VOLUME 11 • NUMBER 1

THE RUSSELL SAGE JOURNAL OF THE SOCIAL SCIENCES

ISBN-13: 978-0-87154-826-9

RSF: The Russell Sage Foundation Journal of the Social Sciences

U.S. Census 2020: Continuity and Change

Part I

VOLUME 11, ISSUE 1, JANUARY 2025

RSF: The Russell Sage Foundation Journal of the Social Sciences

U.S. Census 2020: Continuity and Change

Part I

VOLUME 11, ISSUE 1, JANUARY 2025

The Russell Sage Foundation

The Russell Sage Foundation, one of the oldest of America's general purpose foundations, was established in 1907 by Mrs. Margaret Olivia Sage for "the improvement of social and living conditions in the United States." The foundation seeks to fulfill this mandate by fostering the development and dissemination of knowledge about the country's political, social, and economic problems. While the foundation endeavors to assure the accuracy and objectivity of each book it publishes, the conclusions and interpretations in Russell Sage Foundation publications are those of the authors and not of the foundation, its trustees, or its staff. Publication by Russell Sage, therefore, does not imply foundation endorsement.

Board of Trustees

Jennifer Lee, *Chair*
Marianne Bertrand
Cathy J. Cohen
Sheldon Danziger
James N. Druckman
Jason Furman
Michael Jones-Correa
David Laibson
David Leonhardt
Earl Lewis
Hazel Rose Markus
Tracey L. Meares
Mary Pattillo
Jennifer Richeson
Thomas J. Sugrue
Celeste Watkins-Hayes

Mission Statement

RSF: The Russell Sage Foundation Journal of the Social Sciences is a peer-reviewed, open-access journal of original empirical research articles by both established and emerging scholars. It is designed to promote cross-disciplinary collaborations on timely issues of interest to academics, policymakers, and the public at large. Each issue is thematic in nature and focuses on a specific research question or area of interest. The introduction to each issue will include an accessible, broad, and synthetic overview of the research question under consideration and the current thinking from the various social sciences.

RSF Journal Editorial Board*

*All editorial board members are based in the United States unless otherwise noted.

Scott W. Allard, University of Washington
Asad L. Asad, Stanford University
Irene Bloemraad, University of British Columbia, Vancouver
Sheldon H. Danziger, Russell Sage Foundation
Erica Groshen, Cornell University
Leslie Paik, Arizona State University
Nicole Shelton, Princeton University
Thomas J. Sugrue, New York University
Celeste Watkins-Hayes, University of Michigan

Copyright © 2025 by Russell Sage Foundation. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. Permission is not granted for large language model training. Reproduction by the United States Government in whole or in part is permitted for any purpose.

Opinions expressed in this journal are not necessarily those of the editors, editorial board, trustees, or the Russell Sage Foundation.

We invite scholars to submit proposals for potential issues to journal@rsage.org. Submissions should be addressed to Suzanne Nichols, Director of Publications.

To view the complete text and additional features online please go to **www.rsfjournal.org**.

Open Access Policy

RSF: The Russell Sage Foundation Journal of the Social Sciences is an open access journal. It is published under a Creative Commons Attribution-NonCommercial-No Derivs 3.0 Unported License.

Russell Sage Foundation
112 East 64th Street
New York, NY 10065

ISSN (print): **2377-8253**
ISSN (electronic): **2377-8261**
ISBN: **978-0-87154-826-9**
ROR: **https://ror.org/02yh9se80**

RSF: The Russell Sage Foundation Journal of the Social Sciences

VOLUME 11, ISSUE 1, JANUARY 2025

U.S. Census 2020: Continuity and Change, Part I

ISSUE EDITORS
Zhenchao Qian and Trevon Logan

CONTENTS

Introduction 1
Zhenchao Qian and Trevon Logan

Part I. Census Counts and Classifications

How Census Undercount Became a Civil Rights Issue and Why It Is Increasingly Important 26
Lisa Neidert, Reynolds Farley, and Jeffrey Morenoff

The "Rise" of Multiracials? Examining the Growth in Multiracial Identification in the 2020 U.S. Census 44
Ilana M. Ventura and René D. Flores

Ethnoracial Transformations? Linking Administrative Data to Explain Changes in Identification 65
John Anders, Mary E. Campbell, Craig Wesley Carpenter, and Luna Chandna

Part II. Inequality in Housing, Residence, and Activity Space

Misalignment of Housing Growth and Population Trends: Cohort Size and Lagging Measurements Through Recession and Recovery 86
Dowell Myers, Hyojung Lee, and JungHo Park

Who Is Black on the Block? Black Immigrants and Changing Black Neighborhoods 110
Nima Dahir

Economic Inequality and the Geography of Activity Space Segregation: Combining Mobile Device Data and Census Data 132
Siwei Cheng, Yongjun Zhang, and Jenna Shaw

Part III. Gender and Racial Inequality in Education, Time Use, and Employment

The Deepening Gender Divide in Credentials, 2000–2020: Continuity, Change, and Implications 154
Claudia Buchmann, Rachel E. Dwyer, and Man Yao

How Ethnoracial Groups Spend Their Time 178
Sarah James and Elizabeth Wrigley-Field

Unstable Work Schedules and Racial Earnings Disparities Among U.S. Workers 201
Julie Y. Cai and Marybeth J. Mattingly

U.S. Trends in Job Stability by Sex, Race, and Ethnicity from 1996 to 2020 224
Michael Lachanski

Introduction

ZHENCHAO QIAN AND TREVON LOGAN

U.S. Census 2020: Continuity and Change *is the focus of this double issue of* RSF: The Russell Sage Foundation Journal of the Social Sciences. *This introduction briefly describes the broad socioeconomic changes between 2010 and 2020 in the United States and their implications for inequality, families, and American society. We then review the changes in employment, earnings, and education; housing and residential mobility; families and living arrangements; gender, sexuality, race-ethnicity, immigration, and rural America among others discussed in this issue. We highlight the areas of change, stemming from both changes in data availability and measurement and substantive material outcomes with a focus on whether the patterns follow the trends of past decades or change in new directions that signal more fundamental structural changes in American society.*

Keywords: US Census 2020; continuity, change, and inequality; race, gender, sexuality, class, and nativity; employment and earnings; families and living arrangement; housing, residence, and activity space; rural America

This double issue of *RSF: The Russell Sage Foundation Journal of the Social Sciences* gathers researchers from multiple social science disciplines to analyze data from the 2020 Census, American Community Survey, Current Population Survey, administrative, and other data sources to provide a deep understanding of the American population, its growth, structure, diversity, and inequality. The volume explores a variety of topics to help place the 2020 Census into perspective and use it as a benchmark for future analysis. In doing so, we continue the Russell Sage Foundation's long tradition of bringing cutting edge social science insights for each decennial census. Building on work from earlier censuses, surveys, and administrative data (Bean and Tienda 1987; Bianchi and Spain 1986; Farley 1995; Farley and Haaga 2005; Fischer and Hout 2006; Levy 1987; Lieberson and Waters 1988; Logan 2014), the issue documents and analyzes changes, continuity, and inequality in the United States, centering on the period between 2010 and 2020. It covers topics on employment, earnings, and educa-

Zhenchao Qian is a professor of sociology and research associate of Population Studies and Training Center at Brown University, United States. **Trevon Logan** is the ENGIE-Axium Endowed Professor in the Department of Economics at The Ohio State University, United States.

© 2025 Russell Sage Foundation. Qian, Zhenchao, and Trevon Logan. 2025. "Introduction." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 1–24. https://doi.org/10.7758/RSF.2025.11.1.01. Direct correspondence to: Zhenchao Qian, at zhenchao_qian@brown.edu, Department of Sociology, Brown University, Box 1916, Maxcy Hall, 108 George Street, Providence, RI 02912, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

tion; housing and residential mobility; families and living arrangements; gender, sexuality, race-ethnicity, and immigration among others, with a focus on whether these patterns follow the trends of past decades or change in new directions that signal the undercurrents of continuity and change in American society.

The decennial population census has registered more than two centuries of growth and transformation in America's political, social, and economic life. It records the nation's population size, composition, growth, and change. It documents patterns and trends of families and living arrangements, education, employment and earnings, and housing and residential patterns. It witnesses growing population diversity in ethnicity, race, and nativity. It defines, creates, and redefines demographic groups. It captures multiple dimensions of inequality at individual and structural levels. It allows us to both place contemporary patterns into a longer temporal arc and note the stark contrast of the past and present with a goal of understanding the evolution of American society. To that end, this volume features a wide range of topical questions that seek to delve deeper into the evolving currents of American society and to map out the new areas that are beginning to emerge as we refine and redefine dimensions of American society.

The census traditionally gives us the opportunity to ask big questions about and measure changes in American society. The 2010 Census revealed that income and wealth inequality increased in the first decade of the twenty-first century, continuing the trend started in the 1970s and with the Great Recession in the late 2000s furthering the divide that separates the rich from both the poor and the middle class (Levy 1987; Logan 2014), at a time when economic stratification had transformed into a political issue. Meanwhile, young adults had more education than their parents and women have completed college education at a higher rate than men, yet young people and women were otherwise behind in employment, earnings, and economic mobility (Burkhauser and Larrimore 2014; DiPrete and Buchmann 2013). Continuing immigration had increased the shares of racial minorities; fertility declines had accelerated the rate of population aging; and the transformation of gender, family, and work further diversified the U.S. population. Growing diversity, reflecting tremendous group differences in opportunities and constraints, exacerbated inequality in living arrangements, living standards, health, socioeconomic status, wealth, and poverty from 2000 to 2010 (Bean et al. 2014; Qian 2014; Seltzer and Yahirun 2014).

The changes in American society since the 2010 Census were similarly pronounced. The decade started with an American society still recovering from the Great Recession of 2008 and its attendant housing market crisis. New concerns about increasing economic and racial inequality emerged, political movement on immigration policy took shape, and growing American divides along racial, socioeconomic, political, and rural-urban lines created both the Tea Party and Occupy Wall Street movements. By the time of the 2020 Census, the American public was in the midst of a pandemic, still sorting through the gender dynamics of the #MeToo movement, and had codified same-sex marriage into law nationwide. A particularly divisive presidential election was under way, as was a racial reckoning over police brutality and a new emerging acceptance of (and resistance to) transgender members of American society. At the same time, immigration had dipped to unprecedented lows with the severity of the economic downturn. Immigration continued to be a political and economic issue with international humanitarian crises, and debate about immigration policies went beyond the strength or porous nature of the nation's borders, but also in consideration of those who immigrated undocumented as children (also known as Dreamers) years earlier. In many instances, the speed of changes in American society in the 2010s was unprecedented.

All this change raises several big questions: What did the Great Recession do to Americans' quality of life? How divided have Americans become, and along what axes are those divides most prominent? Is progress toward racial or class equality evident? How and where have the gaps in gender remained in American society? How has immigration continued to change the nation? How large and diverse is the transgender and nonbinary population—nascent categories that rose to national prominence in the

2010s? Is the American divide between rural and urban areas increasing? Moreover, how do we expect these trends to change in the future?

Against these big questions are related questions that add more gravitas (and, we would add, more scholarly specificity) to the larger questions: How have job tenures, work schedules, earnings, and workforce attachment changed? How has economic inequality affected the living conditions of older Americans? Are men and women continuing to diverge in their educational outcomes, and what does this imply for gender inequality? Are Americans increasingly likely to live alone, as popular narratives suggest? Has racial economic inequality been more or less pronounced in rural areas? Where are Americans spending their time, with whom are they spending it, and does this vary significantly by race and gender? In many ways, the relative sparse nature of the snapshot of the census is, by itself, not enough to answer these questions. These questions require us to move beyond the census to look at additional data that offer finer levels of detail and exploit new technologies (such as cell phones) to answer questions that would be impossible to ask of the 2020 Census.

The speed of change in American society, and our desire to have timely answers to pressing questions about America, has significantly altered the standard data that we use to describe the population. In the past, we relied on censuses to find answers to these questions from all Americans, especially when the censuses between 1940 and 2000 included two types of questionnaires: a short form for most households and a long form with additional questions about the household for a sample of households. The census stopped using the long form starting in 2010 and only had nine questions in the short form in 2020. Launched in 2005, the American Community Survey (ACS) has replaced the long-form census and included additional questions. ACS interviews around 3.5 million people in the United States annually and offers up-to-date year-to-year information on individuals and communities. In addition, the Current Population Survey (CPS), Household Pulse Survey (HPS), and other surveys collect data on topics not in the decennial census, such as education, marriage and family, employment, migration, nativity, and health. CPS, initiated in 1940, remains the primary source of monthly information on the labor force, employment, and time-use data for the U.S. population. HPS, an online survey started during the pandemic, was designed to capture the experiences of COVID-19 in real time and gathers innovative data on a variety of demographic groups that other surveys have not included, such as sex assigned at birth and current gender identity at high frequency, given that it is a weekly survey. Thus the first item to note is the relative lack of reliance on the census itself to answer the big and small questions about Americans. For that, we must turn to different, but related, data that better describe how Americans live in real time.

At a broad level, this volume reflects the breadth and depth of social science research on topics related to broad trends in American demographics and inequality. It includes work from sociologists, demographers, gender scholars, economists, political scientists, and other social scientists working on substantive issues related to America's continual discovery of itself in the current moment. Another dimension is both the breadth of what we learn about American society and the depth of our knowledge given the emerging data sources social scientists now use. The pandemic leveraged our ability to quickly field high-quality surveys, and one result of that work are new and deeply insightful snapshots of American society changing rapidly in real time. Coupling that with the Russell Sage Foundation's longstanding prominence in scholarly reflection on the census yields a volume at both the cutting edge and the historical firmament of research on American social and demographic change.

The research presented in this double issue covers the important topics just outlined and seeks to answer whether trends in the past continued or changed during the 2010s. The volume starts with an article on census undercount of disadvantaged populations, followed by two articles on racial fluidity and large increases in multiracial populations, which may redefine various racial boundaries. The next three articles document the housing shortage after the Great Recession, the role of immigration in neighborhood change, and racial and

economic differences in mobility of activity space. We then cover multiple dimensions of inequality, including education, income, job tenure, work schedule, and time use in daily lives across gender and racial groups. Next are articles on changes in living arrangements and the emergence of LGBTQ+ families and households. The volume ends with two articles on urban-rural differences in income, with a focus on transitions and trajectories among rural communities as America continues to become increasingly urban as a nation. The broad sweep of the articles in this double issue reflects the scope of questions that can be asked and answered in the census and its related data sources, continuing the Russell Sage Foundation's tradition of leveraging high-quality social science research as a tool to reflect on the current state of American society and the trajectory that brings us to this point.

CENSUS COUNT AND POLITICAL REPRESENTATION

We begin with the political implications of the census because the census, by design, is primarily used for political purposes. The census is decreed in the U.S. Constitution not for social science analysis, but for apportionment of legislative bodies, particularly Congress. Population redistribution based on the 2020 Census resulted in two additional congressional seats in Texas, one additional seat in Colorado, Florida, Montana, North Carolina, and Oregon, and one lost seat each in California, Illinois, Michigan, New York, Ohio, Pennsylvania, and West Virginia. The resulting redistricting requirements exacerbated existing political inequality. Given state legislative practices, Republicans controlled boundaries of 187 congressional districts (43 percent of Congress) and Democrats seventy-five districts (17 percent), with the remainder drawn by independent commissions or being at large districts since the state is represented by a single congressperson (Mekour 2022). This political tilt on redistricting has led to legal battles over the nature of the process—political or racial gerrymandering has been a claim in court cases in Alabama, Alaska, Arkansas, Georgia, Idaho, Illinois, Maryland, Michigan, Nevada, New Jersey, New Mexico, North Carolina, Ohio, and Texas. The accusation is that deliberate undercounts of parts of the population will coalesce with political prerogatives to create the most partisan state congressional delegations possible.

The goal of every census is to count everyone accurately and in the right place. Yet the census does miscount people. The pandemic broke out when the 2020 Census was under way. Pandemic disruptions of operations raised concerns about whether undercounts and overcounts in previous censuses worsened for the 2020 Census. Political meddling in the census by the Donald Trump administration also exacerbated the worries about data quality (Wines 2022). The Census Bureau's Demographic Analysis, based on vital records and other administrative data, and Post-Enumeration Survey, based on a sample survey, conclude that the counts at the national level are largely accurate and that the 2020 Census overcounted household populations in eight states and undercounted household populations in six others. This is in contrast to estimates of no overcounts and undercounts at the state level in the 2010 Census (Cohn and Passel 2022). For example, Rhode Island, long projected to lose one of the two U.S. congressional seats, was able to keep both because the Rhode Island population was overcounted by about 5 percent, or roughly fifty-five thousand residents, more than enough to avoid losing the seat.

The 2020 Census continued to undercount historically undercounted populations, mainly disadvantaged groups, missing 3 percent of African Americans, 5 percent of Hispanics, and 6 percent of American Indians on reservations (U.S. Census Bureau 2022). The 2020 undercount rates were about the same statistically as in 2010, but increased significantly for Hispanics. Children up to four years old were undercounted by nearly 3 precent. Given that young children are disproportionately racial minorities and immigrants, the undercount of children is another factor in the undercount of immigrants and racial and ethnic minorities. The undercounts matter. Undercounted groups receive fewer federal dollars and less political representation than they are owed.

The article by Lisa Neidert, Reynolds Farley, and Jeffrey Morenoff (2025, this volume, issue 1) provides a review of several Supreme Court

litigation cases for undercount and reveals that none of them was successful for adjustment for apportionment and redistricting. They point out further that undercounted states, municipalities, and school districts received fewer federal dollars because these dollars were allocated based on poverty and unemployment, the characteristics mostly common among the undercount population. They then zoom in to Detroit as a case study to demonstrate the undercount of Detroit's population in 2020, the origins of the undercount and its financial impact. The Census 2020 showed a loss of thirty-one thousand residents in one year and a loss of about fifty thousand housing units. A virtual audit conducted by the city afterward found that the census showed consistently lower occupancy rates and the Census Bureau missed about 12 percent of the residential housing units. Omissions were more pronounced in the blocks with lower self-response rates. This study reveals that the list used during the census operation consisted of far fewer housing units than the master address file developed before the census and accepted by the Census Bureau. The authors question whether the undercount was due to erroneous omissions of legitimate housing units or misclassification of occupied housing units as vacant. The undercount, concentrated in more disadvantaged neighborhoods, deals a serious financial blow to Detroit—the city government may be losing about $5 million in state revenue sharing each year during the 2020s.[1] The census is typically thought of as a demographic survey instrument used to describe American society. We begin this volume, however, by emphasizing the political economy at the heart of the census and its direct impact on the American population.

EMERGENCE OF MULTIRACIAL POPULATIONS

The question on race has been included starting from the very first census, in 1790. Over time, racial classification of Americans has undergone tremendous change, reflecting increasing racial and ethnic diversity in the population. The 2020 Census asked two questions to collect the races and ethnicities of the U.S. population. The first is Hispanic or Latino origin, categorized into Not Hispanic, Latino, or Spanish origin; Mexican, Mexican American, Chicano; Puerto Rican; Cuban; or another Hispanic, Latino, or Spanish origin. The second is race, categorized into white, black or African American, American Indian or Alaska Native, Asian (specifically, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, and so on), Native Hawaiian and Pacific Islander, and Some Other Race. Combining the two questions, the most prevalent racial or ethnic group was the non-Hispanic white population. It accounted for 58 percent of the population in 2020, a decline from 64 percent in 2010 (figure 1). Meanwhile, Hispanics and non-Hispanic Asians increased in prevalence over the decade. Applying the diversity index measure, Eric Jensen and colleagues (2021) find that the likelihood that two people chosen at random in the United States are from different racial or ethnic groups increased from 55 percent in 2010 to 61 percent in 2020.

In 2000, the Census Bureau started to identify multiracial populations, that is, people who identify as members of two or more races.

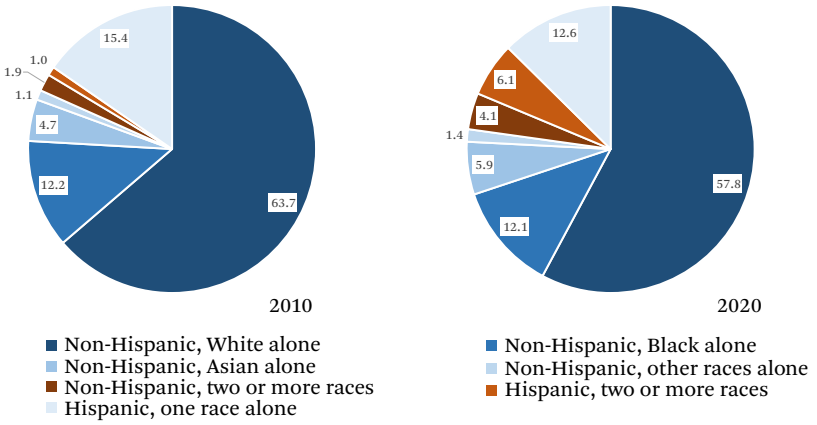
1. The gap between the estimated and census-derived population counts has a large impact on local expenditures that are directly tied to population by law. These closure estimates discontinuously change local expenditures based on census counts. As Juan Carlos Suárez Serranto and Philippe Wingender (2016) note, "The error of closure has been substantial in recent Censuses. In 1980, the Census counted 5 million more people that had been derived by using the total population level from the 1970 Census and adding population growth throughout the decade. The 1990 Census counted 1.5 million fewer people than the national estimate. This was due to systematic undercounting of certain demographic groups. In 2000, the Census counted 6.8 million more people than the estimated population level based on the 1990 Census. These errors of closure are even more important in relative terms at the local level due to the difficulty of tracking internal migration" (5). Further, the dollar values from small errors are large: "For instance, GAO finds that relatively small differences (about 0.5%) in the national error of closure in 2000 led 22 states to obtain additional $200 million dollars of funding and 17 states to obtain a deficit of $368 million" (7).

About 6.8 million people, 2.4 percent of the U.S. population, reported two or more races in 2000 (Jones and Bullock 2012). In 2010, as shown in figure 1, 2.9 percent reported two or more races (1.9 percent non-Hispanic and two or more races and 1 percent Hispanic and two or more races). In 2020, the share and size of the multiracial population increased substantially: 33.8 million Americans reported multiple race membership, and about 4 percent now identify as non-Hispanic multiracial and 6 percent Hispanic multiracial (figure 1). This sharp rise is unlikely attributable only to increases in children born to people in interracial relationships.

Who selected two or more races? Among those who reported two or more races, the largest combinations were white and Some Other Race, followed by white and American Indian and Alaska Native, white and black, white and Asian, and black and Some Other Race. Notably, the increase in multiracial populations was largely due to the increase in the Some Other Race population. The Hispanic or non-Hispanic Some Other Race population alone increased by 46 percent, from 6 percent of the total population in 2010 to 8 percent in 2020. The Some Other Race alone or in combination population increased drastically, by 733 percent over the same period (Jones et al. 2021). The Census Bureau attributed the rapid increase to the design improvement of the Hispanic and race questions. Indeed, the improved design drastically increased the number of Hispanics in the category of Some Other Race. In 1990, the last decennial census that allowed respondents to mark only one race, about 50 percent of the Hispanics identified white and less than half marked race of Other—a category similar to Some Other Race today. In 2010, when respondents were allowed to mark two or more races, the race question included a checkbox for white but left no room for detailed ethnicity or national origin answers for the white category. In 2020, for those who checked white, the questionnaire adds "Print, for example, German, Irish, English, Italian, Lebanese, Egyptian, etc." These examples did not include any Hispanic group, which may have discouraged Hispanic whites from checking white alone and caused the decline in the Hispanic white alone population. As a result, over the decade between 2010 and 2020, the number of Hispanics who identified as white alone declined by 53 percent; more Hispanics identified Some Other Race alone, an increase of 42 percent; and Hispanics, identified as white, were much more likely to check Some Other Race simultaneously (Jones et al. 2021). These dramatic changes reveal the rapid change in classifications may sometimes be a product of survey design better matching personal identification.

In this volume, Ilana Ventura and René Flores (2025, issue 1) offer strong evidence of the role the design change plays in the dramatic rise of multiracial populations. They compare data from American Community Sur-

Figure 1. Percent Distribution by Race-Ethnicity



Source: Authors' calculations using U.S. Census Bureau 2023.

vey for 2000, 2010, 2020, and 2021, exploiting the design change for the 2020 and 2021 ACS questionnaires. They then compare the results with data from Current Population Survey for 2005, 2010, 2020, and 2021, none of which included a design change. The analysis shows that multiracial populations increased in the 2010s potentially because of increases in interracial fertility, especially among Asian and black Americans, but the increase in multiracial populations in the 2010s was too large to be explained by the natural growth alone, especially for Hispanics. In fact, they reveal that the increase for Hispanics can mostly be attributable to a large growth in the classification of Some Other Race—a result of design change. Overall, the design change doubled the number of multiracial people among the U.S. population as a whole and increased multiracial people by a factor of seven among Hispanics in the 2010s.

As Ventura and Flores show, multiracial populations did increase net of the design change, but by a relatively smaller amount. Several factors contribute to this difference. First, interracial marriage or unions continued to increase. Since 1967, the year the U.S. Supreme Court in the *Loving v. Virginia* case lifted the ban of interracial marriage throughout the country, the percentage of newlyweds who were intermarried jumped from 3 percent then to 17 percent in 2015 (Livingston and Brown 2017). Children born to interracially married couples grew rapidly as a result. Children born to interracial parents who were cohabiting or not in unions also increased. Based on the birth registrations from National Vital Statistics System of National Center for Health Statistics, Zhenchao Qian and Yifan Shen (2020) calculate that the births born to interracial parents, regardless of whether they were married, cohabiting, or single, increased from 10 percent in 2000 to 14 percent in 2016.

Second, not every multiracial person identifies with two or more races. Among children up to seventeen years old between 2008 and 2014, 72 percent of those born to black-white couples checked both white and black, but 16 percent marked only black and 12 percent only white; 48 percent of those born to American Indian–white couples checked both American Indian and white, but 23 percent marked only American Indian and 28 percent only white; 74 percent of those born to Asian-white couples checked both one Asian ethnic category and white, but 8 percent marked only Asian and 18 percent only white; and 60 percent of those born to Hispanic–non-Hispanic white couples checked a Hispanic category and non-Hispanic white, but 15 percent marked only a Hispanic category and 25 percent marked only non-Hispanic white (Lichter and Qian 2018). Racial classifications of children born to interracial couples depend on race, gender, and nativity of the minority partner, and couples' educational attainment, among others (Qian 2004; Lee and Bean 2004). A continuous rise in interracial marriage and subsequent growth in multiracial populations may prompt more children born to interracial parents to report two or more races.

Third, are Americans rethinking their racial identities? Genetic ancestry tests have become popular in recent years, but few test takers fully accept what the tests reveal (Roth, Côté, and Eastmond 2022). In fact, testing often reinforces race privilege among those who already experience it (Roth and Ivemark 2018). White test takers do not necessarily seek to promote racial diversity but some may desire a bit of something nonwhite, a cultural cachet often associated with beauty, exoticism, and a marginal degree of social distinctiveness (Ferla 2023). Genetic ancestry tests, which accelerated in their use and given large technological change and lower costs of ancestry testing in the 2010s, may increase racial awareness and reveal surprising ancestral backgrounds, but they do not necessarily contribute to the increase in multiracial populations.

Fourth, America has changed from a mainly biracial society to a more diverse one (Alba 2020). Furthermore, race in Latin America is more fluidly defined. Immigrants from Latin America can be white, black, Asian, Amerindian, or some combination. In addition, recent cohorts of immigrants are significantly more likely to originate from Africa, Asia, the Caribbean, and Latin America. Immigration along with interracial marriage continues to expand the levels and diversity of multiracial populations in America.

Changes in family structures, schools, neighborhoods, workplaces, and friendship networks may prompt individuals to think more about their racial identities. They may change their racial classifications over their life course. In this volume, John Anders, Mary Campbell, Craig Carpenter, and Luna Chandna (2025, issue 1) underscore racial fluidity by linking the individuals appeared in both 2010 Census microdata and the 2010–2020 American Community Surveys. They restrict the sample to adults aged twenty-five or older at the 2010 Census, old enough to maximize the likelihood that respondents themselves filled out the questionnaires. As a result, changes in racial classification for an individual over time could reflect potential changes in social context over the life course (Doyle and Kao 2007; Agadjanian 2022). Anders and his colleagues find that ethnoracial identity remains very stable among non-Hispanic whites, with over 98 percent remaining non-Hispanic white over time. In contrast, nearly 7 percent of the individuals chose a different ethnoracial identity in a later ACS than in the 2010 Census. This means that disproportionately more nonwhites (including Hispanic nonwhites) change their racial classifications. For example, nearly half of the foreign-born Hispanics who reported two or more races in the 2010 Census identified as only Hispanic white in a later ACS. Hispanics, a panethnic and racially diverse group, are highly fluid in racial identity. Anders and his colleagues report that younger people are more likely to change racial identities than their older counterparts, in part because of greater concentrations of ethnoracial minorities among the younger population. Noticeably, ethnoracial changes are also more likely to occur among immigrants and individuals with low socioeconomic status, suggesting potential confusion of racial identities among the disadvantaged populations. This issue is likely to be less serious in the future as the Office of Management and Budget released the new standards in March 2024 for collecting information on race and ethnicity (Statistical Policy Directive 15). It now has only a single question, asking respondents to select as many options as apply to how they identify. The question includes the following seven race or ethnicity categories: American Indian or Alaska Native, Asian, black or African American, Hispanic or Latino, Middle Eastern or North African, Native Hawaiian or Pacific Islander, and white.

Individuals who report a multiracial identity are diverse in racial combination, but most of them claim a white background. Among the multiracial births in 2016, 82 percent had black-white, American Indian–white, Asian American–white, or Hispanic-white parents (Qian and Shen 2020). The dramatic growth in the multiracial populations that are partly white may have played an important role in the declining share of the non-Hispanic white alone population (Alba 2020). Multiracial populations are too heterogeneous to be considered as one racial group. Currently, the Census Bureau classifies multiracial populations as not white. However, multiracials, many of whom are multiracial whites, are different from members of single-race minorities (Alba, Beck, and Basaran Sahin 2018). They are diverse but on average more advantaged in parental education, income, and residential patterns than single-race minorities (Alba 2020). Indeed, multiracial populations challenge the conceptions and statistical accounting of racial classifications and will have important social and political consequences over time. We highlight here how these categories continue to change as our racial constructions ebb and flow to reflect new realities and nuance in racial formations.

INEQUALITY IN HOUSING, RESIDENCE, AND ACTIVITY SPACE

The Great Recession in the late 2000s witnessed the continuation of a long-term decline in long-distance migration and highlighted a unique increase in local moves within metropolitan areas (Stoll 2014). The increases in short-distance moves were attributable to high levels of unemployment and home foreclosures during the Great Recession. The local movers were likely to be young, less educated, and black and Latino, to live below the poverty line, and to have difficulties paying rents or staying current with mortgage payments. Homeownership rates fell sharply as a result. In this volume, Dowell Myers, Hyojung Lee, and JungHo Park (2025, issue 1) explore the trend and recovery in homeownership after the Great Recession. They high-

light how changing cohort sizes of young adults over the 2010s complicate the recovery of housing markets. Being mindful that the homeownership rate is a prevalence measure, an accumulated status from the past, including homes owned by those who bought them many years ago, they focus on young adults, who are mostly current or recent buyers, to capture current housing preferences. Myers and his colleagues show that young adults who entered housing markets varied in population size because of different cohort sizes at birth among baby boomers, Generation X, and millennials. The authors reveal that fewer people coming of age in the late 2000s and the early 2010s, because of smaller birth cohorts of the late baby boomers and Generation X, created the narrative for lower homeownership preferences and discouraged planning for more homes or appropriate homes for the cohort of millennials, who are about one-third larger than Generation X by total population size. They show that oscillating birth cohorts, along with housing bubbles, restraints on mortgage applications, and pullback in housing construction during and following the Great Recession (2006–2016), created pent-up housing demand. Homeownership rates began to rise in 2017, but housing supply fell sharply behind the demand, drove acute housing shortages, and resulted in affordability problems. Young adults with greater economic resources and whites experienced substantially stronger recovery of homeownership than those with fewer economic resources and those from disadvantaged minority groups. Those with greater wealth and higher incomes were better able to secure housing despite the general increase in prices.

Homeownership continues to contribute to socioeconomic and racial residential sorting because individuals and families in the same neighborhoods share similar attributes (Logan and Parman 2017). Spatial differences in housing prices and homeownership rise and income segregation by neighborhood escalates (Bischoff and Reardon 2014). The influx of immigrants in recent years has increased racial and ethnic diversity in neighborhoods and communities. In 2021, number of immigrants reached forty-five million, accounting for about 14 percent of the total population (Migration Policy Institute 2023). Among them, 52 percent were from the Americas, 31 percent from Asia, and 6 percent from Africa. Not only were more immigrants from non-European countries but also more children were born on average to first-generation immigrants than to the native born (Camarota and Zeigler 2021). The number of children born to diverse immigrants has also contributed to a significant increase in the population of racial and ethnic minorities, especially at younger ages (Parrado 2011).

Immigrants have had a large impact on neighborhood residential patterns. Nima Dahir (2025, this volume, issue 1) focuses on how black immigrants, a group that experienced strong growth in recent decades, influence changes in black neighborhoods. Analyzing data from the 2000 Census and ACS from 2008 to 2012 and 2016 to 2020, she explores how neighborhood influxes of black immigrants are related to subsequent in- or out-migration of native-born blacks, whites, and ethnoracial minorities. Highlighting the importance of neighborhood ethnoracial heterogeneity at the baseline in 2000, Dahir shows that only in neighborhoods in which native-born blacks were a majority in the baseline would an increase in the black immigrant population trigger black native out-migration and white in-migration. The analysis also shows that black immigrants play a buffering role in a white neighborhood, preceding the arrival of native-born blacks, but have a reverse buffering role in black neighborhoods, preceding the arrival of whites. That is, black immigrants in general are a signal of neighborhood racial composition change. Dahir explores the potential mechanisms of what happens when black immigrants move into a neighborhood: making the neighborhoods less affordable to trigger an exit of blacks or moving into the neighborhoods where rent and home value began to grow. The findings underscore the unique role of black immigrants, a particular social position, in shaping neighborhood change and attenuating spatial inequality among ethnoracial groups.

The census has allowed us to learn a great deal about residential and income segregation. These are both important aspects of American society, but changes in technology and society have allowed people to interact in a variety of

new ways. By the time of the 2020 Census, more than 90 percent of Americans owned some type of cellular phone, whereas in 2010 only 30 percent did (Wike et al. 2022). This rapid change in communication technology also comes with another benefit—the ability to track people as they move across space. Because cell phones are now commonly a part of the everyday wardrobe ("wallet, keys, phone") we literally travel with a geographic system that can locate us performing our daily tasks, both work and recreationally.

Next, Siwei Cheng, Yongjun Zhang, and Jenna Shaw (2025, this volume, issue 1) offer an exciting perspective on another dimension of segregation by leveraging this new technology that the vast majority of Americans now use. Exploiting cell phone data, they determine where people live and where they work and play as a function of where they spend their time. These patterns reflect our daily routines, and they link our home locations (where we spend our time sleeping) to the other locations we visit through the course of our days. They note several surprising facts about American interactions across class and race (which they can proxy for with the composition of our home communities) beyond the home. First, they find, rather intuitively, that places of work and activities are significantly less segregated than neighborhoods. Americans truly do work and play in diverse environments. At the same time, the level of this interaction varies significantly over cities: although the trend is generally true, some cities have much larger baseline levels of interactions. Second, they find that black and white households vary in their levels of isolation in these activity spaces across the United States. In general, in the Northeast and Midwest, black and white citizens are more isolated in their activity spaces than in other parts of the country. Even though residential segregation has declined nationwide in the past forty years, this activity-level analysis of segregation reveals a new way in which racial distinctions and isolation occur. Third, they find that city-level inequality is related to the isolation of activity spaces nationwide. Unlike the high levels of racial isolation in the Northeast and Midwest, the isolation of the wealthiest and poorest in activity spaces is pronounced nationwide. This implies that not only do the rich and poor live separately, but the possibility of their social interactions with each other is also more limited than we may have anticipated in metropolitan areas. With the distinction of American cities as cosmopolitan spaces, they also retain a great deal of class distinctions that carry over from home to work and even recreation.

GENDER AND RACIAL INEQUALITY IN EDUCATION, TIME USE, AND EMPLOYMENT

Over the course of the twentieth century, the largest changes in labor-force participation, occupation, and earnings were for women (Goldin 2021). Beginning from a relatively small share of total employment, by the time of the 2010 Census, women made up more of the labor market than at any other time in history. Among younger women in large cities, they outearned their male peers, which led to concerns about the prospects of marriage for women who faced a relative dearth of men of marriageable age with similar credentials (Fry 2022; Dean 2022). Among young women, nearly half have a bachelor's degree, which only slightly more than a third of similarly aged men have one (Reeves and Smith 2021). Other features of female-dominated employment led it to be less sensitive to the business cycle than men's employment. First, women were overrepresented in service fields that did not contain cyclical demand, such as education and health. Second, women were in lower-paid occupations relative to men, which tended to have greater security of employment over the business cycle. Third, women valued flexibility benefits of jobs more than men did, allowing them to meet private demands for their time in a manner consistent with their desired labor supply.

Behind this is the gender gap in college completion, where women have outnumbered men in bachelor's degrees since the 1980s. Given the financial crisis and the pandemic, there were reasons to believe that this situation may change. First, the declining value of the college degree may lead to lower rates of women's completion than previously. Second, the pandemic-induced recession, unlike those that came before it, predominantly affected previously safe employment in services, education,

and health, precisely the fields in which women were overrepresented (Fabrizio, Gomes, and Tavares 2021). Third, the growing marketing and proliferation off credentials, especially those by for-profit education providers, which targeted women (Cottom 2017). Fourth, student debt has increased dramatically, and given the persistent gender differences in earnings, the returns to college completion for women have declined (American Association of University Women 2021).

Did the shock of the pandemic and other secular changes in the labor-market change the trends in the tilt of bachelor's degrees toward women? Claudia Buchmann, Rachel Dwyer, and Man Yao (2025, this volume, issue 1) seek to answer this question. Using administrative survey data, including the census and the National Center for Education Statistics, they find a number of interesting facts regarding the gender of higher education in the United States. The gender gap in bachelor's degree attainment has stabilized. Although a gap in education completion remains, it has not changed in the last decade. What has continued to evolve is the gender gap in degrees above the bachelor level, particularly professional degrees. Buchmann and colleagues argue that this acceleration could be partly driven by the growth of for-profit educational degrees, which may exacerbate student loan inequality by gender. In addition, the returns to advanced degrees where women outnumber men has declined over time, which could become another area of increasing gender inequality in the future.

America has become more racially diverse as a result of the continuous influx of immigration from Latin America and Asia. Yet America's racial minorities have long been denied the rights to white Americans. Slavery and Jim Crow segregation for blacks, status of "aliens ineligible for citizenship" for Asians, coerced relocation from tribal lands to reservations for American Indians, and becoming American citizens through conquest for Mexicans, Puerto Ricans, and Native Hawaiians are a few examples (Harrison and Bennett 1995). With various barriers and limited opportunities for upward mobility for racial minorities, racial diversity was synonymous with racial inequality. In the era of racial reckoning in the 2010s, bookended by the Great Recession and the pandemic, how did blacks, Latinos, Asian Americans, or other racial groups fare relative to whites across a broad range of social, economic, and political dimensions? Three articles in this volume provide some of the answers.

Next, Sarah James and Elizabeth Wrigley-Field (2025, this volume, issue 1) analyze data from American Time Use Survey (2003–2019) and compare daily time use among white, black, Latino, and Asian people. They explore how ethnoracial minorities are constrained in their choices to spend their time in various daily activities. They find that white people have the most pleasant elective leisure activities; ethnoracial minorities, especially Asians, report higher levels of daily activities that are rated unpleasant than whites; and blacks spend the most time alone and the most time doing affectively neutral activities, such as watching television. James and Wrigley-Field highlight several pathways including employment, place of residence, people to spend time with, administrative burdens, and psychosocial stress that could lead to such racial disparities in time use and quality of life in the United States.

Before the pandemic, the increasing inequality reflected not only the growth of income among the top 20 percent of the income distribution but also the stagnant wages at the bottom. Indeed, job growth in the 2010s was concentrated in the lower half. Although jobs proliferated, jobs with higher levels of pay did not. These same occupations in the retail, service, and health-care sectors became seriously constrained during the pandemic, and the recovery in the same industries saw extreme wage growth in the lower end of the distribution. As the labor market tightened and unionization increased (and saw larger gains in wages for union members than several previous decades) the labor market after 2020 looked remarkably different from the one that existed just a few years earlier.

