicholson-Crotty, & Redding, 2016). This is potentially problematic, as aggregated student outcomes, such as test scores or punishments, reflect both individual- and group-level processes, introducing potential aggregation bias into estimates using district-level data (Burstein, 1980; Hanushek et al., 1996). Disentangling group-level and individual-level effects is essential to establishing a causal link between bureaucratic representativeness and behavioral responses among the public. Moreover, teachers and students likely sort into schools and classrooms in a nonrandom fashion; studies that fail to account for such endogenous sorting are unlikely to identify the causal relationships that would provide definitive evidence of the behaviors predicted by representative bureaucracy theory. In other words, relationships between the demographic composition of a district's teacher force and the outcomes of demographically similar students in that district may be attributable to something other than representation (Clotfelter, Ladd, & Vigdor, 2005, 2006; Clotfelter, Ladd, Vigdor, & Wheeler, 2006; Guarino, Reckase, & Wooldridge, 2014). Bradbury and Kellough (2010) note the need for microlevel estimates of the impacts of demographic mismatch between bureaucrats and the citizens they serve on behavioral and policy outcomes in order to better establish causation.

Toward that end, the current study makes several contributions to the representative bureaucracy literature. First, we employ student and teacher (micro) level data to examine individual-level effects of demographic representation among teachers on student outcomes. Second, we introduce a novel empirical strategy for identifying unbiased estimates of the causal effects of demographic representation on students: two-way fixed-effects models that account for both student and teacher unobserved heterogeneity. Finally, we link education policy scholarship on absences and representative bureaucracy scholarship to identify street-level demographic representation as a mechanism through which teachers and schools influence student attendance. As non-white students are more likely to face racially mismatched teachers in the classroom, demographic representation may play a particularly important role in policy strategies aimed at reducing persistent race-based gaps in educational outcomes.

Hypotheses

The current study tests the following hypotheses derived from representative bureaucracy in the context of elementary education:

Hypothesis 1(a): Students assigned to an other-race teacher have more absences.
Hypothesis 1(b): Students assigned to an other-race teacher have more unexcused absences.
Hypothesis 1(c): Students assigned to an other-race teacher are more likely to be chronically absent.

The relationship between teachers and parents will influence parental decisions to coproduce with schools by ensuring their child attends school each day. Specifically, we expect that demographic representation will have a positive effect on coproduction, as measured by attendance in elementary school. Demographic representation among teachers may shape their relationships with parents through both active and passive means. For instance, teachers may more actively support students of the same race. This may be through higher subjective assessments of ability and educational potential (Gershenson et al., 2016; Meier & Stewart, 1992; Ouazad, 2014) or higher effort on the part of teachers (Keiser et al., 2002; Meier & Stewart, 1992). Alternatively, absenteeism may be caused by parental and student discomfort with other-race teachers through symbolic effects of demographic representation. We do not disentangle the effects of active and passive representation, although systematic differences in absences between the students of same-race and other-race teachers likely reflects behavioral responses to both active and passive representation.

Hypothesis 2(a): Students assigned to an other-race teacher have more suspensions.
Hypothesis 2(b): Students assigned to an other-race teacher are more likely to ever be suspended.

Despite a large body of evidence indicating that African-American students are suspended more often and for longer durations than their white counterparts (e.g., Gregory, 1995; U.S. Department of Education, Office for Civil Rights, 2014), the mechanisms driving these gaps remain unclear (Kinsler, 2011). If representation plays a role in referring students to suspension, students paired with racially mismatched teachers will be more likely to be suspended and to receive longer suspensions. Elementary education is an ideal context in which to test these hypotheses since students and parents interact primarily with a single classroom teacher. In other education contexts, such as high school or middle school, students interact with a variety of teachers throughout the day, complicating the identification of individual teachers' mismatch effects.

Data

The empirical analysis uses student-level longitudinal administrative data on kindergarten through fifth grade students in North Carolina's public schools between 2006 and 2010 to test the hypothesis that public behavior responds to demographic representation among street-level bureaucrats. The data were coded and made available to researchers by the North Carolina Education Research Data Center (NCERDC). The NCERDC student-level records from these years can be linked to unique classroom teacher identifiers via course membership files. The data also contain information on student and teacher demographics (i.e., race and sex) and annual tallies of students' total absences, excused and unexcused absences, and total suspensions.

Importantly, North Carolina public schools serve a diverse student body broadly similar to national demographics and student absence and suspension rates in North Carolina are broadly similar to those observed nationally (Gershenson, 2016; Wright, 2015). While the data used in the analysis come from one state, Gershenson (2016) demonstrates that teacher effects on absenteeism in North Carolina strongly resemble teacher effects on absenteeism observed in a nationally representative sample of students. Similarly, Wright (2015) finds similar relationships between representation and elementary suspensions using nationally representative data from the ECLS-K. Together, these findings suggest our results may be generalizable beyond North Carolina. Conversely, as Grissom et al. (2009) note, race carries different cultural meanings across regions within the United States, and historical context makes race particularly salient around education issues in southern states like North Carolina. While the general direction of the relationship between representation and absences or suspensions would likely be observed in other states, the relative size and practical importance of the effects may vary with the cultural context of the state.

