SOCIUS

Data Visualization

Historical Patterns and Trends in Teacher-Student Demographic Changes in the United States

Maithreyi Gopalan[1] iD **, Jilli Jung[2]** iD **, and Paul Hanselman[3]** iD

Abstract
This visualization represents historical patterns and trends in racial/ethnic distributions of teachers and students over the past five decades in K–12 public schools in the United States. Specifically, the authors highlight the demographic mismatch between the school-age population and the teaching workforce that persists for all non-White groups. The rapidly diversifying, multiethnic school-age population highlighted by the 2020 census combined with the persistent, predominantly White teacher population continues to remain a concerning issue given the multifaceted benefits of student-teacher demographic match for students from minoritized backgrounds. Recruitment and retention of a diverse teaching workforce that mirrors the school-age population must remain a core education policy priority in the coming decades.

Keywords
demographic trends, census, teacher-student race-ethnicity congruence

The 2020 census revealed that for the first time in the United States, more than half of all children (0–17 years old) were non-White (U.S. Census Bureau 2021). Even though the growth in racial/ethnic diversity of the U.S. population in general but especially among the child population is not new (Johnson and Lichter 2010; Qian 2014), we highlight a key stylized, demographic pattern in this visualization. Specifically, although the racial/ethnic composition of the school-age population, a large subset of the child population, has also been undergoing significant changes over the past five decades, the demographic makeup of teachers who educate an increasingly multiethnic student population remains predominantly White.

The benefits of student-teacher racial-ethnic congruence—when students' race/ethnicity matches the race/ethnicity of their teachers—came into sharp focus recently (Gershenson et al. 2022; Lindsay and Hart 2017; Hart, 2020). The vast majority of the theoretical and empirical research shows that exposure to minority teachers has been beneficial for minority students (particularly Black students) across a broad range of educational outcome (Egalite 2023). For example, minority students' exposure to teachers who share their race/ethnicity improves achievement (Dee 2004), high school graduation, and college enrollment (albeit primarily

in two-year colleges) (Gershenson et al. 2022). Studies have also shown that exposure to Black teachers reduces Black students' suspension and expulsion in schools (Lindsay and Hart 2017), which in turn has long-term benefits in terms of criminal justice involvement, health, and well-being that extend well into early adulthood (Bacher-Hicks, Billings, and Deming 2019). Yet a recent study of a nationally representative sample of kindergarten students in 2011 followed longitudinally until fifth grade showed that on average, Black and Hispanic students were 67 and 71 percentage points less likely than White students, respectively, to have same-race or same-ethnicity teachers, even after adjusting for several other child- and school-level covariates (Gottfried and Fletcher 2023). The prevalence of which students have access to a same race/ethnicity teacher is closely tied to the demographic patterns of both the teacher workforce and the

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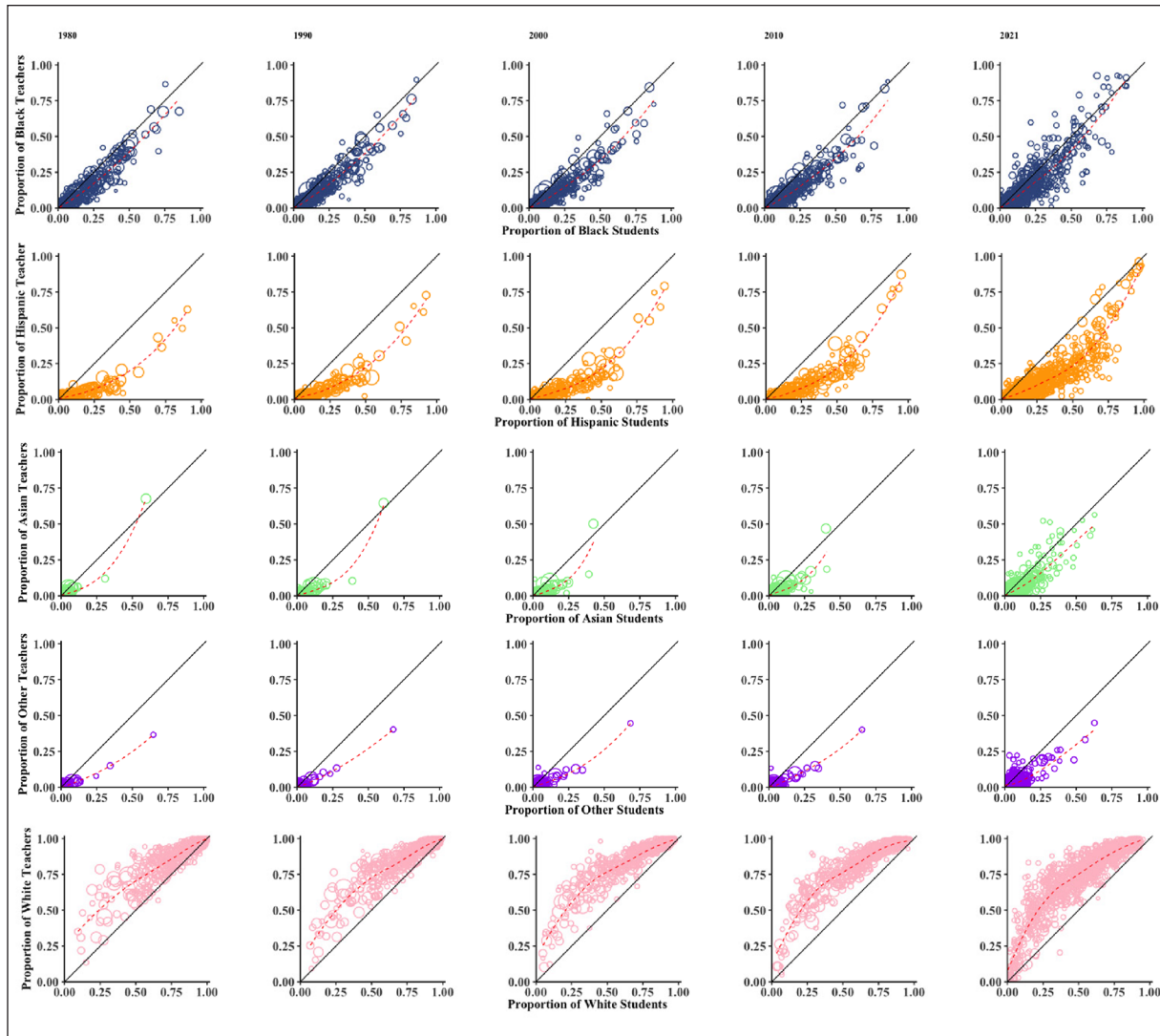Email: mgopalan@uoregon.edu