One aspect of the low-wage labor market is the extreme volatility of work schedules. Employees in this sector, which is different from the gig economy, where volatility in labor supply drives hours of work, are given highly vari-

able schedules. Variability is not only in schedules but also in hours of pay. This leads to the simultaneous feature of low pay and volatile pay for a significant share of the low-wage labor market (Guyot and Reeves 2020). Even more, these jobs are disproportionately held by women and racial minorities, and the volatility of the low-wage labor market may play a role in enduring inequality.

Julie Cai and Marybeth Mattingly (2025, this volume, issue 1) explore this topic in two ways. They follow a cohort of workers over a four-month period to explore both their work schedules and their wages. They find that work-hour volatility was relatively common and steady until the pandemic, when overall volatility spiked by nearly 50 percent. Nearly all of this increase was for workers who had already experienced volatility before the pandemic. Black and Latino workers had significantly higher baseline volatility before the pandemic, and the subsequent increase during the pandemic was relatively more modest given their higher starting level. Although volatility for workers declined to pre-pandemic levels by 2022 overall, for Asian workers it remained higher. For workers working the same average number of hours, working in more volatile work hours settings is related to lower wages. Additionally, a racial disparity emerges within volatile hours themselves. Despite consistent employment, black workers earn significantly less than white workers when their work hours are volatile. This relationship became even more intense for black workers during the Great Recession and the pandemic. As the labor market continues to evolve into the next decade, the precarity of low-wage employment continues to leave low-wage workers with higher uncertainty.

One common feature of contemporary labor markets is that job tenure and career have been redefined. Whereas previous generations of Americans could expect to work in a specific occupation for the majority of their working lives, contemporary labor-market observers note that workers in today's labor market will have several careers by the time they retire (Broom 2023). This affects not only the way workers train and search for jobs, but also the expectations that workers have about employment more generally. Although we know a great deal about wages and work hours, we know much less about how long people stay in their jobs (job duration), how job duration changes over time, and how it varies among groups in the population. Searching for new employment, either from dissatisfaction with current employment or driven by the loss of a job, is costly. At the same time, periods of significant technological and economic change may give rise to new industries (and cause severe declines in others) that would be related to population level changes in job duration over time. Given the macroeconomic experiences of the Great Recession and the "creative destruction" of the internet and other technological changes, knowing how American job duration changes is important for understanding how our economy has changed.

Using the concept of expected job duration, how long one expects to hold a particular job with a given employer, Michael Lachanski (2025, this volume, issue 1) uses life table techniques to analyze changes in job duration for the past twenty-five years. Indeed, this is the first research on job duration in fifteen years. Drawing on the IPUMS Current Population Survey Job Tenure Supplement and the U.S. Census Bureau's Quarterly Workforce Indicators and nonstable population theory, Lachanski uses the number of new job starts and stable employment positions to estimate the expected duration of employment in the private sector in two-year increments from 1996 to 2020. The main highline finding is that employment duration overall has been remarkably stable over this period. If anything, despite the rhetoric that employment has become more detached than in the past, Lachanski finds that expected tenure has increased from 1996 to 2020. When separating these effects by sex and race, he finds that women and men have similar durations of employment, which stands somewhat in contrast to the idea that women's employment is less cyclical than men's. By race, black workers have persistently lower employment durations than white workers, but not when conditioning on those who have been employed for one year. Latino workers have slightly longer durations over the entire period, both at initial job starts and conditional on being employed for a year. Lachanski's exclusion

of public-sector employment may be one reason for these findings, as women and black workers are overrepresented in public employment, which tends to be more stable than private-sector employment. Similarly, the data restrict us to those who are not self-employed, so the transitions to and between the gig economy are not observed in the data. Even with this caveat, the findings here challenge the narrative that employer-employee relationship duration has changed significantly over time.

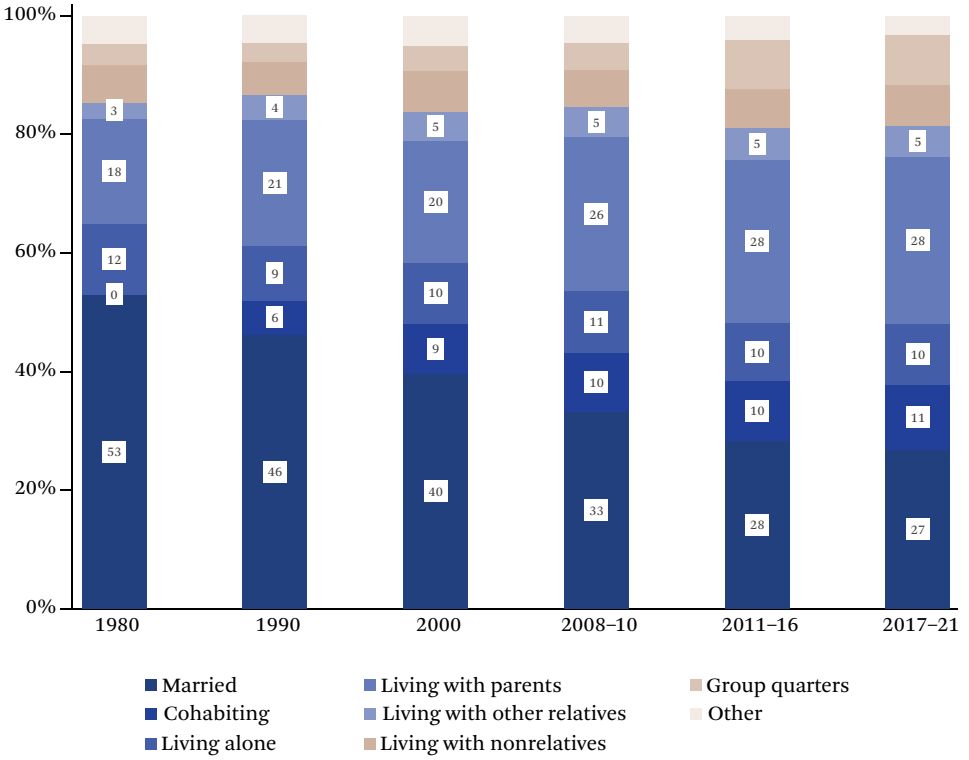
LIVING ARRANGEMENTS

Vivek Murthy, surgeon general of the United States, warned in 2023 that Americans have become increasingly lonely and isolated. Lack of social connections is taking a toll on Americans' mental and physical health. Over time, more Americans are unmarried: among adults aged eighteen and older, the percentage living with a spouse declined from 56 percent in 2001 to 50 percent in 2021 (U.S. Census Bureau 2021). Unmarried cohabitation, a less stable relationship than marriage, continued to rise for this population, from 4 percent to 8 percent over the same period. Given the trends in marital stability and the increasing educational gradient with health, knowing who lives alone and with others plays a critical role in helping us see how communities and households are changing. Popular press such as *Bowling Alone* by Robert Putnam have argued that America's political dilemmas may have their roots in the increasing rate to which we live separately from each other, as this is seen as a key input to civic engagement, public political participation, and prosocial behavior. The pandemic revealed that the density of housing in the United States varied significantly by race and education, which had implications for the prevalence of COVID-19 among certain populations unable to engage in social distancing given the density of their communities (Yang, Choi, and Sun 2020; Zhai et al. 2023). However, despite the pandemic, the proportion of adults living alone barely budged, from 14 percent in 2001 to 15 percent in 2021. Lonely adults do not necessarily live alone and may not be able to afford living alone. They may live with parents, relatives, or nonrelatives. Social distancing and isolation during the pandemic may have exacerbated loneliness regardless of living arrangement.

The census is critical in determining who lives with whom. Household size and composition have always been important in census measurement. Intergenerational, nuclear, and single-person households all tell us different features about American families, economy, and society. Let us now focus on young adults age twenty to thirty-four, the group that have experienced most changes in living arrangement. Using data from the decennial censuses from 1980 to 2000 along with ACS 2008–2021 data, figure 2 presents this young population's living arrangement: married, cohabiting, living alone, living with parents, living with other relatives, living with nonrelatives, in group quarters, and others. The proportion of those married declined sharply from 53 percent in 1980 to 27 percent between 2017 and 2021; meanwhile, the proportion cohabiting, unavailable in 1980, increased to 10 percent in the same period. The median age at first marriage reached an all-time high, twenty-eight and thirty, respectively, for women and men in 2023 (U.S. Census Bureau 2024). Marriage delay and retreat among young people was common. Although cohabitation, a shorter and more unstable relationship, grew, it did not offset the decline of marriage. Consequently, declines in unions were largely responsible for rising levels of singlehood. Although fewer Americans get married, most still expect to marry. In 2014, 76 percent of the Americans expected to marry at some point (Smock and Schwartz 2020). In the end, marriage has become more attached to socioeconomic status and a symbol of economic success (Gibson-Davis, Edin, and McLanahan 2005; Edin and Kefalas 2005). Whether to marry, when to marry, and how long to marry are increasingly divergent across racial-ethnic and social class lines. Men and women with economic resources are more likely to marry and stay married than their counterparts.

Despite marriage retreat and rising singlehood, the proportion of young adults living alone in the past four decades changed little, about 10 percent (see figure 2). This trend actually holds for all adults. In this volume, Hyunjoon Park, Matthew Sheen, and Paula Clark

Figure 2. Living Arrangements Among People Age Twenty to Thirty-Four



Source: Authors' calculations using Ruggles et al. 2024.

(2025, issue 2) explore trends in living alone among adults aged twenty-five to seventy-four. Although living alone was relatively uncommon in the middle of the twentieth century, when fewer than 15 percent of all households were single person, today more than 25 percent of all households are single persons living alone. Analyzing data from the censuses from 1980 to 2000 and ACS from 2010 to 2019 reveals several facts about the trend of living single. Stability in the share of American households living alone has been remarkable. Despite the public discourse that the share of single-person households may have social, economic, and political consequences, the authors show only modest change, at best, in the proportion living alone. More surprising, marriage appears to play a limited role in the stability of the trend. Even though the proportion of never-married men and women in prime age groups has increased, the share of those who live alone has declined, offsetting the increase in the share of nonmarried individuals in the same age group. That is, the link between marriage and cohabitation is weakening, which leaves us with a more nuanced story about where the trend in single living is coming from. Indeed, the only noticeable change in living alone over this period is older men aged sixty-five to seventy-four, and this is partly offset by declines in women in the same age group living alone. Population aging and longevity has changed the composition but not the population share of single-person households in the United States.

One notable finding from figure 2 is that single young adults became increasingly likely to live with their parents, from 17 percent in 1980 to 27 percent in the 2017 to 2021 period. Extended singlehood prolongs the emerging adulthood during which young people explore more and long, from romantic or cohabiting partnerships, in or out of college, to various work options and job episodes (Arnett 2004). Such frequent explorations introduce uncer-

tainties and financial difficulties (Qian 2012). Intensified by the Great Recession, the pandemic, and attendant housing shortages and rising housing and rental prices, they often end up living with parents. After all, young adults living with parents had less education, lower income, and higher rates of unemployment than those who lived alone or were married (based on our calculations, results not shown). Disadvantaged young adults have to rely on their parents when they face tough setbacks in relationships, schools, or jobs.

Lucie Schmidt, Lara Shore-Sheppard, and Tara Watson (2025, this volume, issue 2) offer a unique perspective to explore the living arrangements of older Americans. Older Americans are more likely to live alone than any other elderly group in the world. However, differences by race and gender in the extent to which people live alone are evident. Highly educated older adults are more likely to own homes, access to wealth, and live independently than others, a phenomenon described as aging in place (Anderson 2024). This raises a related question: who among the older adults tend to live with children or grandchildren? The discussion on living arrangements of young adults above offers some clues. Schmidt and her colleagues provide a clear picture. They highlight racial and socioeconomic differences in patterns of older adults living with children. Older adults step in when children and grandchildren are in economic insecurity. Among older people between sixty-five and ninety, whites have much lower levels of coresidence with children than blacks and Latinos. The reason is mostly economic. Economically vulnerable older people are more likely to live with children to pool limited resources. Their analyses show that older people tend to live with their children and grandchildren and form multigenerational living if safety net policies are less generous, housing costs are higher, or older people are Latino, Asian, or foreign born. In contrast, older people tend to live with only grandchildren and form skip-generational living if female incarceration rates are higher or older people are toward the bottom of the predicted income distribution. It is clear that older people chip in and help when their children are incarcerated or their children and grandchildren are in dire economic need. Older people living with children are disproportionately racial minorities and at the bottom of the socioeconomic ladder.

Once again, black-white differences in living arrangements are strong, the same as seen along the socioeconomic lines. Blacks are much less likely to marry than whites and married blacks are more likely to divorce than their white counterparts. Black children are more likely to live with their mothers or grandmothers than white children. Using data from the Panel Study of Income Dynamics, Christina Cross (2019) shows that black children spent 55 percent of their childhood with a single mother, relative to 13 percent for white children and 19 percent for Hispanic. Such sharp differences can be traced at least in part to structural racism (Pager and Shepherd 2008; Rackin and Gibson-Davis 2018; Baker and O'Connell 2022). Structural disadvantages often lead to unstable and short-term relationships, which "may launch chains of disadvantage in relationships throughout the life course that then have cumulative effects on health over time" (Cherlin 2010; Umberson et al. 2014, 20).

THE EXPANDING CONCEPTS OF MARRIAGE, FAMILY, AND GENDER

Another major milestone in American families came in 2015 when the Supreme Court ruled in favor of marriage equality. The legalization of same-sex marriages in this landmark decision led to a rapid rise in number of same-sex households. In 2021, some 1.2 million same-sex couple households lived in the United States, 710,000 married and 500,000 unmarried (Scherer 2022). This doubles the count of same-sex households in 2010. However, data on same-sex individuals and households are sparse. Soon after the Supreme Court in 2020 held that the 1964 Civil Rights Title VII's prohibition on employment discrimination based on sex encompasses discrimination based on sexual orientation and gender identity, Congress passed the LGBTQ+ Data Inclusion Act in 2022, which would require federal surveys to include data collection on sexual orientation, gender identity, and other sex characteristics on a voluntary basis. This requirement will fill the data void and help advance equity of the LGBTQ+ popu-

lation. The Household Pulse Survey in 2021 marked the first time a Census Bureau sponsored survey included questions which identified the LGBTQ+ population. The HPS, which tracked American experiences during the pandemic, revealed the socioeconomic inequities this population faced. It shows that LGBTQ+ respondents exhibit more with anxiety and depressive symptoms than their counterparts do (Marlay, File, and Scherer 2022). The HPS builds the foundation for increased data collection of the LGBTQ+ population in future nationally representative surveys.

Gender minorities, individuals whose current gender does not align with their sex assigned at birth, are an understudied but a sizable population in the United States. In this volume, Christopher Carpenter, Maxine Lee, and Laura Nettuno (2025, issue 2) analyze data from HPS 2021–2023 and offer the first evidence on marital status and family outcomes of transgender and other gender minority populations. Their analysis shows that gender minorities are younger, less likely to be heterosexual, much less likely to be married, and more likely to have a spouse who has passed away than their cisgender counterparts. In addition, noncisgender people are less likely than their cisgender women counterparts to have children in the household and more likely to live in households with more adults than their cisgender counterparts. Given that unions and marriages offer the social, emotional, and financial support for most adults, non-cisgender people's higher levels of living alone, divorce, and widowhood, along with significant social stigma, discrimination, harassment, and violence, may indicate higher levels of challenge and loneliness.

RURAL AMERICA

The 2016 presidential election brought renewed focus to rural areas in the United States. Observers noted that previous administrations had paid relatively little attention to rural communities, which tended to be overlooked and considered stagnant places (Love and Loh 2020). The surprising political power of rural voters caused social scientists to begin exploring rural areas again, but some researchers had long been committed to understanding changes in rural communities over the last several decades (Lichter and Brown 2011). Even though the popular imagination and media narrative paint rural America as racially and class homogeneous, essentially the white working class, rural communities are actually extremely diverse. In fact, the United States puts rural communities into any of several categories: graying America, Hispanic centers, Latter-Day Saints enclaves, aging farmlands, Native American lands, evangelical hubs, working-class country, rural Middle America, and African American South (Ajilore and Willingham 2020). The names of these locations give some clues about the baseline diversity of rural communities in the United States. They are defined both by the relative aging, occupational structure, and racial-ethnic composition. They also differ extensively economically. Between 2010 and 2016, for example, graying America and Hispanic centers added more than sixteen thousand new businesses in their communities while rural Middle America and African American South lost more than that over the same period. They also have different socioeconomic outcomes. Recent research shows that economic mobility is not perfectly mapped onto these measures of economic activity. Even though both the African American South and rural Middle America have similar trajectories of business losses, they have vastly different economic mobility rates. Of all rural communities, the African American South has the lowest rate of upward intergenerational mobility, and rural Middle America has a mobility rate well above the mean for rural communities (Ajilore and Willingham 2020). Any focus on rural communities must account for their inherent diversity.

In this volume, Daniel Lichter and Kenneth Johnson (2025, issue 1) provide an in-depth analysis of the transitions and trajectories of rural communities over the last few decades. By 2020, fewer than 15 percent of all Americans lived in nonmetro areas. How are these communities alike and different? Using a 4D (depopulation, deaths, diversity, and deprivation) approach to the issue, they document the divergence and congruence of these four outcomes over time. For the first time in history, the vast majority of nonmetro counties, more

than two-thirds, lost population. The acceleration of population decline in rural areas is now one defining feature of all nonmetro areas. Rural areas are also places that have seen diverse outcomes in mortality—exacerbated by the COVID-19 pandemic and the so-called deaths of despair that have been particularly harsh for white Americans in rural communities. This has led to accelerating declines in the white population in rural communities, which are increasing in their diversity due to more stable nonwhite populations and some inflows from immigrant groups (as opposed to inflows from urban areas). It is this increasing diversity that Lichter and Johnson relate to the political upheaval that has received considerable media attention. What has been overlooked, and what Lichter and Johnson document, is the increasing poverty (deprivation) of rural communities. At the same time, they establish the lack of any monolithic rural America. Renewed opportunities for urbanization (especially for rural communities on the outer edges of urban centers), increasing economic activity due to green economy initiatives, and the creation of recreational enclaves in rural communities have changed the trajectories, and even led to some gentrification, of rural communities from 1990 to 2020. The ability of some rural areas to incorporate or serve as key outlets for increasingly urban America has resulted in another portion of rural America that is increasingly isolated and in precipitous decline. To speak of a monolithic rural America is to avoid a discussion of their inherent diversity and dramatically divergent trajectories.

Finally, Bradley Hardy, Shria Holla, Elizabeth Krause, and James Ziliak (2025, this volume, issue 2) consider race and place by analyzing the rural-urban and black-white gaps in income from 1970 to 2020 using data from the Current Population Survey. Troubled by the narrative that rural areas are monolithic and racially homogeneous, they look at the tax system and resulting transfers to see how they have influenced trajectories of black and rural incomes over time. In doing so, they draw an analogy between rural and black communities as being subjected to the same socioeconomic forces such as lower quality schooling, community divestment, and lower levels of entrepreneurial activity. Since the 1970s, the U.S. tax system has changed significantly, as has the attendant social safety net. These changes would be particularly pertinent to black and rural communities given their lower average incomes before taxes and transfers. Some of the most prominent tax-based transfers would be the earned income tax credit and the child tax credit, and social safety net programs such as food assistance. These transfers have narrowed the racial and geographic gaps between the groups over time. Overall, improvement in outcomes has been significant, and the tax and transfer system have been important in stabilizing the incomes of black and rural households. At the same time, the inequality between black and rural households and the highest income households has grown. Similar to the increases in the inequality observed by others, the geographic gaps and racial gaps in income between the richest and the poorest have grown over time. The ability of the American tax and transfer system to lessen the impact of growing inequality has been stymied by more recent acceleration in high income earnings and the retreat from more progressive taxation policies. In particular, they show that black residents in rural areas have fared worse than those in urban areas, leaving black households in rural areas furthest behind in terms of income gaps.

CONCLUSION

In this double issue, researchers from multiple social science disciplines analyze data from various sources and provide updated and insightful snapshots of American society in the 2010s to the present. The decade of the 2010s is unusual. It started with America still recovering from the Great Recession and ended in the midst of a once-in-a-lifetime pandemic. In the intervening years, America witnessed Occupy Wall Street condemning and drawing attention to growing income inequality; Black Lives Matter underscoring persistent racism, racial injustice, and mass incarceration; the #MeToo Movement raising awareness of the endemic nature of sexual harassment and sexism in the workplace and beyond; the legalization of same-sex marriages advancing the rights of LGBTQ+ individuals; the urban-rural divide be-

coming widened again; and the elections of Donald Trump and Joe Biden to the White House, which intensified political polarization in America.

Although those changes occurred at the macro level, the degree to which they were felt within America varied significantly. Unemployment and home foreclosures during the Great Recession hit the young and disadvantaged populations hardest. The decade of the 2010s highlighted various dimensions of inequality and opportunity, including the role of place as a key correlate of socioeconomic mobility, and generated prospects of tackling some of the root causes. Yet before much improvement was made, the COVID-19 pandemic further exposed health disparities and widened social inequalities along race, gender, and class lines. Ironically, the same role that place has shown with mobility carried over to the duration and severity of the pandemic. The theme from the studies reported in this double issue is that inequalities persisted over the last decade and continued to disadvantage minorities, women, and young Americans. The variability of disadvantage remains acute in American society.

Inequalities are highly tied to race-ethnicity in American society. The undercount of blacks and Hispanics in the 2020 Census, especially in disadvantaged neighborhoods, may skew racial-ethnic inequality given missing information about those at the bottom of the socioeconomic ladder. It also has the potential to lead to political inequality, which may have a direct impact on the policies pursued to counter the negative effects of disadvantage. In addition, the growth of multiracial populations has changed the racial composition of the country. Multiracial individuals, mostly part white and part minority, are situated socioeconomically between whites and the minority group (Alba 2020). The shares of multiracial people and their classifications—being white, a minority race, or multiracial—may redefine racial boundaries and introduce variability in racial-ethnic inequality. America's racial composition continues to revise and redefine itself, showing the porous nature of America's racial divides.

Many studies in this double issue focus on race-ethnicity, a salient feature of American society and an important source of inequality. Racial-ethnic minorities continue to experience inequality. Blacks and Latinos tended to experience greater work-hour volatility, shorter job tenure, and lower wages than whites; they failed to catch up in homeownership after the Great Recession because of pent-up demand in housing that they did not have the resources to overcome; they, along with Asians, engaged in more hours than whites performing unpleasant daily activities. These examples make it clear that racial inequality manifests in nearly every aspect of life. Changes in racial composition and the growth of the racial-ethnic minorities in recent decades highlight urgent needs to tackle root causes of racial inequality. At the same time, immigration is redefining some of the typical ways we think of racial groups. For example, the increasing share of immigrants in the black population makes it increasingly difficult to cling to old notions of race within the black population itself.

Gender gaps in college completion remained relatively unchanged in the 2010s, but women's gain above the bachelor's degree level, especially professional degrees, widened. More women seek for-profit educational degrees and exacerbate student loan inequality by gender. Buchmann and her colleagues also show that women's outnumbering men in holding advanced degrees declined over time, signaling persistent gender gaps in earnings that favor men. The COVID-19 pandemic led to an economic disruption that has been termed a she-cession due to the changes in women's labor supply and labor-force attachment, which were atypical of most other economic downturns. The pandemic also drew attention to the wages and work conditions in the service sector, elementary education, especially retail, restaurants and hotels, health care, and childcare—all occupations dominated by women. In 2022, American women earned 82 cents for every dollar by men, a large jump relative to forty years ago when they earned just 65 cents (Aragão 2023). Yet the gender pay gap remained very much unchanged in the past two decades, despite women's advancement in college completion. Job tenure does not vary much by gender but earnings gaps increase as men and women spend more time in the labor force. Indeed, throughout the life course, women with chil-

dren carry a motherhood penalty even as men enjoy a fatherhood premium (Kochhar 2023). Gender discrimination in workplaces as well as gender inequality in division of household labor and childcare plays an important role (Ishizuka 2021).

Young people were also hit hard in the 2010s. More young people coming of age after the Great Recession means that more were unable to find steady jobs and own homes or afford rents, especially during a time when demand for homes far exceeds the supply. Fewer were getting married or entering unions, but many were unable to live independently. Continuing the trend started during the Great Recession, more young people lived with their parents in the 2010s (Qian 2012). Economic factors may be a primary reason for this phenomenon. Young people who lived with their parents were more likely to be unemployed, have lower income, have less education, or be racial minorities than their counterparts who lived alone or were married. Parents or older people who live with children often do so in order to pool resources or provide financial help to children or grandchildren in need. Economic hardship contributes to loneliness among young people, regardless of their living arrangement. Meanwhile, non-cisgender people tend to be younger and less likely to marry or enter a union. Compounded by social stigma and discrimination, they also experience higher levels of loneliness and social isolation (Marlay, File, and Scherer 2022).

Taken together, the studies in this double issue underscore continuation of inequality along race, gender, and class. They also underscore that the continuation is not linear, but rather nuanced and highly dependent on the window through which we seek to understand inequality—whether social, economic, political, or another dimension. The recent national elections show an increasing fractionalization of America politically and socially. Economic inequality in the 2010s, exacerbated by the COVID-19 pandemic, may have pushed political polarization to a new height. The divides concern issues as diverse as education, immigration, gun control, reproductive rights, and media access. The racial, gender, education, and economic correlates of political views are strong, and some observers have pointed to geographic differences in political behavior and policy choices as well (Brown and Mettler 2023). The census and all the relevant data can help us answer how various dimensions of inequality and young adults' disadvantaged economic prospects have lined up with political divergence in the United States. Relatedly, the census can also help us place the current fixation with polarization in appropriate perspective: Is this a new development in American society? Is this a return to earlier types of polarization seen in the nineteenth century? Is there a way of moving ahead by reducing inequality? As the current decade continues to unfold, answers will reveal themselves only with time.

REFERENCES

Agadjanian, Alexander. 2022. "How Many Americans Change Their Racial Identification over Time?" *Socius* 8 (January): 23780231221098547. https://doi.org/10.1177/23780231221098547.

Ajilore, Olugbenga, and Caius Z. Willingham. 2020. "The Path to Rural Resilience in America." Washington, D.C.: Center for American Progress. Accessed April 3, 2024. https://www.americanprogress.org/article/path-rural-resilience-america.

Alba, Richard. 2020. *The Great Demographic Illusion: Majority, Minority, and the Expanding American Mainstream*. Princeton, N.J.: Princeton University Press.

Alba, Richard, Brenden Beck, and Duygu Basaran Sahin. 2018. "The Rise of Mixed Parentage: A Sociological and Demographic Phenomenon to Be Reckoned With." *Annals of the American Academy of Political and Social Science* 677(1): 26–38. https://doi.org/10.1177/0002716218757656.

American Association of University Women. 2021. "Deeper in Debt." Accessed April 3, 2024. https://www.aauw.org/app/uploads/2021/05/Deeper_In_Debt_2021.pdf.

Anders, John, Mary E. Campbell, Craig Wesley Carpenter, and Luna Chandna. 2025. "Ethnoracial Transformations? Linking Administrative Data to Explain Changes in Identification." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 65–84. https://doi.org/10.7758/RSF.2025.11.1.04.

Anderson, Dana. 2024. "Homeowners Today Stay in Their Homes Twice as Long as They Did in 2005, Driven Largely by Older Americans Aging in Place." *Redfin News*, February 14. Accessed April 3, 2024. https://www.redfin.com/news/homeowner-tenure-2023.

Aragão, Carolina. 2023. "Gender Pay Gap in U.S. Hasn't Changed Much in Two Decades." Washington, D.C.: Pew Research Center. Accessed April 3, 2024. https://www.pewresearch.org/short-reads/2023/03/01/gender-pay-gap-facts.

Arnett, Jeffrey Jensen. 2004. *Emerging Adulthood: The Winding Road from the Late Teens Through the Twenties*. Oxford: Oxford University Press.

Baker, Regina S., and Heather A. O'Connell. 2022. "Structural Racism, Family Structure, and Black–White Inequality: The Differential Impact of the Legacy of Slavery on Poverty Among Single Mother and Married Parent Households." *Journal of Marriage and Family* 84(5): 1341–65. https://doi.org/10.1111/jomf.12837.

Bean, Frank D., James D. Bachmeier, Susan K. Brown, Jennifer Van Hook, and Mark A. Leach. 2014. "Unauthorized Mexican Migration and the Socioeconomic Integration of Mexican Americans." In *Diversity and Disparities: America Enters a New Century*, edited by John Logan, 341–74. New York: The Russell Sage Foundation.

Bean, Frank D., and Marta Tienda. 1987. *The Hispanic Population of the United States*. New York: Russell Sage Foundation.

Bianchi, Suzanne M., and Daphne Spain. 1986. *American Women in Transition*. New York: Russell Sage Foundation.

Bischoff, Kendra, and Sean F. Reardon. 2014. "Residential Segregation by Income, 1970–2009." In *Diversity and Disparities: America Enters a New Century*, edited by John Logan, 208–33. New York: The Russell Sage Foundation.

Broom, Douglas. 2023. "Having Many Careers Will Be the Norm, Experts Say." Davos Agenda, May 2. World Economic Forum. Accessed April 3, 2024. https://www.weforum.org/agenda/2023/05/workers-multiple-careers-jobs-skills.

Brown, Trevor E., and Suzanne Mettler. 2023. "Sequential Polarization: The Development of the Rural-Urban Political Divide, 1976–2020." Perspectives on Politics. Cambridge: Cambridge University Press. Accessed April 3, 2024. https://www.cambridge.org/core/journals/perspectives-on-politics/article/sequential-polarization-the-development-of-the-ruralurban-political-divide-19762020/ED2077E0263BC149FED8538CD9B27109.

Buchmann, Claudia, Rachel E. Dwyer, and Man Yao. 2025. "The Deepening Gender Divide in Credentials, 2000–2020: Continuity, Change, and Implications." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 154–77. https://doi.org/10.7758/RSF.2025.11.1.08.

Burkhauser, Richard, and Jeff Larrimore. 2014. "Median Income and Income Inequality: From 2000 and Beyond." In *Diversity and Disparities: America Enters a New Century*, edited by John Logan, 105–38. New York: Russell Sage Foundation.

Cai, Julie Y., and Marybeth J. Mattingly. 2025. "Unstable Work Schedules and Racial Earnings Disparities Among U.S. Workers." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 201–23. https://doi.org/10.7758/RSF.2025.11.1.10.

Camarota, Steven A., and Karen Zeigler. 2021. "Fertility Among Immigrants and Native-Born Americans." Washington, D.C.: Center for Immigration Studies. Accessed April 3, 2024. https://cis.org/Report/Fertility-Among-Immigrants-and-NativeBorn-Americans.

Carpenter, Christopher S., Maxine J. Lee, and Laura Nettuno. 2025. "Gender Minority Status and Family Inequality in the United States." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 65–85. https://doi.org/10.7758/RSF.2025.11.2.04.

Cheng, Siwei, Yongjun Zhang, and Jenna Shaw. 2025. "Economic Inequality and the Geography of Activity Space Segregation: Combining Mobile Device Data and Census Data." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 132–52. https://doi.org/10.7758/RSF.2025.11.1.07.

Cherlin, Andrew J. 2010. "Demographic Trends in the United States: A Review of Research in the 2000s." *Journal of Marriage and Family* 72(3): 403–19. https://doi.org/10.1111/j.1741–3737.2010.00710.x.

Cohn, D'Vera, and Jeffrey S. Passel. 2022. "Key Facts About the Quality of the 2020 Census." Washington, D.C.: Pew Research Center.

Cottom, Tressie McMillan. 2017. *Lower Ed: The Troubling Rise of For-Profit Colleges in the New Economy*. New York: The New Press.

Cross, Christina J. 2019. "Racial/Ethnic Differences

in the Association Between Family Structure and Children's Education." *Journal of Marriage and Family* 82(2): 691–712. https://doi.org/10.1111/jomf.12625.

Dahir, Nima. 2025. "Who Is Black on the Block? Black Immigrants and Changing Black Neighborhoods." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 110–31. https://doi.org/10.7758/RSF.2025.11.1.06.

Dean, Jeff. 2022. "Young Women Earn More Than Young Men in Several U.S. Cities." National Public Radio. Accessed April 3, 2024. https://www.npr.org/2022/04/02/1090466033/gender-pay-gap-women-earn.

DiPrete, Thomas A., and Claudia Buchmann. 2013. "Gender Disparities in Educational Attainment in the New Century: Trends, Causes and Consequences." In *Diversity and Disparities: America Enters a New Century*, edited by John R. Logan. New York: Russell Sage Foundation.

Doyle, Jamie Mihoko, and Grace Kao. 2007. "Are Racial Identities of Multiracials Stable? Changing Self-Identification Among Single and Multiple Race Individuals." *Social Psychology Quarterly* 70: 405–23.

Edin, Kathryn, and Maria Kefalas. 2005. *Promise I Can Keep: Why Poor Women Put Motherhood Before Marriage*. Berkeley: University of California Press.

Fabrizio, Stefania, Diego B. Gomes, and Marina Mendes Tavares. 2021. "COVID-19 She-Cession: The Employment Penalty of Taking Care of Young Children." *IMF* working paper no. 2021/058. Washington, D.C.: International Monetary Fund. Accessed April 3, 2024. https://www.imf.org/en/Publications/WP/Issues/2021/03/03/COVID-19-She-Cession-The-Employment-Penalty-of-Taking-Care-of-Young-Children-50117.

Farley, Reynolds. 1995. *State of the Union: America in the 1990s*. New York: Russell Sage Foundation.

Farley, Reynolds, and John Haaga. 2005. *The American People: Census 2000*. New York: Russell Sage Foundation.

Ferla, Ruth La. 2023. "Generation E.A.: Ethnically Ambiguous." *New York Times*, December 28. Accessed April 3, 2024. https://www.nytimes.com/2003/12/28/style/generation-ea-ethnically-ambiguous.html.

Fischer, Claude S., and Michael Hout. 2006. *Century of Difference: How America Changed in the Last One Hundred Years*. New York: Russell Sage Foundation.

Fry, Richard. 2022. "Young Women Are Out-Earning Young Men in Several U.S. Cities." Washington, D.C.: Pew Research Center. Accessed April 3, 2024. https://www.pewresearch.org/short-reads/2022/03/28/young-women-are-out-earning-young-men-in-several-u-s-cities.

Gibson-Davis, Christina M., Kathryn Edin, and Sara McLanahan. 2005. "High Hopes but Even Higher Expectations: The Retreat from Marriage Among Low-Income Couples." *Journal of Marriage and Family* 67(5): 1301–12.

Goldin, Claudia. 2021. "Journey Across a Century of Women." *Miken Institute Review* 23(2): 36–45.

Guyot, Katherine, and Richard V. Reeves. 2020. "Unpredictable Work Hours and Volatile Incomes Are Long-Term Risks of American Workers." Washington, D.C.: Brookings Institution. https://www.brookings.edu/articles/unpredictable-work-hours-and-volatile-incomes-are-long-term-risks-for-american-workers.

Hardy, Bradley J., Shria Holla, Elizabeth S. Krause, and James P. Ziliak. 2025. "Stalled Progress? Five Decades of Black-White and Rural-Urban Income Gaps." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 115–36. https://doi.org/10.7758/RSF.2025.11.2.06.

Harrison, Roderick J., and Claudette E. Bennett. 1995. "Racial and Ethnic Diversity." In *State of the Union: America in the 1990s,* vol. 2: *Social Trends*, edited by Reynolds Farley, 141–210. New York: Russell Sage Foundation.

Ishizuka, P. 2021. "The Motherhood Penalty in Context: Assessing Discrimination in a Polarized Labor Market." *Demography* 58(4): 1275–300. https://doi.org/10.1215/00703370-9373587.

James, Sarah, and Elizabeth Wrigley-Field. 2025. "How Ethnoracial Groups Spend Their Time." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 178–200. https://doi.org/10.7758/RSF.2025.11.1.09.

Jensen, Eric, Nicholas Jones, Megan Rabe, Beverly Pratt, Lauren Medina, Kimberly Orozco, and Lindsay Spell. 2021. "The Chance That Two People Chosen at Random Are of Different Race or Ethnicity Groups Has Increased Since 2010." *America Counts: Stories Behind the Numbers*, August 12. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/library/stories/2021/08/2020-united-states

-population-more-racially-ethnically-diverse-than-2010.html.

Jones, Nicholas, and Jungmiwha Bullock. 2012. *The Two or More Races Population: 2010*. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www2.census.gov/library/publications/cen2010/briefs/c2010br-13.pdf.

Jones, Nicholas, Rachel Marks, Roberto Ramirez, and Merarys Rios-Vargas. 2021. "2020 Census Illuminates Racial and Ethnic Composition of the Country." *America Counts: Stories Behind the Numbers*, August 12. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/library/stories/2021/08/improved-race-ethnicity-measures-reveal-united-states-population-much-more-multiracial.html.

Kochhar, Rakesh. 2023. "The Enduring Grip of the Gender Pay Gap." Washington, D.C. Pew Research Center. Accessed April 3, 2024. https://www.pewresearch.org/social-trends/2023/03/01/the-enduring-grip-of-the-gender-pay-gap.

Lachanski, Michael. 2025. "U.S. Trends in Job Stability by Sex, Race, and Ethnicity from 1996 to 2020." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 224–46. https://doi.org/10.7758/RSF.2025.11.1.11.

Lee, Jennifer, and Frank D. Bean. 2004. "America's Changing Color Lines: Immigration, Race/Ethnicity, and Multiracial Identification." *Annual Review of Sociology* 30(1): 221–42.

Levy, Frank. 1987. *Dollars and Dreams: The Changing American Income Distribution*. New York: Russell Sage Foundation.

Lichter, Daniel T., and David Brown. 2011. "Rural America in an Urban Society: Changing Spatial and Social Boundaries." *Annual Review of Sociology* 37(1): 565–92. https://doi.org/10.1146/annurev-soc-081309-150208.

Lichter, Daniel T., and Kenneth M. Johnson. 2025. "Depopulation, Deaths, Diversity, and Deprivation: The 4Ds of Rural Population Change." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 88–114. https://doi.org/10.7758/RSF.2025.11.2.05.

Lichter, Daniel T., and Zhenchao Qian. 2018. "Boundary Blurring? Racial Identification among the Children of Interracial Couples." *Annals of the American Academy of Political and Social Science* 677(1): 81–94. https://doi.org/10.1177/0002716218760507.

Lieberson, Stanley, and Mary C. Waters. 1988. *From Many Strands: Ethnic and Racial Groups in Contemporary America*. New York: Russell Sage Foundation.

Livingston, Gretchen, and Anna Brown. 2017. "Intermarriage in the U.S. 50 Years After Loving v. Virginia." Washington, D.C.: Pew Research Center.

Logan, John. 2014. *Diversity and Disparities: America Enters a New Century*. New York: Russell Sage Foundation.

Logan, Trevon D., and John M. Parman. 2017. "The National Rise in Residential Segregation." *Journal of Economic History* 77(1): 127–70. https://doi.org/10.1017/S0022050717000079.

Love, Hanna, and Tracy Hadden Loh. 2020. "The 'Rural-Urban Divide' Furthers Myths About Race and Poverty—Concealing Effective Policy Solutions." Washington, D.C.: Brookings Institution. Accessed April 3, 2024. https://www.brookings.edu/articles/the-rural-urban-divide-furthers-myths-about-race-and-poverty-concealing-effective-policy-solutions.

Marlay, Matthew, Thom File, and Zachary Scherer. 2022. "Mental Health Struggles Higher Among LGBT Adults Than Non-LGBT Adults in All Age Groups." *America Counts: Stories Behind the Numbers*, December 14. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/library/stories/2022/12/lgbt-adults-report-anxiety-depression-at-all-ages.html.

Mekour, Deborah. 2022. "Despite Huge Redistricting Advantage, Republicans Play It Safe." VOA News, November 2. Accessed April 3, 2024. https://www.voanews.com/a/despite-huge-redistricting-advantage-republicans-play-it-safe-/6736897.html.

Migration Policy Institute. 2023. "Migration Data Hub." Accessed April 3, 2024. https://www.migrationpolicy.org/programs/migration-data-hub.

Myers, Dowell, Hyojung Lee, and JungHo Park. 2025. "Misalignment of Housing Growth and Population Trends: Cohort Size and Lagging Measurements Through Recession and Recovery." *RSF: The Russell Sage Foundation of the Social Sciences* 11(1): 86–109. https://doi.org/10.7758/RSF.2025.11.1.05.