Restricting the analytic sample to students in self-contained K–5 classrooms for whom student absences and basic student and teacher demographic information is observed yields a sample of 1,028,885 unique students, 43,708 unique teachers, 162,209 unique classrooms, and 2,124,022 student-year observations. As noted by Gershenson (2016), the North Carolina data shows no evidence of systematically missing data. Student-years are the unit of analysis. Suspension data and the distinction between excused and unexcused absences are sometimes missing, usually in concert and at the school or district level.

Dependent Variables

The primary dependent variable of interest is the count of annual total absences, which captures, in part, parental efforts at coproduction in response to relationships with teachers. When possible, we also decompose total absences into excused and unexcused absences. Unexcused absences are of particular interest, as teachers and schools likely have larger effects on unexcused absences and unexcused absences cause more harm to student achievement than do excused absences (Gottfried, 2009). Of course, focusing on average changes in annual absences may mask important distributional effects of student-teacher racial mismatch on absenteeism. For instance, a classroom taught by a black teacher in which most black students exhibit no change in annual absences and a handful of black students experience a large increase in attendance would yield a deceptively small average effect of having a same-race teacher on student absenteeism. To avoid such concerns, we also estimate models of chronic absenteeism, where chronic absence is defined as being absent 18 or more times during the academic year. While definitions of "chronically absent" vary, we choose 18 as it coincides with the modal definition of chronic absence, which is being absent on at least 10 percent of school days (18 absences per year in a standard 180 day tear) (Balfanz & Byrnes, 2012; Bruner, Discher, & Chang, 2011).[3] These analyses

are operationalized using binary variables as the dependent variable, which equals 1 if the student was absent 18 times or more, and 0 otherwise.

We also examine the effect of student–teacher demographic mismatch on total suspensions. Unlike absences, even one suspension is a major shock and many students complete entire academic years, and even entire primary school careers, without experiencing even one suspension. Accordingly, we consider an "ever suspended" outcome, which is a binary indicator equal to 1 if the student was suspended at least once during the academic year.

Independent Variables

The independent variable of interest is a measure of the racial match between student and teacher. We operationalize this by creating an other-race indicator that equals 1 if the student's race is different from the teacher's race and 0 if the student and teacher are of the same race. The other-race indicator can then be interacted with student race and gender indicators to test whether the effect of having an other-race teacher varies by students' demographic backgrounds. Importantly, as explained below, the student and classroom FE eliminate the need to condition on other student, teacher, and classroom control variables.

Descriptive Statistics

Table 1 summarizes the analytic sample. Column 1 does so for the full sample and shows that on average, students were absent about seven times per year and about 6 percent of students were chronically absent. On average, about 60 percent of absences were unexcused. As expected, suspensions are quite rare among primary school students: only about 3 percent of students were suspended in a given year. About 40 percent of students had an other-race teacher. The student population is slightly more than half white, one quarter black, and about 11 percent Hispanic.

Columns 2–5 of Table 1 similarly summarize the analytic sample separately for white, non-white, male, and female students, respectively. Consistent with previous research, a simple comparison of columns 2 and 3 shows that non-white students are significantly more likely to be suspended, and have more suspensions, than white students (e.g., Kinsler, 2011). Non-white students are also significantly more likely to have an other-race teacher than are white students, as the overwhelming majority of primary school teachers in North Carolina are white females. This is true in nationally representative survey data as well (Gershenson, 2016). Also consistent with past research, a simple comparison of columns 4 and 5 shows that male students are significantly more likely than female students to be suspended (e.g., Costenbader & Markson, 1998; Mendez & Knoff, 2003; Skiba et al., 2002). However, males and females are equally likely to be assigned to an other-race teacher, which is again consistent with patterns in nationally representative survey data (Gershenson, 2016).

Table 2 presents OLS estimates of descriptive regressions that further examine differences between demographic subgroups in the likelihood of being assigned to

Table 1. Analytic Sample Summary Statistics

Sample	All Students (1)	White Students (2)	Non-White Students (3)	Male Students (4)	Female Students (5)
Absences	7.084	7.402	6.671	7.133	7.031
	(6.330)	(6.259)	(6.398)	(6.389)	(6.267)
Chronic absence	0.060	0.061	0.059	0.062	0.058
Excused absence	4.292	4.922	3.476	4.292	4.292
	(4.806)	(4.964)	(4.463)	(4.824)	(4.786)
Unexcused absence	2.566	2.254	2.969	2.612	2.518
	(3.707)	(3.310)	(4.131)	(3.750)	(3.661)
Total suspensions	0.057	0.032	0.089	0.089	0.022
	(0.402)	(0.287)	(0.512)	(0.512)	(0.231)
Days suspended	0.096	0.048	0.158	0.152	0.037
	(0.862)	(0.653)	(1.070)	(1.116)	(0.454)
Ever suspended	0.033	0.020	0.050	0.050	0.015
ISS	0.014	0.010	0.019	0.022	0.006
	(0.191)	(0.156)	(0.229)	(0.240)	(0.120)
OSS	0.043	0.021	0.070	0.067	0.016
	(0.322)	(0.213)	(0.421)	(0.412)	(0.180)
Other race teacher	0.407	0.062	0.854	0.405	0.409
Student Demographics					
Male	0.513	0.516	0.510	1.000	0.000
White	0.564	1.000	0.000	0.567	0.562
Non-white	0.436	0.000	1.000	0.433	0.438
Asian	0.018	0.000	0.042	0.018	0.019
Native American	0.017	0.000	0.037	0.016	0.017
Black	0.251	0.000	0.574	0.250	0.251
Hispanic	0.114	0.000	0.261	0.114	0.114
Multi-racial	0.043	0.000	0.094	0.042	0.044