Figure 1. Visualization.
Source: Authors' calculations on the basis of census datasets (census 5 percent samples for 1980, 1990, and 2000; 2006–2010 American Community Survey five-year data and 2017–2021 American Community Survey five-year data downloaded from IPUMS [Ruggles 2024]).
Note: Each bubble represents a Consistent Public Use Microdata Area (CPUMA); CPUMAs are nonoverlapping, statistical geographic areas used in the census microdata samples. CPUMAs are the most detailed geographic units that are consistently comparable across decades. The red dotted line represents the local polynomial regression fit of the bivariate distribution. The size of the bubble represents the overall school-age population in the CPUMA.

diversifying school-age population. Thus, demographic trends of the school-age and teacher populations have important implications for the quality and equity of the educational system (Gist and Bristol 2022).

Using bubble and scatter plots, we visually depict the bivariate distribution of the share of minority students and the share of minority teachers for each large race/ethnic category over the past five decades (Figure 1). Each bubble represents a Consistent Public Use Microdata Area (CPUMA); CPUMAs are nonoverlapping, statistical geographic areas used in the census microdata samples that are largely comparable over time. A teacher workforce matching the student composition for the racial/ethnic group would be represented by a point on the 45° line, while points below the line reflect underrepresentation. Unsurprisingly, across all years, we find that non-White teachers are underrepresented

relative to non-White students in most CPUMAs. This underrepresentation, indicated by distance below the 45° line, has remained consistent over time, even as the shares of non-White students and teachers have both increased. The disparities are particularly striking for Hispanic students, who are now the largest non-White group but have the fewest same-ethnicity teachers in their areas (relative to student population) of any group.[1]

The persistent underrepresentation of teachers of color we document has serious policy implications for teacher labor markets, especially as it coincides with historical declines in the prestige and interest in teaching occupations (Kraft and Lyon 2022). Specifically, our findings highlight that perceptions of teacher prestige fell significantly (between 20 percent and 47 percent from 2010 to 2020) to reach the lowest levels recorded over the past half century. Similarly, using several surveys, our findings document that high school and college students' interest in the teaching profession dropped precipitously (about 50 percent since the 1990s and 38 percent since 2010, reaching the lowest level in the past 50 years). These patterns of decline in the standing of the teaching profession are not new. Specifically, the historical feminization of teaching and the racialized nature of public school education since its inception (see Gershenson, Hansen, and Lindsay 2021 for more details) has been highlighted in the literature. That said, our visualization, which makes it salient that the lack of diversification of teachers compared the increasingly diversifying school-age population in the past five decades, shows that attracting and retaining the best and diverse talent to teaching profession has been neither easy nor successful in the aggregate.

A recent U.S. Census Bureau report also highlighted how teachers are among the most educated but earn less than other similarly educated workers (Newberger and Beckhusen 2022). Policies aimed at diversifying the teacher labor force (Wellington et al. 2023) must reckon with the fact that the college-educated workforce from minoritized backgrounds may increasingly choose other lucrative occupations. Bonuses and or structured compensation packages (Clotfelter et al. 2008; Gershenson et al. 2021) that tie incentives for teaching in schools with a high percentage of minority students will be required across several geographic areas. The recruitment and retention of a diverse teaching workforce that mirrors the school-age population must be a core education policy priority in the coming decades.

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[1]See Figure S4 in the online supplemental materials for a collapsed version that emphasizes comparisons between Hispanic and Black students. Also, see Figures S1 to S3 in the online supplemental materials for univariate distributions of teacher and student racial/ethnic compositions over this period overall and at the CPUMA level.

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Supplemental Material

Supplemental material for this article is available online.

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Author Biographies

Maithreyi Gopalan is an associate professor at the University of Oregon. She is interested in conducting policy-relevant, interdisciplinary research that explores the causes and consequences of racial and socioeconomic disparities in student outcomes, using experimental and quasi-experimental research methods.

Jilli Jung recently graduated from the educational theory and policy program in the Department of Education Policy Studies at The Pennsylvania State University. Her research interests lie in examining the impacts of social and educational policies on adolescents, using quasi-experimental designs.

Paul Hanselman is an associate professor at the University of California-Irvine. He is interested in examining how features of schooling contribute to social inequality and the ways in which local contexts shape students' experiences and the implications for educational policy and interventions.