Neidert, Lisa, Reynolds Farley, and Jeffrey Morenoff. 2025. "How Census Undercount Became a Civil Rights Issue and Why It Is Increasingly Important." *RSF: The Russell Sage Foundation of the*

Social Sciences 11(1): 26–43. https://doi.org/10.7758/RSF.2025.11.1.02.

Pager, Devah, and Hana Shepherd. 2008. "The Sociology of Discrimination: Racial Discrimination in Employment, Housing, Credit, and Consumer Markets." *Annual Review of Sociology* 34(1): 181–209.

Park, Hyunjoon, Matthew Sheen, and Paula Clark. 2025. "Living Alone for Black and White Men and Women over Four Decades, 1980–2019." *RSF: The Russell Sage Foundation of the Social Sciences* 11(2): 26–45. https://doi.org/10.7758/RSF.2025.11.2.02.

Parrado, Emilio A. 2011. "How High Is Hispanic/Mexican Fertility in the United States? Immigration and Tempo Considerations." *Demography* 48(3): 1059–80. https://doi.org/10.1007/s13524-011-0045-0.

Qian, Zhenchao. 2004. "Options: Racial/Ethnic Identification of Children of Intermarried Couples." *Social Science Quarterly* 85(3): 746–66.

———. 2012. "During the Great Recession, More Young Adults Lived with Parents." Census Brief for Project US2010. New York: Russell Sage Foundation and American Communities Project of Brown University. Accessed April 3, 2024. https://s4.ad.brown.edu/Projects/Diversity/Data/Report/report08012012.pdf.

———. 2014. "Divergent Paths of American Families." In *Diversities and Disparities: America Enters a New Century*, edited by John Logan, 237–69. New York: Russell Sage Foundation.

Qian, Zhenchao, and Yifan Shen. 2020. "Context of Interracial Childbearing in the United States." In *Analyzing Contemporary Fertility*, edited by Robert Schoen, 65–87. New York: Springer.

Rackin, Heather M., and Christina M. Gibson-Davis. 2018. "Social Class Divergence in Family Transitions: The Importance of Cohabitation." *Journal of Marriage and Family* 80(5): 1271–86. https://doi.org/10.1111/jomf.12522.

Reeves, Richard V., and Ember Smith. 2021. "The Male College Crisis Is Not Just in Enrollment, but Completion." Washington, D.C.: Brookings Institution. https://www.brookings.edu/articles/the-male-college-crisis-is-not-just-in-enrollment-but-completion.

Roth, Wendy D., Rochelle Côté, and Jasmyne Eastmond. 2022. "Bridging Boundaries? The Effect of Genetic Testing on Ties Across Racial Groups." *Social Problems* 71(2): 180–202. https://doi.org/10.1093/socpro/spab082.

Roth, Wendy D., and Biorn Ivemark. 2018. "Genetic Options: The Impact of Genetic Ancestry Testing on Consumers' Racial and Ethnic Identities." *American Journal of Sociology* 124(1): 150–84. https://doi.org/10.1086/697487.

Ruggles, Steven, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. 2024. "IPUMS USA: Version 15.0 [dataset]." Minneapolis, Minn: IPUMS. https://doi.org/10.18128/D010.V15.0.

Scherer, Zachary. 2022. "Key Demographic and Economic Characteristics of Same-Sex and Opposite-Sex Couples Differed." *America Counts: Stories Behind the Numbers*, November 22. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/library/stories/2022/11/same-sex-couple-households-exceeded-one-million.html.

Schmidt, Lucie, Lara Shore-Sheppard, and Tara Watson. 2025. "Living with Children and Economic Disadvantage Among Seniors." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 46–64. https://doi.org/10.7758/RSF.2025.11.2.03.

Seltzer, Judith A., and Jenjira Yahirun. 2014. "Diversity in Old Age: The Elderly in Changing Economic and Family Contexts." In *Diversity and Disparities: America Enters a New Century*, edited by John Logan, 270–305. New York: Russell Sage Foundation.

Smock, Pamela J., and Christine R. Schwartz. 2020. "The Demography of Families: A Review of Patterns and Change." *Journal of Marriage and Family* 82(1): 9–34. https://doi.org/10.1111/jomf.12612.

Stoll, Michael A. 2014. "Residential Mobility in the United States and the Great Recession: A Shift to Local Moves." In *Diversity and Disparities: America Enters a New Century*, edited by John Logan, 139–80. New York: Russell Sage Foundation.

Suárez Serrato, Juan Carlos, and Philippe Wingender. 2016. "Estimating Local Fiscal Multipliers." *NBER* working paper no. 22425. Cambridge, Mass.: National Bureau of Economic Research. https://doi.org/10.3386/w22425.

Umberson, Debra, Kristi Williams, Patricia A. Thomas, Hui Liu, and Mieke B. Thomeer. 2014. "Race, Gender, and Chains of Disadvantage: Childhood Adversity, Social Relationships, and Health." *Journal of Health and Social Behavior*

55(1): 20–38. https://doi.org/10.1177/0022146514521426.

U.S. Census Bureau. 2021. "Census Bureau Releases New Estimates on America's Families and Living Arrangements." Press release. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/newsroom/press-releases/2021/families-and-living-arrangements.html.

———. 2022. "Census Bureau Releases Estimates of Undercount and Overcount in the 2020 Census." Press release. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/newsroom/press-releases/2022/2020-census-estimates-of-undercount-and-overcount.html.

———. 2023. "Decennial Census P.L. 94-171 Redistricting Data Table P2." Press release. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/programs-surveys/decennial-census/about/rdo/summary-files.html.

———. 2024. "Table MS-2. Estimated Median Age at First Marriage, by Sex: 1890 to Present." Historical Marital Status Tables. Washington: U.S. Census Bureau. Accessed April 3, 2024. https://www.census.gov/data/tables/time-series/demo/families/marital.html.

Ventura, Ilana M., and René D. Flores. 2025. "The 'Rise' of Multiracials? Examining the Growth in Multiracial Identification in the 2020 U.S. Census." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 44–64. https://doi.org/10.7758/RSF.2025.11.1.03.

Wike, Richard, Laura Silver, Janell Fetterolf, Christine Huang, Sarah Austin, Laura Clancy, and Sneha Gubbala. 2022. "Internet, Smartphone and Social Media Use." Washington, D.C.: Pew Research Center. Accessed April 3, 2024. https://www.pewresearch.org/global/2022/12/06/internet-smartphone-and-social-media-use-in-advanced-economies-2022.

Wines, Michael. 2022. "Census Memo Cites 'Unprecedented' Meddling by Trump Administration." *New York Times*, January 15. Accessed April 5, 2024. https://www.nytimes.com/2022/01/15/us/2020-census-trump.html.

Yang, Tse-Chuan, Seung-Won Emily Choi, and Feinuo Sun. 2020. "COVID-19 Cases in US Counties: Roles of Racial/Ethnic Density and Residential Segregation." *Ethnicity & Health* 26(1): 11–21. https://doi.org/10.1080/13557858.2020.1830036.

Zhai, Wei, Xinyu Fu, Mengyang Liu, and Philip Hubbard. 2023. "The Impact of Ethnic Segregation on Neighbourhood-Level Social Distancing in the United States amid the Early Outbreak of COVID-19." *Urban Studies* 60(8): 1403–26. https://doi.org/10.1177/00420980211050183.

I

Census Counts and Classifications

How Census Undercount Became a Civil Rights Issue and Why It Is Increasingly Important

LISA NEIDERT, REYNOLDS FARLEY, AND JEFFREY MORENOFF

This article traces the history of census undercount and its importance to civil rights. The Constitution mandates a census and calls for Congress to use the results to apportion seats in Congress and the Electoral College. A substantial undercount in the census will misallocate congressional and electoral college votes. More recently, census-derived statistics are used for the geographic allocation of federal and state funds. This linkage of the census count to the distribution of federal and state funds puts the undercount on the radar for states and municipalities. Closely tied to the undercount and becoming a more central issue to the Census Bureau is the difficulties in reaching hard-to-count populations. Is the Census Bureau up to the task? We end our story with a discussion of Detroit's experience with the 2020 Census, including its unsuccessful challenge to its housing count.

Keywords: decennial census, undercount, civil rights, federal revenue sharing funds, Detroit

The census is the only federal statistical program mentioned in the Constitution. Every ten years the census enumerates the total population so that this nation will have a democratic government in which each state has political power reflecting its population size. James Madison wanted the first census to be expanded beyond bare enumeration. He wished to collect information about the population so that Congress could be more informed when they enacted laws and spent tax dollars.

From 1790 to 1940, all respondents were asked a series of questions about their demographic and economic status. From 1940 to 2000, a sample of households received a long form that asked such questions; most respondents, however, filled out a short form asking

Lisa Neidert is affiliated with the Department of Sociology at the University of Michigan, United States. **Reynolds Farley** is the Otis Dudley Duncan Professor Emeritus at the University of Michigan and is affiliated with the Population Studies Center and the Gerald Ford School of Policy, United States. **Jeffrey Morenoff** is the associate dean for research and policy experiments and professor of public policy at the Gerald R. Ford School of Policy at the University of Michigan, United States.

© 2025 Russell Sage Foundation. Neidert, Lisa, Reynolds Farley, and Jeffrey Morenoff. 2025. "How Census Undercount Became a Civil Rights Issue and Why It Is Increasingly Important." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 26–43. https://doi.org/10.7758/RSF.2025.11.1.02. Direct correspondence to: Lisa Neidert, at lisan@umich.edu, 909 Northwood Ann Arbor, Michigan 48103, United States; Reynolds Farley, at renf@umich.edu, 807 Asa Gray Drive #306 Ann Arbor, Michigan 48105, United States; Jeffrey Morenoff, at morenoff@umich.edu, Gerald R. Ford School of Public Policy, University of Michigan, 735 South State Street, Ann Arbor, Michigan 48109, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

their address, name, race, sex, and age. Since 2001, the collection of detailed information about economic and demographic characteristics has been collected not by the census but by the annual American Community Survey (ACS). The ACS does not enumerate the population. Instead, it gathers data about the characteristics of residents of places whose official population size is ascertained by the decennial census. The current sample size for the annual ACS is about 3.5 million housing units. The population for each place is updated every year by the Census Bureau's Population Estimates program. Communities use these data for operational purposes by analyzing the characteristics of neighborhoods to deploy programs. Researchers use the data for analyzing social and economic trends, investors and nonprofits to make decisions about where they will locate their facilities. In all cases, the accuracy and completeness of the census enumeration is critical.

Census under- and overcounting is a civil rights issue. If some states are significantly overcounted and others undercounted, some states may be over- or underrepresented in Congress. If areas with many black and Hispanic residents are undercounted while areas with white and Asian residents are overcounted, legislative seats within a state may be erroneously assigned, and federal and state dollars may flow to overcounted areas rather than to the locations that were intended to receive such funds. Although census errors are important, other forces are often more important to civil rights, including gerrymandering and voting rights issues. With the rapidly increasing distribution of federal funds tied to the census counts and characteristics drawn from the ACS, census undercount looms large in importance. Although undercount is a national issue, its impact is often local. We close this article with an illustration of a city that has in the past and most recently challenged the Census Bureau concerning its apparently substantial undercount. This undercount costs the city state and federal monies and diminishes its influence in the state legislature. Thus we end our story with Detroit's experience with the Census 2020 and its formal challenge to the 2020 housing and population counts.

CENSUS UNDERCOUNT

A perception of undercount in the census is long standing, however exaggerated. For instance, without any evidence, both George Washington and Thomas Jefferson told their European counterparts that the population of the United States in 1790 exceeded four million, not the 3.9 million enumerated in the first census (U.S. Census Bureau 2024). After the 1870 census, the mayors of Indianapolis, New York, and Philadelphia were so upset with their small population counts that they demanded a recount. President Ulysses Grant ordered the Census Office to count those cities a second time (Anderson 2015, 91)—the only time a president ordered a recount.

In the nineteenth and early twentieth century, the census date was June 1 or April 1. In 1920, the census questionnaire included a new question asking farmers about the value of their crops in 1919. The Department of Agriculture had requested that Census 1920 be taken on January 1 because farmers would more likely remember the value of their crops from the previous year. That date was selected but with a curious result. Congress never used Census 1920 data to reapportion congressional and Electoral College seats, the only time that happened. Data from the 1920 Census showed that the country had shifted from majority rural to majority urban and much of the urban population was composed of recent immigrants. Using 1920 data would have shifted seats from rural states to those with rapidly growing urban areas, with their large population of recent Catholic and Jewish immigrants (Prewitt 2017). Congress had already prohibited migration from Asia but in 1924 greatly restricted and almost terminated the flow from eastern and southern Europe by using the relative size of the foreign population in the 1890 Census as the basis for immigration quotas.

CENSUS UNDERCOUNT: DEMOGRAPHERS TO THE RESCUE

The first statistical analysis to measure the extent of undercount was accomplished by demographer Daniel Price (1947), who compared the count of men, age twenty-one to thirty-five who registered with the Selective Service in 1940 to the number enumerated in the 1940

Census. Not only was there a 3.1 percent undercount of these men, but also a differential undercount with black males showing a deficit of 14.8 percent, almost five times the undercount of white males. Another group of demographers illustrated a different method to measure undercount using birth and death registration numbers. Ansley Coale and Mel Zelnick (1963) demonstrated that vital statistics data about births and deaths could be used to assess the completeness of the census count by age, sex, and race. For instance, the 1950 count of children four years old and younger should have been almost the same as number of births in the preceding five years minus deaths to that age group. It was not. Their findings supported what Price had shown: a much greater undercount of blacks than whites.

UNDERCOUNT: WHY IT DIDN'T MATTER

Undercount is never good and differential undercount is worse, but it was not as much of a civil rights issue in the 1940s or even in the 1960s. Why? First, very few blacks in the South were allowed to vote or even register to vote. In 1867, shortly after the Fourteenth Amendment to the Constitution was adopted, 66.9 percent of black men of voting age were registered to vote in Mississippi. This was higher than the comparable percentage for white men of voting age—59.6 percent. By 1892, registration numbers had plummeted for blacks to 5.7 percent, but the number remained virtually unchanged for whites at 56.5 percent (U.S. Commission on Civil Rights 1965, 8). Mississippi was an outlier for the South, but registration numbers for the voting age black population were below 50 percent in eleven southern states in 1956 and remained below 50 percent for all but three—Florida, Tennessee, and Texas, in 1964 (U.S. Commission on Civil Rights 1965, 11).

Differential undercount mattered more when blacks had the right to vote. It took the Voting Rights Act of 1965 for data from the decennial census to make a difference. The Voting Rights Act of 1965 included a preclearance provision in Section 5, inserted because so few blacks were voting in many southern states. Section 5 required states that had prevented blacks from registering to vote or voting to obtain Department of Justice approval when they changed their voting procedures. In 2013, in *Shelby County v. Holder* the Supreme Court did away with the preclearance requirement.[1] The majority opinion asserted that there was no longer a disparity in registration and voting between blacks and whites. In addition, the coverage formula had not been updated and was still based on decades-old data from the 1960s. In Ruth Bader Ginsburg's vibrant dissent, she famously wrote, "Throwing out preclearance when it has worked and is continuing to work to stop discriminatory changes is like throwing away your umbrella in a rainstorm because you are not getting wet." In fact, recent research out of the Brennan Center for Justice (Morris and Grange 2024) shows that the black-white voting gap has increased across the United States since 2012. This is especially true in the previously covered jurisdictions. They argue that one explanation for the elimination of the race-specific disparity in registration and voting at the time of *Shelby v. Holder* was that a black man, Obama, was the presidential candidate.

A second reason undercount was not particularly relevant for civil rights was malapportionment—drawing the boundaries of voting districts so that they have unequal populations. The Compendium of State Legislative Apportionment is a treasure trove that shows the disparities in districts before the Supreme Court intervened (National Municipal League 1962, iii–vi). Congressional district disparities between the most populous and the least populous district were more than two to one in thirteen states in the 1960s. State legislative districts were even worse. In twenty states, it only took 33 percent of the population to control the state house; for the state senate, the number rose to twenty-eight states. This extreme malapportionment gave residents in some areas of a state very much more political influence than those in other areas, a clear example of gerrymandering at work.

Even though the Supreme Court focused on the Tennessee state house in their 1962 *Baker v. Carr* decision, these differences in population size among voting districts were not just in the

1. *Shelby County v. Holder*, 370 U.S. 529 (2013).

South.[2] In 1960, in the lower house in Vermont, one district had only twenty-four residents while another had 35,531 (National Municipal League 1962). State senates had equally extreme examples. In California, Los Angeles County with a population of more than six million had the same representation in the state senate as three inland counties, which had a combined population of just over fourteen thousand. So much for the principal of one person, one vote.

Malapportionment was rampant until a series of Supreme Court decisions. The first, *Baker v. Carr* (1962), concluded that redistricting cases were judiciable based on the equal protection clause of the Fourteenth Amendment. Subsequent cases addressed whether districts would have to have equal populations. *Gray v. Sanders* (1963) established the famous "one person, one vote" principle for state house districts, by upending the county unit system.[3] *Wesberry v. Sanders* (1964) required that congressional districts be drawn with equal populations.[4] *Reynolds v. Sims* (1964) required that state senate districts be equal in population size using census counts.[5] Quoting the Chief Justice Earl Warren, "legislators represent people, not acres or trees."

These changes to the rules for drawing state senate voting districts were extremely contentious, especially the judgment that state senate districts had to have the same population size. Most but not all states had set up their state legislative maps like the federal system with congressional House seats based on equal populations, whereas every state gets two senators regardless of its population. Some states used the rationale that specific areas in their state should have representation in Congress and the state legislature regardless of their population size. Congress, led by Senator Everett Dirksen (*U.S. News and World Report* 1967) labored to pass a constitutional amendment to overturn the rule for drawing of state senate districts. After congressional efforts failed, energy went to overturning this decision via a constitutional convention (Smith 2014). The quest for a Constitutional Convention almost came to fruition with 33 states voting for it—just one shy of the two-thirds majority needed. However, this may be overstating the close call as some of the states that voted in favor of the convention were voting before their new per capita state legislative maps had been drawn.

A final reason undercount was not a civil rights issue at this time was that federal dollars did not really flow to states and municipalities based on the census count until the 1980s. We discuss this issue later.

LITIGATION OF UNDERCOUNT

Next, we turn to Supreme Court cases that address whether adjusted counts would be produced by the Census Bureau and whether these could be used for apportionment and redistricting. Although these are old cases, the issue of the difficulties of fully enumerating the hard-to-count populations and whether it can or should adjust for over and undercount is as important now as in the past.

In the 1970s, the city of Detroit, *Young v. Klutznick a*nd the state of New York, *Carey v. Klutznick* took the lead in trying to resolve the census undercount problem through litigation.[6] Prior to the 1980 count, they filed suits contending that not only could the census be conducted more accurately, but that a large post-enumeration survey (PES) could detect undercounts for specific groups and for specific local areas. Post-enumeration surveys are one of two ways the Census Bureau measures undercount. In brief, the PES is a follow-up to the decennial census by independently surveying a sample of the population. The results of this survey are compared to the original enumeration for completeness of count within a household as well as whether the household

2. *Baker v. Carr*, 369 U.S. 186 (1962).

3. *Gray v. Sanders*, 272 U.S. 368 (1963).

4. *Westberry v. Sanders*, 376 U.S. 1 (1964).

5. *Reynolds v. Sims*, 377 U.S. 433 (1964).

6. *Young v. Klutznick*, 652 F.2d 732, 6th Cir. (1981); *Carey v. Klutznick*, 653 F.2d 732, 2nd Cir. (1981).

was completely missed during the census enumeration. This is covered in more detail when we discuss the 2020 Census.

A primary motivation for this litigation was that Detroit and New York were large cities in states that had numerous suburban and rural residents. If the cities were undercounted, their residents were underrepresented in the state legislature and representatives from rural and suburban areas could easily pass laws and tax policies favorable to their own districts but unfavorable to residents in big cities. The plaintiffs contended that PES data should be used to adjust the actual census count to remedy the constitutional violations. The lower courts in Michigan and New York supported the plaintiffs. However, the Sixth Circuit Court of Appeals overturned the lower court decision and argued that the plaintiff, Mayor Coleman Young of Detroit, had not demonstrated a judicially cognizable injury and therefore lacked standing to sue. The Census Bureau planned to release the official but unadjusted apportionment count on December 31, 1980. However, on December 30, the district court in New York handling that city's litigation issued an order enjoining that release since it did not include an adjustment for undercount. The Supreme Court met the next morning. They overturned the lower court order, and the apportionment population was released on December 31 without an adjustment for undercount ending the challenges to the 1980 Census (Brown 1980).

The Census Bureau's PES analysis of Census 1980 found the typical shortcoming: an undercount of 5.2 percent of blacks and an overcount of 1.2 percent of whites. Detroit and New York repeated the litigation they began in the previous decade, contending that the continuing racial differences in undercount deprived the residents of large cities of their fair share of representation in state houses and in Congress. The Ronald Reagan administration settled with the plaintiffs by agreeing that the Census Bureau would take a large post-enumeration survey. An eight-person panel—four appointed by the plaintiffs and four by the defendants—would then recommend to the secretary of Commerce whether the actual count or the adjusted count should be the official apportionment population. If the panel deadlocked, the secretary of Commerce would cast the deciding vote.[7] The committee deadlocked, leaving Secretary of Commerce Robert Mosbacher with the deciding vote. He turned down the option to adjust for undercount and the actual count was official (Anderson 2015, chap. 11).

In July 1990, a coalition of cities and states led by New York continued the litigation. They filed suit claiming that undercount of minorities in Census 1990 likely cost cities representation and probably gave two states congressional seats they did not deserve thereby denying two other states congressional representation the Constitution mandated. The litigants also contended procedural errors in the decision-making process. The litigation proceeded slowly. In 1996, the Supreme Court recognized an undercount of minorities but ruled that the unadjusted numbers would be official numbers (*Wisconsin v. New York et al.*).[8] Mayor Rudy Guiliani immediately stated that the Supreme Court decision meant that New York City was likely undercounted by 230,000; probably lost at least one seat in the state legislature and would cost the city $500 million annually in federal funds (Greenhouse 1996).

MORE LITIGATION: REENGINEERING THE CENSUS

By now, attention increased on reengineering the census to both cut costs and improve accuracy. Two panels of the Committee on National Statistics examined possible improvements and innovations for the 2000 Census. In the end, the Census Bureau's plan included a more user-friendly questionnaire. The real innovation, though, was to use sampling in the nonresponse-follow-up (NRFU) operation, which had the potential to cut costs. The sampled population would represent all the nonresponses. In addition, a large post-enumeration survey would be combined with the enumera-

7. An Undercount Steering Committee comprised Census Bureau statisticians and voted 7–2 in favor of adjusting for undercount, as did the Census Bureau director, Barbara Bryant.

8. *Wisconsin v. New York et al.*, 517 U.S. 1 (1996).

tion via dual-system-estimation, which would result in a one-number census. Not all statistical reviews embraced everything in the Census Bureau plan, but they were in favor of sampling for NRFU and a large post-enumeration survey to measure undercount (Norwood 2016).

In the words of the Census Bureau director at the time, Kenneth Prewitt (2005), "The census was politically radioactive in 2000 and it may remain so." Republicans were skeptical about the merits of the plan and threatened to hold up funding for the census. The Bill Clinton administration supported the Census Bureau.[9] Fearing that this would have political implications, Speaker of the House Newt Gingrich sued the administration. Because the suit involved two branches of the government, the matter immediately went to the Supreme Court. In 1999, in a 5–4 decision in *Department of Commerce v. U.S. House of Representatives*, the Court ruled that the Constitution forbade the use of sampling in the census and mandated a continuation of traditional census taking.[10] They did not, however, eliminate the post-enumeration survey to measure undercount but ruled that information from a sample could not be used to adjust for census errors.

THE CIVIL RIGHTS ACT STILL HAS A LEG TO STAND ON

By July 2023, seventy-four suits had been filed in twenty-seven states challenging how the state legislature used Census 2020 data to reapportion congressional and legislative districts (Brennan Center for Justice 2023). Many of these suits were filed by groups representing black and Hispanic plaintiffs but, in North Dakota, representatives of Native Americans filed suit contending that that state legislature had not drawn state legislative districts where Native Americans made up a substantial fraction or majority of the voting age population. As the Census Bureau's PES showed, Native Americans on tribal lands or reservations were undercounted by 5.6 percent. A recent study found that nonwhites are drastically underrepresented in local governments including elected positions (DeBenedictis-Kessner 2024).

Federal court decisions in 2023 placed great emphasis on the use of census data to protect the voting rights of minorities and thereby bringing to the fore questions about civil rights violations due to differential undercount in the census. Title 2 of the Voting Rights Act of 1965 prohibits states from adopting policies or procedures that would diminish the voting rights of racial minorities or of certain specific language groups, including Spanish speakers. After the 1990 Census, the Alabama legislature created one congressional district in which a majority of the voting age population was black. For the first time since Reconstruction, a black was elected to represent Alabama in Congress. The state now has seven congressional districts. Using Census 2020 data, the Alabama legislature redrew the state's congressional districts. In one of them, 46 percent of the voting age population was African American but the percentage black in the other six congressional districts was much lower due to the choices the legislators made in drawing the map. Census 2020 reported that one-quarter of the state's voting age population were single-race non-Hispanic blacks.

Many states have a tradition of both blacks and whites voting for members of their own race, a tradition the Supreme Court noted. After the Alabama legislature drew new congressional maps based on Census 2020 data, voting rights plaintiffs in Alabama argued that there should be two districts where blacks could elect a representative that would serve their interests and sued. A panel of federal judges in Alabama unambiguously upheld the plaintiffs' view and ordered the districts be redrawn so that Alabama voters would have the opportunity to elect more than one black to Congress.

The Alabama attorney general appealed to the Supreme Court. Most court watchers were surprised when the Supreme Court upheld the lower court ruling with a 5–4 majority and ordered that Alabama redraw its districts in com-

9. Clinton had run for office on a reinventing government platform, which would reduce the number of government employees. Sampling for NRFU fits this model well. More long-lasting was the outsourcing of technology at the Census Bureau, which occurred under his administration (Ruggles and Magnuson 2020).

10. *Department of Commerce et al. v. U.S. House of Representatives et al.*, 525 U.S. 316 (1999).

pliance with the Voting Rights Act (*Allen v. Milligan*).[11] Eventually, the state legislature complied with this ruling, as did other states with large concentrations of blacks.

This victory for civil rights may be short lived, however. Brett Kavanaugh voted with the majority but raised the issue of whether a time limit should be set on how long minority voting districts are necessary. In time, a case will raise that issue. In addition, several of the southern states that had to draw an additional minority voting district have challenged the minority voting rights districts on other grounds.

The Eighth Circuit ruled that only the U.S. Department of Justice could serve as a plaintiff in litigation regarding how legislative districts were drawn.[12] In Georgia, the state legislators dismantled a coalition minority opportunity district of Hispanic and Asians, neither of which were large enough to be a stand-alone minority opportunity district (Gringlas 2023). They did this to create an additional black opportunity district. Will coalition minority opportunity districts be on the chopping block? If so, these are quite numerous in states such as Texas and California.

THE 2020 CENSUS

The federal government spent $13.7 billion to enumerate the population in 2020, that is, a cost of $41 per person (GAO 2023). For decades, administrations have sought to minimize that cost. Recall that President Clinton ran on a reinventing government platform, which was supposed to bring efficiencies to the federal government and save money. It has not worked, at least as far as the cost of the decennial census.

The 2020 Census was conducted under incredibly challenging circumstances (Sullivan and Cork 2023). Because of the COVID-19 pandemic, the Census Bureau had to delay the start of its nonresponse-follow-up. There was also political interference. The Donald Trump administration reduced funding for the census, which led to the cancellation of several pre-tests in sites the Census Bureau had selected because few residents had computers with high-speed connectivity. The Census Bureau wanted to assess the challenges of enumerating in that environment. The Trump administration also attempted to add a question on citizenship. As demographers predicted, this apparently reduced the response rate among Hispanics. For Census 2020, the post-enumeration survey estimated that 5.0 percent of Hispanics were missed, but the same study in 2010 reported that only 1.5 percent of Hispanics were not counted. In a complicated decision by the Supreme Court, citizenship was not added to the 2020 Census questionnaire.[13] However, then President Trump wrote an executive order to have the Census Bureau and other executive agencies determine how many citizens and noncitizens there were in the United States.[14] A year later, he wrote a memorandum that would exclude unauthorized immigrants from the apportionment count (Lo Wang 2020).

The apportionment counts were not released before Trump left office, so he was not able to attempt to implement this plan. The idea, however, has staying power. In January 2024, Senator Hagerty from Tennessee and Senator Budd from North Carolina along with twenty-two other Republican senators introduced the Equal Representation Act, requiring that Census 2030 include a citizenship question and that only the count of citizens could be used to allocate congressional and electoral college seats (Budd 2024). This has almost no chance of being enacted into law, but another Supreme Court ruling is possible about what the Constitution means that apportionment should be based on the count of the "whole number of persons" in each state.

A major cost-cutting innovation for Census 2020 was providing households with an array of ways to respond: by telephone, by mail, or by internet. Since 2000, the Census Bureau has used a Master Address File (MAF) to reach the residential address of respondents. The initial

11. *Allen et al. v. Milligan*, 599 U.S. 1 (2023).

12. *Arkansas NAACP et al. v. Arkansas Board of Apportionment et al.*, 578 F.Supp.3d 1011 (2023).

13. *Department of Commerce et al. v. New York et al.* 18 U.S. 966 (2019)

14. Exec. Order No. 13880, 84 Fed. Reg. 136 (July 16, 2019).

MAF was based on the 1990 Census Address Control file and the U.S. Postal Service delivery sequence file. This is updated twice a year. Since the passage of the Census Address List Improvement Act of 1994,[15] the Census Bureau can work with local government to improve the MAF. The law created the Local Update of Census Addresses (LUCA) program, which gives local governments the opportunity to examine the list of addresses in their area before the decennial census enumeration, allowing them to suggest modifications. The Census Bureau provides feedback to the municipalities. Not all municipalities participate, but 2020 saw more address updates than expected (GAO 2019).

Another innovation for the 2020 Census was the use of handheld devices to collect data from nonrespondents. All responses were entered into the device, which meant that the Census Bureau knew which nonresponding households had been reached and in turn that enumerators could be more efficiently deployed. The handheld devices were part of the planning for the 2010 Census, but the project was behind time and over budget, so the innovation was not brought on board until the 2020 Census.

By 2019, the Census Bureau had an updated address list for each locality. Each household received a census enumeration form in the mail shortly before April 1 and was encouraged to respond by mail, telephone, or internet. All households that do not respond are followed by enumerators going door to door.

Because of COVID, the nonresponse-follow-up operation did not begin until August. The Census Bureau intended to continue the NRFU operation through November 2020, but the Trump administration ordered that it end at the end of August. Federal courts in California rejected the administration's effort and ordered that NRFU continue until early October.[16]

If a housing unit did not respond, NRFU interviewers went to the missing address and attempted to enumerate the household or determine that the housing unit was empty or demolished. If the NRFU interviewer determined that the residence was occupied but could not contact anyone living there, at some point the enumeration software prompted the interviewer to secure information from a neighbor. The Census Bureau used administrative records to complete the enumeration of households that were never reached. In 2020, this amounted to 4.6 percent of verified MAF addresses (Sullivan and Cork 2023, chap. 8). The Supreme Court's 2002 *Utah v. Evans* decision approved the use of imputation in the census.[17]

The Census Bureau has long been aware of an undercount and initiated processes to accurately measure it. Starting in 1980, the Census Bureau conducted post-enumeration surveys after each census. An independent sample of addresses was matched to the original enumeration of the same addresses. An enumerator went to the sampled address to determine if accurate information had been provided about who lived there on the April 1 census date. This revealed who was missed and who was overcounted in the census. These studies found a large racial difference in census quality, a substantial undercount of children but an overcount of persons age eighteen to twenty-nine and a more substantial overcount of persons fifty and older (U.S. Census Bureau 2022).

Table 1 shows the Census Bureau's PES estimates of census accuracy from 1990 to 2020. It also reports the number of people, by race, over- or undercounted in Census 2020. Overall, the census did an excellent job, at least at the national level. In 2020, the Census Bureau counted 331 million residents with an estimated net undercount of only six hundred thousand—just 0.2 percent. A look at the race-specific data, however, reveals that Census 2020 and earlier numerations substantially undercounted blacks, Hispanics, and Native Americans and that the white and Asian populations were substantially overcounted. Demographer William O'Hare (2019b) contends that much more attention should be paid to gross omissions as estimated by the PES, rather than the

15. Public Law 103–430.

16. *National Urban League v. Ross*, No. 20-16868 (9th Cir. 2020).

17. *Utah v. Evans*, 536 U.S. 452 (2002).

net undercount rate. The Census Bureau's 2020 PES, for example, reported that the census failed to count about nineteen million persons. This was offset, though, by about seven million who were counted twice and eleven million who were imputed based on proxy interviews or through administrative records. The gross omission rate was 5.6 percent and the net omission rate only 0.2 percent. In other words, the Census Bureau's PES reveals a substantial overcount of some groups such as "snowbirds," who have two residences, and college students, who are often counted both at home and in their college residence. These overcounts offset omissions (Hill et al. 2022, appendix table 2). The net omission rates give an extremely misleading view of census accuracy.

The racial difference in census accuracy is large. The Census 2020 PES reports that about 3.9 million Hispanics and blacks were missed but almost 4.1 million whites and Asians were counted twice. The PES estimates of census quality are based on data for the population living in households. The Census Bureau does not measure the over- or undercount of persons living in group quarters such as dormitories, barracks, nursing homes, or prisons. In 2020, approximately eight million people, some 2.5 percent of the total population, lived in group quarters.

Using an online apportionment calculator (Population Studies Center 2024), one can determine what the difference in apportionment would be if the PES estimates of states' 2020 household populations were correct (Hill et al. 2022). This exercise shows that using the Census 2020 counts gave Colorado, Minnesota, and Rhode Island congressional and electoral college seats they should not have. Florida, Tennessee, and Texas each lost a seat because of census deficiencies, assuming that the PES is correct (see figure 1).

Undercount in Census 2020 apparently misallocated three congressional and electoral college seats, which presents a civil rights issue. The undercount implies that residents of Colorado, Minnesota, and Rhode Island will have more power in determining who will be elected president in 2024 and who will serve in Congress than the framers of the Constitution intended. Residents of Florida, Tennessee, and Texas, however, will have less influence.

THE CENSUS: COUNTING FOR DOLLARS

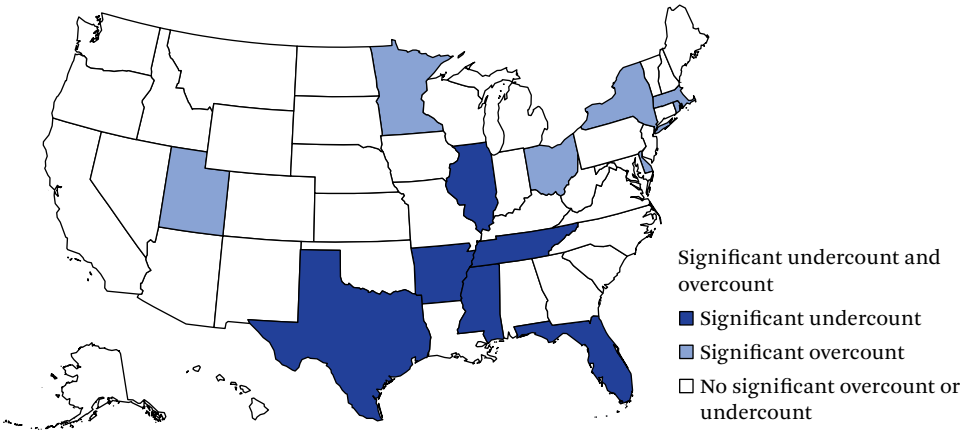
Large cities have always complained about the political and financial implication of undercount, but most of this objection flew under the radar until Andrew Reamer (2020) at George Washington University created the Counting for Dollars website in 2016. This data-laden and detailed resource shows the distribution of dollars to states based on population numbers or other community characteristics measured by the ACS, which is linked to the census. In fiscal year (FY) 2017, this amounted to 316 federal spending programs distributing $1.5 trillion. By FY 2021, it amounted to 353 federal programs distributing $2.8 trillion (Ross 2023). Some of

Table 1. Census Bureau Estimates of Undercount and Overcount by Race: 1990 to 2020

	Total	Percentage			
Group	2020	2020	2010	2000	1990
Total population	617,491	0.2	0.0	0.5	−1.6
Total White	1,647,880	0.8	0.5	n.a.	n.a.
Non-Hispanic White	3,227,800	1.6	0.8	1.1	−0.7
Total Black	−1,548,930	−3.3	−2.1	−2.8	−5.5
Total Asian	622,754	2.6	−0.1	0.8	−2.4
Native American on reservations	−112,023	−5.6	−4.9	0.9	−12.2
Hispanics of all races	−2,623,879	−5.0	−1.5	−0.7	−5.0
Total enumerated		331,449,281	304,504,815	281,421,906	248,124,013

Source: Authors' tabulation based on O'Hare 2019a; Jensen and Kennell 2022.
Note: n.a. = not ascertained

Figure 1. States with Statistically Significant Over- or Undercounts of Household Population in Census 2020 as Determined by Post-Enumeration Survey

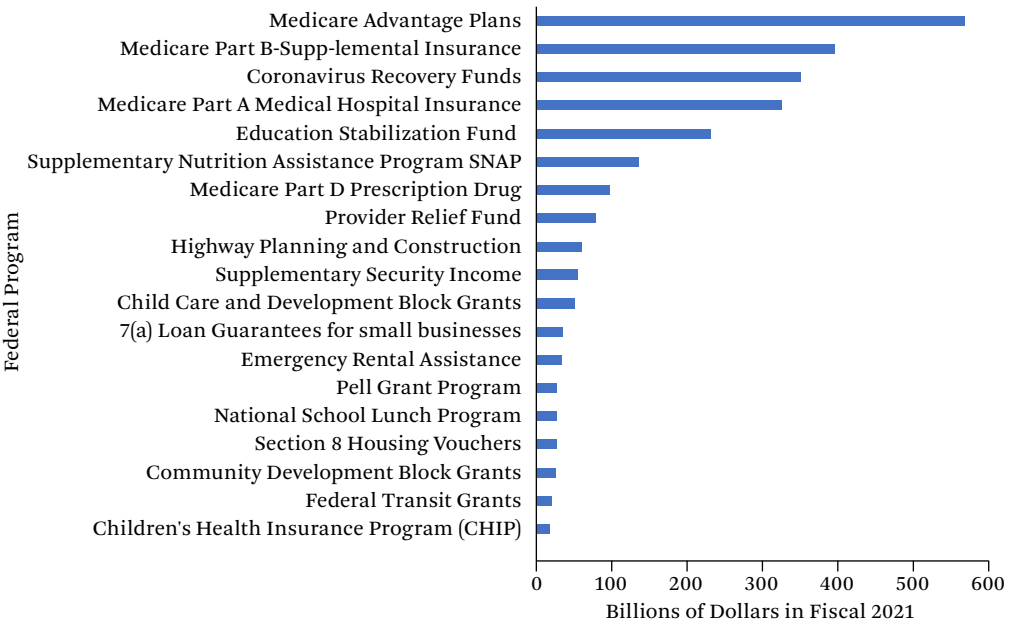


Source: Authors' tabulation based on data from Hill et al. 2022.

the major federal programs that distribute funds to states, local governments and school districts are presented in figure 2.

Since the early 1970s, when President Nixon proposed revenue sharing, Census Bureau data have been used to allocate federal monies to local governments and school districts. Nixon proposed that 2 percent of what the Internal Revenue Service collected be distributed to the nation's thirty-one thousand local government based on their population size, their poverty rate, and the taxes imposed on residents. Cen-

Figure 2. Federal Programs that Dispersed $18 Billion or More to State and Local Governments in Fiscal 2021 that Used Census Data to Allocate Funds



Source: Authors' tabulation based on Ross 2023.

sus Bureau data were used to determine population size and the poverty rate. Census 1970 asked an income question so that the Census Bureau could determine the poverty rate for each of the local governments. This federal revenue sharing, albeit at a reduced rate, began in the Gerald Ford administration but was terminated in the Reagan administration.

Since the 1970s, Congress has vastly increased the federal programs that distribute funds to states, municipalities, and school districts based on characteristics such as poverty, unemployment, and housing overcrowding that are measured by the Census Bureau in their surveys, especially the American Community Survey. The population figures in these surveys are intricately linked to the previous last census count. Thus census undercount or overcount has an impact on the share of the $2.8 trillion annual disbursement that subnational governments and school districts receive from the federal government.