Notes: $N = 2,124,022$ student-years. (Suspension data observed for $N = 989,985$). Standard deviations of nonbinary variables are reported in parentheses. Chronic absence is a binary indicator equal to 1 if the student was absent 18 or more times during the academic year, and 0 otherwise. Ever suspended is a binary indicator equal to 1 if the student was suspended from school at least once during the academic year and 0 otherwise. ISS and OSS refer to In and Out of school suspensions, respectively.

an other-race teacher and in absences and suspensions.[4] Panel A uses crude white/non-white race categories while panel B uses six specific race categories. Column 1 confirms that non-white students are significantly more likely than white students to have an other-race teacher and that this is true for all racial minorities. Panel A of column 2 shows that males have slightly more absences than females, and that non-white students have almost one fewer absence per year than white students.

Panel B of column 2 reveals substantial heterogeneity in annual absences across non-white races. Specifically, the lower absence rate for non-white students seen in panel A is driven primarily by Asian students, who on average are absent two fewer times than white students. Black students, meanwhile, average 1.2 more absences per year than white students. Column 3 documents similar patterns in the probability of being chronically absent. Columns 4 and 5 of Table 2 do the same for total suspensions and "ever suspended," respectively. Once again, the demographic patterns in suspensions are similar to those documented in previous research and to those for absences documented in columns 2 and 3 of Table 2. Specifically, boys have more suspensions, and are more likely to have ever been suspended, than girls. Non-whites are more likely to have been suspended than white students, and this is

Table 2. Descriptive OLS Regressions

Dependent Variable	Other-Race Teacher (1)	Absences (2)	Chronic Absence (3)	Total Suspensions (4)	Ever Suspended (5)
A. Crude race groupings					
Male student	−0.001	0.109	0.003	0.067	0.036
	(0.000)*	(0.013)***	(0.000)***	(0.003)***	(0.001)***
White student	(omitted)				
Non-white student	0.796	−0.713	−0.001	0.057	0.031
	(0.006)***	(0.039)***	(0.001)	(0.004)***	(0.002)***
Adj. R^2	0.641	0.003	<0.001	0.012	0.017
B. Detailed race groupings					
Male student	−0.001	0.109	0.003	0.067	0.036
	(0.000)**	(0.013)***	(0.000)***	(0.003)***	(0.001)***
White student	(omitted)				
Asian student	0.897	−2.018	−0.022	−0.020	−0.010
	(0.004)***	(0.063)***	(0.002)***	(0.002)***	(0.001)***
Black student	0.587	1.195	0.036	0.032	0.019
	(0.056)***	(0.132)***	(0.004)***	(0.006)***	(0.003)***
Hispanic student	0.698	−0.682	0.003	0.096	0.050
	(0.008)***	(0.050)***	(0.001)**	(0.006)***	(0.002)***
Multiracial student	0.906	−0.982	−0.012	−0.002	0.000
	(0.003)***	(0.048)***	(0.001)***	(0.002)	(0.001)
Adj. R^2	0.644	0.007	0.001	0.018	0.024
N	2,124,022	2,124,022	2,124,022	989,985	989,985

Notes: Standard errors are clustered by school. Chronic absence is a binary indicator equal to 1 if the student was absent 18 or more times during the academic year, and 0 otherwise. Ever suspended is a binary indicator equal to 1 if the student was suspended from school at least once during the academic year, and 0 otherwise. ***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$.

driven by both black and Hispanic students. Asian students experience significantly fewer suspensions than white students.

Method

The goal of the current study is to estimate the causal effect of student–teacher racial mismatch on student outcomes (Y) such as absences and suspensions. Intuitively, then, interest is in the δ parameter in student-year multivariate regression models of the form

$$Y_{ijst} = \beta_0 + \beta_1 race_i + \beta_2 race_j + \delta 1\{race_i \neq race_j\} + \beta_3 X_i + \beta_4 Z_{jst} + \varepsilon_{ijst} \qquad (1)$$

where subscripts i, j, s, and t index students, teachers, schools, and years, respectively; *race* is a set of mutually exclusive race indicators; $1\{\cdot\}$ is an indicator function; X is a vector of time-invariant student characteristics (e.g., gender, innate ability); Z is a vector of time-varying teacher and school characteristics (e.g., teacher's experience, certification, class size; school's enrollment, resources, principal effectiveness); and ε is an idiosyncratic error term comprised of unobserved determinants of Y.[5]

Of course, OLS estimates of equation (1) are very likely biased by unobserved factors that jointly determine assignment to an other-race teacher and outcomes Y.

For example, parental motivation and involvement in children's education likely influences both student attendance and classroom assignments. Accordingly, we follow Fairlie et al. (2014) in augmenting equation (1) to include both student and classroom FE. Equation (1) becomes

$$Y_{ic} = \delta 1\{race_i \neq race_c\} + \theta_i + \omega_c + \varepsilon_{ic} \tag{2}$$

as student race and X are subsumed by the student FE (θ); teacher race and Z are subsumed by the classroom FE (ω); and the j, s, t subscripts collapse to a single classroom subscript (c) because the sample is restricted to students in self-contained classrooms.