As an example, consider Medicaid. Congress enacted this program in 1965 to provide states with federal funds that would provide health insurance to low-income individuals. In fiscal 2022, the federal government dispersed $571 billion to states for Medicaid. The federal allocation formula is a complicated one and states have two options about how their revenue will be calculated. However, the key element in the distribution of Medicaid funds is the per capita income of the residents of the state. The higher the per capita income, the smaller the share of total medical costs paid by the federal government and the higher the share paid by the state. At present, the federal reimbursement rate is 50 percent for Connecticut, New Jersey, and New York but 75 percent for Mississippi. In other words, residents of New York state must put up one dollar for every dollar of Medicaid aid they obtain from Washington. However, one dollar spent by Mississippi taxpayers for Medicaid benefits nets them three dollars in federal dollars.

Table 2 shows the Census Bureau's demographic estimate of the likely undercount of a racial group in Census 2020 and that group's per capita income as reported in the 2021 American Community Survey. A census overcount of whites and Asians in a state paired with a 4 to 5 percent undercount of blacks and Hispanics would carry over to the population figures used in the ACS and the state's per capita income could be erroneously high, forcing the state's taxpayers to overpay for Medicaid.

In 1997, members of Congress realized that many children in this country did not have health insurance because they did not qualify for Medicaid. Congress responded by passing the Child's Health Insurance Program (CHIP). This is a state and federal program that rapidly increased the proportion of the nation's children covered by health insurance. States pay the administrative costs, but the federal government distributed $15 billion to states in 2022 for the CHIP program. The distribution formula is like that used for Medicaid. That is, it depends on the ACS estimate of the annual per capita income in a state.

In 1965, President Lyndon Johnson signed the Elementary and Secondary Education Act, which initiated direct federal support for local school districts. Title I of that act distributes federal monies both to the state educational agency and to individual school districts within the state. The allocations to local school districts depend on the proportion of children age

Table 2. Data Used to Calculate Reimbursement Rates for Medicaid

Group	Percentage of Under-Over Count of Group (2020)	Per Capita Income (2021)
Non-Hispanic single race Asians	Over 2.6	$47,500
Non-Hispanic single race Whites	Over 1.6	$44,200
Non-Hispanic single race Blacks	Under 3.3	$26,700
Hispanics of any race	Under 5.0	$24,400

Source: Authors' tabulation based on Ruggles et al. 2022.

Table 3. Percentage of Michigan Population Insured by Medicaid and Children Under Eighteen Impoverished in 2021

Medicaid insurance coverage	
City of Detroit	26
Detroit suburbs	21
Michigan outside Metro Detroit	22
State of Michigan	24
Under 18 impoverished	
City of Detroit	44
Detroit suburbs	16
Michigan outside metro Detroit	23
State of Michigan	19

Source: Authors' tabulation based on Ruggles et al. 2022.

five to seventeen living in that school district who are formula eligible; that is, their household income is below the poverty line. In fiscal 2022, Title I distributed $36 billion to local school districts. The data used to distribute those funds are obtained from the American Community Survey. The five-year compiled files of ACS data provide a count of impoverished children living in each school district, but the ACS does not enumerate the population. The ACS population figures instead reflect the previous decennial census with updates for population change: births, death, and domestic and international migration.

The Census Bureau's demographic analysis of the quality of the 2020 enumeration by age reported that 5 percent of children under age five were not counted in the census but the college-age population—ages eighteen to twenty-four—was overcounted by 4 percent, the same overcount rate for those age sixty-five and older (U.S. Census Bureau 2022). The Census Bureau does not present that information specific for the race of children, but their evaluations of census quality consistently show an overcount of whites and Asians and an undercount of blacks and Hispanics. Most likely, school districts with primarily minority students were less completely counted in the census than school districts with few minority students. This has implications for the ACS estimates of impoverished children in school districts. The current federal allocation provides about $1,500 annually for every student in districts with high childhood poverty rates and about $1,100 for students in districts with lower poverty rates.

Table 3 shows the distribution of two populations who benefit from federal policies linked to census counts in the state of Michigan: Medicaid recipients and children in poverty. It is abundantly clear that Detroit has a far larger share of Medicare recipients and children in poverty than other populations in suburban Detroit or outside metropolitan Detroit. Quoting a presentation by Andrew Reamer (2019): "For the most part, census-derived data don't determine the 'size of the pie' but 'who gets what slice of pie'."

Funds not received by a state or municipality because of an undercount are distributed to other states and municipalities that were more accurately counted or overcounted in the census. Undercounting matters because it reduces the slice of the pie going to localities that can least afford to lose their share of funding and sends more money to overcounted municipalities.

The Counting for Dollars website provides detailed and up-to-date information about the more than three hundred federal programs that currently distribute more than $2.8 trillion in federal government dollars to local governments and school districts annually. No other website provides similarly comprehensive information about the many states that share some of their tax revenue with local governments. In many states, population size is a major criterion.

In Maine, for instance, the state places what

it receives from sales taxes, corporate income taxes, and personal income taxes into a pool. A fraction of that pool is distributed annually to local governments. Three criteria are used to determine how much a local government receives. The criteria are population size, local state valuation of property, and the sum of local assessments of property values (Office of the State Treasurer, State of Maine 2024).

Michigan has both constitutional and legislative revenue sharing. Its 1963 constitution mandates that each year approximately 10 percent of what the state collects in sales tax must distributed to the state's 2,863 local governments. Each government gets a share of revenue equal to its share of the state total population as determined by the most recent census.

In 2024, constitutional revenue will likely provide the city of Detroit with about $71 million, about $110 per person. This suggests that if Detroit's population were undercounted by 40,000 in Census 2020, the city would lose about $5 million each year until the results of Census 2030 are released (State of Michigan, Department of Treasury 2024). That $5 million would go to municipal governments that were more accurately enumerated or overcounted in 2020. Michigan also has legislative revenue sharing designed to provide support to local governments whose tax base has recently dropped.

The importance of this issue to the financing of local governments was highlighted by developments in January 2024. The Census Bureau will take a special census, paid for by the local community, of any local governmental unit any time during the first seven years of a decade. In many states, the allocation of state dollars is based on the most recent official Census Bureau count of a community.

By January 2024, seven cities in Iowa, four in Illinois, more than a dozen in Tennessee, and two in Washington agreed to either pay the Census Bureau to take a special census in 2024 or decided to take a special census on their own. In most of these places, it was done to capture more state dollars. In others, it was done because officials believed the 2020 population was undercounted or had grown since then. The mayor of Bondurant, Iowa, for example, stated that the Census Bureau would bill his city for $400,000 for a special census but that expenditure will be a net plus for the city because Bondurant will get an additional $1 million each year until the Census 2030 count is released (Leone and Schneider 2024).

In Tennessee, the state constitution allows cities to take their own censuses. Quite a few locations are doing so, including Memphis. They are motivated because Tennessee currently distributes about $170 annually per resident (Tennessee State Data Center 2024).

DETROIT CHALLENGES THE CENSUS ONCE AGAIN: CENSUS 2020

So far, this article has described the importance of census accuracy. Redistricting is based on decennial census counts and a census undercount can hurt at the state level for apportionment, but is even more critical for the mapping of legislative districts. Undercounting also deprives communities of funding that is based on either population counts or the characteristics of undercounted populations. To paraphrase the title of a book by Barbara Bryant, the first woman to direct the Census Bureau, the census moves power and money (Bryant and Dunn 1995).

To illustrate the harm and the difficulties of adequately redressing census undercount, we turn to the city of Detroit and its experience with the 2020 Census, including its formal challenge to the census count. Three years before the census, the Census Bureau provided Detroit with the address list they intended to use for the enumeration, the Master Address File. The city updated that list. In 2018, and the Census Bureau and city agreed on a count of slightly more than 360,000 dwelling units—occupied and unoccupied in the city.

The Census Bureau annually calculates and publishes population estimates of municipalities. Detroit was often cited for leading the nation in population decline. From 1950 to 2013, the city lost residents at a rate of nineteen thousand per year. Demographic trends turned around after the city came out of bankruptcy in 2014. Large employers invested heavily in the city and the local government finally had funds to revitalize city services and invest in neighborhoods. According to Census Bureau estimates, from 2014 to 2019, the city lost residents

at a rate of only two thousand per year. The Census Bureau estimated that 670,000 lived in Detroit in 2019 and that the city had 360,000 housing units.

However, when the 2020 Census results were published for Detroit, the census showed 639,000 residents and 310,000 housing units, which implies a loss of thirty-one thousand residents and about fifty thousand residential units in one year. Mayor Michael Duggan and local demographers immediately recognized that these results were puzzling and likely erroneous.

The mayor and his staff examined data for Detroit neighborhoods and discovered that the vacancy rate in several of the city's most elegant neighborhoods, including Boston Edison, were high. Boston Edison, where the city's financial elite in the 1920s built their mansions, is one of the most magnificent inner-city neighborhoods in the nation. A team was assembled to explore the potential undercount in Detroit. It included the city staff, a group from Wayne State University, and demographers from the University of Michigan (Cooney et al. 2021). The first project, this team undertook was to determine whether the Census 2020 vacancy rates made sense. To explore this notion, the team examined the 2020 Census count of occupied housing units in two types of neighborhoods, each consisting of five census block groups. The first neighborhood should have been relatively easy to count because it had among the highest rates of census self-response in the city, had relatively high rates of residential stability, and was mostly single-unit, owner-occupied housing. The second was more typical of Detroit—relatively low rates of census self-response, lower rates of residential stability, and higher vacancy rates. Census 2020 counted 625 block groups in Detroit with an average population size of 1,022.

The group from Wayne State canvassed the first sample of block groups in stable neighborhoods and enumerated the number of total and occupied housing units. These were compared with postal delivery data (USPS) and the 2020 Census count. The Wayne State enumeration data tracked very closely to the USPS data, whereas the Census 2020 data showed consistently lower occupancy rates. The second set of block groups was not enumerated but compared with postal delivery data. Overall, this research revealed that in this small sample of neighborhoods was a likely undercount of occupied housing units of 8.1 percent (Cooney et al. 2021).

This finding—a major undercount of occupied housing units—could not be used to challenge the adequacy of the nonresponse follow-up (NRFU) enumeration in Detroit because census challenges are limited to geographic errors and processing errors. A discrepancy in occupancy rates would not be considered a data collection error. The city felt that missing housing units was an example of a process issue—an inadequate NRFU. The city submitted a formal challenge about the missing housing units to the Census Count Resolution Program (CQR). This is a Census Bureau program through which local governments can submit their objections to the official count. The city compared USPS records for all city blocks and found that 4,350 blocks had more housing units than the 2020 Census count showed. In that census, 14,290 blocks in Detroit had an average population size of forty-five. This finding was submitted and almost immediately rejected because the Census Bureau would not accept USPS data as a data source. The city had ninety days to respond.

The city conducted a virtual audit of all housing units on these 4,350 blocks—that is, 30 percent of all blocks in the city. According to USPS data, these blocks included 114,274 residential addresses. The city used street-view images (such as Google Street View and Detroit Street View) to assess the presence and condition of the housing units. The raters found two images of each address as close as possible to April 1, 2020 (one before and one after the census). Raters were trained to count housing units based on the Census Bureau's definition of an inhabitable residential unit, the definition the Census Bureau uses to determine whether a housing structure is sufficiently protected from the elements that someone could live there—regardless of whether the unit is currently occupied or vacant.

The audit also included a quality-control process in which a random sample of housing units were rated twice. On occasion, raters

could not rate a housing unit. These were viewed with satellite imagery to allow a better visual examination.

In the end, the raters found that the Census Bureau missed 11.8 percent of the residential housing units on these 4,350 blocks. Omissions were more pronounced in the blocks with lower self-response rates. Recall that the Census Bureau shifted to self-reporting online and assumed that most householders would use a computer with a high-speed connection to fill out their census form on their laptop. However, Detroit is one of the least connected big cities in the country (National Digital Inclusion Alliance 2019). Thus it was no surprise that Detroit had the lowest Census 2020 self-response rate among the fifty largest cities in the United States (Khan 2020). The Census Bureau's 2019 ACS reported that 82 percent of Detroit housing units were occupied and that each unit had an average of 2.3 residents. An undercount of 11 percent of housing units implies that Census 2020 may have undercounted Detroit's population by twenty-four thousand if restricted to the CQR challenge blocks and up to sixty thousand if applied to the entire city.

An issue relevant to Detroit's missing housing units is a lack of transparency in how the Census Bureau develops the Master Address File. Recall that the city made changes to the MAF via the LUCA program that were accepted by the Census Bureau. The city does not get to see which addresses were deleted during the 2020 Census, however. The government watchdog has recommended more transparency and collaboration between the Census Bureau and municipalities in the MAF operations (GAO 2019). Further, the Panel to Evaluate the Quality of the 2020 Census observed that the "decennial census is as much an inventory of housing and residential addresses/locations as an enumeration of persons" (NASEM 2022).

Low self-response rates are exacerbated if not enough time and resources are devoted to the NRFU operation. Detroit officials complained that its local area census office started late, ended early, and was not adequately staffed and supervised. Indeed, all the suburban census offices started their NRFU operation before the Census Bureau opened its Detroit NRFU office. Detroit was not well served by the 2020 Census. The consequences are substantial. One of the authors of this article, Jeffrey Morenoff, testified at a Senate subcommittee meeting held in Detroit in 2022 that focused on Census 2020 operations in Detroit (Mackay and Rahal 2022).

"This seismic decline in housing stock is likely inaccurate and translates into a significant population undercount," Morenoff said. "There's a real impact behind this undercount of people that should have gotten millions of dollars that should have gone to programs providing affordable housing, nutrition assistance, early childhood education and more won't reach the people who need them."

In the end, Detroit's Count Resolution Appeal was rejected by the Census Bureau. The city can challenge the population estimates, which at the beginning of the decade are very much driven by the 2020 Census. However, these—as well as the unsuccessful CQR—require incredible expertise and effort on the part of a city, especially if the challenge is based on more than just building permits. Even if the population estimate challenges are successful, Detroit is stuck with the 2020 Census housing unit counts for its starting point for all the population estimates.

CONCLUSION

The framers of the U.S. Constitution established a country from former British colonies. They determined that each state should have political power proportional to its population. Hence the constitution mandates a decennial census. The United States and Australia are the only two countries with such a constitutional mandate for such an enumeration.

Data collected in the census have influenced the allocation of federal spending since the nation's founding but, since the 1970s, the increase in the federal programs that disperse money to local governments based on their population size and their characteristics measured by the Census Bureau has been tremendous. Truly, the decennial census moves power and money.

The Census Bureau's analysis of census quality reveals that the overall count of the total population in Census 2020 was extremely accurate but this came about because of an

overcount of some groups and an undercount of others. This article focuses on the substantial undercount of Hispanics and blacks and the offsetting overcount of Asians and whites. Indeed, these errors in Census 2020 may have misallocated three congressional and Electoral College seats.

Supreme Court decisions in the 1960s and 1970s clearly established that the democratic principles underlying the constitution call for electoral districts within a local government to be equal in population size as measured by the U.S. Census. In 2023, the Supreme Court just as authoritatively ruled the Voting Rights Act of 1965 mandates that when election districts are drawn, they must be drawn to enhance the chances of electing to office a member of one of the protected minorities specified in that 1965 law; that is, blacks, Hispanics, and Native Americans. As a result of recent federal court orders, Alabama and Louisiana have redrawn their congressional districts to increase the likelihood of minority representation in Congress. The number of African Americans serving in Congress rose from five of 435 when the Civil Rights Act was enacted in 1965 to fifty-four of 435 in 2024 and the number of Hispanics in the House of Representative rose from three in 1965 to forty-five in 2024 (Brookings Institution 2024). If the 2023 Supreme Court decision holds, this likely guarantees that the number of blacks and Hispanics in Congress will continue to increase.

At present, Census 2030 is being planned. We reviewed the issue of undercount in Detroit and showed that it is almost impossible for a municipality or state to present evidence that will lead the Census Bureau to change the census count. The evidence that the city of Detroit presented was compelling. This affects the annual population estimates, which are bookended by the most recent decennial census. Those annual population estimates are influential in the dispersion of federal and state dollars. It is likely that locations with many minority residents are losing their fair share of such monies and locations that were overcounted are getting more than their fair share.

Based on our Detroit analysis, we offer several suggestions about improving the Master Address File for Census 2030 and the need for a very prompt and well-organized NRFU operation. Quite likely, to reduce costs, there will be calls for Census 2030 to rely heavily on administrative records to impute residents to households that did not respond to the census.

Before using administrative records to reduce the expensive cost of NRFU work in Census 2030, the Census Bureau and Congress need to assure the nation that their use will not perpetuate or exacerbate the differential under- and overcounts by race and ethnicity described in this article.

REFERENCES

Anderson, Margo. 2015. *The American Census.* New Haven, Conn.: Yale University Press, 2015.

Brennan Center for Justice. 2023. "Redistricting Litigation Roundup." December 21. Last modified July 7, 2023. Accessed April 2, 2024. https://www.brennancenter.org/our-work/research-reports/redistricting-litigation-roundup-0.

Brookings Institution. 2024. "Vital Statistics on Congress: Chapter 1—The Demographics of Members of Congress." Accessed March 17, 2024. https://www.brookings.edu/articles/vital-statistics-on-congress.

Brown, Warren, 1980. "High Court Clears Way for '80 Census Report." *Washington Post*, December 31.

Bryant, Barbara Everitt, and William Dunn. 1995. *Moving Power and Money: The Politics of Census Taking*. Ithaca, N.Y.: New Strategist Publications.

Budd, Ted. 2024. "Budd, Hagerty, Colleagues Introduce Bill Requiring Census to Include Citizenship Question." Press release, January 25. Accessed March 17, 2024. https://www.budd.senate.gov/2024/01/25/budd-hagerty-colleagues-introduce-bill-requiring-census-to-include-citizenship-question.

Coale, Ansley J., and Mel Zelnick. 1963. *New Estimates of Fertility and Population in the United States: A Study of Annual White Births from 1855 to 1960 and of Completeness of Enumeration in the Censuses from 1880 to 1960*. Princeton, N.J.: Princeton University Press.

Cooney, Patrick, Ren Farley, Samiul Jubaed, Kurt Metzger, Jeffrey Morenoff, Lisa Neidert, and Ramona Rodriguez Washington. 2021. "Analysis of the Census 2020 Count in Detroit." *Poverty Solutions*, December. Ann Arbor: University of Michigan, Ford School. Accessed March 17, 2024.

https://sites.fordschool.umich.edu/poverty2021/files/2021/12/PovertySolutions-Census-Undercount-in-Detroit-PolicyBrief-December2021.pdf.

De Benedictis-Kessner, Justin. 2024. "Non-White People Are Drastically Underrepresented in Local Governments." *The Conversation*, January 29. Accessed April 2, 2024. https://theconversation.com/nonwhite-people-are-drastically-underrepresented-in-local-government-212318.

Greenhouse, Linda. 1996. "High Court Rules Results Are Valid in Census 1990." *New York Times*, March 21.

Gringlas, Sam. 2023. "Georgia Redistricting Tests If the Voting Rights Act Protects 'Coalition Districts'." *Morning Edition*, December 23. Accessed April 2, 2024. https://www.npr.org/2023/12/20/1220384013/georgia-redistricting-voting-rights-act-coalition-districts.

Hill, Courtney, Krista Helm, Jinhee Hong, and Nam Phan. 2022. "Census Coverage Estimates for People in the United States by State and Census Operations." Washington: U.S. Census Bureau. Accessed April 2, 2024. https://www2.census.gov/programs-surveys/decennial/coverage-measurement/pes/census-coverage-estimates-for-people-in-the-united-states-by-state-and-census-operations.pdf.

Jensen, Eric, and Timothy Kennell. 2022. "Detailed Coverage Estimates for the 2020 Census Releases Today." Washington: U.S. Census Bureau. Accessed March 17, 2024. https://www.census.gov/library/stories/2022/03/who-was-undercounted-overcounted-in-2020-census.html.

Khan, Nisa. 2020. "Michigan at 8th Place for 2020 Census Self-Response, but Detroit Last for Large Cities." *Detroit Free Press*, October 19. Accessed March 17, 2024. https://www.freep.com/story/news/local/michigan/2020/10/19/michigan-detroit-2020-censusresponse/3710170001.

Leone, Laryissa, and Mike Schneider. 2024. "Des Moines Suburbs to Go Through Census Process Again—Why?" We Are Iowa, January 3. Accessed April 2, 2024. https://www.weareiowa.com/article/news/community/iowa-illinois-midwest-states-2024-census-recount-altoona-bondurant-grimes-johnston-norwalk-pleasant-hill-waukee/524-c0bf6a20-40c8-4abf-9154-04aa04dfdd97.

Lo Wang, Hansi. 2020. "With No Final Say, Trump Wants to Change Who Counts for Dividing Up Congress' Seats." *Morning Edition*, July 21. Accessed April 2, 2024. https://www.npr.org/2020/07/21/892340508/with-no-final-say-trump-wants-to-change-who-counts-for-dividing-up-congress-seat.

Mackay, Hannah, and Sarah Rahal. 2022. "Detroit, Michigan Leaders Push to Challenge Census Count." *Detroit News*, July 22. Accessed March 17, 2024. https://www.detroitnews.com/story/news/local/detroit-city/2022/07/25/mayor-duggan-michigan-leaders-discuss-census-undercount-detroit/10119877002.

Morris, Kevin, and Coryn Grange. 2024. "Growing Racial Disparities in Voter Turnout, 2008–2022." New York: Brennan Center for Justice.

National Academies of Sciences, Engineering, and Medicine (NASEM). 2022. *Understanding the Quality of the 2020 Census: Interim Report*. Washington, D.C.: The National Academies Press. https://doi.org/10.17226/26529.

National Digital Inclusion Alliance. 2019. "Worst Connected Cities 2019." Accessed March 17, 2024. https://www.digitalinclusion.org/worst-connected-cities-2019.

National Municipal League. 1962. *Compendium on Legislative Apportionment*. New York: National Municipal League.

Norwood, Janet. 2016. "Politics and Federal Statistics." *Statistics and Public Policy* 3(1): 1–8.

Office of the State Treasurer, State of Maine. 2024. "Revenue Sharing." Accessed March 17, 2024. https://www.maine.gov/treasurer/revenue-sharing.

O'Hare, William. 2019a. *Differential Undercounts in the U.S. Census*. Cham: Springer Nature.

———. 2019b. " Understanding Who Was Missed in the 2010 Census." Washington, D.C.: Population Reference Bureau. https://www.prb.org/resources/understanding-who-was-missed-in-the-2010-census.

Population Studies Center. 2024. "Apportionment Calculator." Ann Arbor: University of Michigan, Institute for Social Research. Accessed March 17, 2024. https://psc.isr.umich.edu/research/apportionment-calculator-for-us-census.

Prewitt, Kenneth. 2005. "Politics and Science in Census Taking." In *The American People: Census 2000*, edited by Reynolds Farley and John Hagga. New York and Washington, D.C.: Russell Sage Foundation and Population Reference Bureau.

———. 2017. "The 1920 Census Broke Constitutional Norms—Let's Not Repeat That in 2020." *Items: Insights from Social Science*, July 13. Accessed April 2, 2024. https://items.ssrc.org/parameters/the-1920-census-broke-constitutional-norms-lets-not-repeat-that-in-2020.

Price, Daniel O. 1947. "A Check on Under Enumeration in the 1940 Census." *American Sociological Review* 12(1): 44–49.

Reamer, Andrew. 2019. "Census-Guided Federal Spending: A Comprehensive Accounting." Paper presented to National League of Cities. Washington, D.C. (November 18, 2019). Accessed April 2, 2024. https://gwipp.gwu.edu/sites/g/files/zaxdzs6111/files/downloads/Reamer%20NLC%20Census%2011-18-19.pdf.

———. 2020. "Counting for Dollars 2020: The Role of the Decennial Census in the Geographic Distribution of Federal Funds." April 29. Washington, D.C.: GW Institute of Public Policy. Accessed March 17, 2024. https://gwipp.gwu.edu/counting-dollars-2020-role-decennial-census-geographic-distribution-federal-funds.

Ross, Ceci Villa. 2023. "Uses of Decennial Programs Data in Federal Funds Distribution." Washington: U.S. Census Bureau.

Steven Ruggles, Sarah Flood, Ronald Goeken, Megan Schouweiler, and Matthew Sobek. 2022. "IPUMS USA: Version 12.0 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D010.V12.0.

Ruggles, Steven, and Diane Magnuson. 2020. "Census Technology, Politics, and Institutional Change, 1790–2020." *Journal of American History* 107(1): 19–51.

Smith, J. Douglas. 2014. *On Democracy's Doorstep: The Inside Story of How the Supreme Court Brought "One Person, One Vote" to the United States*. New York: Hill and Wang.

State of Michigan, Department of Treasury. 2024. "Revenue Sharing Programs." Accessed March 17, 2024. https://www.michigan.gov/treasury/local/share.

Sullivan, Teresa A., and Daniel L. Cork, eds. 2023. *Assessing the 2020 Census*. Washington, D.C.: National Academies Press.

Tennessee State Data Center. 2024. "2020 Census Challenges, Reviews Net Population Gains for Tennessee Municipalities." January 10. Accessed March 17, 2024. https://tnsdc.utk.edu/2024/01/10/2020-census-challenges-reviews-net-population-gains-for-tennessee-municipalities.

U.S. Census Bureau. 2022. "Post-Enumeration Survey and Demographic Analysis Help Evaluate 2020 Census Results." Press release, March 10. Washington: U.S. Census Bureau. Accessed March 17, 2024. https://www.census.gov/newsroom/press-releases/2022/2020-census-estimates-of-undercount-and-overcount.html.

———. 2024. "1790." Accessed March 17, 2024. https://www.census.gov/history/pdf/1790overview.pdf.

U.S. Commission on Civil Rights. 1965. *Voting in Mississippi*. Washington: U.S. Government Printing Office.

U.S. Government Accountability Office (GAO). 2019. "Actions Needed to Improve Census Bureau's Process for Working with Governments to Build Address List." GAO-20-17. Washington: U.S. Government Printing Office.

———. 2023. "2020 Census: A More Complete Lessons Learned Process for Cost and Schedule Would Help Next Decennial." GAO-23-105819. Washington: U.S. Government Printing Office. Accessed April 2, 2024. https://www.gao.gov/products/gao-23-105819.

U.S. News and World Report. 1967. "Rewrite the Constitution? An Interview with Everett Dirksen." 62(23)(June 5): 63–69. Accessed April 2, 2024. https://archive.org/details/sim_u-s-news-weekly-special-issues_1967-06-05_62_23/page/2/mode/2up.

The "Rise" of Multiracials? Examining the Growth in Multiracial Identification in the 2020 U.S. Census

ILANA M. VENTURA AND RENÉ D. FLORES

According to the U.S. Census, the multiracial population grew 276 percent between 2010 and 2020 and now represents 10.2 percent of the national population. Some believe that norms of hypodescent, which limited multiracial self-identification for most of U.S. history, are weakening. We explore two competing explanations: natural demographic growth and modifications in census methods and data processing. Through a cohort-level analysis of multiracial identification over time in the American Community Survey, we find that the multiracial population is growing naturally. However, most of the multiracial growth stems from changes in data processing enacted in 2020. Such changes doubled multiracial self-identification among the general population, which was fueled by a sevenfold increase among the Hispanic population. We confirm the absence of sharp cultural shifts in multiracial identification by examining data from the Current Population Survey, which did not implement data processing changes during this period, as a counterfactual data source.

Keywords: multiracial, racial identification, census data

For most of U.S. history, the hypodescent rule limited self-identification to only one race (Goldberg 2004), but this rule appears to be on the wane. Since 2000, the U.S. Census has allowed respondents to report more than one race. Multiracials, people who identify in multiple races, are the fastest-growing racial population in the country (Davenport, Iyengar, and Westwood 2022). According to the census, multiracials represented 2.4 percent and 2.9 percent of the population in 2000 and 2010, respectively (Jones et al. 2021; Jones and Symens Smith 2001). However, by 2020 multiracials amounted to 10.2 percent—a 276 percent growth rate.

This dramatic population growth has puzzled observers. Some think it is driven by more multiracial babies being born. Others believe it represents larger "shifts in culture and society" in terms of how Americans identify themselves and how they think about the identities available to them (Tavernise, Mzezewa, and Heyward 2021). Although some degree of cultural change away from norms of hypodescent

Ilana M. Ventura is a research methodologist at NORC at the University of Chicago, United States. **René D. Flores** is an associate professor of sociology at the University of Chicago, United States.

© 2025 Russell Sage Foundation. Ventura, Ilana M., and René D. Flores. 2025. "The 'Rise' of Multiracials? Examining the Growth in Multiracial Identification in the 2020 U.S. Census." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 44–64. https://doi.org/10.7758/RSF.2025.11.1.03. Direct correspondence to: Ilana M. Ventura, at ventura-ilana@norc.org, NORC, 55 East Monroe St, 30th Floor, Chicago, IL 60603, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

would be necessary to even recognize children born from different-race parents as multiracial, we doubt such a large cultural shift would happen in only ten years. More likely, changes in data collection procedures by the census may have contributed to this trend. Nevertheless, when asked which factor was causing this demographic shift, census officials said they could not "say for sure one way or another" (Tavernise, Mzezewa, and Heyward 2021). Our inability to identify the source of this phenomenon hinders our understanding of the demographic composition of the United States. It also limits our ability to evaluate if and how racial norms and boundaries may be shifting.

Because such rapid sociocultural shifts are unlikely, we explore two competing explanations for this sudden growth: natural population growth, and modifications in census data procedures. We use data from the U.S. Census Bureau's American Community Survey (ACS) and the Current Population Survey (CPS) to assess these competing explanations. We use a cohort analysis to examine the natural growth hypothesis because multiracial identification should be relatively stable within cohorts over time and increase between cohorts. Indeed, we find evidence supporting the natural growth of multiracials, particularly among Asians and Blacks. However, we find a spike in multiracial identification among Hispanics who select Some Other Race (SOR) between 2010 and 2020. Due to changes in census coding procedures of Hispanics in 2020, we then use detailed ancestry data and racial identification data for Hispanics in 2020 to align 2020 data with 2010 data for comparative analysis. We find that changes in U.S. Census data processing in 2020 doubled multiracial identification among the general population, fueled by a sevenfold increase among the Hispanic population. We confirm the absence of sharp cultural shifts in racial identification by analyzing data from the Current Population Survey, which did not implement data processing changes during this period, as a counterfactual data source.

Multiracial identification will continue to gradually increase due to natural growth, but we do not expect a major shift away from monoracial identification norms for most Americans, in the near future.

MULTIRACIAL IDENTIFICATION IN THE UNITED STATES CONTEXT

In 1967, the Supreme Court unanimously struck down laws banning interracial marriage, which led to an increase in mixed-race births (Qian and Lichter 2011). Nevertheless, for most of U.S. history, the hypodescent rule limited self-identification to only one race, both in society and in the census (Goldberg 2002). Hypodescent, also known as the *one-drop rule*, is a social and legal practice that assigns a person with mixed ancestry to the racial category perceived as subordinate or inferior. In other words, if a person has any amount of African ancestry, they are typically classified as Black, regardless of their appearance or other ancestry.

However, tension exists between how people see themselves and how the state categorizes them, especially given changing social and political contexts. The Census Bureau began to grapple with this tension in the 1960s (Jacobson 2002), a time dominated by conversations of civil rights and the need to use census data to challenge redistricting after the Voting Rights Act. Kenneth Prewitt, Census Bureau director from 1998 to 2001, argues that how we represent—or choose not to represent—groups of people in the census is an "inherently political" decision informed by the politics of the time (2000, 245). Census categories of race and ethnicity can mean more than just aggregate numbers of groups of people. These categories can create racial groups and draw boundaries within and between populations (Nobles 2000; Skerry 2000).

With the growing multiracial population in the United States and no way to measure their size, advocacy groups wanted the census to include a specific "multiracial" category leading up to the 2000 Census (Farley 2002). Although early research adding a multiracial option was shown to reduce the number of people identifying as Native American or Alaskan Native and Asian or Pacific Islanders, African American groups were the most vocally opposed to the additional category (Skerry 2002). Leaders from African American organizations argued that a multiracial option would not only eventually dilute the number of Americans who identified as Black, but also "potentially blur the catego-

ries upon which hard-won antidiscrimination and affirmative action programs are based" (Skerry 2002, 328). As a compromise, the census decided on a mark-all-that-apply option, allowing the categorization of people as multiracial based on their selections.

Although this question format seemingly allows multiracial respondents to report their often complex origins, in practice the government has often applied a monoracial logic based on hypodescent when processing the data. Because the federal government still needed to be able to have counts of minority groups by geography for maintenance of the Voting Rights Act, and other apportionment decisions, the federal government mandated that "Responses that combine one minority race and white are allocated to the minority race" (OMB 2000), which complicated determinations about the sizes of protected groups for legislative purposes. Indeed, research has found that in smaller counties, decisions on how to categorize multiracial people can have significant impacts on group-level population counts, especially of American Indians and Asians (Harrison 2002). We therefore must pay close attention not only to administrative-level changes in how we categorize but also how we interpret these categories.

CHOOSING THE MULTIRACIAL IDENTITY

Constructivist scholars see ethnic identity as fluid and dynamic, not fixed or unchanging (Corntassel 2003; Waters 1994). Rather than being determined by biology, they argue that ethnoracial identities may be influenced by changing social norms and contexts (Nagel 1994). Consistent with constructivism, researchers have found that the hypodescent rule has apparently weakened in recent years, influencing the identification choices of mixed-ancestry individuals. In 1960, most children born to married couples consisting of one parent who is Asian and one parent who is White or of one parent who is Black and one parent who is White were classified in the same box as their minority parent. Today, individuals of mixed ancestries are increasingly identifying in multiple categories (Roth 2005; Liebler et al. 2017). Moreover, the identity choices of mixed-race people are informed by social, cultural, political, and economic factors.

Multiracial identification depends on the specific ethnoracial groups involved. It is more common among Native American–White individuals, perhaps reflecting the destigmatization of the American Indian label (Nagel 1995; Harris and Sim 2002). In contrast, identification is more rigid for Asian Whites and Black Whites—the latter being more likely than other combinations of a minority race category and White group to be singularly classified with their minority race by their parents (Qian 2004; Brunsma 2005).

Social class shapes multiracial identification (Townsend et al. 2012). Better-off parents of Hispanic White and Asian White children are more likely to move them away from a monoracial identification (Brunsma 2005). Similarly, greater family resources are associated with whitening biracials' self-identification, even after adjusting for other family and community traits (Davenport 2016).

Cultural factors also shape the identities of mixed-race people. National origin and proximity to the immigrant experience affect the racial identification of mixed-heritage children (Lichter and Qian 2018; Sáenz et al. 1995). Children of immigrants are more likely to have mixed parentage and identify as multiracial (Lee and Bean 2004). In addition, the identity choices of biracial individuals are informed by their region, neighborhood, and school, and the racial composition of their social networks (Herman 2004; Brunsma 2005; Roth 2005).

Phenotype also influences self-identification choices. Black White biracial individuals who are fairer in appearance are more likely to identify as multiracial than as their minority race (Rockquemore and Brunsma 2008), whereas those who appear more prototypically minority encounter higher levels of racial discrimination and are more likely to identify with their minority race than as White (Herman 2004). In addition, mixed-race women are more likely than men to identify as multiracial than as monoracial, perhaps because women are less likely to be perceived as singular racial minorities (Davenport 2016; Ho et al. 2011; Rockquemore 2002).

The literature suggests that multiracial identification is strongly influenced by social, cultural, economic, and political factors. However, individual race and Hispanic identification over time is quite stable (Liebler et al. 2017) and sociocultural norms only change gradually (Kiley and Vaisey 2020). Given the sharp increase in multiracial identification from 2010 to 2020, we do not expect that sociocultural norms can shift as rapidly to explain this trend. We examine two competing hypotheses for this jump: natural growth, and changes to census procedures.

Mechanism 1. Natural Growth

Demographers distinguish between natural and social sources of ethnoracial population growth (Hout and Goldstein 1994). Natural growth is caused by differential mortality and fertility plus migration. In contrast, social growth originates from changes in individuals' categorical membership. One obvious explanation for these shifts in the multiracial population could be natural demographic trends. Racial intermarriage has increased steadily since legal prohibitions were struck down by the Supreme Court in 1967 (Qian and Lichter 2011). In addition, post-1965 immigration flows, mostly from Asia and Latin America, have added to the country's ethnoracial diversity (Alba, Beck, and Basaran Sahin 2018). The U.S. Census decision to permit respondents to select multiple races in the 2000 Census is linked to a recognition of racial intermarriage and the resulting rise of multiracial children being born (Perlmann and Waters 2002). Of course, sociocultural factors are also likely at play in recognizing children born from different-race parents as multiracial, but we doubt such a large cultural shift would happen in a decade.

Thus, we should expect growing numbers of racially "mixed" babies over time, which could be fueling this rise in multiracial identification. However, because we know that census procedures have also changed over time, we must also consider not only the demographic shifts, but also the administrative procedural ones.

Mechanism 2. Census Data Procedures

Survey methodologists have found that seemingly small changes in question wording can affect individuals' responses (Rasinki 1989; Schuman and Presser 1996). Even subtle changes in the procedures used by national censuses to identify ethnoracial populations may lead to significant changes in the size and characteristics of these populations (Pryor et al. 1992). René Flores, María Vignau Loría, and Regina Martínez-Casa (2023) find that a slight change in the wording of the ethnic identification question by the Mexican Census in 2010 more than doubled the self-identified Indigenous population in Mexico. The U.S. Census has a long history of modifications in the race and ethnicity questions, which has notably affected how we count people of Latin American origins over time.

For most of U.S. history, the census had no dedicated Hispanic or Latino category save for a 1930 only Mexican racial category. In the 1960s, Hispanic activists urged the census to identify Hispanics as a minority population under the Voting Rights Act. However, government officials and some activists did not want to create a Hispanic race category and "insisted that Mexicans and Puerto Ricans were simply White Americans who were destined to assimilate" (Mora 2014, 11). Additionally, the census feared that a Hispanic race option might result in high nonresponse because Mexicans, Puerto Ricans, and Cubans did not necessarily consider themselves a unified Hispanic racial group at the time, which could affect census data quality. In the end, the census compromised and created a separate ethnicity question, as opposed to a Hispanic race category, to identify Hispanics.

Even though the Hispanic question in the 1970 Census was only on the long-form questionnaire, the question wording prompted a presumed overcount of Hispanics because respondents in the South or central regions of the country likely marked themselves as "Central or South American" (Cohn 2010).[1]

The 1980 Census placed the Hispanic ques-

1. The 1970 Hispanic question asked "Is this person's origin or descent—" with response categories of Mexican, Puerto Rican, Cuban, Central or South American, Other Spanish, and No, none of these.

tion on the short form questionnaire. It used different wording for the Hispanic question,[2] jointly with a media campaign promoting the existence of a panethnic Hispanic group in the United States (Mora 2014). The creation of the Hispanic ethnicity question for the 1980 Census allowed for the count of Hispanic people as two groups if needed, which had both practical and conceptual implications. On the practical side, the ethnicity question would allow users of census data to split Hispanic respondents between Black and White or to separate Hispanic from Black and White for the sake of interest groups involved in the categorization compromises.

In practice, many Latinos check Some Other Race in the census race question and write in their national origins. When the 2000 Census allowed people in the United States to select more than one racial category, it became common for Latinos to select White or Black in addition to the Some Other Race category. In fact, almost half of multiracials in 2000 were a combination of Hispanics who marked Some Other Race alongside one of the other specific race category options (Farley 2002). Additionally 90.4 percent of the Some Other Race respondents in 2000 were Hispanic, and 97.4 percent of those who selected only Some Other Race were Hispanic (Farley 2002).

The 2010 Census (beginning with the 2008 ACS), included an updated direction prompt for the ethnicity and race questions indicating that "For this census, Hispanic origins are not races," presumably so that Hispanics would keep their Latin American–origin responses in the Hispanic ethnicity question instead of place it in the race question (Cohn 2010). Respondents were prompted only to write in racial origins for American Indian or Alaska Native, Other Asian, Other Pacific Islander, and Some Other Race categories. If someone selected multiple racial groups and wrote in a Latin American or Hispanic origin in the Some Other Race category, they were coded only as the non-Hispanic racial group or groups. Respondents' written Hispanic origin was disregarded in coding.[3] For example, if a person selected Korean and wrote in Costa Rican in the Some Other Race box, they were solely classified racially as Asian, and the Costa Rican write-in was ignored by coders (Marks and Rios-Vargas 2021; Jones et al. 2021). The census counted fewer Some Other Race Hispanics in 2010 (30.6 percent) than in 2000 (32.7 percent), likely a result of these methodological changes.