Simultaneously controlling for student *and* classroom FE is crucial to the identification strategy. The student FE ensure that δ is identified from within-student variation in "other race" (i.e., students who have an other-race teacher in some years but not others) and thus control for potentially confounding student or household factors that jointly influence student outcomes and assignment to an other-race teacher. Similarly, the classroom FE ensure that δ is identified from within-classroom variation in "other race" (i.e., comparing students of different races in the same classroom, some who are the same race as the classroom teacher and some who are not). As teacher FE are subsumed by the classroom FE, classroom FE effectively control for the possibility that non-white teachers have different attitudes toward student discipline than do white teachers. The classroom FE also ensure that comparisons are made between white and non-white students who are subject to the same classroom resources, school policies, disruptions, school and teacher reporting of absences and suspensions, and instructional quality and philosophy. Estimating the two-way FE specification in equation (2) using the usual OLS estimator is computationally infeasible due to the high dimensionality of the model (i.e., 1,028,885 student FE and 162,209 classroom FE) (Abowd, Kramarz, & Margolis, 1999). We sidestep this problem by using the two-way FE estimation algorithm proposed by Mittag (2012).[6] Standard errors are clustered by school, which makes statistical inference robust to a lack of iid between students and classrooms within the same school, and to serial correlation within schools over time.[7]

The remaining threat to the validity of the two-way FE estimates is endogenous sorting that systematically varies by teacher and student background. Intuitively, the student FE control for the possibility that white and non-white students are systematically different, or that the students assigned to white teachers are systematically different from those assigned to non-white teachers. However, if such differences vary by student and teacher race, such differential sorting might bias the two-way FE estimates because the error term in equation (2) would be correlated with the "other race" indicator. An example of such differential sorting is the scenario in which black students with high unobserved ability sort into classrooms taught by black teachers while white students with high unobserved ability sort into classrooms taught by white teachers.

Following Fairlie et al. (2014), we test for the presence of this type of differential sorting on observables. Intuitively, if there is no systematic differential sorting on

observable student characteristics (L) and the elements of L are highly correlated with the ε in equation (2), then differential sorting on unobservables of the sort described above is unlikely to seriously threaten the validity of the preferred two-way student and classroom FE estimator given in equation (2).

Implementing a Fairlie et al. (2014) style test for differential sorting by observables requires computing the mean value of student characteristic L of classroom c's race-r students $\left(\overline{L}_c^r\right)$. In the simplest form of the test, we create a binary indicator equal to 1 for the black student average, and 0 for the non-black student average. We then use two observations per classroom to estimate linear regressions of the form

$$\overline{L}_{cgst}^r = \alpha Black_c + \gamma 1\{r=1\} + \pi Black_c \times 1\{r=1\} + \xi_g + \psi_s + \tau_t + e_{cgst}^r \qquad (3)$$

where c, g, s, and t index classrooms, grades, schools, and years, respectively; *Black* is a binary indicator equal to 1 if the classroom teacher is black, and 0 otherwise; $1\{\cdot\}$ is an indicator function; ξ, ψ, and τ are grade, school, and year FE, respectively; and e is an idiosyncratic error term. An alternative version of equation (3) is estimated in which the three FE are combined in one grade-by-school-by-year FE. Standard errors are clustered by schools.

The parameter of interest is π, which represents the "difference-in-differences estimate" of the average difference in observed characteristics between black and non-black students who are assigned to black and non-black teachers. Intuitively, if π is significantly different from 0, there is differential sorting on observables by student race that varies with the race of the classroom teacher. If this is occurring, it is likely that similar sorting occurs on unobservables as well, which would bias estimates of the preferred two-way FE model characterized by equation (2). Alternatively, if the OLS estimate of π is statistically indistinguishable from 0, there is no evidence of differential sorting on observables, and thus differential sorting on unobservables in a way that would bias the two-way FE estimates of (2) is unlikely.

Results

Sorting Test

Table 3 reports estimates of the sorting test characterized by equation (3) for six observed student characteristics that are likely correlated with the ε in equation (2): gender, lagged unexcused absences, lags of the "chronic absence" and "ever suspended" indicators, and administrative diagnoses of math and reading learning disabilities. Regardless of how the grade, school, and year FE are specified, Table 3 shows that the interaction term is statistically indistinguishable from 0, and small in magnitude, for each of the six student characteristics. There is no evidence of endogenous sorting on student observables into classrooms taught by "other race" teachers; thus, it is unlikely that such sorting occurs on unobservable dimensions.

Table 3. Sorting Test Estimates

Dependent Variable	Male (1)	Lagged Unexcused Absences (2)	Lagged Chronic Absence (3)	Lagged Ever Suspended (4)	Math Learning Disability (5)	Reading Learning Disability (6)
A. School, Grade, and Year FE Estimates						
Black student	−0.003	0.254	0.033	−0.008	0.007	0.003
	(0.002)*	(0.027)***	(0.002)***	(0.001)***	(0.002)***	(0.002)*
Black teacher	0.005	0.064	0.002	0.000	−0.001	0.013
	(0.002)**	(0.039)	(0.002)	(0.002)	(0.005)	(0.005)**
Interaction term (π)	**−0.002**	**−0.052**	**0.004**	**0.004**	**0.001**	**−0.001**
	(0.003)	**(0.054)**	**(0.003)**	**(0.003)**	**(0.004)**	**(0.004)**
N	169,736	79,909	58,610	95,110	89,015	89,015
B. School-by-Grade-by-Year FE Estimates						
Black student	−0.003	0.233	0.034	−0.008	0.005	0.001
	(0.002)*	(0.026)***	(0.002)***	(0.001)***	(0.002)***	(0.002)
Black teacher	0.005	0.063	0.001	−0.002	0.002	0.011
	(0.002)**	(0.037)*	(0.002)	(0.002)	(0.005)	(0.006)**
Interaction term (π)	**−0.002**	**−0.034**	**0.004**	**0.004**	**0.001**	**−0.000**
	(0.003)	**(0.052)**	**(0.003)**	**(0.003)**	**(0.003)**	**(0.004)**
N	169,736	79,909	58,610	95,110	89,015	89,015

Notes: Bold interaction terms are the interaction between the black teacher and black student mean indicators, which constitute the sorting test described by equation (2) in the text. Standard errors are clustered by school. ***$p < 0.01$, **$p < 0.05$, and *$p < 0.1$.

Effects of Racial Mismatch on Student Absences

Table 4 presents estimates of the baseline two-way FE specification for various measures of absenteeism. Column 1 uses a simple count of total annual absences and finds that being assigned to an other-race teacher leads to about 0.04 more absences per year, and this small effect is marginally statistically significant. Of course, focusing on the count of total annual absences might be misleading for at least two reasons. First, it could be that having an other-race teacher has a particularly strong effect on some students, but essentially zero effect on others. We investigate this hypothesis in column 2 by replacing the count of absences with a binary indicator equal to 1 if the student was chronically absent (18 or more absences), and 0 otherwise. The estimated effect of having an other-race teacher on the probability of being chronically absent is 0.002, which translates to a 3 percent increase, and is statistically significant.[8] This effect is arguably practically significant, as chronically absent students' math scores are about 0.1 SD lower than classmates who regularly attend school (Gershenson, Jacknowitz, & Brannegan, 2017).

Second, unexcused absences are likely more responsive than excused absences to schooling inputs and are therefore more likely to be influenced by teachers' representativeness. Accordingly, columns 3 and 4 of Table 4 report estimates of two-way FE models that take the annual counts of excused and unexcused student absences, respectively, as the dependent variable. Consistent with this reasoning, column 3 shows that there is essentially zero relationship between student–teacher racial match and students' excused absences, while column 4 shows that other-race teachers have a positive, statistically significant effect on unexcused absences of about 0.06

Table 4. Effect of Other-Race Teachers on Student Absences

Outcome	Absences (1)	Chronic Absence (2)	Excused Absences (3)	Unexcused Absences (4)
Other-race	0.042	0.002	−0.001	0.059
	(0.025)*	(0.001)**	(0.031)	(0.025)**
N	2,124,022	2,124,022	1,400,434	1,400,434
Adj. R^2	0.596	0.383	0.573	0.591

Notes: All models condition on both student and classroom FE. Both sets of FE are jointly statistically significant in all models. Standard errors are clustered by school. Chronic absence is a binary indicator equal to 1 if the student was absent 18 or more times during the academic year, and 0 otherwise. **$p < 0.05$ and *$p < 0.1$.

unexcused absences (2.3 percent). That the effect is larger on unexcused absences is consistent with the hypothesis of representative bureaucracy theory that some combination of passive and active representation affects students' and parents' engagement with the school and decision to actively coproduce with teachers. This intuitive result also provides additional evidence that our empirical strategy is identifying a causal relationship.

The baseline estimates reported in Table 4, which restrict the effects of student–teacher racial mismatch on student absences to be the same for all students, might mask important variation in such effects across the student body. Indeed, there are numerous reasons why such effects might vary by student demographics. For example, Gershenson et al. (2016) find that student–teacher demographic mismatch affects teachers' educational expectations for black students, and particularly for black males, but not for students from other racial backgrounds. More generally, effects of mismatch are likely greater for subgroups of the student population whose race and gender are underrepresented in the teacher workforce (Grissom et al., 2015; Meier & Stewart, 1992; Meier, Wrinkle, & Polinard, 1999; Rocha & Hawes, 2009; Thompson, 1976).

Accordingly, we test for heterogeneity in the causal relationship between student–teacher racial mismatch and student absences by augmenting equation (2) to include interactions between the other-race indicator and indicators of students' race and gender. Table 5 presents these estimates for three measures of absenteeism: total absences, chronic absence, and unexcused absences. The first three columns of Table 5 sequentially allow the effect of having an other-race teacher to vary by student gender, student race, and student gender and race simultaneously. The male and non-white interaction terms are always positive, but never statistically significant. The estimated effect for non-white males in column 3 of Table 5 is particularly striking, as it is nearly three times larger than the baseline estimate in column 1 of Table 4, and indicates that non-white males assigned to white classroom teachers have an extra 0.11 annual absences (2 percent).