This changed in 2020 when census officials considered Latino nationalities presented in the Some Other Race box as valid answer options. The same respondent who had indicated that they were Korean and wrote in Costa Rican in the Some Other Race box would be classified as both Asian and Some Other Race, and thus multiracial, as well as Hispanic or Latino by ethnicity. However, the race codes would not indicate Costa Rican because Hispanic options could not be coded as races under the guiding Office of Management and Budget standards of the time. We hypothesize that this change in wording and coding procedure artificially inflated the number of people identified as multiracial in the 2020 Census relative to 2010 estimates.

DATA AND METHODS

We use data from the Census's American Community Survey (ACS) for the years 2000, 2010, 2020, and 2021 obtained through IPUMS (Ruggles et al. 2023). The COVID-19 pandemic elevated nonresponse rates in the 2020 Census, and concerns about the 2020 weights (Daily et al. 2021). Thus we include 2021 data as a robustness check.

To ensure that other larger sociocultural shifts that may prompt widespread increases in multiracial identification were not related to the sudden increase in multiracial identification we find in the ACS data, we also examine patterns of multiracial identification in a sec-

2. The 1980 Hispanic question asked "Is this person of Spanish/Hispanic origin or descent?" with response categories of No (not Spanish/Hispanic); Yes, Mexican, Mexican-American, Chicano; Yes, Puerto Rican; Yes, Cuban; Yes, other Spanish/Hispanic.

3. However, if the respondent only selected Some Other Race, then this coding was kept.

ond data source as a counterfactual. In other words, if sociocultural shifts caused the rapid rise in multiracial identification, other data sources should reflect similar increases. We test this by analyzing data from the Current Population Survey (CPS) March Annual Social and Economic Supplement (Flood et al. 2022).[4] The CPS, which is a large nationally representative survey, uses somewhat distinct self-identification question formats, residence rules, and editing procedures than the ACS (Menendez 2007). These differences may result in different baseline estimates of the multiracial populations in each survey. However, unlike the ACS, the CPS did not change its race and Hispanic origin questions, and only minimally changed how it processed them during the 2010 to 2020 period.[5] This makes the CPS an ideal counterfactual to examine racial identification patterns in the absence of changes to census procedures.

To assess the effect of the coding changes on the estimates of multiracial identification in 2020, we need to align the ACS 2020 and 2021 data to 2010, by removing—to the best of our ability—the effect of the procedural coding change in the data. In other words, we need to recode the 2020 and 2021 data to "look like" 2010 data. Because this change only affected self-reported Hispanics in 2020 and 2021, we make this adjustment only for Hispanics.[6] For all non-Hispanic respondents in 2020 and 2021, the adjusted multiracial indicator is equal to the raw census-variable-based multiracial indicator. Hispanic respondents were marked as multiracial in the adjusted 2020–2021 multiracial indicator when

> Hispanic respondents are categorized as three or more major races.[7]
>
> Hispanic respondents are categorized as two major races with two non-Other bivariate race indicators.
>
> Hispanic respondents have two non-Hispanic ancestries.
>
> Hispanic respondents have any mixture ancestry.

4. We use data from 2005, 2010, 2020, and 2021. We are unable to use CPS data from 2000 due to a lack of congruence in race categories and a lack of capacity to measure multiracial identification in that year. In 2000, respondents could only select White, Black, American Indian/Aleut/Eskimo or Asian or Pacific Islander. In 2003, the Asian or Pacific Islander categories were separated and respondents were able to select multiple racial identifications for the first time.

5. From 2003 onward, the CPS allowed respondents to select one or more from five race groups: White, Black, Asian, Hawaiian/Pacific Islander, or American Indian/Alaskan native. From 2003 to 2012, the CPS reported fourteen combinations of two to four race groups, as well as the catch-all categories of two or three races and four or five races. However, beginning in 2013, the CPS presented a new scheme that reported all of the combinations of up to four races, therefore providing a total of twenty-six reportable groups in the data. For our analysis, this change would not affect our results because we are only interested in a binary outcome of multiracial, and not the specific categories of the makeup of the multiracial groups over time (see comparability notes in documentation for variable RACE in the CPS in Flood et al. 2022).

6. In the 2020 ACS, many Brazilians were "misclassified" as Hispanics (U.S. Census Bureau 2022). Following procedures similar to those of Jeffrey Passel and Jens Krogstad (2023) we remove Brazilians from the Hispanic category in 2020 that reported Other in their Hispanic categorization and did not have any other specific Hispanic ancestry. This is likely an overcorrection because the Hispanic backcoding in other years was based on Hispanic write-ins, which are limited in the public use data. If anything, this would only deflate our estimates of Hispanic multiracials. Passel and Krogstad note that this likely affected "at least 416,000 Brazilians" who described themselves as Hispanic or Latino on the 2020 ACS, using country of birth and single-ancestry variables. In our estimate, we identify 419,195 Brazilians moved out of the Hispanic category. However, our estimate uses both ancestry and place of birth variables.

7. This is because if one of the categories is a Some Other Race write-in of a Hispanic category, the other two are presumed to be any of the remaining major racial categories.

Hispanic respondents have one Uncodable and one non-Hispanic ancestry.

Hispanic respondents have one Other and one non-Hispanic ancestry.[8]

All other Hispanic respondents in 2020 and 2021 categorized as two major races when one race was Other in the detailed racial categories were recoded as not multiracial in the adjusted multiracial indicator.[9]

For this work, we also create synthetic cohorts based on birth decade. We limit analysis to those born in 1940 or later. All analyses include children because they are a crucial indicator of racial change. However, the racial identification of children is likely done by their parents, who are filling out household forms on their behalf.

First, we examine raw and adjusted multiracial identification by year and cohort by major racial or ethnic group over time in descriptive statistics. We focus specifically on the effects of the 2020 and 2021 coding changes on Hispanic identification.

Second, we then use logistic regression to model multiracial identification in the ACS and CPS on Hispanics, Black, White, and Asian respondents for 2010 and 2021. We estimate raw and adjusted multiracial identification in the ACS, and then replicate the model using CPS data for Hispanics (models 1–3), to concurrently test both the census artifact and natural growth hypotheses. We then estimate multiracial identification for non-Hispanic Black (models 4 and 7), White (models 5 and 8), and Asian (models 6 and 9) respondents in the ACS and CPS, to show the importance of natural growth across the non-Hispanic population for the major U.S. race groups, as well as the correspondence of the two datasets. Our main independent variables are year and cohort. However, because we recognize the association of individual-level sociodemographic factors with multiracial identification, we also control for gender, immigrant generation (first, 1.5, second plus), household income, educational attainment, county-level partisanship, and region.[10] Controlling for each of these individual-level factors, that the literature has shown to influence multiracial identification, allows us to better adjudicate the effects of year and cohort on multiracial identification.

Results

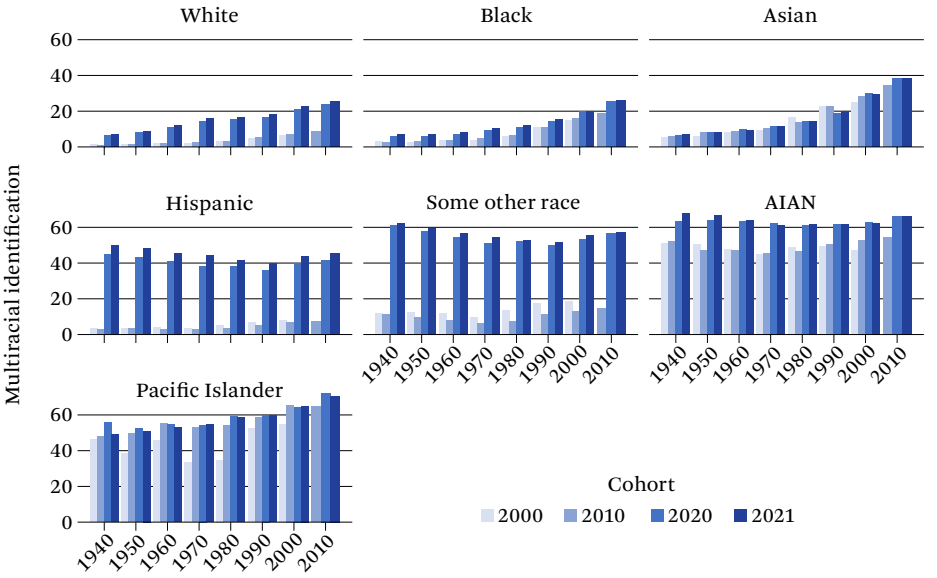
We begin our analysis exploring the natural growth hypothesis. We examine American Community Survey estimates of multiracial identification by racial and ethnic group, by year and birth cohort. Figure 1 shows birth cohort on the x-axis, with multiracial identification of each race-ethnic group in columns shaded by year of the data. In other words, figure 1 shows the percentage of individuals that identify with each ethnoracial category that identify with at least two major race categories. If growth in multiracial identification is due to natural growth, we should see general consistency in multiracial identification within cohort over time, because the ethnoracial identification of each birth cohort should not change considerably over time, as well as a steady growth between cohorts. Figure 1 shows some

8. Hispanic ancestries are noted, so Other would indicate a not otherwise categorized non-Hispanic category.

9. As explained regarding census changes in 2020, if someone wrote in a Latin American country or Hispanic ancestry in the race question, they were recoded as Other.

10. We define the 1.5 generation as having migrated to the United States prior to age eighteen. We use County Presidential Returns, 2000–2020 data from the MIT Election Data and Science Lab (2022) for the county-level partisanship measure. For ACS and CPS respondents in areas with masked county-level indicators, we aggregate democratic vote shares as a "rest of state" value for these respondents. We then create a three-way categorial indicator to segment different levels of Democratic, Republican, or swing counties with the following values of democratic vote share: less than 45 percent, 45 to 55 percent, greater than 55 percent. We note that, given the smaller sample size of the CPS, we see greater suppression of county variables in the CPS than in the ACS. Because of this suppression, we are not fully confident in the comparisons by Democratic vote share between the ACS and CPS models. However, we chose to keep this control in the model for the sake of cross dataset comparability.

Figure 1. Multiracial Identification by Year and Cohort, and Major Race or Ethnic Group



Source: Authors' tabulations based on Ruggles et al. 2023.
Note: All numbers in percentages.

evidence for the natural growth hypothesis, mainly for Asian and Black Americans, with steady increases in multiracial identification by birth cohort.

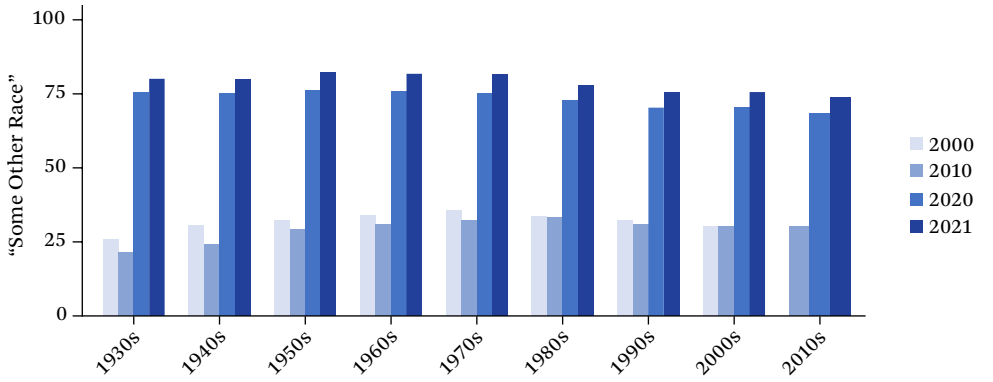
However, we also see disproportionate jumps in multiracial identification between 2010 and 2020 for White, Some Other Race, and Hispanic Americans that are too large and sudden to be explained by simple natural growth. Hispanics report an almost 40 percentage within-cohort point increase in multiracial identification between 2010 and 2020 across all cohorts. If there had been such a break in cultural norms to dilute hypodescent, we should see a similar steep break among Asians and Blacks, which we do not.

Next, we examine the overlap between Hispanic and Some Other Race identification, for two reasons. First, the jump in multiracial identification between 2010 and 2020 is primarily among Hispanics and Others. Second, the census changed its coding procedures in 2020 to recode Latin American origins in the race question as Some Other Race. In 2010, on the other hand, Latin American origin write-ins were ignored in coding. Figure 2 shows the percentage of Hispanics who mark Some Other Race in the 2000, 2010, 2020, and 2021 ACS, by birth cohort. Although multiracial identification is mostly stable across cohort, with a slight within-cohort drop in nearly every cohort between 2000 and 2010,[11] we see an increase of approximately 50 percentage points across all cohorts between 2010 and 2020. This is very likely the result of changes in census text and coding procedures, where Latin American origins are coded as valid race values of Some Other Race in 2020, but not in prior years. The percentage of Hispanics who mark Some Other Race is about 5 percentage points greater in 2021 than in 2020 across cohorts.

We have another way of testing the hypothesis that codification changes drove multiracial growth, focusing on the Some Other Race Hispanics. To do so, we examine the shift in number and proportion of Hispanics identifying as two major races and as three or more major races, by year (table 1). Given changes in cen-

11. This drop in multiracial identification between 2000 and 2010 aligns with the 2010 addition to the directions for the race and ethnicity questions that note "Hispanic origins are not races" (Cohn 2010).

Figure 2. Percentage of Hispanics Who Mark "Some Other Race"



Source: Authors' tabulation based on Ruggles et al. 2023.
Note: All numbers in percentages.

sus procedures in 2020, we would expect to see a spike in Hispanics marking two races where one of them is Some Other Race in 2020, with similar rates of those marking three or more races in 2020 as marking two races in 2010. This is because if we remove those with Some Other Race from the 2020 three or more races group, they would still be categorized by at least two other major racial groups. Indeed, as shown in table 1, we see a large jump in the proportion of Hispanics who identify as Some Other Race with exactly two major race groups between 2010 and 2020 (from 2.3 percent in 2010 to 36 percent in 2020). Although 0.2 percent of Hispanics identify as Some Other Race with three or more groups in 2010, 2 percent of Hispanics identify as Some Other Race with three or more groups in 2020. In other words, in 2020, we know that those who identify with three or more major race categories are multiracial according to the 2010 and 2000 definitions, because if we remove those with Some Other Race from this group, they would still be categorized by at least two other major racial groups. However, what of the remainder of this group?

Table 1. Multiracial Hispanics Who Mark "Some Other Race" and Total Percent Multiracial Hispanics, by Number of Major Race Groups

		Marked Some Other Race		
Year	*N* Major Race Groups	Count SOR Hispanics	% SOR Hispanics in Year	Total % Multiracial Hispanics by Year
2000	2	1,179,000	3.44	4.53
	3+	71,000	0.21	0.35
2010	2	1,185,000	2.34	4.08
	3+	97,000	0.19	0.39
2020	2	21,855,000	36.00	37.52
	3+	1,214,000	2.00	2.24
2021	2	25,085,000	40.12	41.5
	3+	1,428,000	2.28	2.53

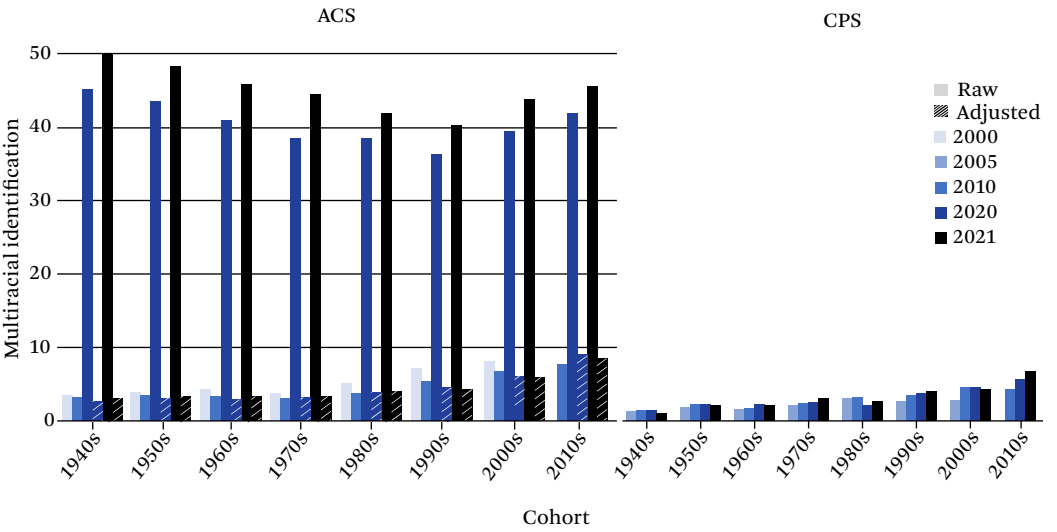
Source: Authors' calculations based on Ruggles et al. 2023.
Note: Values rounded to the nearest thousand.

As explained in the data and methods section, we create an adjusted indicator for Hispanic multiracial identification, only for the 2020 and 2021 ACS, which allows us to deflate estimates of Hispanic multiracial identification to be comparable to 2000 and 2010 estimates. We plot raw and adjusted percentages of multiracial identification of Hispanics by cohort and year in figure 3. We also present similar estimates from the CPS March Annual Social and Economic Supplement for comparison. Given that the CPS maintained consistent wording and data processing procedures during this period, we use the CPS to comparatively examine the growth trajectory of the multiracial population, even under different baseline methodological procedures. We must note, of course, that the ACS and CPS race and ethnicity questions have different text and data editing procedures—with the ACS allowing for more freedom in write-in options even in prior years—which accordingly results in different estimates of the multiracial populations in each survey (Menendez 2007). However, because we are comparing trends in identification changes, differences in baselines do not affect our conclusions. Our adjusted ACS estimates align considerably closer to patterns illustrated in the CPS data relative to the original 2020 and 2021 multiracial indicators, with little change between 2010 and 2020 for most cohorts, and a slight increase for the 2010 cohort. Indeed, this further suggests that census procedural change is likely the major cause of the jump in multiracial identification between 2010 and 2020, given that we do not see a similar jump in the CPS data.

Figure 4 shows similar raw and adjusted multiracial identification by year and cohort in the ACS and CPS data, but for all racial and ethnic groups combined. Once we adjust for the Hispanic inflation of multiracial identification in 2020 and 2021, we do still see increases in multiracial identification in the ACS between 2010 and 2020, but less so relative to the raw ACS data. In the CPS, we see stable or decreasing multiracial identification by cohort between 2010 and 2020 for all cohorts, except for 2010—which shows a modest increase. However, such a comparison is still useful because it allows us to attempt to adjudicate the nature of some of the variation in multiracial identification of the U.S. population by year.

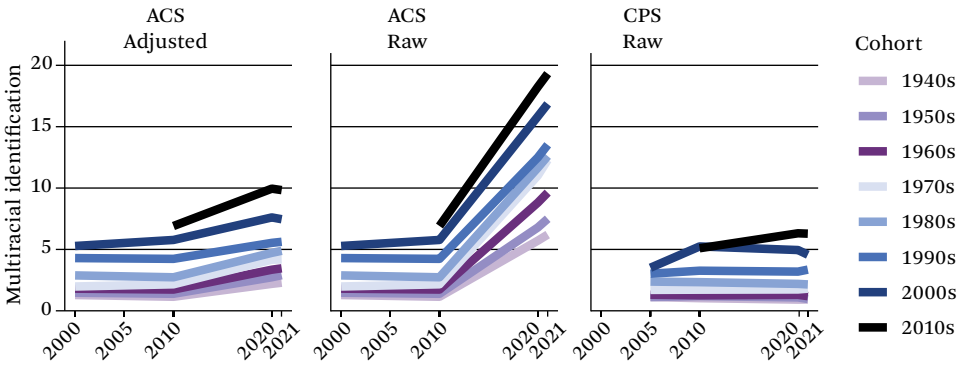
Thus, we can confidently state that changes

Figure 3. Raw and Adjusted Percentage Multiracial of Hispanics by Year and Cohort



Source: Authors' calculations based on Ruggles et al. 2023 and Flood et al. 2022.
Note: Figure presents three estimates of multiracial Hispanics by cohort and year: raw ACS estimates, adjusted ACS estimates, and raw CPS estimates.

Figure 4. Total Raw and Adjusted Percentage Multiracial Identification by Year and Cohort



Source: Authors' calculations based on Ruggles et al. 2023 and Flood et al. 2022.
Note: Figure presents raw and adjusted estimates of multiracials for all individuals in samples, by cohort and year. Panel 1 shows adjusted ACS estimates (adjustment only affects Hispanics), panel 2 shows raw ACS estimates, and panel 3 shows raw CPS estimates.

in coding methodology doubles estimates of multiracial identification between 2010 and 2020 for the general population—which is a result of an increase in multiracial identification by a factor of seven among the Hispanic population due to the 2020 data processing method. However, as shown by increases in multiracial identification by cohort using adjusted ACS and CPS data, it is also true that natural growth has lent to an increase in the multiracial population of the United States as well. Later cohorts are more multiracial than prior cohorts, likely due to a mix of intermarriage and migration, as well as potential changes in cultural norms around multiracial identification.

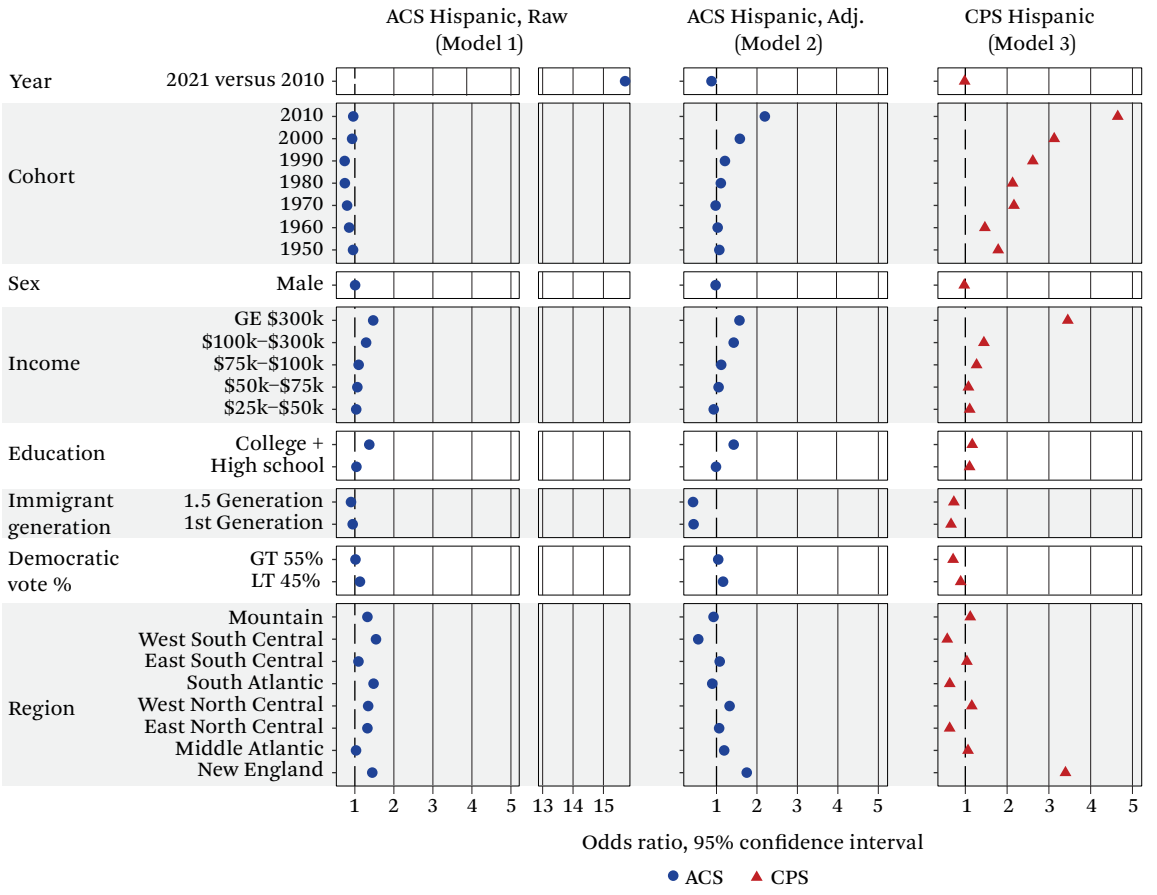
Although our data do not allow us to test for changes in cultural norms around multiracial identification over time, we can control for some of their likely sociodemographic correlates. Doing so allows us to better test both the natural growth and census artifacts hypotheses without the effects of individual-level variation in some of the sociodemographic correlates of multiracial identification. We use logistic regression to estimate multiracial identification using 2010 and 2021 data, controlling for the following individual- and region-level correlates of multiracial identification: income, gender, education, immigrant generation, political ideology (county level), and geographic region of residence.[12]

Figure 5 presents odds ratios estimating multiracial identification of Hispanics in the ACS (both raw and adjusted) and the CPS (output for models 1 through 3 presented in table A.1), with controls. We note two key findings. First, the odds ratio for year in the raw and adjusted ACS data dropped from 15.7 to 0.8, respectively. The odds ratio for year in the CPS data is 1.0, which indicates that the year has no statistical effect on multiracial identification in the CPS data, net of controls. The drop in the effect of year in the ACS models indicates that, even when controlling for sociodemographic correlates of multiracial identification, our adjusted multiracial indicator removes much of the effect of the change in census data procedures in the data. This is further evidence supporting the census artifact hypothesis. Second, after the adjustment, we see a steady increase in the odds of identifying as multiracial by cohort for Hispanics for those born in 1980 or later in the ACS. This increase in multiracial identification by cohort is also present in the CPS data (model 3), providing further support for the natural growth hypothesis for Hispanics.

Figure 6 presents odds ratios estimating multiracial identification among non-Hispanic

12. We use 2021 data for the models due to concerns about 2020 weights.

Figure 5. Estimating Multiracial Identification in 2010 and 2021 for Hispanics (Odds Ratios)

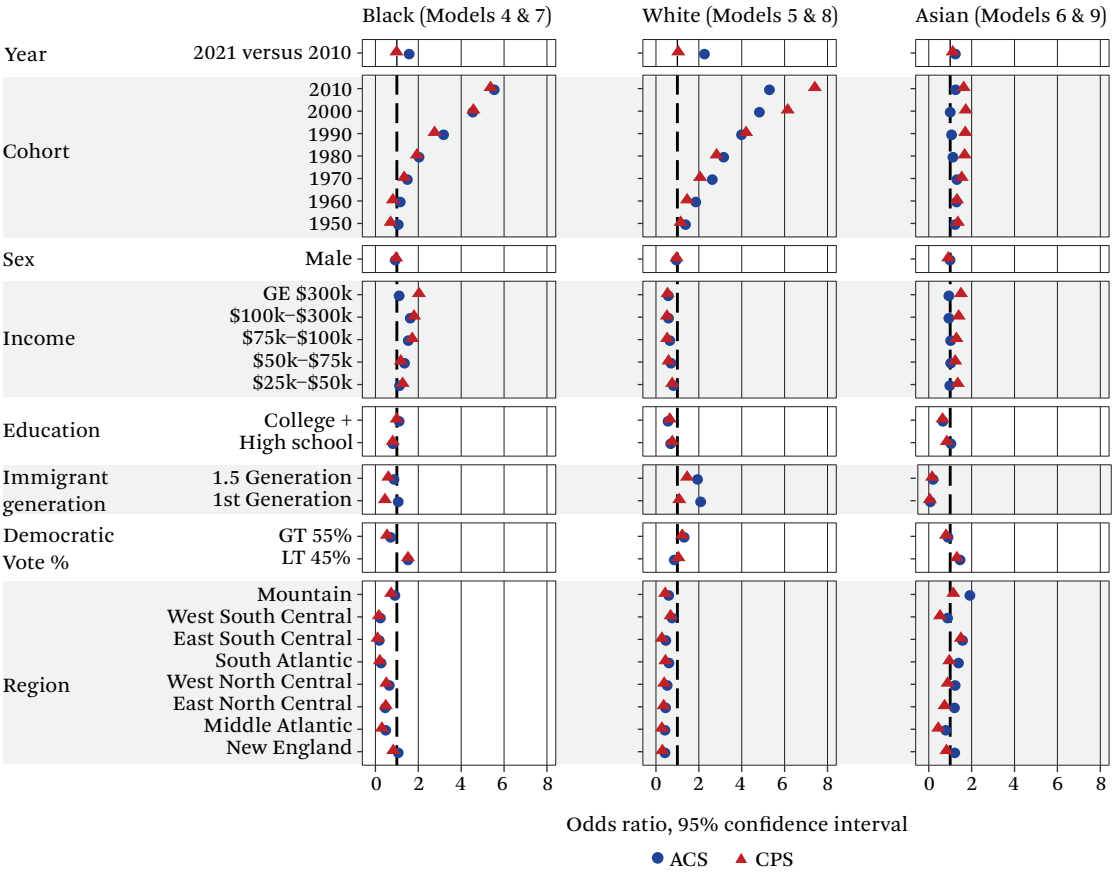


Source: Authors' calculations based on Ruggles et al. 2023 and Flood et al. 2022.
Note: Figure presents odds ratios estimating multiracial identification using ACS data (models 1 and 2) and CPS data (model 3), for 2010 and 2021. Model 2 uses the adjusted multiracial indicator as the dependent variable. Model 1 figure has a break in the x-axis between values 5 and 13, for ease of interpretation of the figure.

Black, White and Asian respondents in the ACS (circles) and the CPS (triangles), with controls (output for models 4–9 presented in table A.2). This allows us to examine the natural growth hypothesis for Blacks, Whites, and Asians. The adjusted ACS multiracial indicator was only for self-reported Hispanics, however; therefore we do not produce raw and adjusted estimates for non-Hispanics. In figure 6, odds ratio estimates for cohort trace closely in both the ACS and CPS datasets for Black and White respondents, with steady increases by cohort, but less so for Asian respondents. This indicates the importance of natural growth in multiracial identification, net of controls, only for Black and White respondents.

Puzzling here is that although Asians show the clearest raw increase in multiracial identification by cohort in figure 1, we see less of this growth in the model. Once we control for individual and region level covariates, the association of cohort drops away for Asians. However, we do see the importance of individual-level immigration and regional variation. Specifically, 1.5 generation and first generation immigrants have lower odds of identifying as multiracial than second- or later-generation Asians. We plot multiracial identification in the 2021

Figure 6. Estimating Multiracial Identification in 2010 and 2021 for Non-Hispanic Blacks, Whites, and Asians (Odds Ratios)



Source: Authors' calculations based on Ruggles et al. 2023 and Flood et al. 2022.
Note: Figure presents odds ratios estimating multiracial identification using ACS data (models 4, 5, and 6) and CPS data (models 7, 8, and 9), for 2010 and 2021.

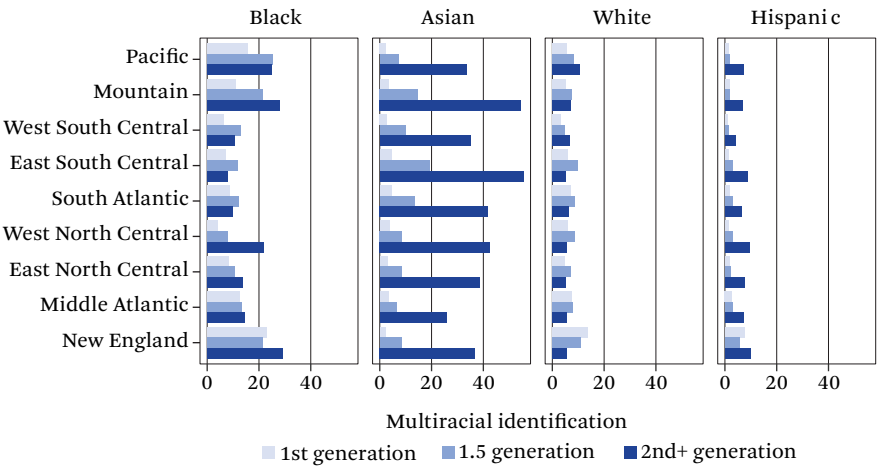
ACS by race-ethnicity (adjusted), region, and immigrant generation, to better elucidate these patterns. As we see in figure 7, the Asian American born are considerably more likely to identify as multiracial than the 1.5 and first generation, and this pattern varies by region. Explanation for this variation is beyond the scope of this article, but we suspect this may be related to regional cultural differences as well as differential intermarriage rates by Asians across U.S. regions.

DISCUSSION

How the Census Bureau chooses to categorize people is not always aligned with how people see themselves. Unable to fit into standard U.S. race categories, many Latinos check Some Other Race in the census, though they may be otherwise considered White, Black, or Indigenous according to external classification by the census or the state (Rodriguez 2009). This work finds that modifications in census data procedures between 2010 and 2020 of Hispanic-origin Some Other Race write-ins in the racial identification question doubled multiracial identification among the general population, by increasing multiracial identification by a factor of seven among the Hispanic population.

In this issue, John Anders and his colleagues (2025) use a sample of linked respondents who

Figure 7. Percentage Multiracial Identification in 2021 ACS (Adjusted)



Source: Authors' tabulation based on Ruggles et al. 2023.

completed both 2010 and 2020 Censuses and find a similar fortyfold increase in Hispanic multiracial counts. They also find that 80 percent of Hispanic multiracial identifications identified as single-race Hispanic White in 2010, which aligns with our findings. We hypothesize that some of these 2010 White-Hispanics who later identified as multiracial in 2020 may have written-in a Hispanic origin as a Some Other Race in 2010, but were backcoded out from the Some Other Race category in 2010.

However, after correcting for changes in census procedures, we still find strong evidence for the natural growth hypothesis through cohort-level growth in multiracial identification, but also some unexplained variation. Although we expect multiracial identification to continue to grow due to natural growth, we do not yet see a significant departure from monoracial identification norms, except for U.S.-born Asians, who have higher rates of multiracial identification. Future work may explore what is driving cohort changes in multiracial identification, including immigration, regional, socioeconomic, and cultural level changes. Indeed prior work has found evidence of fluidity in racial identification over time (Liebler et al. 2017), particularly in response to changes in social position (Saperstein and Penner 2012).

As the census considers a combined race-ethnicity question for the 2030 Census (OMB 2023), we hypothesize that Latinos may decrease their multiracial self-identification. Indeed, Latinos often do consider their national origin a racial category, especially when multiracial options are available on surveys. However, such a change in methods may cause yet another shock to comparability in census racial classifications between census years. This article shows both the importance of understanding self-identification patterns from the perspective of data collection and what they mean at the level of individuals and society at large. Scholarship has shown how the state has the power to "make race," and may do so through adding or changing racial categories on the census, surveys, and administrative forms (Marx 1997; Loveman 2014; Mora 2014; Gómez 2020; Nobles 2000). Our work demonstrates that the state also has the power to change the ethnoracial composition of the population by changing processing procedures of existing race data without any actual changes in individual self-identification.

We expect research to continue to explore these topics, and delve deeper into issues of societal-level change in multiracial identification, given the complex and continually changing racial and ethnic tapestry of the United States.

Table A.1. Estimating Hispanic Multiracial Identification in 2010 and 2021 (Log Odds)

	Model 1. ACS Hispanic (Raw)	Model 2. ACS Hispanic (Adjusted)	Model 3. CPS Hispanic
Intercept	−3.255***	−3.109***	−4.081***
	(0.002)	(0.003)	(0.005)
2021	2.754***	−0.132***	−0.017***
	(0.001)	(0.001)	(0.001)
Cohort (vs 1940s)			
1950s	−0.046***	0.07***	0.58***
	(0.002)	(0.003)	(0.005)
1960s	−0.158***	0.028***	0.384***
	(0.002)	(0.003)	(0.005)
1970s	−0.222***	−0.019***	0.772***
	(0.002)	(0.003)	(0.005)
1980s	−0.298***	0.1***	0.757***
	(0.001)	(0.003)	(0.005)
1990s	−0.3***	0.191***	0.961***
	(0.002)	(0.003)	(0.005)
2000s	−0.073***	0.455***	1.14***
	(0.002)	(0.003)	(0.005)
2010s	−0.044***	0.785***	1.536***
	(0.002)	(0.003)	(0.005)
Male	0.007***	−0.023***	−0.026***
	(0.000)	(0.001)	(0.001)
Income (versus LT $25k)			
$25k–$50k	0.036***	−0.073***	0.099***
	(0.001)	(0.002)	(0.002)
$50k–$75k	0.063***	0.049***	0.072***
	(0.001)	(0.002)	(0.002)
$75k–$100k	0.094***	0.11***	0.239***
	(0.001)	(0.002)	(0.002)
$100k–$300k	0.254***	0.355***	0.368***
	(0.001)	(0.001)	(0.002)
GE $300k	0.386***	0.449***	1.239***
	(0.001)	(0.002)	(0.003)
Education (vs. LT high school)			
High school	0.04***	−0.014***	0.097***
	(0.001)	(0.001)	(0.002)
College +	0.315***	0.355***	0.153***
	(0.001)	(0.002)	(0.002)
Immigrant generation (versus 2+)			
First	−0.056***	−0.834***	−0.418***
	(0.001)	(0.002)	(0.002)
1.5	−0.103***	−0.864***	−0.321***
	(0.001)	(0.002)	(0.002)

Table A.1. (*continued*)

	Model 1. ACS Hispanic (Raw)	Model 2. ACS Hispanic (Adjusted)	Model 3. CPS Hispanic
County Democratic presidential vote share (versus 45–55 percent)			
GT 55 percent Democrat	0.017***	0.041***	−0.346***
	(0.001)	(0.001)	(0.001)
LT 45 percent Democrat	0.125***	0.151***	−0.117***
	(0.001)	(0.001)	(0.002)
Region (versus Pacific)			
New England	0.37***	0.558***	1.223***
	(0.002)	(0.002)	(0.002)
Middle Atlantic	0.029***	0.174***	0.062***
	(0.001)	(0.001)	(0.002)
East North Central	0.279***	0.062***	−0.47***
	(0.001)	(0.002)	(0.003)
West North Central	0.294***	0.281***	0.144***
	(0.002)	(0.003)	(0.003)
South Atlantic	0.392***	−0.111***	−0.467***
	(0.001)	(0.001)	(0.002)
East South Central	0.088***	0.075***	0.036***
	(0.002)	(0.004)	(0.004)
West South Central	0.434***	−0.598***	−0.567***
	(0.001)	(0.002)	(0.002)
Mountain	0.278***	−0.076***	0.111***
	(0.001)	(0.002)	(0.002)
N	881,357	881,357	67,453
AIC	100,360,000	40,418,601	31,364,998
Pseudo R^2	1	0.8678	1
Percent concordant	77.6	64.7	64.0

Source: Authors' calculations based on Ruggles et al. 2023 and Flood et al. 2022.
* $p < .05$; ** $p < .01$; *** $p < .001$

Table A.2. Estimating Black, Asian, and White Multiracial Identification in 2010 and 2021 (Log Odds)

	Model 4. ACS Black	Model 5. ACS White	Model 6. ACS Asian	Model 7. CPS Black	Model 8. CPS White	Model 9. CPS Asian
Intercept	−2.651***	−3.468***	−0.996***	−2.382***	−3.26***	−1.783***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
2021	0.455***	0.816***	0.216***	−0.016***	0.039***	0.111***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cohort (versus 1940s)						
1950s	0.066***	0.315***	0.207***	−0.342***	0.14***	0.305***
	(0.003)	(0.002)	(0.004)	(0.004)	(0.002)	(0.005)
1960s	0.15***	0.618***	0.255***	−0.204***	0.374***	0.275***
	(0.003)	(0.002)	(0.004)	(0.004)	(0.002)	(0.005)
1970s	0.398***	0.965***	0.271***	0.294***	0.721***	0.43***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
1980s	0.709***	1.151***	0.118***	0.661***	1.039***	0.515***
	(0.003)	(0.001)	(0.003)	(0.003)	(0.002)	(0.005)
1990s	1.155***	1.385***	0.057***	1.015***	1.436***	0.532***
	(0.003)	(0.001)	(0.003)	(0.003)	(0.002)	(0.005)
2000s	1.514***	1.574***	0.006†	1.519***	1.815***	0.544***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
2010s	1.712***	1.665***	0.227***	1.681***	2.003***	0.488***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.005)
Male	−0.075***	−0.048***	−0.012***	−0.035***	−0.039***	−0.095***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Income (versus LT $25k)						
$25k–$50k	0.124***	−0.206***	−0.02***	0.239***	−0.281***	0.303***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
$50k–$75k	0.308***	−0.355***	0.018***	0.17***	−0.53***	0.209***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
$75k–$100k	0.428***	−0.43***	0.023***	0.54***	−0.653***	0.254***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
$100k–$300k	0.488***	−0.536***	−0.056***	0.589***	−0.669***	0.333***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.003)
GE $300k	0.1***	−0.554***	−0.066***	0.709***	−0.613***	0.407***
	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)	(0.003)
Education (versus LT high school)						
High school	−0.205***	−0.364***	0.034***	−0.212***	−0.275***	−0.17***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
College +	0.103***	−0.567***	−0.42***	−0.007**	−0.435***	−0.442***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
Immigrant generation (versus 2+)						
First	0.058***	0.736***	−2.602***	−0.808***	0.085***	−3.025***
	(0.002)	(0.001)	(0.002)	(0.004)	(0.002)	(0.003)
1.5	−0.141***	0.661***	−1.602***	−0.506***	0.373***	−1.853***
	(0.002)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)

Table A.2. (*continued*)

	Model 4. ACS Black	Model 5.: ACS White	Model 6. ACS Asian	Model 7. CPS Black	Model 8. CPS White	Model 9. CPS Asian
County Democratic presidential vote share (versus 45–55 percent)						
LT 45 percent Democrat	0.416***	−0.152***	0.381***	0.418***	0.05***	0.272***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
GT 55 percent Democrat	−0.348***	0.278***	−0.103***	−0.616***	0.203***	−0.218***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Region (versus Pacific)						
New England	0.066***	−0.884***	0.19***	−0.185***	−1.205***	−0.189***
	(0.002)	(0.001)	(0.003)	(0.003)	(0.002)	(0.003)
Middle Atlantic	−0.741***	−0.874***	−0.239***	−1.194***	−1.282***	−0.81***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
East North Central	−0.771***	−0.795***	0.181***	−0.727***	−1.022***	−0.304***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
West North Central	−0.43***	−0.651***	0.211***	−0.677***	−0.958***	−0.127***
	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)	(0.003)
South Atlantic	−1.329***	−0.494***	0.328***	−1.577***	−0.81***	−0.041***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
East South Central	−1.74***	−0.777***	0.453***	−2.322***	−1.285***	0.405***
	(0.002)	(0.001)	(0.004)	(0.003)	(0.002)	(0.004)
West South Central	−1.447***	−0.291***	−0.13***	−1.808***	−0.383***	−0.64***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
Mountain	−0.094***	−0.514***	0.651***	−0.312***	−0.843***	0.135***
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.003)
N	631,928	3,972,873	376,447	43,295	221,585	21,952
AIC	44,488,998	129,720,000	26,526,899	34,694,294	89,503,448	17,918,660
Pseudo R^2	0.9997	0.9491	1	1	1	1
Percent concordant	74.5	72.4	79.7	77.5	70.8	80.6

Source: Authors' calculations based on Ruggles et al. 2023 and Flood et al. 2022.
* $p < .05$; ** $p < .01$; *** $p < .001$

REFERENCES

Alba, Richard, Brenden Beck, and Duygu Basaran Sahin. 2018. "The U.S. Mainstream Expands—Again." *Journal of Ethnic and Migration Studies* 44(1): 99–117. https://doi.org/10.1080/1369183X.2017.1317584.