Columns 4–6 of Table 5 do the same for chronic absence, and find similar patterns: males, non-white students, and particularly non-white males are disproportionately harmed by having an other-race classroom teacher. For example, the non-white males assigned to white teachers are 0.6 percentage points more likely to be

Table 5. Heterogeneous Effects of Racial Mismatch on Student Absences

Outcome	Absences			Chronic Absence			Unexcused Absences		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Other-race (OR)	0.014	0.003	−0.012	0.002	−0.001	−0.001	0.045	0.078	0.050
	(0.033)	(0.058)	(0.068)	(0.002)	(0.003)	(0.003)	(0.032)	(0.055)	(0.062)
OR×Male	0.055		0.027	0.001		0.000	0.028		0.054
	(0.045)		(0.067)	(0.002)		(0.003)	(0.041)		(0.058)
Male APE	0.069			0.003			0.073		
	(0.034)**			(0.002)*			(0.033)**		
OR×Non-white		0.075	0.050		0.007	0.006		−0.035	−0.012
		(0.098)	(0.108)		(0.004)	(0.005)		(0.094)	(0.101)
Non-white APE		0.078			0.005			0.043	
		(0.052)			(0.002)**			(0.052)	
OR×Male×Non-white			0.048			0.0003			−0.045
			(0.086)			(0.004)			(0.084)
Non-white male APE			0.114			0.006			0.047
			(0.060)*			(0.002)**			(0.061)
Joint significance of interaction terms (p)			0.504			0.501			0.792
N	2,124,022	2,124,022	2,124,022	2,124,022	2,124,022	2,124,022	1,400,434	1,400,434	1,400,434
Adj. R^2	0.596	0.596	0.596	0.383	0.383	0.383	0.591	0.591	0.591

Notes: All models condition on both student and classroom FE. Both sets of FE are jointly statistically significant in all models. Standard errors are clustered by school. Chronic absence is a binary indicator equal to 1 if the student was absent 18 or more times during the academic year, and 0 otherwise. Standard errors for the average partial effects (APE) were computed via the delta method. **$p < 0.05$ and *$p < 0.1$.

chronically absent than non-white males assigned to a same-race teacher, and this difference is statistically significant at the 5 percent confidence level. This estimate is arguably practically significant as well, as it represents a 10 percent increase in the likelihood that a student is chronically absent.

Finally, columns 7–9 of Table 5 repeat the exercise for unexcused absences. These results are more mixed, as the non-white interaction terms are smaller in magnitude and sometimes negative, although none of the interaction terms are statistically significant. However, column 7 does show that boys' unexcused absences are more affected by having an other-race teacher than those of girls, which is consistent with the results for total absences and chronic absence observed in columns 1 and 4 of Table 5.

Effects of Racial Mismatch on Student Suspensions

Table 6 analyzes the relationship between student–teacher racial mismatch and student suspensions in the same ways that student absences were investigated in Tables 4 and 5. Similar patterns emerge: assignment to an other-race teacher increases students' propensity to be suspended and these effects are strongest among male and non-white students. Column 1 of Table 6 presents baseline two-way FE estimates of the effect of student–teacher racial mismatch on the intensive margin of student suspensions, as measured by total annual suspensions. The estimate in column 1 shows that, on average, students with a racially mismatched teacher are suspended 0.01 more times per year than their counterparts with a race-congruent

Table 6. Effects of Racial Mismatch on Student Suspensions

Outcome	Total Suspensions				Ever Suspended			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Other-race (OR)	0.011	0.006	0.006	0.010	0.005	0.002	0.002	0.003
	(0.005)**	(0.005)	(0.009)	(0.009)	(0.002)**	(0.002)	(0.004)	(0.004)
OR×Male		0.011		−0.008		0.005		−0.002
		(0.008)		(0.008)		(0.004)		(0.005)
Male APE		0.017				0.007		
		(0.008)**				(0.003)**		
OR×Non-white			0.010	−0.008			0.006	−0.001
			(0.015)	(0.015)			(0.008)	(0.008)
Non-white APE			0.017				0.007	
			(0.010)*				(0.005)	
OR×Male×Non-white				0.035				0.014
				(0.016)**				(0.008)*
Non-white male APE				0.030				0.013
				(0.013)**				(0.006)**
Joint significance of interaction terms (p)				0.192				0.271
Adj. R^2	0.432	0.432	0.432	0.433	0.340	0.340	0.340	0.340

Notes: $N = 989{,}985$. All models condition on both student and classroom FE. Both sets of FE are jointly statistically significant in all models. Standard errors are clustered by school. Ever suspended is a binary indicator equal to 1 if the student was suspended from school at least once during the academic year, and 0 otherwise. Standard errors for the average partial effects (APE) were computed via the delta method. **$p < 0.05$ and *$p < 0.1$.

teacher. While this effect is modest in magnitude, recall that suspensions in elementary school are relatively rare: a 0.01 increase in suspensions constitutes a 19 percent increase in suspensions from the sample mean.

Columns 2–4 of Table 6 augment the model estimated in column 1 to allow the effect of having an other-race teacher to vary by students' gender and race. Consistent with the results for student absences, the male and other-race interaction terms in columns 2 and 3 are positive but statistically insignificant. Column 4 of Table 6 further extends the model to allow the racial mismatch effect to vary by student gender and race simultaneously. The male-non-white triple interaction term is positive, relatively large in magnitude, and statistically significant. This indicates that on average, relative to white females assigned to non-white teachers, non-white males assigned to white teachers experience 0.035 more suspensions per year. The net effect of having a white teacher for non-white male students is 0.03 suspensions (>20 percent increase).

The number of suspensions is an appealing measure of student conduct in that the number of suspensions likely approximates the number of severe behavioral incidents. However, suspensions are rare in elementary school and, by definition, students who experience multiple suspensions in a given year are rarer still. Moreover, the extensive margin (i.e., whether a student is ever suspended during the course of the school year) may be more policy and developmentally relevant, given the discrete disruption associated with even a single incident that leads to a suspension. Thus, columns 5–8 of Table 6 repeat the analysis of the relationship between student–teacher racial mismatch and a binary indicator equal to one if the student was ever suspended.

The baseline estimate reported in column 5 of Table 6 shows that being assigned to an other-race teacher increases the likelihood that a student is ever suspended by half of a percentage point. Again, although the point estimate is small in magnitude, it represents a 15 percent increase in the baseline probability that an elementary school student is suspended in a given year. Column 5 shows that the effect is slightly larger for males, and remains statistically significant, although the difference between male and female students is not significantly different from 0. Like the results for total suspensions, column 7 shows that an other-race teacher has no significant impact on the likelihood of being suspended at least once for non-white students, although the point estimate remains positive and of similar magnitude. Finally, and again consistent with the results for total suspensions reported in column 4, column 8 of Table 6 shows that the impact of student–teacher racial mismatch on the probability that a student is suspended in a given academic year is mostly driven by non-white males in classrooms taught by white teachers. Again, the statistically significant point estimate of about 0.01 is practically significant as well, which amounts to approximately doubling the likelihood that non-white males are suspended at least one time during a given academic year. The relationship between teacher mismatch and suspension being driven by non-white males in classrooms with white teachers and not the reverse is consistent with the cultural mismatch hypothesis that implicit bias affects teacher discretion in referral for punishment (Skiba et al., 2011, 2014).

Discussion

The results provide strong evidence of a causal relationship between student–teacher racial mismatch and student absenteeism and suspensions, as predicted by representative bureaucracy theory. Our within-classroom analysis of the impact of racial mismatch at the student–teacher level finds modest, positive, statistically significant effects of racial mismatch on both absenteeism and suspensions, regardless of how absenteeism and propensity to be suspended are measured. Despite the modest effect sizes for student absences, these estimates provide the clearest evidence to date that representative bureaucracy theory correctly emphasizes the importance of broad representation of a diverse array of subgroups among street-level bureaucrats for effective governance. Moreover, the modest absolute increase in chronic absenteeism reflects a substantive increase of 3.3 percent in the likelihood a student will be chronically absent. As previously noted, chronic absenteeism has particularly strong negative effects on long-run student success and evidence suggests that reducing chronic absenteeism alone can yield significant reductions in sociodemographic achievement gaps (Balfanz & Byrnes, 2012).

The effects of student–teacher racial mismatch on student suspensions are even larger than those on student absences. Suspensions are particularly interesting in this case because they characterize both the relationship a teacher has with students and the discretion a teacher exercises in the "sentencing" process following an incident through recommendations and referrals to administrators. The former captures elements of passive representation while the latter is more associated with active representation. While the current study stops short of disentangling these two mechanisms, the results nonetheless provide strong evidence that representation among teachers matters at the classroom level. Students with racially mismatched teachers experienced a 20 percent increase in suspensions, driven primarily by the response of non-white male students to white classroom teachers. Further, students with racially mismatched teachers experienced a 15 percent increase in the likelihood of being suspended at least once during the academic year. These sizable effects underscore the likelihood that some combination of passive and active representation at the classroom level affects socially, academically, and developmentally important student outcomes.

The evidence of a causal link between student–teacher demographic mismatch and student suspensions and absences presented here provides novel, strong support for representative bureaucracy theory, which predicts that demographic alignment among street-level bureaucrats and the citizens they serve cultivates a better relationship for coproducing public services. These effects, estimated at the individual level, provide the strongest evidence to date that both passive and active representation play important roles in the administration of effective public organizations. While organization-level inputs and context likely moderate the magnitude of the relationship between demographic match and policy outcomes, these results reflect minimum estimates of the effect of demographic representation on the production of public services and indicate that even at street-level interactions, demographic representation provides important benefits for minority students. This carries important implications for representative bureaucracy scholarship, as it indicates that in street-

level positions with broad discretion, individual bureaucrats of the same race or ethnicity as their citizens can form strong, productive relationships even if the larger organization's workforce is not broadly representative.

Conclusion

Together, student suspensions and absences provide a snapshot of outcomes that are likely shaped by the relationships that teachers form with students in their classrooms and with students' parents more generally. Students who miss instructional time, whether due to absence or suspension, fall behind their peers and require additional effort, as well as support from teachers and parents, to catch up. Student–teacher demographic mismatch has a positive impact on both absences and suspensions, which suggests that some combination of passive and active representation occurs in the classroom. Demographic representation in the classroom shapes the individual relationship between street-level bureaucrats, in this case teachers, and citizens in ways that facilitate coproduction and avoid disruptions that harm organizational performance. In the context examined here, students, parents, and teachers of the same race likely cultivate a stronger relationship and these relationships reduce the amount of instructional time missed by the students, indirectly aiding a core goal of schools. The results of the study suggest staffing public bureaucracies with more demographically representative staff at the street level might improve citizen engagement with public organizations by inducing a basic form of coproduction. These findings carry both immediate practical implications and generate additional questions for future research.