Anders, John, Mary E. Campbell, Craig Wesley Carpenter, and Luna Chandna. 2025. "Ethnoracial Transformations? Linking Administrative Data to Explain Changes in Identification." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 65–84. https://doi.org/10.7758/RSF.2025.11.1.04.

Brunsma, David L. 2005. "Interracial Families and the Racial Identification of Mixed-Race Children: Evidence from the Early Childhood Longitudinal Study." *Social Forces* 84(2): 1131–57. https://doi.org/10.1353/sof.2006.0007.

Cohn, D'Vera. 2010. "Census History: Counting Hispanics." Washington, D.C.: Pew Research Center. Accessed April 11, 2024. https://www.pewresearch.org/social-trends/2010/03/03/census-history-counting-hispanics-2.

Corntassel, Jeff. 2003. "Who Is Indigenous? 'Peoplehood' and Ethnonationalist Approaches to Rearticulating Indigenous Identity." *Nationalism and Ethnic Politics* 9(1): 75–100. https://doi.org/10.1080/13537110412331301365.

Daily, Donna, Patrick Cantwell, Karen Battle, and David G Waddington. 2021. "ACS Research and Evaluation Report Memorandum Series #ACS21-RER-04." https://www.census.gov/content/dam/Census/library/working-papers/2021/acs/2021_CensusBureau_01.pdf.

Davenport, Lauren D. 2016. "The Role of Gender, Class, and Religion in Biracial Americans' Racial Labeling Decisions." *American Sociological Review* 81(1): 57–84. https://doi.org/10.1177/0003122415623286.

Davenport, Lauren D., Shanto Iyengar, and Sean J. Westwood. 2022. "Racial Identity, Group Consciousness, and Attitudes: A Framework for Assessing Multiracial Self-Classification." *American Journal of Political Science* 66(3): 570–86. https://doi.org/10.1111/ajps.12674.

Farley, Reynolds. 2002. "Racial Identities in 2000: The Response to the Multiple-Race Response Option." In *The New Race Question: How the Census Counts Multiracial Individuals*, edited by Joel Perlmann and Mary C. Waters, 62–101. New York: Russell Sage Foundation.

Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. 2022. "Integrated Public Use Microdata Series, Current Population Survey: Version 10.0. [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D030.V10.0.

Flores, René D., María Vignau Loría, and Regina Martínez-Casas. 2023. "Transitory Versus Durable Boundary Crossing: What Explains the Indigenous Population Boom in Mexico?" *American Journal of Sociology* 129(1): 123–61.

Goldberg, David Theo. 2002. *The Racial State*. New York: John Wiley & Sons.

———. 2004. "Racial Americanization." In *Racialization: Studies in Theory and Practice*, edited by Karim Murji and John Solomos, 1:87–102. Oxford: Oxford University Press.

Gómez, Laura E. 2020. *Inventing Latinos: A New Story of American Racism*. New York: The New Press.

Harris, David R., and Jeremiah Joseph Sim. 2002. "Who Is Multiracial? Assessing the Complexity of Lived Race." *American Sociological Review* 67(4): 614–27. https://doi.org/10.2307/3088948.

Harrison, Roderick. 2002. "Inadequacies of Multiple-Response Race Data in the Federal Statistical System." In *The New Race Question: How the Census Counts Multiracial Individuals*, edited by Joel Perlmann and Mary C. Waters. New York: Russell Sage Foundation.

Herman, Melissa. 2004. "Forced to Choose: Some Determinants of Racial Identification in Multiracial Adolescents." *Child Development* 75(May): 730–48. https://doi.org/10.1111/j.1467-8624.2004.00703.x.

Ho, Arnold K., Jim Sidanius, Daniel T. Levin, and Mahzarin R. Banaji. 2011. "Evidence for Hypodescent and Racial Hierarchy in the Categorization and Perception of Biracial Individuals." *Journal of Personality and Social Psychology* 100(3): 492–506. https://doi.org/10.1037/a0021562.

Hout, Michael, and Joshua R. Goldstein. 1994. "How 4.5 Million Irish Immigrants Became 40 Million Irish Americans: Demographic and Subjective Aspects of the Ethnic Composition of White Americans." *American Sociological Review* 59(1): 64–82. https://doi.org/10.2307/2096133.

Jacobson, Matthew Frye. 2002. "History, Historicity, and the Census Count by Race." In *The New Race Question: How the Census Counts Multiracial Individuals*, edited by Joel Perlmann and

Mary C. Waters, 259–62. New York: Russell Sage Foundation.

Jones, Nicholas, Rachel Marks, Roberto Ramirez, and Merarys Rios-Vargas. 2021. "Improved Race, Ethnicity Measures Show U.S. Is More Multiracial." Washington: U.S. Census Bureau. Accessed April 11, 2024. https://www.census.gov/library/stories/2021/08/improved-race-ethnicity-measures-reveal-united-states-population-much-more-multiracial.html.

Jones, Nicholas A., and Amy Symens Smith. 2001. "The Two or More Races Population: 2000." Census 2000 Brief C2KBR/01-6. Washington: U.S. Census Bureau. Accessed April 11, 2024. https://www2.census.gov/library/publications/decennial/2000/briefs/c2kbr01-06.pdf.

Kiley, Kevin, and Stephen Vaisey. 2020. "Measuring Stability and Change in Personal Culture Using Panel Data." *American Sociological Review* 85(3): 477–506.

Lee, Jennifer, and Frank D. Bean. 2004. "America's Changing Color Lines: Immigration, Race/Ethnicity, and Multiracial Identification." *Annual Review of Sociology* 30(1): 221–42.

Lichter, Daniel T., and Zhenchao Qian. 2018. "Boundary Blurring? Racial Identification Among the Children of Interracial Couples." *The Annals of the American Academy of Political and Social Science* 677: 81–94.

Liebler, Carolyn A., Sonya R. Porter, Leticia E. Fernandez, James M. Noon, and Sharon R. Ennis. 2017. "America's Churning Races: Race and Ethnicity Response Changes Between Census 2000 and the 2010 Census." *Demography* 54(1): 259–84. https://doi.org/10.1007/s13524-016-0544-0.

Loveman, Mara. 2014. *National Colors: Racial Classification and the State in Latin America*. Oxford: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199337354.001.0001.

Marks, Rachel, and Merarys Rios-Vargas. 2021. "Improvements to the 2020 Census Race and Hispanic Origin Question Designs, Data Processing, and Coding Procedures." Washington: U.S. Census Bureau. Accessed April 11, 2024. https://www.census.gov/newsroom/blogs/random-samplings/2021/08/improvements-to-2020-census-race-hispanic-origin-question-designs.html.

Marx, Anthony W. 1997. *Making Race and Nation: A Comparison of South Africa, the United States, and Brazil*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511810480.

Menendez, Janin. 2007. "ACS and ASEC Data on Citizenship, Year of Entry and Region of Birth." *Population Bureau* working paper. Washington: U.S. Census Bureau. Accessed April 11, 2024. https://www.census.gov/content/dam/Census/library/working-papers/2007/acs/2007_Menendez_01.pdf.

MIT Election Data and Science Lab. 2022. "County Presidential Election Returns 2000–2020." Harvard Dataverse. https://doi.org/10.7910/DVN/VOQCHQ.

Mora, G. Cristina. 2014. *Making Hispanics: How Activists, Bureaucrats, and Media Constructed a New American*. Chicago: University of Chicago Press.

Nagel, Joane. 1994. "Constructing Ethnicity: Creating and Recreating Ethnic Identity and Culture." *Social Problems* 41: 152–76.

———. 1995. "American Indian Ethnic Renewal: Politics and the Resurgence of Identity." *American Sociological Review* 60(6): 947–65. https://doi.org/10.2307/2096434.

Nobles, Melissa. 2000. *Shades of Citizenship: Race and the Census in Modern Politics*. Redwood City, Calif: Stanford University Press.

Office of Management and Budget (OMB). 2000. "Guidance on Aggregation and Allocation of Data on Race for Use in Civil Rights Monitoring and Enforcement." OMB Bulletin no. 00-02. Washington, D.C.: The White House. Accessed April 11, 2024. https://obamawhitehouse.archives.gov/node/15503.

———. 2023. "Initial Proposals for Updating OMB's Race and Ethnicity Statistical Standards." *Federal Register* 88: 5375–84. Accessed April 11, 2024. https://s3.documentcloud.org/documents/23587529/initial-proposals-for-updating-ombs-race-and-ethnicity-statistical-standards.pdf.

Passel, Jeffrey S., and Jens Manuel Krogstad. 2023. "How a Coding Error Provided a Rare Glimpse into Latino Identity Among Brazilians in the U.S." Washington, D.C.: Pew Research Center. Accessed September 29, 2023. https://www.pewresearch.org/short-reads/2023/04/19/how-a-coding-error-provided-a-rare-glimpse-into-latino-identity-among-brazilians-in-the-u-s/.

Perlmann, Joel, and Mary C. Waters. 2002. *The New Race Question: How the Census Counts Multira-*

cial Individuals. New York: Russell Sage Foundation.

Prewitt, Kenneth. 2000. "The US Decennial Census: Political Questions, Scientific Answers." *Population and Development Review* 26(1): 1–16. https://doi.org/10.1111/j.1728-4457.2000.00001.x.

Pryor, Edward T., Gustave J. Goldmann, Michael J. Sheridan, and Pamela M. White. 1992. "Measuring Ethnicity: Is 'Canadian' an Evolving Indigenous Category?" *Ethnic and Racial Studies* 15(2): 214–35. https://doi.org/10.1080/01419870.1992.9993742.

Qian, Zhenchao. 2004. "Options: Racial/Ethnic Identification of Children of Intermarried Couples*." *Social Science Quarterly* 85(3): 746–66. https://doi.org/10.1111/j.0038-4941.2004.00243.x.

Qian, Zhenchao, and Daniel T. Lichter. 2011. "Changing Patterns of Interracial Marriage in a Multiracial Society." *Journal of Marriage and Family* 73(5): 1065–84. https://doi.org/10.1111/j.1741-3737.2011.00866.x.

Rasinki, Kennith A. 1989. "The Effect of Questions Wording on Public Support for Government Spending." *Public Opinion Quarterly* 53(3): 388–94. https://doi.org/10.1086/269158.

Rockquemore, Kerry Ann. 2002. "Negotiating the Color Line: The Gendered Process of Racial Identity Construction Among Black/White Biracial Women." *Gender & Society* 16(4): 485–503. https://doi.org/10.1177/0891243202016004005.

Rockquemore, Kerry Ann, and David L. Brunsma. 2008. *Beyond Black: Biracial Identity in America*. Lanham, MD: Rowman & Littlefield.

Rodriguez, Clara E. 2009. "Contestations over Classifications: 'Latinos', the Census and Race in the United States." *Journal de La Société Des Américanistes* 95(2): 175–205.

Roth, Wendy D. 2005. "The End of the One-Drop Rule? Labeling of Multiracial Children in Black Intermarriages." *Sociological Forum* 20(1): 35–67. https://doi.org/10.1007/s11206-005-1897-0.

Ruggles, Steven, Sarah Flood, Matthew Sobek, Danika Brockman, Grace Cooper, Stephanie Richards, and Megan Schouwiler. 2023. "Integrated Public Use Microdata Series USA: Version 13.0 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D010.V13.0.

Sáenz, Rogelio, Sean-Shong Hwang, Benigno E. Aguirre, and Robert N. Anderson. 1995. "Persistence and Change in Asian Identity Among Children of Intermarried Couples." *Sociological Perspectives* 38(2): 175–94. https://doi.org/10.2307/1389289.

Saperstein, Aliya, and Andrew M. Penner. 2012. "Racial Fluidity and Inequality in the United States." *American Journal of Sociology* 118(3): 676–727. https://doi.org/10.1086/667722.

Schuman, Howard, and Stanley Presser. 1996. *Questions and Answers in Attitude Surveys: Experiments on Question Form, Wording, and Context*. Thousand Oaks, Calif.: Sage Publications.

Skerry, Peter. 2000. *Counting on the Census?: Race, Group Identity, and the Evasion of Politics*. Washington, D.C.: Brookings Institution Press.

———. 2002. "Multiracialism and the Administrate State." In *The New Race Question: How the Census Counts Multiracial Individuals*, edited by Joel Perlmann and Mary C. Waters, 327–39. New York: Russell Sage Foundation.

Tavernise, Sabrina, Tariro Mzezewa, and Giulia Heyward. 2021. "Why the Census Reported an Increase in Multiracial Americans." *New York Times*, August 13. Accessed April 11, 2024. https://www.nytimes.com/2021/08/13/us/census-multiracial-identity.html.

Townsend, Sarah S. M., Stephanie A. Fryberg, Clara L. Wilkins, and Hazel Rose Markus. 2012. "Being Mixed: Who Claims a Biracial Identity?" *Cultural Diversity and Ethnic Minority Psychology* 18(1): 91–96. https://doi.org/10.1037/a0026845.

U.S. Census Bureau. 2022. "Data Processing Error for the Hispanic Origin Question for 2020 ACS." Errata Note no. 129. Washington: U.S. Census Bureau. Accessed April 11, 2024. https://www.census.gov/programs-surveys/acs/technical-documentation/errata/129.html.

Waters, Mary C. 1994. "Ethnic and Racial Identities of Second-Generation Black Immigrants in New York City." *International Migration Review* 28(4): 795–820.

Ethnoracial Transformations? Linking Administrative Data to Explain Changes in Identification

JOHN ANDERS, MARY E. CAMPBELL, CRAIG WESLEY CARPENTER, AND LUNA CHANDNA

We link the 2010 Census microdata to the 2010–2020 American Community Surveys and Social Security Administration records to test patterns of ethnoracial identification change across this decade. After documenting substantial ethnoracial stability in some categories, we find substantial flows between many racial categories, more movement into Hispanic identification than movement out of the Hispanic category, foreign-born Hispanic multiracial respondents are 14 percentage points (40 percent) more likely to identify later as Hispanic White than their native-born counterparts, and foreign-born non-Hispanic multiracial respondents are 19 percentage points (90 percent) less likely to identify later as non-Hispanic White than native-born. Higher income and education are both associated with less racial identification change. Change also varies by household type.

Keywords: administrative data, linked data, ethnoracial fluidity, racial change, immigrant identity

To understand contemporary demographic change, it is crucial to understand how the ethnoracial identifications of adults have changed in the 2010s, especially among groups where we might expect a high rate of fluidity in identification, such as immigrants to the United States. The 2010s were a time of significant demographic change, with a large growth in the

John Anders is assistant professor in the Department of Economics at Trinity University, San Antonio, Texas, United States. **Mary E. Campbell** is a professor in the Department of Sociology at Texas A&M University and director of the Texas Federal Statistical Research Center, United States. **Craig Wesley Carpenter** is an assistant professor in the Department of Agricultural, Food, and Resource Economics at Michigan State University, United States. **Luna Chandna** is a graduate student in the Department of Sociology at Texas A&M University, United States.

© 2025 Russell Sage Foundation. Anders, John, Mary E. Campbell, Craig Wesley Carpenter, and Luna Chandna. 2025. "Ethnoracial Transformations? Linking Administrative Data to Explain Changes in Identification." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 65–84. https://doi.org/10.7758/RSF.2025.11.1.04. This article includes research conducted in the Texas Federal Statistical Research Data Center (TXRDC). The Census Bureau has reviewed this data product to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data used to produce this product (Data Management System [DMS] number P-7530695, Disclosure Review Board [DRB] approval numbers CBDRB-FY23-POP001-0094, CBDRB-FY23-POP001-0164, and CBDRB-FY24-POP001-0040). This material is based on work supported by the National Science Foundation under Grant No. 2148889. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation or the U.S. Census Bureau. The authors are listed alphabetically. Direct correspondence to: Mary E. Campbell, at m-campbell@tamu.edu, Liberal Arts Social Sciences Building, 2935 Research Pkwy Suite 311, College Station, TX 77845, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

multiracial population from 2010 to 2020 and increasing ethnoracial diversity through immigration from Latin America and Asia (Jones et al. 2021). Demographic models often assume the ethnoracial identifications of individuals in each of these categories are stable across the life course and across different types of data collections (surveys, censuses, administrative data, and so on). In reality, changes in racial identification vary significantly across racial groups, across places, and over time (Liebler et al. 2017). These changes are not always evident when we look at cross-sectional data, because racial change does not occur in only one direction. People move both into and out of categories, which can create the illusion of stability in the overall size of the category when actually change is considerable in who selects the category (Liebler et al. 2017). These changes may vary by geography (Pickett, Saperstein, and Penner 2019) and birth cohort in important ways as well, making the impact of ethnoracial fluidity uneven across the United States. If ethnoracial self-identification varies by where and when a person is born, longitudinal data that tracks an individual from birth into adulthood is crucial to documenting this source of variation. These changes in racial and ethnic identification could have important implications for ethnoracial inequality if, for example, the changes are patterned by consequential differences such as immigrant generation.

ETHNORACIAL CHANGE WITHIN A LIFETIME: LITERATURE REVIEW

How ethnoracial fluidity has changed over time and its consequences for immigrants and the native born have been argued many times. Even in the nineteenth century, movement into and out of ethnoracial categories was noteworthy, often associated with changes in socioeconomic status (Saperstein and Gullickson 2013). Despite rhetoric that racial categories (especially White and Black) have been uniquely rigid in the United States, evidence indicates that even in this context "money whitens" (Saperstein and Gullickson 2013; Vargas 2015). How the rigidity of the Black category compares with the Hispanic and Asian categories, and how that rigidity has shifted over time, remains a subject of considerable interest and argument today (Alba 2020; Lee and Bean 2012). Knowing the magnitude of ethnoracial change for immigrant and native-born populations, and how that compares across ethnoracial groups, is key to understanding how immigrants are incorporated into the United States today. Examining contemporary racial fluidity for immigrants provides an important window into the current context of reception and integration, through measurable effects on ethnoracial self-categorization choices (Duncan and Trejo 2018).

Recent work with linked census data shows pronounced response changes between 2000 and 2010. Carolyn Liebler and her colleagues (2017) find that multiracial, Hispanic, American Indian and Alaskan Native, and Pacific Islander respondents all demonstrated high rates of change across census years. Children and those who lived in the West (where intermarriage and multiracial identification are also more common) were more likely to change identification (Liebler et al. 2017). The authors were limited, however, to the variables available in the census and to two points in time (2000 and 2010), so they were not able to investigate the more contemporary geographic, socioeconomic, and immigration-specific patterns we test here. We expand their study into the 2010s, and test the relationship between racial fluidity and nativity, place and year of birth, and socioeconomic characteristics such as educational attainment.

Studies using other data sources have also found considerable fluidity in identification over the life course and have tested local and generational variation in these patterns. A comparison of four different data sources reveals that racial change with linked survey data ranged from 5 to 12 percent of respondents (Agadjanian 2022). Work with the National Longitudinal Survey of Youth, for example, shows that fluidity is more common in the Southwest (New Mexico, Arizona, California) and in the upper Midwest (Ohio, Michigan) and in counties with greater poverty, unemployment, and diversity (Pickett, Saperstein, and Penner 2019). Fluidity is also common among adolescents

who identify with multiple racial groups (Doyle and Kao 2007). The National Longitudinal Study of Adolescent to Adult Health shows that the patterns of ethnoracial change are shaped by skin tone, and that ethnoracial stability is more common for adolescents with highly educated mothers (Doyle and Kao 2007). Latinx young adults change ethnoracial identification in patterns that also reflect the tight connection between skin tone and others' perceptions of racial categories (Irizarry, Monk, and Cobb 2023). Work with linked Social Security data shows that fluidity occurs even in data collections late in life (Breen 2023), with more fluidity into the non-Hispanic White category for those who had higher socioeconomic status in young adulthood.

Many of the groundbreaking studies that have been able to examine ethnoracial identification change during an individual's lifespan have either been limited to relatively small samples, because of the comparative rarity of the event (Saperstein and Penner 2012), or to relatively short time spans, because of the limited availability of linked data (Liebler et al. 2017). To test questions about ethnoracial identification change across birth cohorts and into the 2010s, this project brings together additional data: very large samples of millions of respondents, and geographic data for sample members from a range of administrative data sources.

MEASUREMENT OF ETHNICITY AND RACE

Every decennial census in U.S. history has measured ethnoracial categories differently than the decade before (Fischer and Hout 2006), and many categories have been added or removed from the federal ethnoracial options as ideas about salient racial and ethnic categories have changed (Davenport 2020). Since the Office of Management and Budget issued revised standards for the federal collection of ethnic and racial data in 1997, analysis of the implications of these standards has been extensive. Indeed, the 2000 Census was the first to allow self-selection of more than one racial category, though not the first to include a multiracial group, because earlier censuses had included enumerator-assigned multiracial categories (Farley 2002). It was immediately apparent that these changes to the data collection standards had important implications for population projections and our understanding of demographic change. For example, since 2000, many studies have asked how intermarriage, immigration, and uncertainties about the identification choices of future generations might change our estimates of population size (Edmonston, Lee, and Passel 2002; Lee and Bean 2012; Perlmann 2002; Waters 2000).

Immigration has a profound relationship with how people think about and express ethnoracial identities. Many immigrants find that the U.S. federal ethnoracial categories do not match their self-understanding (Rodriguez 2000). Thus the amount of time spent in the United States, degree of cultural incorporation, and number of generations in the United States are often important predictors of ethnoracial identification, as more exposure to U.S. norms changes respondents' ideas about race and racial categories (Newby and Dowling 2007; Feliciano and Rumbaut 2018; Rodriguez 2000; Davenport 2020). If immigrants with higher socioeconomic standing and more social integration are more likely to adopt the standard federal racial categories, especially Whiteness (Duncan and Trejo 2011), then these intergenerational and intragenerational identification shifts will obscure the actual socioeconomic mobility of the group by creating selectivity in the decision to exit the group. Past European immigrant groups followed a pattern like this, with White ethnic groups becoming virtually indistinguishable from each other over time on many socioeconomic indicators (Lieberson and Waters 1990), but debates about whether current immigrant groups from Latin America and Asia have access to the same opportunities are ongoing (Alba 2020).

The largest immigrant groups to the United States also have high rates of intermarriage relative to White and African American adults, though lower than American Indian adults (Lee and Bean 2012). This historical pattern creates another important context for understanding contemporary fluidity; more than one-quarter of newly married Asian Americans and Hispan-

ics were married to someone with a different ethnoracial identification (Bialik 2017). This means that, for many immigrant groups, the projections for the group size depend heavily on whether and how children from interracial relationships are ethnoracially identified (Edmonston, Lee, and Passel 2002).

RESEARCH QUESTIONS

Our longitudinally linked data allow us to investigate ethnoracial identification over time and to test two questions: How many individuals change ethnoracial identification? Specifically, how many of the individuals captured in American Community Surveys (ACS) in the 2010s identified with a different ethnoracial category in the 2010 Census? Does the rate of change of ethnoracial identification vary by birth-year cohort, nativity of birth, place of birth if born in the United States, socioeconomic characteristics, or household type?

The need for work that can use longitudinally linked data to rigorously test key questions such as whether immigrants from different parts of the world are more likely to identify as White, as multiracial, or as single-race people of color is critical (Alba 2020; Duncan and Trejo 2011). That question is central to future population projections and work on demographic change in the United States. It is essential that we have high-quality evidence on this question because if the category of White is expanding to include more children of immigrants and multiracial respondents over time, that would change predictions such as the coming majority-minority status of the United States, and estimates of ethnoracial inequality, for example.

Data and Methods

We use the Federal Statistical Research Data Center system to link the 2010 Census to the 2010–2020 American Community Surveys and the Numident (the Social Security Administration's numeric identification system) using individual protected identification keys, or PIKs (for more on the system, see U.S. Census Bureau 2023). PIKs are linked to individual observations by the U.S. Census Bureau using the Person Identification Validation System (PVS), which uses probabilistic matching to assign a unique Census Bureau identifier for each person (Wagner and Layne 2014).[1] Individuals who do not have a Social Security number and those whose personal information was too ambiguous or incomplete do not receive a PIK (Liebler et al. 2017). Once a PIK is assigned in each separate data set, it can be used to link individuals in one census or survey to their response in another census or survey.

We develop a sample from respondents born between 1920 and 1985 who have valid Social Security numbers (who therefore appear in the Numident), who completed one (or more) American Community Surveys, who completed the 2010 Census, and who have a non-missing place of birth. Our sample includes (at least) two observations of adult residential location as well as adult racial and ethnic identification (Taylor, Stuart, and Bailey 2016).[2] We restrict the sample to birth cohorts born between 1920 and 1985, so that respondents are at least twenty-five years old at the 2010 Census. This leaves us with a sample of about 22.9 million respondents with a 2010 Census response linked to a 2010–2019 ACS response. We report the sample of respondents with a 2020 ACS response linked to their 2010 Census response separately because of significant changes in the ethnoracial identification questions on the 2020 ACS (for the ethnoracial questions from each data source, see figure A.6).[3]

For this article, we begin with a careful and detailed descriptive analysis of racial and eth-

1. Catherine Massey and Amy O'Hara (2014) report that samples from 2010 have a successful PIK rate above 90 percent. Brittany Bond and her colleagues (2014) report the ACS PIK rate of 2009 is 89 percent and 2010 is 93 percent, with slightly higher match rates for non-Hispanic Whites than other groups.

2. The Numident is used to establish individuals' county of birth following Evan Taylor, Bryan Stuart, and Martha Bailey (2016).

3. See online appendix at https://www.rsfjournal.org/content/11/1/65/tab-supplemental.

nic identification changes for respondents who completed multiple data collections in the 2010s. We focus special attention on immigrants and the native born. We use these linkages to examine ethnoracial changes during the last decade and to assess the fluidity of racial and ethnic identification across birth decades and geography.

Variable Construction

For our key variable, ethnoracial identification, we create a variable in each dataset (Census and ACS) that combines Hispanic and racial responses into a single set of mutually exclusive categories (non-Hispanic White, Black, American Indian, Asian American, Native Hawaiian/Pacific Islander, multiracial, and Some Other Race; Hispanic White, Black, American Indian, Asian American, Native Hawaiian/Pacific Islander, multiracial and Some Other Race). We use only the unedited responses that respondents entered in the form, dropping all respondents with missing information on these key questions. For respondents who completed more than one ACS survey between 2010 and 2020, we use their most recent ACS response. It is important that for these initial analyses, all multiracial respondents are grouped together into a single ethnoracial category (non-Hispanic multiracial or Hispanic multiracial). One important implication is that people who change from one multiracial identification to another (for example, from Black-White to Asian–American Indian) would not be captured by our measure of ethnoracial change. These changes will be explored in a future article.

We also create a variable separating respondents into mutually exclusive categories based on place of birth (native born and foreign born) using the ACS. We gather year and county of birth data from the Numident, providing birth cohort and birthplace data, and we gather place of residence from the respondent's most recent ACS response.

Finally, the 2010–2019 ACS ethnoracial data are not entirely comparable with the 2020 ACS ethnoracial data. The 2020 ACS included many new write-in boxes (like the 2020 Census), and because the coding of those write-in categories created the opportunity to code the new category of Middle Eastern and North Africa (MENA), more opportunities for ethnoracial fluidity were introduced in the 2020 ACS because of the difference in the survey item structure. Including respondents in the 2020 ACS with respondents in the 2010–2019 ACSs for comparison to respondents in the 2010 Census was problematic. Therefore, we separated the 2020 ACS respondents from the 2010–2019 ACS respondents and linked them to their 2010 Census responses and Numident data in an independent sample to examine changes in their ethnoracial identification that could include MENA. Thus, the analyses below include tests of fluidity for 2010–2019 ACS respondents linked to the 2010 Decennial Census, and then a separate analysis of 2020 ACS linked to 2010 Decennial Census responses in order to examine the impact of adding a MENA category to the response options.

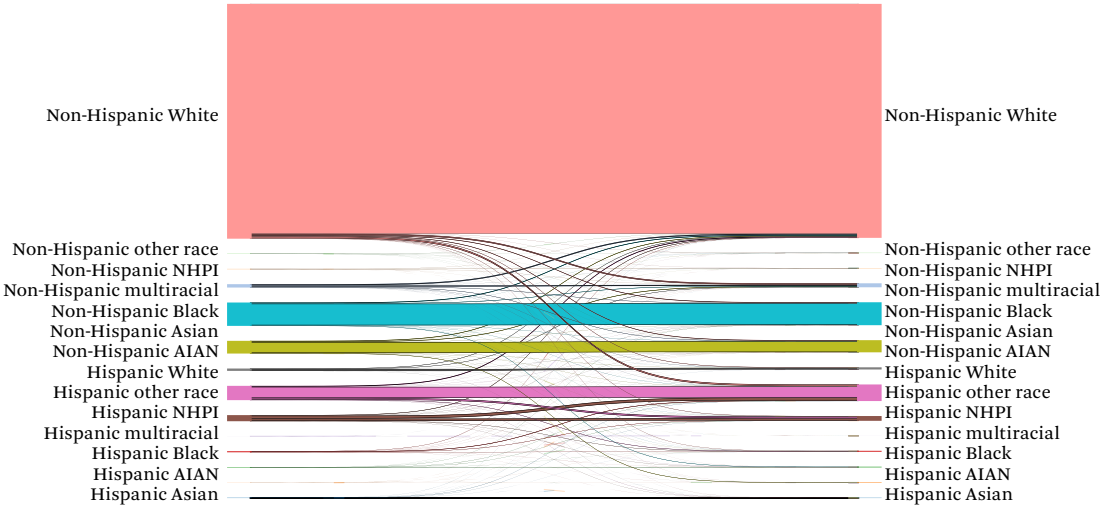
Results

The following analyses include tests of fluidity for 2010–2019 ACS respondents linked to the 2010 Census, and then a separate analysis of 2020 ACS linked to 2010 Census responses in order to examine the impact of adding a MENA category to the response options.

How Many Individuals Change Ethnoracial Identification?

The nature of surveying and data collection could influence ethnoracial response changes. Questionnaire design itself might cause changes in ethnoracial responses (Campbell and Rogalin 2006; Snipp 2003; Waters 2000) and differences may arise depending on who fills out the forms (Campbell 2007; Porter, Liebler, and Noon 2016). We find evidence that filling out a census form and filling out an ACS form prompt different responses. Comparing the responses of people who filled out a 2010 ACS form with those from their 2010 Census form shows ethnoracial change too; the change is not limited to only those who filled out later forms (2011–2019). Because we see ethnoracial change even in a less than one-year time span, this suggests that a meaningful proportion of the fluidity we find across data collections is

Figure 1. Ethnoracial Patterns: All Flows (Counts)



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.

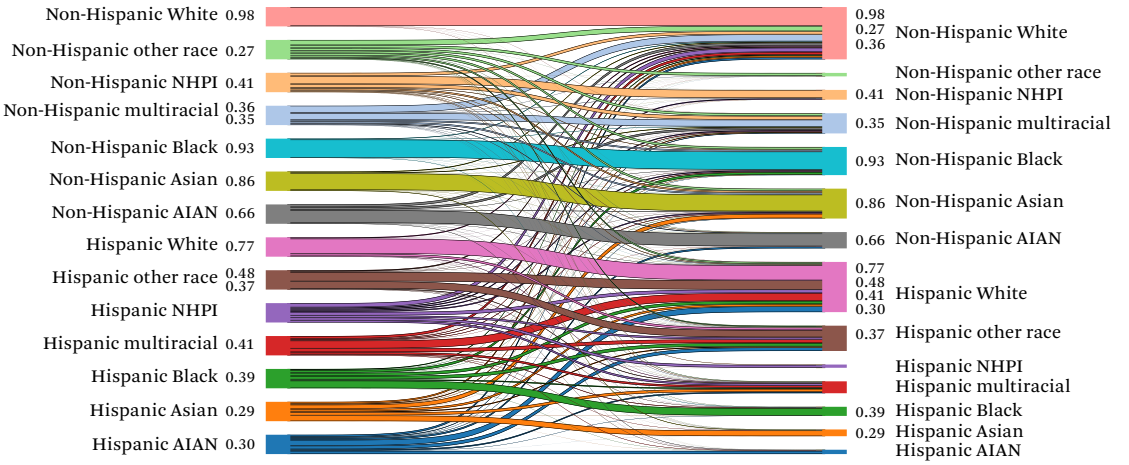
about the meaning of those survey instruments to the respondents. It is important, then, that we think about our results in terms of racial and ethnic identification fluidity, which can occur across contexts even at one point in time, rather than simply as a permanent change in ethnoracial identification, which implies a temporal process with finality.

Given previous work (Liebler et al. 2016, 2017), we expect to observe the highest rates of fluidity among respondents who identify as American Indian, Alaska Native, Native Hawaiian, Other Pacific Islander, in a multiple-race response group, or Hispanic. We also expect switching race within ethnicity to be more common for foreign-born than native-born persons as people are integrated into the U.S. racial system and learn new racialized schema (Campbell 2020; Roth 2012). Matching expectations, we find native-born respondents have a lower probability of changing their ethnoracial response than foreign-born respondents, which varies by the area of residence. Also consistent with expectations, we find the rate of ethnoracial change, as well as group-specific rates of change, is meaningfully different for later birth cohorts.

We display our main results in sankey or flow diagrams. After coding each ethnic and racial combination for the 2010 Census and the (most recent) 2010–2019 ACS, we have a 14×14 matrix of ethnoracial pairs between which identity changes for each respondent can occur. We find an overall fluidity (response change) rate of 6.9 percent, relative to 6.1 percent reported by Liebler and her colleagues (2017) between 2000 and 2010.[4] Figures 1 and 2 show that overall, stability in ethnoracial identity is substantial: more than 98 percent of the 17.5 million respondents who identified as non-Hispanic White in the 2010 Census also identified as non-Hispanic White in the (latest) 2010–

4. Given that we replicated Liebler and colleagues' (2017) findings internally to verify relative coding consistency, this small difference has two possible main sources. First, the census periodically updates how they match individuals to data (that is, the PIK), and we use an updated version of the PIK. Second, Liebler and colleagues (2017) measures fluidity using the 2000 and 2010 Censuses, whereas we link the 2010 Census to the 2011–2019 American Community Survey responses. It may be that individuals respond differently to mandatory censuses relative to voluntary surveys.

Figure 2. Ethnoracial Patterns: All Flows (Percent of 2010 Decennial)



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.
Note: The ethnoracial flows are from the 2010 Census on the left to the 2010–2019 ACS on the right. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 (14 × 14) ethnoracial pairs between which respondents could change. This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born from 1920 to 1985.

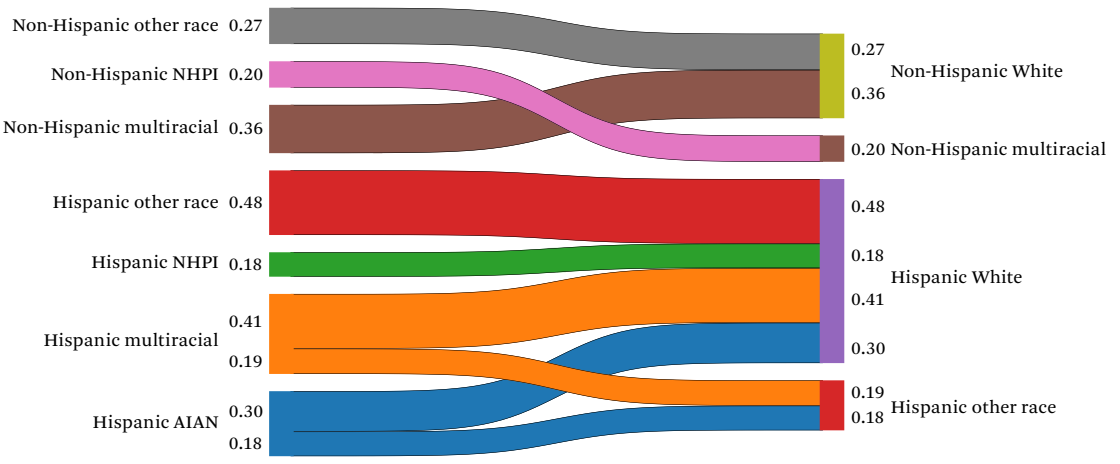
2019 ACS. Similarly, 93 percent of the 1.6 million respondents who identified as non-Hispanic Black in the 2010 Census also identified as non-Hispanic Black in the (latest) 2010–2019 ACS.

For visual ease, in the following figures we focus on the changes between identification for specific transition pairs. Figure 3 shows flows for the most dominant transition pairs, pooling respondents across native- and foreign-born status.

The figure shows prominent flows between racial groups when the respondent's response to the Hispanic ethnicity question remains consistent. For example, 41 percent of Hispanic multiracial respondents in the 2010 Census identified as Hispanic White in a later ACS, whereas 19 percent identified as Hispanic Other Race. We find prominent flows out of multiracial and Other Race, but also from American Indian and Alaska Native and Native Hawaiian and Other Pacific Islander. We discuss these prominent flows by nativity status.