First, the larger effects of racial mismatch on non-white males underscores the need to diversify the teacher workforce, which both nationally and in North Carolina, remains composed predominantly of white females. However, a practical limitation of policies designed to hire more non-white teachers, at least in the short run, is the limited supply of non-white teachers in U.S. public schools and in the teacher-training pipeline (Goldring, Gray, & Bitterman, 2013; Putman, Hansen, Walsh, & Quintero, 2016). An alternative policy proposal that is feasible in the short run, then, is the use of theoretically informed (Wise) implicit bias training workshops (Walton, 2014). For example, Okonofua, Paunesku, and Walton (2016) describe a low cost, "light touch" empathic discipline intervention provided to middle school teachers that significantly reduced student suspensions and increased students' perceptions of teachers' attitudes toward them.

Second, student absenteeism and suspensions are only two observable dimensions along which representation likely affects teacher–parent interactions and student educational outcomes. As Grissom et al. (2015) rightly point out, future research on students' educational outcomes and the relationship between school staff and parents would benefit from the application of insights from representative bureaucracy theory to develop a more complete picture of the dynamics operating in public school systems. Because elementary school students' absences at least partially reflect parental decisions, our results underscore the importance of representation among street-level bureaucrats in building and sustaining the support for public

organizations necessary for equitably carrying out the goals and missions set for public organizations. However, future research should apply these insights to other coproduction-related behaviors in public school systems. For instance, future research could examine the extent to which same-race teachers and administrators induce more demanding forms of coproduction, such as volunteering, attending school board meetings to participate in school system governance, or participating in Parent Teacher Associations. In addition to examining more intensive coproduction behaviors, scholars should investigate the extent to which more coproduction and public involvement resulting from increased representation improves public organization performance and social outcomes.

Third, representative bureaucracy scholars might consider how representation among street-level bureaucrats affects longer-term outcomes. For example, in the education context, exposure to a same-race teacher has been shown to significantly increase black students' high school graduation rates and the likelihood that they plan to attend college (Gershenson et al., 2017). If, as the evidence presented here suggests, representative bureaucracies function as a passive means to ensure equitable access to and outcomes from public services, examining long-term outcomes like educational attainment will allow for a clearer assessment of the lasting ramifications of underrepresentation in the public workforce. For instance, considering the possibility that early exposure to same-race bureaucrats shapes long-run educational attainment speaks to the possibility that representation in public schools might affect the availability of diverse college-educated workers for staffing future public organizations. Future scholarship should consider the long-run social outcomes of other public services that might be improved by more demographic representation among street-level bureaucrats.

Finally, scholars of representative bureaucracy should consider other public service contexts in which the relationship between bureaucrats and citizens might shape the prevalence of coproduction, compliance, or administrative burdens. While empirical evidence regarding the importance of demographic representation among teachers has grown recently, the evidence generalizing representative bureaucracy theory to other street-level bureaucrats, such as social workers, public defenders, probation officers, or police officers, remains relatively thin, particularly concerning individual-level interactions. Applying a similar empirical approach to other public service contexts would be useful in establishing the generalizability of representative bureaucracy theory across public service contexts.

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Notes

1. A variety of definitions of coproduction have been offered by scholars in multiple disciplines (see Brudney & England [1983] and Bovaird [2007] for discussion). For the purposes of this study, we follow

Brudney and England (1983) and define coproduction as voluntary cooperation on the part of citizens through active participation in the production of a public service.

2. Throughout the manuscript, academic years are referred to by the calendar year of the spring semester (e.g., 2006 refers to the 2005–2006 academic year). We analyze these years because these are the years for which student absences, our key dependent variable, are available.

3. Given the arbitrary nature of the chronic absence definition, we show in Supporting Information Appendix Table A that the main results are robust to using alternative definitions of chronic absence.

4. Due to the binary and discrete count nature of our dependent variables of interest, we also calculate Poisson and logistic regression estimates of the descriptive regressions (see Supporting Information Appendix Table B). The estimates are qualitatively consistent with the OLS estimates. We report OLS estimates for ease of interpretation and comparison across estimators presented in the main text (e.g., the linear two-way FE estimators).

5. Of course, X could be allowed to be time-varying as well, and include things like lagged test scores or lagged dependent variables. Doing so does yield estimates that are qualitatively similar, and often nearly identical, to the preferred student FE estimates.

6. The estimation of multiway FE models is an active area of research (e.g., Abowd, Creecy, & Kramarz, 2002; Arcidiacono, Foster, Goodpaster, & Kinsler, 2012; Correia, 2015; Gaure, 2013; Guimarães & Portugal, 2010).

7. We cluster at the school level because classrooms are nested in schools, and we are thus clustering at the highest level, as advocated by Angrist and Pischke (2009). Nonetheless, the main results are robust to instead clustering by student, classroom, teacher, or district.

8. Supporting Information Appendix Table B shows that this result is robust to the precise definition of chronic absence. Specifically, the effect of student–teacher racial mismatch is about 0.002 regardless of the cutoff used in the definition.

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Supporting Information

Additional Supporting Information may be found online in the supporting information tab for this article.

Appendix Table A. Sensitivity to Definition of Chronic Absence
Appendix Table B. Descriptive Nonlinear Regressions