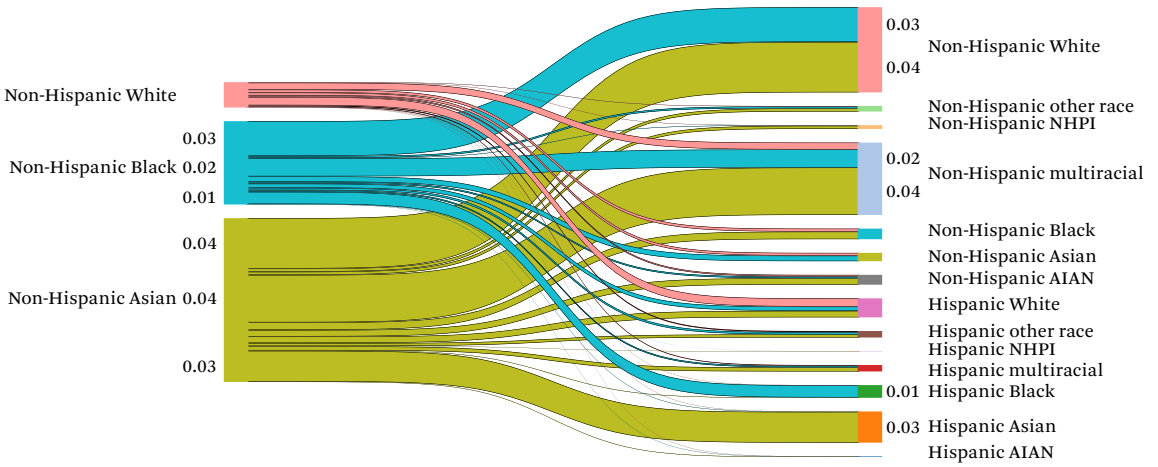
Figures 4 and 5 highlight two stylized facts about ethnoracial flows: flows between groups are substantial even when we exclude the heterogeneous multiracial and Other Race categories in the base year (figure 4), and movement into Hispanic in the ACS is greater than movement out in the ACS (figure 5). Figure 4 shows that although fewer than 1 percent of non-Hispanic White respondents identified as a different category in a later ACS, 4 percent of non-Hispanic Asian respondents identified as non-Hispanic White, 4 percent as non-Hispanic multiracial, and 3 percent as Hispanic Asian, for a total of approximately 14 percent moving out of the non-Hispanic Asian category. Comparatively, Liebler and colleagues (2017), who consider changes from the 2000 to the 2010 Census, found less than half that rate of change, documenting that 4.7 percent of people identifying as non-Hispanic Asian in the 2000 Census left the category in the 2010 Census. Last, we find 3 percent of non-Hispanic Black respondents identified as non-Hispanic White, and a total of approximately 7 percent moved out of the non-Hispanic Black category. This result is also about twice the rate found in Liebler and colleagues (2017), which documents that 3 percent of non-Hispanic Black respondents left the category between the 2000 and the 2010 Census.

Figure 3. Prominent Racial Flows Within Ethnicity (Pooled)



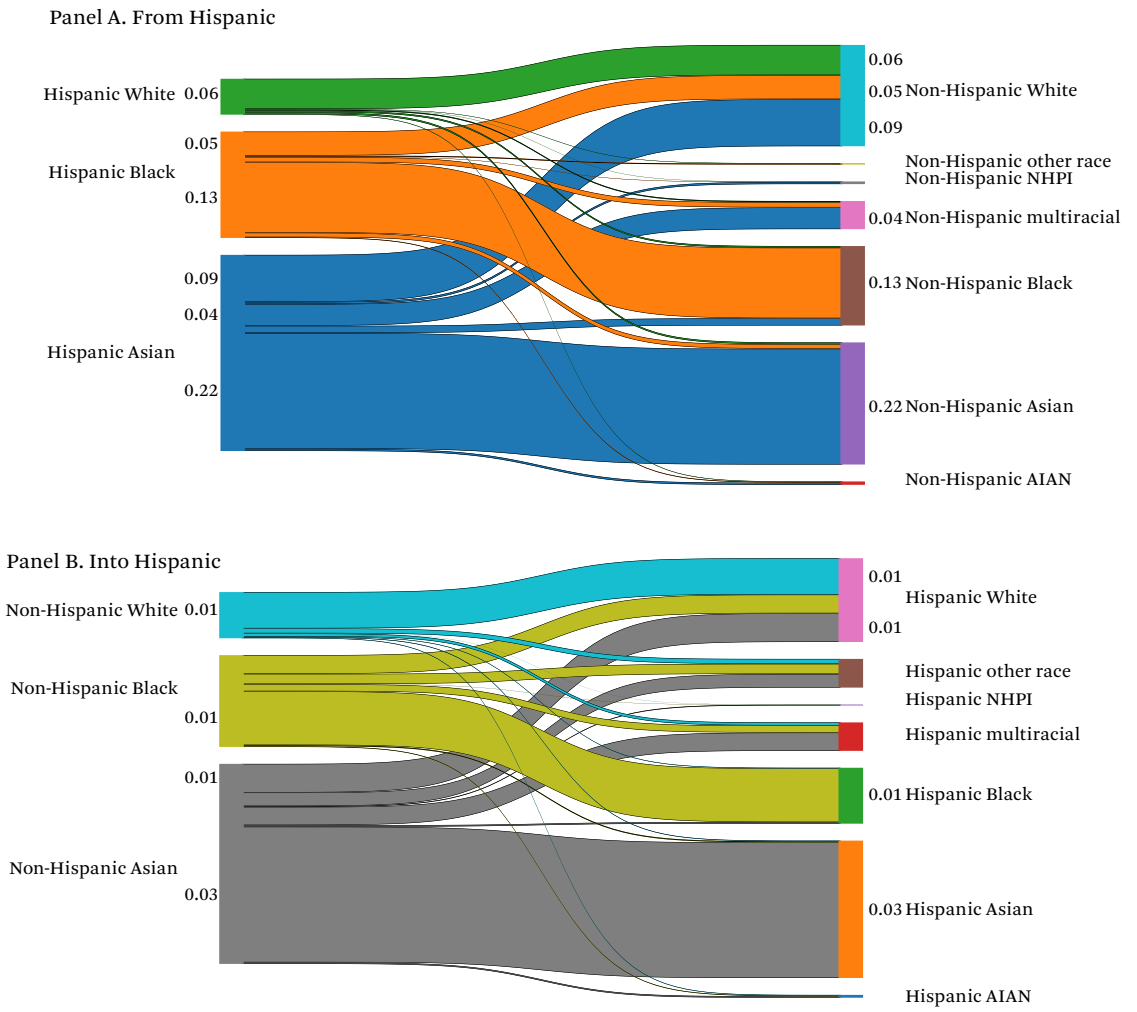
Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.
Note: Ethnoracial flows are from the 2010 Census on the left to the 2010– 2019 ACS on the right. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure restricts to those pairs in which ethnicity remained constant, and for which the percentage of respondents who switched racial responses was at least 18 percent, which is the 95th percentile of the variation in racial change. We call these flow rates above the 95th percentile Prominent Flows. This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

Figure 4. Racial Flows: Flows from Asian, Black, White



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.
Note: Ethnoracial flows are from the 2010 Census on the left to the 2010–2019 ACS on the right. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure restricts to those pairs in which initial 2010 identification was non-Hispanic Asian, Black, or White. This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

Figure 5. Ethnic Flows



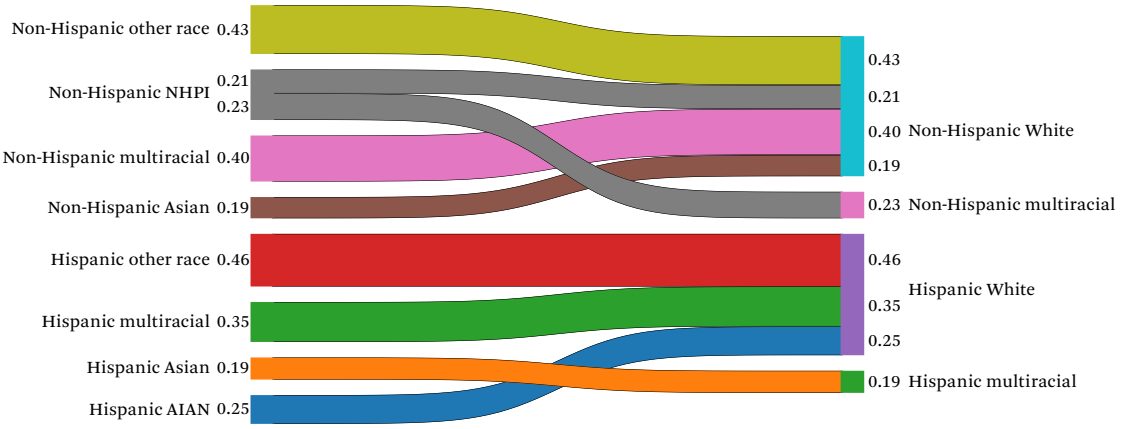
Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.

Note: Ethnoracial flows are from the 2010 Census on the left to the 2010–2019 ACS on the right. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure restricts to those pairs in which initial 2010 identification was non-Hispanic, but later identification was non-Hispanic. This figure pools native and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

Our main results displaying prominent ethnoracial flows exhibit noteworthy differences across nativity status. Figures 6 and 7 repeat figure 3, but are restricted to either native-born or foreign-born respondents. Figure 6 shows prominent flows for native-born respondents: 35 percent of native-born Hispanic multiracial respondents in the 2010 Census identified as Hispanic White in a later ACS (versus 41 percent in the pooled sample); 40 percent of native-born non-Hispanic multiracial respondents in the 2010 Census identified as non-Hispanic White in a later ACS (versus 36 percent in the pooled sample).

Figure 7 also shows results for prominent flows but is restricted to foreign-born respon-

Figure 6. Prominent Racial Flows, Within Ethnicity (Native-Born)



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.
Note: Ethnoracial flows are from the 2010 Census on the left to the 2010–2019 ACS on the right. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure restricts to those pairs in which ethnicity remained constant, and for which the percentage of respondents who switched racial responses was at least 18 percent, which is the 95th percentile of the variation in racial change. We call these flow rates above the 95th percentile "Prominent Flows." This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985. This figure differs from figure 3 in that it is further restricted to native-born U.S. respondents.

dents: 49 percent of foreign-born Hispanic multiracial respondents in the 2010 Census identified as Hispanic White in a later ACS (versus 35 percent in the native-born sample and 41 percent in the pooled sample); 21 percent of foreign-born non-Hispanic multiracial respondents in the 2010 Census identified as non-Hispanic White in a later ACS (versus 40 percent in the native-born sample and 36 percent in the pooled sample).

Figures A.1 through A.5 in the online appendix include more detail on the fluidity for individuals who identified with multiple racial categories or as Other Race. Table A.1 includes the full tabular list of identification changes. As expected, these groups experience high rates of fluidity, and are identified in the ACS with a wide range of categories. The most common response is to have stable ethnic identification (Hispanic or not), but changes in racial identification for these categories are very common. Future work will explore these changes by examining specific multiracial groups and their fluidity.

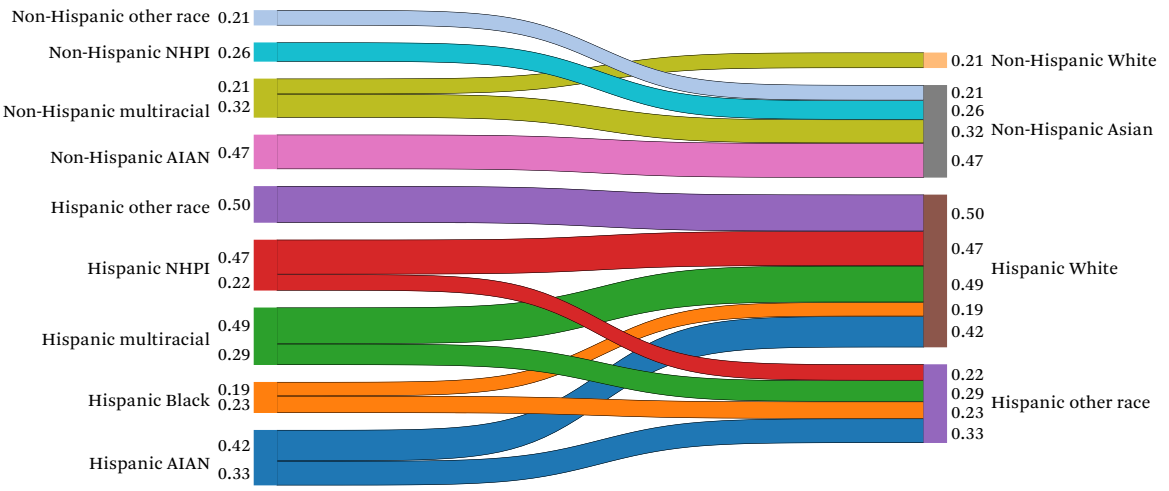
Overall, the results for native-born individuals differ from those for foreign-born individuals in several important respects.[5] First, Hispanic multiracial respondents are 14 percentage points (40 percent) more likely to identify later as Hispanic White if they are foreign born than if they are native born. Second, non-Hispanic multiracial respondents are 19 percentage points (90 percent) less likely to identify later as non-Hispanic White if they are foreign born than if they are native born. Because the results differ based on native- and foreign-born status, we investigate whether place and decade of birth more broadly have an impact on ethnoracial fluidity. We discuss these results in the next section.

Complications Specific to the 2020 ACS

Survey format changes made to the 2020 ACS introduce certain complications which we

5. In the online appendix, tables A.2 and A.3 include the set of identification changes among foreign-born and native-born individuals, respectively.

Figure 7. Prominent Racial Flows, Within Ethnicity (Foreign-Born)



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.
Note: Ethnoracial flows are from the 2010 Census on the left to the 2010–2019 ACS on the right. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure restricts to those pairs in which ethnicity remained constant, and for which the percentage of respondents who switched racial responses was at least 18 percent, which is the 95th percentile of the variation in racial change. We call these flow rates above the 95th percentile Prominent Flows. This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985. This figure differs from figure 3 in that it is further restricted to foreign-born U.S. respondents.

avoided in our main analysis by restricting to the 2010–2019 ACS. Here we report results that address two distinct complications: the introduction of the Middle Eastern or North African category and changes to how Hispanic ethnicity was used to determine multiracial status.

MENA

We matched the 2020 ACS to the 2010 Census, and have produced results showing fluidity across this decade, including movement into this newly created category, MENA. In earlier years, individuals who wrote in an ancestry tied to a Middle Eastern or North African country were recoded as White (Kayyali 2013). In 2020, however, individuals who wrote in an ancestry tied to a Middle Eastern or North African country were recoded as MENA. Therefore, we have tested how many of the respondents identifying with MENA in 2020 self-identified as White on the 2010 Census. Consistent with the instructions given to survey respondents, we find that 89 percent of persons who flowed into MENA in 2020 had identified as White in 2010. We also find that 98 percent of the non-Hispanic White respondents who switched to MENA switched to non-Hispanic MENA.

Hispanic and Multiracial Coding

As Ilana Ventura and René Flores (2025, this issue) detail, in 2020 the Census Bureau changed how it used Hispanic status in the production of multiracial tabulations. Although the bureau had not considered Hispanic a race category before 2020, in 2020 it considered responses referencing Latino countries in the Some Other Race box to be racial identifications. For example, a respondent who entered both Korean and Costa Rican was counted as Asian rather than multiracial in 2010, but as Asian and Some Other Race in 2020 (Ventura and Flores 2025). Thus, simply because of this survey and imputation change, some of the multiracial population in 2020 would have been coded differently prior to 2020. Using our longitudinal data, we explore how individual respondents who were

categorized as multiracial in 2020 were categorized in 2010. We find a nontrivial increase in flows from Hispanic nonmultiracial in 2010 to Hispanic multiracial in 2020. For example, our sample of linked individuals who are observed in both 2010 and 2020 show a fortyfold increase in the count of Hispanic multiracials in 2020. Furthermore, approximately 80 percent of these 2020 Hispanic multiracial identifications are coming from individuals who identified as Hispanic White in 2010. Thus our findings support Ventura and Flores (2025), who argue that 2020 changes to the survey format and imputation method likely increased Hispanic multiracial counts in 2020. Hence the fluidity we are currently (2020 and beyond) observing for Hispanics specifically (especially those who choose the Some Other Race racial category) is the result of the questionnaire design rather than actual contextual fluidity. For this reason, our main results do not include 2020 largely due to this change in question format and postprocessing procedure, which make the comparison across years less direct. Further, given concerns about data quality in the 2020 ACS, we note that the general results and conclusions of this article are robust to including the 2021 ACS.

Ethnoracial Change by Birth Year, Birth Place and Migration

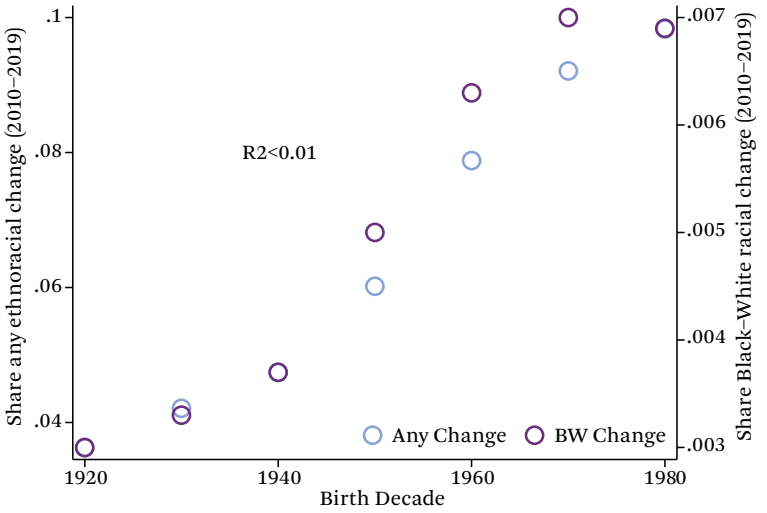
A central unanswered place-based policy question is whether individuals change ethnoracial identification in response to the places they inhabit or whether they seek out places that reflect their chosen ethnoracial identities. Although we do not have a full answer to the central question concerning the direction of causal influence, we can begin to respond by examining how much of the variation in ethnoracial identification can be explained by place of birth, year of birth, and place of residence, both separately and jointly. Figure 8 shows that the rate of change in ethnoracial identification increases sharply across birth cohorts: individuals born in the 1980s are more than twice as likely to change ethnoracial identification in the 2010s than those born in the 1920s. However, despite these trends, birth year alone explains less than 1 percent of the total variation in ethnoracial change.

To understand how much of the variation in ethnoracial identification change can be explained by when and where a person is born, we regress ethnoracial change measures against birth year and birth county fixed effects (that is, indicator variables for the county in which an individual was born). We consider several specifications that toggle the inclusion of birth year and birth county fixed effects. Ultimately, we conclude that place of birth plays a much larger role than year of birth in determining ethnoracial change, explaining about six times more of the variation in ethnoracial change as birth-year fixed effects (figure 9). Furthermore, conditional on using birth year and birth county fixed effects, the addition of county by year linear trends adds little explanatory power. The relative explanatory power of geography of birth is consistent with the hypothesis that environmental conditions in childhood play a formative role in determining ethnoracial fluidity. The literature is considerable on how early childhood environments affect labor market, health, and other economic outcomes (Almond and Currie 2011; Chetty et al. 2014), and perhaps ethnoracial fluidity should be understood as another outcome alongside these better-studied economic outcomes. It is worth emphasizing that, just as true of standard economic outcomes, although early childhood environments may affect an outcome in a statistically significant way, childhood environmental factors do not completely predict adulthood outcomes; in other words, even when causal impact coefficients are estimated precisely the overall model leaves the majority of the outcome variation unexplained (Chetty et al. 2011). Both for standard economics outcomes and for ethnoracial fluidity, where and when you are born is not destiny.

Ethnoracial Change by Income, Education, and Household Size

Given the results by birth year and place of birth, a wide variety of causal factors contributing to observed changes in ethnoracial identity are still possible. To begin to assess the correlation between these different factors and racial identification change, we provide descriptive breakdowns of the rate of ethnoracial change

Figure 8. Trends in Ethnoracial Change by Birth Cohort



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.

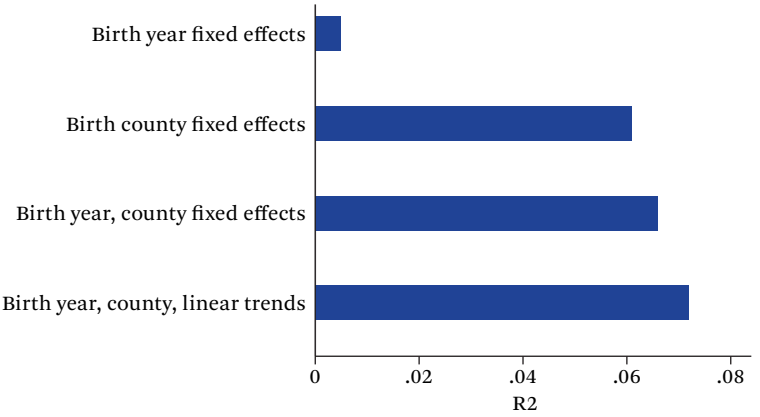
Note: Rates of ethnoracial change are from the 2010 Census to the 2010–2019 ACS. Rates are broken down by birth decade. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure shows rate changes for changes from any designation to any different designation (left axis) as well as the rate change from Black to White or White to Black. (Black-White changes are inclusive of ethnicities. For example, a respondent who changed ethnicity but still identified as Black would not be counted as a Black-White change.) This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

by income deciles, by educational attainment, and by household type.

The results in figures 10 through 12 suggest that socioeconomic status plays an important role in ethnoracial change. Income in particular monotonically predicts ethnoracial change, with lower income individuals having higher rates of change. Specifically, figure 10 shows that as income deciles increase, ethnoracial identity becomes increasingly stable: on average, every $10,000 increase in income is associated with a 3 percent decrease both in any ethnoracial change and in Black-White ethnoracial change.[6] Education and household type bear a more ambiguous relationship to ethnoracial change. Figure 11 shows that, generally speaking, more educational attainment predicts less ethnoracial change, but this relationship is not strictly monotonic because postsecondary attainment is associated with more ethnoracial change than a bachelor's degree and there are small increases in change rates between high school and some college. Figure 12 shows variation in ethnoracial change by household type. Overall, married couples (leftmost category) and persons living alone have similar rates of ethnoracial change, and households with unmarried household heads have the highest rate. The rates of those who are not married and not living alone fall between married or single individuals and unmarried household heads. That the distinction between single per-

6. Calculations used a weighted least squares regression of each ethnoracial change variable against the average nominal income level for each decile. Regressions are weighted by the observations within each income decile. The coefficient is then scaled by the mean of each ethnoracial change variable across the entire sample and reported as a percentage of the mean.

Figure 9. Do Birth Year and Birth Place Explain Ethnoracial Change?



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.

Note: The figure displays R2 values from different specifications, each aimed at showing how much of the variation in ethnoracial identity change can be explained by variation in birth year and birth county. Each specification is an OLS regression where the rate of ethnoracial change between any categories is the dependent variable. The first row displays the R2 where the right-hand side features a fixed effect for each birth year (1920 through 1985). The second row displays the R2 where the right-hand side features a fixed effect for each birthplace. (Birthplace is measured by birth county for U.S. native-born respondents and a generic indicator for foreign-born respondents.) The third row displays the R2 where the right-hand side combines both birth-year and birthplace fixed effects. Last, the fourth row displays the R2 where the right-hand side not only features birth-year and birthplace fixed effects but also includes birthplace-specific linear trends. For example, for native-born respondents each birth county is modeled on a separate linear trend across birth years. This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

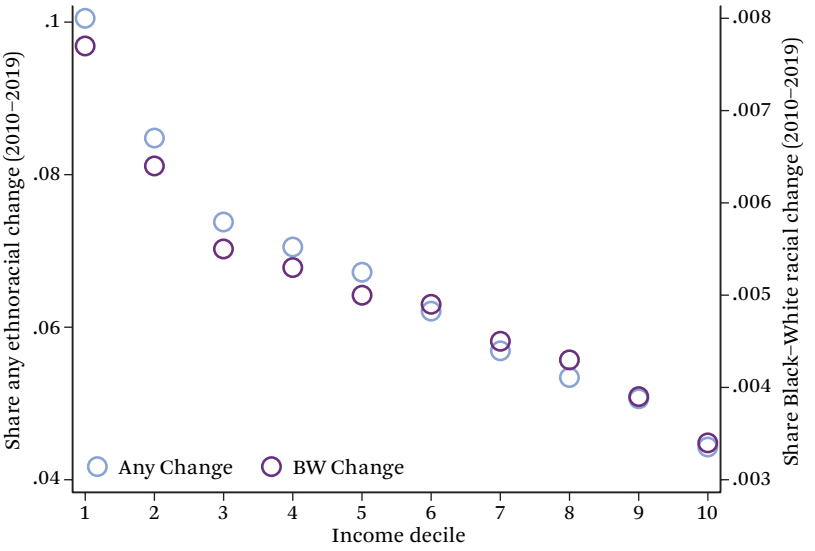
son and multiperson households does not consistently predict ethnoracial change suggests that observed changes in ethnoracial identity are not primarily driven by the number or composition of persons in the household of the survey respondent. That income and educational attainment do consistently predict ethnoracial change provides suggestive evidence that ethnoracial identity may be driven by socioeconomic factors specific to the respondent.

LIMITATIONS AND OPPORTUNITIES FOR FUTURE RESEARCH

Following Liebler and colleagues (2017), we use multiple tests to minimize the potential for bias resulting from questionnaire differences or the presence of a Census Bureau enumerator. As noted, we also limit our sample to unedited responses to ensure that changes in data editing procedures do not create the illusion of consistency when a person has actually changed ethnoracial identification (or vice versa).

Because anyone in the household can complete a census or ACS form, it is difficult to ascertain self-identification. For this reason, future research could limit the sample to individuals who are the only adult in the household, and again to the head of household or person #1 (the one most likely to be the respondent). We test the potential that respondent variation could be driving the findings by limiting the sample to single person households for figure 9. The results of this robustness check are largely the same as the results for all households and are presented in online appendix table A.7. Nonetheless, figure 12 shows slightly lower rates of change for single person households, so this remains an important area for future work. Future work could test whether it

Figure 10. Does Income Predict Ethnoracial Change?



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.

Note: Rates of ethnoracial change are from the 2010 Census to the 2010–2019 ACS. Rates are broken down by (nominal) personal income deciles, as self-reported on the restricted use ACS. Unlike public release versions of the ACS microdata, the restricted use ACS income variable is not top-coded. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure shows change rates for changes from any designation to any different designation (left axis) as well as the rate change from Black to White or White to Black. (Black-White changes are inclusive of ethnicities. For example, a respondent who changed ethnicity but still identified as Black would not be counted as a Black-White change.) This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

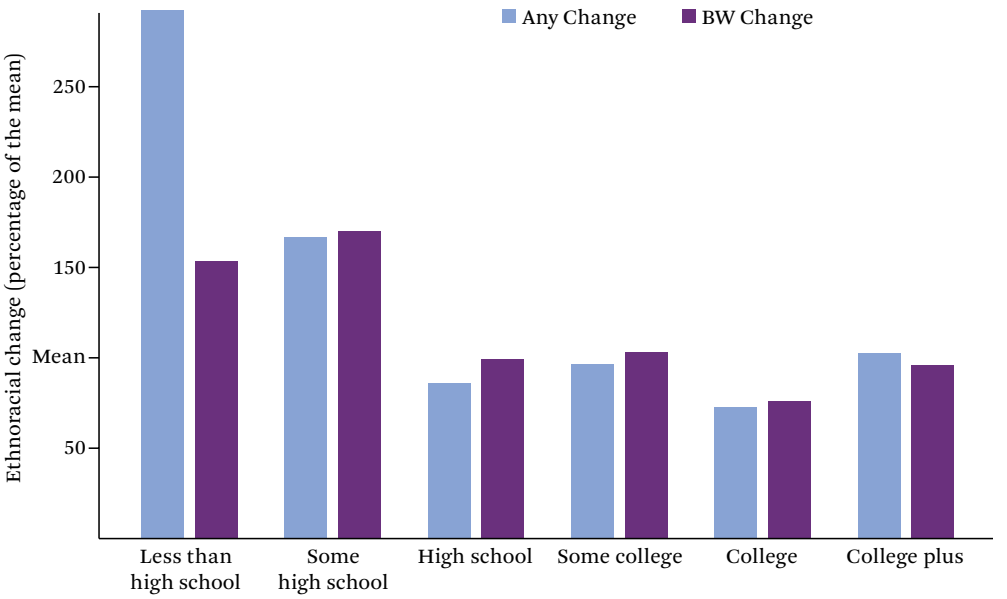
is reasonable to treat Hispanic as a racialized category similar to the other groups. There may be regional variation in this given that Latin Americans in the southern region of the United States are especially likely to be racialized as a minority group (Brown, Jones, and Becker 2018), so testing for regional differences is an area for future research.

Finally, it is especially important that although linking to the Numident creates many advantages such as providing robust county of birth data across birth cohorts, Numident data exclude undocumented residents of the United States who have never had official work authorization in the United States in their lifetime. When we limit our linked sample to those respondents who are successfully linked to the Numident, we limit our linked sample to a subset of immigrants who have at some point in their time in the United States had work authorization. Although imperfect, this project's newly linkable large-scale federal administrative data remain likely the largest and most representative longitudinal sample currently feasible.

DISCUSSION AND CONCLUSIONS

What ethnoracial fluidity do we see in the 2010s in the United States? This decade was a time of significant demographic change, and the fluidity that we see between the 2010 Census and the 2010–2019 ACS demonstrates that the populations that were growing fastest (for example, people who identify with multiple racial categories, Asian Americans, Hispanics) were also the groups with some of the highest rates of

Figure 11. Does Educational Attainment Predict Ethnoracial Change?



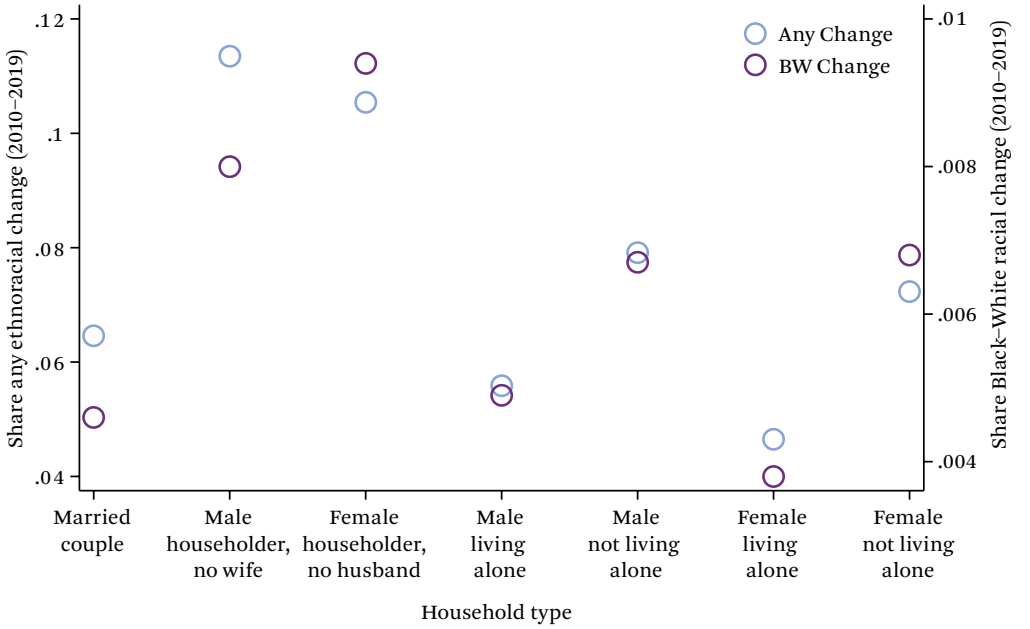
Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019.

Note: Rates of ethnoracial change are from the 2010 Census to the 2010–2019 ACS. Rates are broken down by educational attainment levels, as self-reported on the restricted use ACS. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure shows change rates for changes from any designation to any different designation (left axis) as well as the rate change from Black to White or White to Black. (Black-White changes are inclusive of ethnicities. For example, a respondent who changed ethnicity but still identified as Black would not be counted as a Black-White change.) This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

fluidity across data sources. That we see significant fluidity even when we compare measurements in the same year (the 2010 Census and the 2010 ACS) shows that some of this fluidity is likely due to differences in context and survey design, not just changes over time. The social context of the census, for example, is one that often comes with a lot of political attention and campaigns for individuals to identify with a particular community (Lujan 2014; Hillygus et al. 2010). Surveys like the ACS, on the other hand, do not carry the same political baggage, nor are communities likely to be organizing in order to convince their members to identify in a particular way for mobilization purposes. Nonetheless, the finding that fluidity varies by place of birth, year of birth, income, and educational attainment suggests that fluidity is partly determined by where and when a person grew up and their socioeconomic status, not just survey context and design.

The high rate of fluidity we find for Hispanics and people who choose the Some Other Race category mirrors what others have found (Liebler et al. 2017; Vargas and Stainback 2016), and provides more suggestive evidence that the current OMB measurement strategy (a Hispanic ethnicity question followed by a race question) poorly fits the way that many Hispanic respondents see themselves. Census Bureau research (Mathews et al. 2017) shows that when these questions are combined into a single ethnoracial question, nonresponse de-

Figure 12. Does Household Type Predict Ethnoracial Change?



Source: Authors' calculations based on U.S. Census Bureau 2010 and American Community Survey, 2010–2019

Note: Rates of ethnoracial change are from the 2010 Census to the 2010–2019 ACS. Rates are broken down by household type, as self-reported on the restricted-use ACS. For respondents with multiple ACS entries, we restrict to the most recent response. There are 196 ethnoracial pairs between which respondents could change. This figure shows rate changes for changes from any designation to any different designation (left axis) as well as the rate change from Black to White or White to Black. (Black-White changes are inclusive of ethnicities. For example, a respondent who changed ethnicity but still identified as Black would not be counted as a Black-White change.) This figure pools native- and foreign-born respondents. The sample is restricted to cohorts born between 1920 and 1985.

creases, as does the number of people who choose the Some Other Race category (a category that, by definition, means the respondent did not feel the existing categories accurately represent their self-identification). More people choose a Hispanic identification on a combined question than on the existing separate questions, and Hispanic respondents are less likely to choose Some Other Race (dropping from about 40 percent of all Hispanic respondents to less than 1 percent) but still equally likely to, for example, choose both the Hispanic and the Black categories. The high rate of fluidity we find for this group of respondents is likely artificially increased by this format that forces Hispanic respondents to choose a racial identity from the list whether or not that choice is personally meaningful. Interviews after the completion of the survey also confirmed that combining the race and ethnicity questions into one question resulted in greater matches between respondents' self-categorization on the survey and how they described themselves in a subsequent interview (Mathews et al. 2017). This greater consistency across time points and modes of data collection (survey and interview) suggests that some of the fluidity we are currently (2020 and beyond) observing for Hispanics specifically, especially those who choose the Some Other Race racial category, is the result of the questionnaire design rather than actual contextual fluidity.

These data provide many avenues for fruitful expansion of the research that we report

here. Future analyses will include ethnoracial fluidity for children of immigrants and people who select multiple ethnoracial categories on forms. Furthermore, our results using place and year of birth suggest that migration patterns both within and into the United States may be able to explain some of the variation in ethnoracial fluidity. Finally, our results using county and year of birth set the stage for testing whether childhood experiences affect adulthood ethnoracial identity. Studying migration and early childhood experiences is, in turn, a first step toward identifying to what extent people choose places based on existing ethnoracial identity, and to what extent places shape ethnoracial identity.

REFERENCES

Agadjanian, Alexander. 2022. "How Many Americans Change Their Racial Identification over Time?" *Socius* 8. https://doi.org/10.1177/23780231221098547.

Alba, Richard. 2020. *The Great Demographic Illusion: Majority, Minority, and the Expanding American Mainstream*. Princeton, N.J.: Princeton University Press.

Almond, Douglas, and Janet Currie. 2011. "Killing Me Softly: The Fetal Origins Hypothesis." *Journal of Economic Perspectives* 25(3): 153–72. https://www.aeaweb.org/articles?id=10.1257/jep.25.3.153.

American Community Survey. 2010–2019. "Federal Statistical Research Data Centers." https://www.census.gov/programs-surveys/acs/data.html.

Bialik, Kristen. 2017. "Key Facts About Race and Marriage, 50 Years After *Loving V. Virginia*." Washington, D.C.: Pew Research Center. Accessed April 9, 2024. https://www.pewresearch.org/short-reads/2017/06/12/key-facts-about-race-and-marriage-50-years-after-loving-v-virginia.

Bond, Brittany, David Brown, Adela Luque, and Amy O'Hara. 2014. "The Nature of the Bias When Studying Only Linkable Person Records: Evidence from the American Community Survey." *CARRA* working paper no. 2014-08. Washington: U.S. Census Bureau. Accessed April 9, 2024. https://www.census.gov/content/dam/Census/library/working-papers/2014/adrm/carra-wp-2014-08.pdf.

Breen, Casey F. 2023. "Late-Life Changes in Ethnoracial Self-identification: Evidence from Social Security Administrative Data." *Population Research and Policy Review* 42(10). https://doi.org/10.1007/s11113-023-09764-4.

Brown, Hana E., Jennifer A. Jones, and Andrea Becker. 2018. "The Racialization of Latino Immigrants in New Destinations: Criminality, Ascription, and Countermobilization." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 4(5): 118–40. https://doi.org/10.7758/RSF.2018.4.5.06.

Campbell, Mary E. 2007. "Thinking Outside the (Black) Box: Measuring Black and Multiracial Identification on Surveys." *Social Science Research* 36(3): 921–44. https://doi.org/10.1016/j.ssresearch.2006.07.001.

———. 2020. "Color and Constraint: Skin Tone and Identification Among Recent Immigrants to the United States." *Du Bois Review: Social Science Research on Race* 17(2): 271–92. https://doi.org/10.1017/S1742058X20000193.

Campbell, Mary E., and Christabel L. Rogalin. 2006. "Categorical Imperatives: The Interaction of Latino and Racial Identification." *Social Science Quarterly* 87(5): 1030–52. https://doi.org/10.1111/j.1540-6237.2006.00414.x.

Chetty, Raj, John Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan. 2011. "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR." *Quarterly Journal of Economics* 126(4): 1593–660. https://doi.org/10.1093/qje/qjr041.

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States." *Quarterly Journal of Economics* 129(4): 1553–623. https://doi.org/10.1093/qje/qju022.

Compton, Elizabeth, Michael Bentley, Sharon Ennis, and Sonya Rastogi, eds. 2012. "2010 Census Race and Hispanic Origin Alternative Questionnaire Experiment." Washington: U.S. Census Bureau.

Davenport, Lauren. 2020. "The Fluidity of Racial Classifications." *Annual Review of Political Science* 23(1): 221–40. https://doi.org/10.1146/annurev-polisci-060418-042801.

Doyle, Jamie Mihoko, and Grace Kao. 2007. "Are Racial Identities of Multiracials Stable? Changing Self-Identification Among Single and Multiple Race Individuals." *Social Psychology Quarterly*

70(4): 405–23. https://doi.org/10.1177/019027250707000409.

Duncan, Brian, and Stephen J. Trejo. 2011. "Who Remains Mexican? Selective Ethnic Attrition and the Intergenerational Progress of Mexican Americans." In *Latinos and the Economy: Integration and Impact in Schools, Labor Markets, and Beyond*, *Immigrants and Minorities, Politics and Policy*, edited by David L. Leal and Stephen J. Trejo. New York: Springer.

———. 2018. "Identifying the Later-Generation Descendants of U.S. Immigrants: Issues Arising from Selective Ethnic Attrition." *Annals of the American Academy of Political and Social Science* 677(1): 131–38. https://doi.org/10.1177/0002716218763293.

Edmonston, Barry, Sharon M. Lee, and Jeffrey S. Passel. 2002. "Recent Trends in Intermarriage and Immigration and Their Effects on the Future Racial Composition of the U.S. Population." In *The New Race Question: How the Census Counts Multiracial Individuals,* edited by Joel Perlmann and Mary C. Waters. New York: Russell Sage Foundation.

Farley, Reynolds. 2002. "Racial Identities in 2000: The Response to the Multiple-Race Response Option." In *The New Race Question: How the Census Counts Multiracial Individuals,* edited by Joel Perlmann and Mary C. Waters. New York: Russell Sage Foundation.

Feliciano, Cynthia, and Rubén G. Rumbaut. 2018. "Varieties of Ethnic Self-Identities: Children of Immigrants in Middle Adulthood." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 4(5): 26–46. https://doi.org/10.7758/RSF.2018.4.5.02.

Fischer, Claude S., and Michael Hout. 2006. *Century of Difference: How America Changed in the Last One Hundred Years.* New York: Russell Sage Foundation.

Hillygus, D. Sunshine, Norman H. Nie, Kenneth Prewitt, and Heili Pals. 2010. *The Hard Count: The Political and Social Challenges of Census Mobilization.* New York: Russell Sage Foundation.

Irizarry, Yasmiyn, Ellis P. Monk Jr., and Ryon J. Cobb. 2023. "Race-Shifting in the United States: Latinxs, Skin Tone, and Ethnoracial Alignments." *Sociology of Race and Ethnicity* 9(1): 37–55. https://doi.org/10.1177/23326492221114813.

Jones, Nicholas, Rachel Marks, Roberto Ramirez, and Merarys Rios-Vargas. 2021. "2020 Census Illuminates Racial and Ethnic Composition of the Country." Washington: U.S. Census Bureau. Accessed April 9, 2024. https://www.census.gov/library/stories/2021/08/improved-race-ethnicity-measures-reveal-united-states-population-much-more-multiracial.html.

Kayyali, Randa. 2013. "US Census Classifications and Arab Americans: Contestations and Definitions of Identity Markers." *Journal of Ethnic and Migration Studies* 39(8): 1299–318. https://doi.org/10.1080/1369183X.2013.778150.

Lee, Jennifer, and Frank D. Bean. 2012. *The Diversity Paradox : Immigration and the Color Line in Twenty-First Century America*. New York: Russell Sage Foundation.

Lieberson, Stanley, and Mary C. Waters. 1990. *From Many Strands: Ethnic and Racial Groups in Contemporary America.* New York: Russell Sage Foundation.

Liebler, Carolyn A., Renuka Bhaskar, and Sonya R. Porter (née Rastogi). 2016. "Joining, Leaving, and Staying in the American Indian/Alaska Native Race Category Between 2000 and 2010." *Demography* 53(2): 507–40. https://doi.org/10.1007/s13524-016-0461-2.

Liebler, Carolyn A., Sonya R. Porter, Leticia E. Fernandez, James M. Noon, and Sharon R. Ennis. 2017. "America's Churning Races: Race and Ethnicity Response Changes Between Census 2000 and the 2010 Census." *Demography* 54(1): 259–84. https://doi.org/10.1007/s13524-016-0544-0.

Lujan, Carol Chiago. 2014. "American Indians and Alaska Natives Count: The US Census Bureau's Efforts to Enumerate the Native Population." *American Indian Quarterly* 38(3): 319–41. https://doi.org/10.5250/amerindiquar.38.3.0319.

Massey, Catherine G., Katie R. Genadek, J. Trent Alexander, Todd K. Gardner, and Amy O'Hara. 2018. "Linking the 1940 U.S. Census with Modern Data." *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 51(4): 246–57. https://doi.org/10.1080/01615440.2018.1507772.

Massey, Catherine G., and Amy O'Hara. 2014. "Person Matching in Historical Files Using the Census Bureau's Person Validation System." *CARRA* working paper no. 2014-11. Washington: U.S. Census Bureau.

Mathews, Kelly, Jessica Phelan, Nicholas A. Jones, Sarah Konya, Rachel Marks, Beverly M. Pratt, Julia Coombs, and Michael Bentley, eds. 2017. "2015 National Content Test Race and Ethnicity

Analysis Report." Washington: U.S. Census Bureau.

Newby, C. Alison, and Julie A. Dowling. 2007. "Black and Hispanic: The Racial Identification of Afro-Cuban Immigrants in the Southwest." *Sociological Perspectives* 50(3): 343–66. https://doi.org/10.1525/sop.2007.50.3.343.

Perlmann, Joel. 2002. "Census Bureau Long-Term Racial Projections: Interpreting Their Results and Seeking Their Rationale." In *The New Race Question: How the Census Counts Multiracial Individuals,* edited by Joel Perlmann and Mary C. Waters. New York: Russell Sage Foundation.

Pickett, Robert E.M., Aliya Saperstein, and Andrew M. Penner. 2019. "Placing Racial Classification in Context." *Socius* 5. https://doi.org/10.1177/2378023119851016.

Porter, Sonya R., Carolyn A. Liebler, and James M. Noon. 2016. "An Outside View: What Observers Say About Others' Races and Hispanic Origins." *American Behavioral Scientist* 60(4): 465–97. https://doi.org/10.1177/0002764215613397.

Rodriguez, Clara. 2000. *Changing Race: Latinos, the Census, and the History of Ethnicity in the United States.* New York: New York University Press.

Roth, Wendy. 2012. *Race Migrations: Latinos and the Cultural Transformation of Race.* Redwood City, Calif.: Stanford University Press.

Saperstein, Aliya, and Aaron Gullickson. 2013. "A 'Mulatto Escape Hatch' in the United States? Examining Evidence of Racial and Social Mobility During the Jim Crow Era." *Demography* 50(5): 1921–42. https://doi.org/10.1007/s13524-013-0210-8.

Saperstein, Aliya, and Andrew M. Penner. 2012. "Racial Fluidity and Inequality in the United States." *American Journal of Sociology* 118(3): 676–727. https://doi.org/10.1086/667722.

Snipp, C. Matthew. 2003. "Racial Measurement in the American Census: Past Practices and Implications for the Future." *Annual Review of Sociology* 29(1): 563–88. https://doi.org/10.1146/annurev.soc.29.010202.100006.

Taylor, Evan J., Bryan Stuart, and Martha Bailey. 2016. "Summary of Procedure to Match Numident Place of Birth County to GNIS Places." Technical Note CES-TN-2016-01. Washington: U.S. Census Bureau. Accessed April 9, 2024. https://www2.census.gov/ces/tn/CES-TN-2016-01.pdf.

U.S. Census Bureau. 2010. "Federal Statistical Research Data Centers." Last revised July 5, 2023. Accessed April 9, 2024. https://www.census.gov/about/adrm/fsrdc.html.

———. 2023. "Federal Statistical Research Data Centers." Last revised July 5, 2023. Accessed April 9, 2024. https://www.census.gov/about/adrm/fsrdc.html.

Vargas, Nicholas. 2015. "Latina/o Whitening? Which Latina/os Self-Classify as White and Report Being Perceived as White by Other Americans?" *Du Bois Review* 12(1): 119–36. https://doi.org/10.1017/S1742058X14000241.

Vargas, Nicholas, and Kevin Stainback. 2016. "Documenting Contested Racial Identities Among Self-Identified Latina/os, Asians, Blacks, and Whites." *American Behavioral Scientist* 60(4): 442–64. https://doi.org/10.1177/0002764215613396.

Ventura, Ilana, M. and René D. Flores. 2025. "The 'Rise' of Multiracials? Examining the Growth in Multiracial Identification in the 2020 U.S. Census." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 44–64. https://doi.org/10.7758/RSF.2025.11.1.03.

Wagner, Deborah, and Mary Layne. 2014. "The Person Identification Validation System (PVS): Applying the Center for Administrative Records Research and Applications' (CARRA) Record Linkage Software." *CARRA* working paper no. 2014-01. Washington: U.S. Census Bureau.

Waters, Mary C. 2000. "Immigration, Intermarriage, and the Challenges of Measuring Racial/Ethnic Identities." *American Journal of Public Health* 90(11): 1735. https://doi.org/10.2105/ajph.90.11.1735.

II

Inequality in Housing, Residence, and Activity Space

Misalignment of Housing Growth and Population Trends: Cohort Size and Lagging Measurements Through Recession and Recovery

DOWELL MYERS, HYOJUNG LEE, AND JUNGHO PARK

Population and housing growth are closely linked in the U.S. Census, less so in analysis. Overlooked changes in cohort size and lagged measurements have misled about current housing preferences, and quantity of housing needed, with mistiming producing great volatility. Drawing on decennial census data and American Community Surveys, we develop a cohort-based housing lifecycle model measuring active household formation of renters and owners in intervals from 1990 to 2021. Restrictions of credit and supply legislated in 2010 were aimed at curbing the excesses of the early 2000s bubble but clashed after 2011 with requirements of much larger millennial cohorts, creating shortages in rentals, then ownership. Cohort advancement through the housing lifecycle was greatly delayed until after 2016, when substantial catch-up began of postponed homeownership, widely varied by race. Housing policy should anticipate housing needs of changing cohort sizes and expected life-course transitions, reducing long lags between supply and demand.

Keywords: cohort size, housing lifecycle, homeownership, housing shortage, millennials

Population and housing are intimately linked in family life and in the U.S. Census of Population and Housing. Fully 97 percent of the population lives in housing units, and the very identification and count of households is registered by presence of occupied housing units. Despite the joint collection of data about the population and housing universes in the census and the American Community Survey (ACS) and other major surveys, relatively little research attention has been given to interactions of the two universes. More than just correlating current characteristics of housing and its occupants, population and housing are both subject to long legacy and lag effects that require a deeper integration in order to explain and reduce their frequent misalignment.

Events of the early twenty-first century have

Dowell Myers is professor of policy, planning, and demography in the Sol Price School of Public Policy, University of Southern California, United States. **Hyojung Lee** is assistant professor in the Graduate School of Environmental Studies, Seoul National University, Seoul, South Korea. **JungHo Park** is assistant professor, Department of Housing & Interior Design (BK21 Four AgeTech-Service Convergence), Kyung Hee University, Seoul, South Korea.

© 2025 Russell Sage Foundation. Myers, Dowell, Hyojung Lee, and JungHo Park. 2025. "Misalignment of Housing Growth and Population Trends: Cohort Size and Lagging Measurements Through Recession and Recovery." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 86–109. https://doi.org/10.7758/RSF.2025.11.1.05. Direct correspondence to: Dowell Myers, at dowell@usc.edu, Sol Price School of Public Policy, University of Southern California, 650 Childs Way, Los Angeles, CA 90089-0626, United States; Hyojung Lee, at hyojung.lee@snu.ac.kr; JungHo Park, at jhpark.planner@khu.ac.kr.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

cast harsh light on the neglect of both housing's connection to a prospering economy and its vital support of family life and population growth. The global financial crisis and Great Recession were precipitated by a bubble in U.S. housing prices, whose collapse then undermined the entire financial system, with effects lingering more than a decade after. As a result, the American public—especially the younger generation and people of color—has borne the brunt of acute housing shortages, lack of affordability, and falling homeownership.

The decennial census is an opportunity to overview the changing linkage of housing and population, and to seek better insight on how underlying, major forces have precipitated so many undesired trends. Aided by annual observations of the American Community Survey, we have been studying the pace of post-2010 housing recovery, tracking both supply and demand, and giving special attention to the millennial generation that is both fueling growth in demand and bearing the brunt of current housing shortfalls (Myers, Lee, and Simmons 2020; Myers, Park, and Cho 2021). New work developed here delves deeper into major faults in key indicators traditionally used to measure linkage of population and housing. Beginning in the 1990s, and then spilling into volatile periods of boom, bust, and sustained housing shortage, policymakers and housing analysts appear to be misled about crucial linkages of demographic change to housing demand. We argue, in essence, that the 2000s decade of ample supply of housing and loose mortgage credit was built on a base of shrinking demographic demand, but following the collapse, policy and institutional response in the next decade erred in the opposite direction—namely, constricting construction and tightening financing in ways ill-designed for the swelling demand of the large millennial generation.

DEEP BUT LAGGED CONNECTIONS OF HOUSING AND POPULATION

Housing and population have a deep practical connection, given that the vast majority of people reside in housing units, often for decades in the same house, which leads to the joint collection of housing and population data in the decennial census and major surveys by the Census Bureau.[1] The major nexus between population and housing is the household, defined as the group of people, or single individual, that occupies a housing unit. However, a key difference centers on the universes that provide the denominators for characteristics or behaviors, whether the question is one about housing characteristics of the population base or, alternatively, the population characteristics of the housing base.

The subfield of housing demography adopts a more conscious versatility in switching between population and housing denominators, and it invites the time-honored question, what comes first, population or housing (Myers 1990)? The causal order reverses between levels of geography and for different questions. At the local level, housing must be built before it can be occupied by people, and once built, it is virtually permanent in place, so people come and go, passing through the housing unit. However, at the regional or national level, it is population growth that creates the demand for housing to be built in the first place. And, even prior to that, it is the fertility of earlier decades that creates the wave of people, such as millennials, who will sweep into household forming ages (augmented by immigrants) and require housing.

Denominators in housing research typically are restricted to either households or housing units, rarely extending to the population base that forms the households for analysis (but see Lee and Painter 2013; Paciorek 2016). The population base integrates with the most widely provided data for tracking past and future growth—namely, total population and age groups. For long-term analysis, a population base holds crucial advantages.

Integration of demographics with housing demand analysis has the further advantage that the field of demography brings a focus on multiple dimensions of time that shape supply

1. The largest and most comprehensive is the annual American Community Survey, the longest-running the monthly Current Population Survey (including also a derivative quarterly Housing and Vacancy Survey), or the housing focused, biannual American Housing Survey.

and demand. All demographic analysis is in units of time—age, birth years, durations, and periods. In theory and evidence to follow, this temporal perspective helps address housing change on several interacting time dimensions. A primary analytical tool is to convert ages to cohorts whose cumulative housing legacies can be tracked through time. The aggregated grouping of a cohort holds major advantages over age groups that are disconnected from the prior histories of the people currently occupying each age group.[2] In particular, cohort analysis enables better tracking of lagged effects in groups of consumers' lives.

Simple Mismatch of Housing and Population Growth

Surface indicators suggest how mismatched is the growth of housing and population. A century-long trend has found ever smaller average household sizes, falling from 3.33 in 1960, at the height of the baby boom, to 2.76 in 1980, and declining to 2.55 by 2020 (U.S. Census Bureau 1983, 2023a; Fry 2019). Fully one-quarter (27.6 percent) of occupied units in 2020 had a single person residing and well over half (60.5 percent) of all housing units (58.4 percent of owner-occupied) had only one or two occupants (U.S. Census Bureau 2023a). Yet at the same time that small households predominate, the percentage of single-family homes newly built with four bedrooms or more has risen from 20 percent in 1980 to 48 percent in 2022, and the share with at least three bathrooms has risen from 24 to 64 percent in the same period (U.S. Census Bureau n.d.-b).

The greatest mismatch today is affordability given that the prices of owned homes and rents have increased much more rapidly than incomes. In real terms, median home values increased 68.3 percent between 1980 and 2022 and median gross rents by 32.7 percent, but median household income increased only by 10.1 percent.[3] Thus, households have had to allocate larger shares of budgets to housing expenses. Indeed, younger households in particular leverage their income much more highly to achieve homeownership, with three times the income elasticity among those of age thirty than at age fifty (Gabriel and Rosenthal 2015, figure 3a). In addition, young homebuyers are more likely to depend on parental assistance for down payments (Lee et al. 2020).

Temporal Lags Endemic to Housing Linkages with Population

A key feature linking population and housing more deeply in census data is shared core temporal properties.[4] Housing's unique feature recognized among consumer products is its great durability and expense, which requires reliance on long-term finance for its purchase. A further feature of housing is the length of time required to plan and carry out new construction, so supply changes typically lag two or more years behind changes in demand, which causes demand to periodically overheat available supply.

Population change might appear to proceed gradually, but key consumer decisions are bunched in a fairly narrow portion of the lifetime, ages twenty to forty. Nonetheless, people's housing consumption changes can be held back by volatile economic events of rising interest rates or recession, subsequently with pent-up demand fulfilled when opportunities

2. Cohorts have been termed the ideal aggregation for this reason (Ryder 1965). Unlike panel data, cohorts do not follow individuals over time, but all the members of the cohort have experienced key historical events when they were the same age, entering the labor force or the housing market under conditions of recession or prosperity. This holds essential advantage for research in the tumultuous years surrounding the Great Recession (for a discussion, see Myers, Lee, and Simmons 2020).

3. The median household income, value, and gross rent in the 1980 Census were $16,841, $47,300, and $243, respectively, in 1979 dollars (U.S. Census Bureau 1983). They were $74,755, $320,900, and $1,300 in the 2022 ACS one-year estimates (U.S. Census Bureau 2023. The dollars terms were adjusted with the Consumer Price Index for All Urban Consumers (CPI-U).

4. Temporal variables include survey year, age and cohort, age of housing and year built or vintage, duration of occupancy or year housing was occupied, and (for foreign born) year of immigration.

are more accommodating. As a result, housing changes have been anything but gradual.

The following temporal dynamics are fundamentals called out for attention and are invoked in later assessments of the housing bust, recovery, and shortages.

Young Adults Move at High Velocity but Older Adults Are Long Settled

Young people change residence frequently after completing their education, but in their mid-twenties begin to make increasingly long-term residence decisions. The census asks how long the household has lived in their current residence, and those data are highly revealing of consumers' growing length of association with their current residence (table 1). The vast majority of young householders (under age thirty-five) are recent occupants who have resided in their current housing unit for less than five years, and many fewer older householders report themselves as having recently moved. Instead, half or more of older homeowners have lived continuously in the same home for more than twenty years. A particular implication of this length of occupancy is that the vast majority of occupants other than young renters have not recently selected their units; instead, they chose units to meet their current needs of a decade earlier or before, continuing their residence in the present home for reasons of sentiment, convenience, or simple inertia.

Homeownership Rates Are Compiled Through Past Accumulation

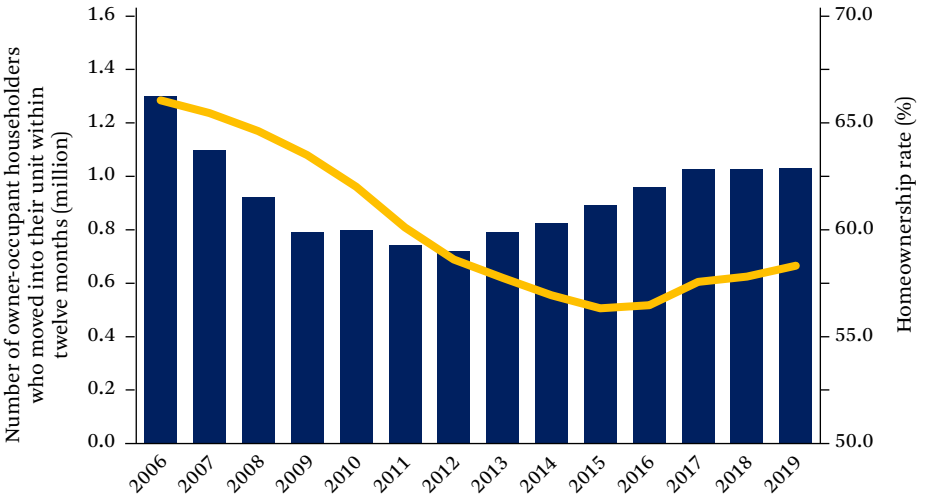
The length of housing careers creates a number of inconsistencies in current measurements. One of the most important, yet widely overlooked, is that the rate of homeownership largely is accumulated from purchase moves over many prior years. The high homeownership rates common among older homeowners, greater than 75 percent of households after age fifty-five, were accrued decades earlier. Referring again to table 1, half of such owners have not moved in the last twenty years, meaning that half at least were already homeowners twenty years earlier (in 2001, when they would have been between thirty-five and fifty-four). Further, many likely were repeat homebuyers at that time who first acquired homeowner status even ten years before that. Thus we should recognize that current homeownership is an accumulated status from the past, purchased at lower prices prevailing in earlier decades,

Table 1. Length of Housing Occupancy, by Tenure, 2021 (Percentage of Age Group)

Age	<25	25–34	35–54	55–74	75+	All
Owners						
Moved in < 1 year	40.0	21.9	7.8	3.9	2.1	7.1
1–4 years	43.2	52.9	27.3	13.2	7.5	21.5
5–9 years	6.4	19.1	24.1	12.2	8.0	16.4
10–19 years	7.1	4.0	29.1	23.0	17.3	22.4
20–29 years	3.3	1.6	9.8	24.8	17.5	16.2
30+ years	0	0.5	1.9	23.0	47.6	16.4
All	100	100	100	100	100	100
Renters						
Moved in < 1 year	59.0	35.0	19.5	13.7	12.4	25.2
1–4 years	37.1	51.9	44.1	33.3	29.5	41.9
5–9 years	2.2	10.3	20.6	21.8	19.1	16.4
10–19 years	1.2	2.1	12.3	17.9	18.9	10.4
20–29 years	0.5	0.6	2.6	8.0	9.0	3.6
30+ years	0	0.2	0.9	5.5	11.0	2.4
All	100	100	100	100	100	100

Source: Authors' tabulations based on 2021 ACS, IPUMS USA (Ruggles et al. 2024).

Figure 1. Disconnect Between Declining Homeownership Rate and Rising Number of Home Buyers, Ages Thirty-Five to Forty-Four



Source: Authors' tabulation for U.S. of ACS PUMS (U.S. Census Bureau 2023b).

not a current achievement paid through current income.

Homeownership Rates Are Lagged and Mislead About Current Preferences

The corollary of this long accumulation and persistence of homeownership rates is that current homeownership rates do not closely reflect trends in current desires or capacities for homeownership. A clear example emerged in the aftermath of the Great Recession. Between 2006, marking the end of the housing bubble, and 2015, the homeownership rate of young adults fell markedly,[5] all the while serving as a centerpiece for popular narratives about generational failure and abandoned preferences for homeownership or actual purchase activity.

A striking anomaly, discovered by Patrick Simmons at Fannie Mae (Myers, Lee, and Simmons 2020), was that actual homebuying by young adults was rapidly rising even while their homeownership rate drifted downward (figure 1). Explanation for the apparent paradox is that the unrecognized structural lag built into the current homeownership rate caused accumulation histories over several previous years to be carried forward into current trends, with misleading result.[6] This pronounced lag risked skewing public perceptions about the health of the housing market and millennials' desires to buy homes, as discussed later.

Age Relationships Can Be Misspecified with Dramatic Error

Economists may have learned to be wary of using age data after witnessing the highly publicized error of Gregory Mankiw and David Weil (1989), who linked age groups to trends in

5. The ownership rate of the thirty-five to forty-four age group fell nearly 10 percentage points, from 66.1 to 56.5 percent of households.

6. The accumulated ownership rate initially was carried forward from the housing bubble years preceding the recession. Viewed in 2008 and 2010, during the actual recession, the accumulated rate was beginning to decline but still heavily weighted by the high homebuying of the preceding bubble years. By 2012 and 2014, after economic and housing recovery had begun, the ownership rate kept declining because it then embodied more heavily the very low home buying of the preceding recession years. Finally, after 2016 the accumulated rate began rising, given that more years of economic recovery had interceded, but that was not until four years after actual home buying had been on the upswing.

house values. The two scholars observed age differences in housing expenditures in 1980 census data, finding much lower expenditures for age groups after forty-five, which is just where the leading cohort of the baby boom generation (born 1946 to 1964) was positioned in 1990. With these age inputs, their model estimated that house values would fall by 47 percent between 1990 and 2010; instead, the opposite occurred, values doubling. In fact, the boomers had been traveling on higher trajectories of housing consumption all along and should never have been assumed to drop down as they aged to the older, smaller, and less expensive homes of their parents. This paper was criticized for many reasons (Green and Hendershott 1996; Woodward 1994), but it was the simple matter of confusing age groups and cohorts that led their forecast so badly astray (Pitkin and Myers 1994). Our takeaway from this pivotal lesson is that legacy effects embedded in cohorts' accumulated homeownership rates require that age data should be structured as cohorts that grow older, not confusing this with age differences that are comparisons across cohorts in fixed periods.

Long Swings and Economic Cycles

Aging of cohorts occurs within another time context—namely, the passage of historical time that is marked by economic cycles of expansion and contraction. Macroeconomists in the mid-twentieth century were sensitized to boom-bust cycles in the economy enveloped in longer swings of population and economic growth. The leading proponent, Simon Kuznets (1958) emphasized long swings of rising and falling consumer demand of some fifteen to twenty-five years duration as overlays to short-term business cycles of expansion and contraction. Richard Easterlin (1968) showed specifically how long swings in fertility rates shaped future swings in labor force and economy, and that relative cohort size also dictated degree of competition among peers in age-specific activities, thus influencing relative well-being (Easterlin 1987).

Impacts on housing construction and consumption played a pivotal role. Surging numbers of young adults require housing for newly formed families, which synchronized rising investment in construction and furnishings, and spurred employment expansion. But the great expense of the durable housing good causes greater reliance on financing. Thus the timing of new construction to meet population demands can be delayed by high interest rates, or other adverse circumstances, but delay makes the accumulated demographic pressure stronger. This long cyclical relation of housing to population change was developed in early detail by Burnham Campbell (1966), and recent scholars have confirmed and extended these relationships using contemporary econometric methods (Francke and Korevaar 2022; Monnet and Wolf 2017).

Recent Surprise Reversals After Peak Millennials

Impacts of relative cohort size are slow acting and often overshadowed by dramatic period events such as recessions. Widespread misreading of the burgeoning millennial generation after the 2010 Census took on its own consequences. City leaders and urban experts saw that the young millennial generation was flocking to major cities, reversing the decades-long trend of big-city population decline. The popular narrative for this back-to-the-city shift was one of an epic culture change: young millennials had discovered strong new preferences for urban living. However, systematic review of survey evidence found the primary support for these "new preferences" was simply millennials' greatly increased urban presence (Myers 2016).

Millennials had always been 32 percent more numerous from the time of their birth in the peak cohort of 1990, rising rapidly from the low numbers of Generation X born annually in the late 1970s. As could be foreseen, the fertility upturn led to a strong upswing twenty to twenty-five years later in districts popular with young singles. This burgeoning pool was amplified further by the Great Recession's prolonged aftermath of depressed economic and housing opportunities, which stalled the usual career and housing advancement by young adults. Attractions to both urban and suburban living remained strong (Lee 2020), but the "peak millennials" thesis (Myers 2016) held that once this rising wave passed age twenty-five after 2015, and assuming effects of the

Great Recession finally abated, the ranks of maturing young people would exercise pent-up demand and move outward in search of larger housing units. In fact, by the end of decade, annual Census Bureau estimates revealed a very strong outward population shift began in large cities in 2015 and accelerated in 2018, well before the added pandemic shock (Frey 2021; Lee 2022). In addition, after 2016, their homeownership rates also shot forward, as will be closely examined.

POPULATION COHORTS AND BIG CHANGES AHEAD

Population aging occurs slowly and steadily, a year at a time, but this can result occasionally in rapid reversals of population impacts at key ages. On the surface, this potential is not always apparent. Robert Shiller received a Nobel prize for his work on volatile asset bubbles, as addressed in both housing and stock markets. Population growth over the last century was featured as one of three trends potentially underlying real house prices in *Irrational Exuberance* (Shiller 2015). Neither the trends in interest rates, real building costs, or total population appear correlated with extremely volatile home prices after 1995 (see figure A.1 in the online appendix: https://www.rsfjournal.org/content/11/1/86/tab-supplemental), but population was singled out for particular dismissal, noting that "population growth has been steady and gradual" (Shiller 2015, 19) and is otherwise unnotable.[7]

In contrast to a steady upward line of population growth, population wields its most acute influence through the potential impacts of age waves, which are best explained as long swings in cohort size at birth that then travel across age groups as cohorts grow older. Both upswings and downswings have potential impacts in specific age groups. Revealing these impacts, first, we structure the population data to reveal the age detail of changes over a long-term trend.[8] In a following section, we estimate the slowing and accelerating rates of cohorts' housing consumption during periods of recession or prosperity, but first we describe only what was knowable in advance about the size differences between cohorts and the timing of arrival in particularly sensitive ages.

Oscillating Age Waves

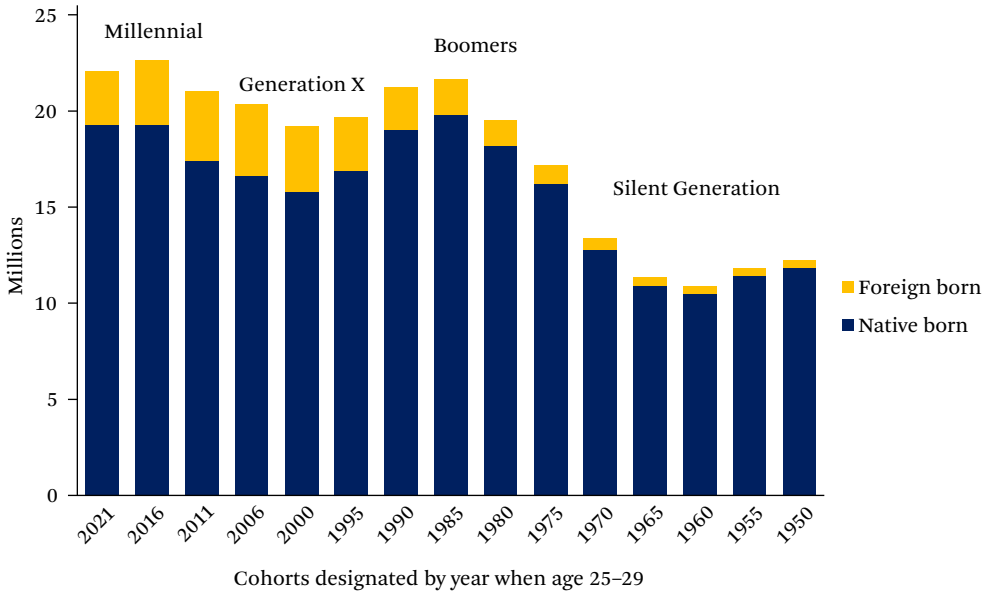
A closer integration of population and housing is built from the ground up by starting with the population data rather than the households already formed. The changing age structure of the U.S. population is initiated by fluctuations in annual births, depressed in the 1920s and 1930s, then booming from the 1940s to early 1960s, and depressed once again through the 1970s, but finally rising again in the 1980s to the peak of the millennial generation born in 1990. The oscillation between falling and then rising sizes of birth cohorts has potential buffeting impacts. These native-born cohorts are augmented by additional residents who are foreign born, typically joining the cohort in their twenties. However, the great bulk of variation in recent decades is due to past fluctuations in native-born births.

Our first analysis addresses the size of cohorts in different generations, both U.S. born and foreign born, choosing an age that makes

7. Shiller (2015) stresses how unimportant is the steady upward line of population growth in his figure 3.1, which is the centerpiece for his housing market discussion, but he never looks beneath the surface of total population. In one of the rare moments when Shiller does touch on demographics, he dismisses the effect of the baby boom generation in reference to the stock market (45–47), not discussing its role in the housing market where demographic linkages to housing are far more motivating.

8. We have assembled a database of observations every five years, with population numbers arrayed in five-year age groups, and with matrices repeated separately by race and Hispanic origin. Data are constructed from the censuses of 1990 and 2000, intercensal population estimates by the Census Bureau, and with observations selected from the American Community Survey beginning in 2006, 2011, 2016, and 2021. The CPS/ASEC microdata was used also for the 1995 housing estimates. These population numbers are independently observed in repeated survey years and arrayed in a matrix of age (in rows) by year (period, in columns). In this usual configuration, cohorts effectively travel on the diagonal, growing five years older as they advance across periods.

Figure 2. Cohort Population Size by Nativity, Observed at Ages 25 through 29 (millions)



Source: Authors' tabulation based on U.S. Census Bureau (1983, 1993, 2003, 2023b) and Gibson and Jung (2006).

most sense for comparison. For this we aim to compare the cohorts when they were age twenty-five to twenty-nine, strongly establishing themselves as young adults. The earliest cohorts observed are members of the silent generation, born from 1925 to 1945, a decade or two earlier than the baby boomers who followed after them.[9] These early cohorts were all quite small, and the baby boomers (born 1946 to 1964) arrived in a series of four larger five-year cohorts. The two youngest cohorts among the boomers started to include foreign-born age peers, which figure 2 accounts for as an added layer. The youngest five-year cohort among the boomers began to enter adulthood with smaller size due to fewer U.S.-born births from 1960 to 1964, and then the much smaller Generation X (born 1965 to 1979) made its entrance.

Whether we compare only the U.S.-born cohort members or the population totals with foreign born added, the cohort reaching age twenty-five to twenty-nine in 2000 is the smallest in decades. Adding to the diminishing effect of this cohort, it follows at least one other cohort also with substantially diminished size, the two of which would fill the twenty-five to thirty-four age group, long considered the fount of housing demand, with much smaller numbers. In 2005, these shrunken cohorts advanced to thirty to thirty-nine, depleting the age range most crucial to home buying, as addressed in the next section. This sinking demographic was softening potential demand in the exact period of the housing bubble when, curiously, housing prices soared despite population decline in key age groups for owner-occupancy.

We devote most attention to the volatile pe-

9. We follow the definitions of generations in a recent comprehensive guide (Twenge 2023):

silent generation	(born 1925 to 1945)
baby boomers	(born 1946 to 1964)
Generation X	(born 1965 to 1979)
millennials	(born 1980 to 1994)
Generation Z	(born 1995 to 2012)

riod after 2006,[10] beginning with the peak of the economic expansion and then deep decline into the Great Recession, whose effects bottomed only in 2011. From that point, a slow recovery proceeded to 2016, then accelerating housing demand to 2021 even amid the pandemic and brief 2020 recession during the COVID shutdown. The population numbers of each cohort are fairly stable across these periods, while the housing behavior to be investigated is highly variable.

In the analysis that follows, initially we select only the U.S.-born adults, because we wish to highlight changes that were knowable for a long time (numbers since birth) but may have been overlooked. Immigration is more variable and is a growing factor in certain years, adding to total housing demand. Immediately apparent in figure 2 is that the expanding immigration of the 1990s was helpful for buffering the downturn in population size of Generation X cohorts, especially in 2000 and 2006. Nonetheless, even with immigrant additions, comparing the boomer cohort age twenty-five to twenty-nine in 1985 with the Generation X cohort following that age in 2000 still shows a decline of 11.5 percent, followed by a renewed rise of 18.5 percent to the peak millennial cohort in 2016. After 2000, immigration growth slowed and virtually no change is observed in the size of the foreign-born component.[11] The key point remains that, nationwide and in the great majority of states, the oscillation of the native-born births is the underlying driver of growth between cohorts entering the twenty-five to twenty-nine age group.

Impacts of Cohort Swings on Growth in Key Age Groups

Changes in population size across cohorts is revealed in a sequence of expansion and contraction. Some fifteen years of growth (boomer cohorts) was followed by fifteen years of downswing (last of the boomers, plus Generation X), followed once more by fifteen years of upswing to the peak millennials. The fifteen-year intervals are long enough to exceed a single business cycle and create an impression of ongoing, persistent change in one direction, before those implicit expectations may be undermined by a reversal. The complexity is that these pulses of growth or contraction arrive at different age groups in different historical years, cohorts arriving first in the youngest ages, before advancing to next older ages. Thus, the pivotal reversal in cohort size occurs in successively older ages in successively later time periods, never synchronized for all ages. Far from following Shiller's steady upward line, population changes by age group are volatile, yet predictable.

This population swing within each age group is illustrated in figure 3. The oldest age shown, forty-five to forty-nine, contained the last remnants of growth from baby boomers in the 1990s, falling to prolonged losses when smaller Generation X cohorts entered after 2006. The next youngest age group, forty to forty-four, picked up renewed growth beginning after 2016, but the thirty-five to thirty-nine age group was already experiencing that renewal by 2011, and the thirty to thirty-four age group experienced the upswing for fifteen years, beginning after 2006. The comparison of upswing to preceding population losses has strong implications for reversals in both rental and ownership demand in key ages.

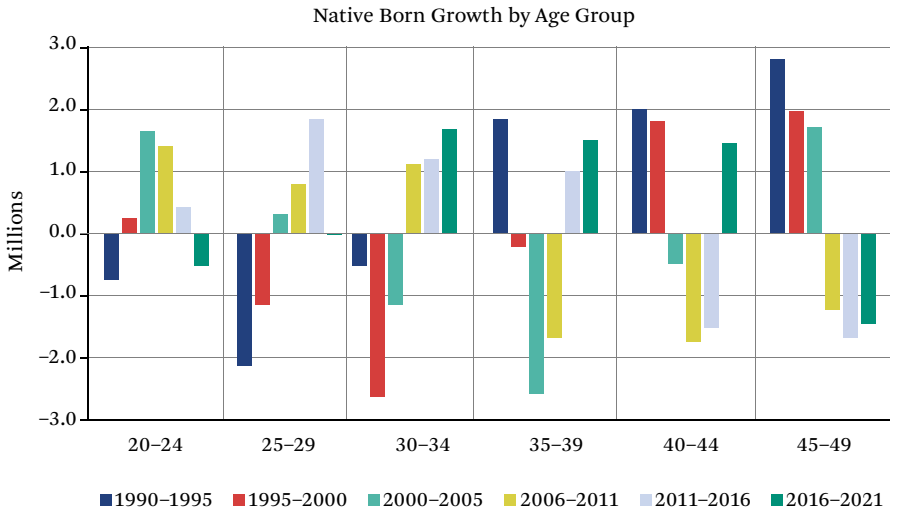
EXPECTED HOUSING DEMAND AND INTERVENING REALITY

The twenty-first-century stage was set for substantial housing growth due to the rising size of prime age groups as the large millennial cohorts reached their high-impact housing age after 2010. However, a major collapse of the housing financial system intervened, spawning

10. The first year when complete population and housing data is available in the American Community Survey, our main source for subsequent analysis, is 2006.

11. Of course, the immigrant population is much less evenly spread across the nation than the U.S.-born population of boomers, Generation Xers, and millennials. The foreign-born population in a few large metropolitan areas (such as New York, Los Angeles, and Miami) can account for between 30 and 40 percent of total population, compared to 14 percent in the nation, and so the downturn in cohort size is potentially much less steep in those areas.

Figure 3. Net Population Change of Age Groups During Each Interval (Millions)



Source: Authors' calculations based on censuses and ACS (U.S. Census Bureau 1993, 2003a, 2023b), augmented by intercensal estimates (U.S. Census Bureau 2004) and IPUMS CPS (Flood et al. 2023).
Note: Population change is observed within each age group from the beginning to end of each five-year interval of history, showing the size change as larger or smaller cohorts enter the age group.

the Great Recession. In addition, some critical faults in the data guidance systems were exposed, so that the impending demographic changes were insufficiently connected to policymaking. Housing would still be tethered to population, but with much confusion and unanticipated delay.

Disruption by the Crash and the Regulatory Response

The institutions that foster housing opportunities are crucial for enabling potential demand to be realized. The first two decades of the century were wildly volatile in that regard. In the first decade loose credit and lax regulation were one way the George W. Bush administration could promote their "ownership society," but Shiller (2015, 60) dryly notes that "this political philosophy did not emphasize the importance of government monitoring of mortgage lending practices." The lack of regulatory oversight during the housing bubble and foreclosure crisis was very widely criticized after the fact.[12] Other parties blamed the burgeoning price escalation and mounting foreclosures on the fair housing initiatives that began under the Bill Clinton (Democratic) administration in the 1990s and may have opened the laissez faire floodgates in the Bush (Republican) administration that followed (Aalbers 2009). Yet Adam Levitin and Susan Wachter (2020, 175) are very clear in their assessment: "The bubble was not the result of government policies supporting fair lending and affordable housing, but rather the result of a shift in mortgage financing from quasi-regulated securitization by the GSE duopoly [that is, Fannie Mae and Freddie Mac] to unregulated securitization by Wall Street."

Indeed, the thorough postmortem provided in Levitin and Wachter's (2020) *Great American Housing Bubble* attributes the price run-up from 2002 to 2006 almost entirely to easy credit that encouraged people to purchase more housing than they could normally afford:

> The expansion of mortgage credit collided with an inelastic housing supply, with the result that home prices were bid up. . . . But because the higher home prices depended on mispriced credit and on underwriting that

12. In his monetary and fiscal history Alan Blinder (2022, 249, 266) labeled the practices "disgracefully lax," "outrageous," and even "went crazy."

> would predictably raise default rates, once the momentum in demand growth and price rises ended, the price increase was unsustainable. In other words, home prices were bid up *beyond fundamentals*, and when the credit supply then ultimately faltered because of the unsustainable nature of the mortgage products it was financing and *the exhaustion of the borrower pool*, a collapse in home prices was inevitable. (Levitin and Wachter 2020, 164, emphasis added)

In response to the dire financial crisis that followed the crash of the housing bubble, and the mounting toll of the subprime foreclosure crisis with nearly eight million lost homes, the federal government was motivated to respond with major new restraints on the banking system that would severely tighten a very loose system of credit approvals. Through the Dodd-Frank legislation enacted in 2010 and subsequent agency guidelines (Bailey et al. 2017), the pipeline for home loans was sharply constricted, not only raising the qualifying criteria but also greatly expanding documentation requirements and slowing the processing speed so that many fewer mortgage applications could be approved.[13] The justified goal was to correct for the excesses of the loose regulation during the housing bubble and make real estate lending much safer. However, less willingness to take on risk means fewer opportunities for home buyers below the top echelon of income and credit, dropping the homeownership rate 2.3 points lower than it would have been under the stricter, pre-bubble standards prevailing in 2001 (Acolin et al. 2016; Wachter and Acolin 2022). The extreme, overly tight correction is graphically revealed in the Urban Institute's Housing Credit Availability Index (as shown in figure A.2 in the online appendix).[14]

Housing construction also suffered in the decade of the 2010s, facing its own difficulties in assembling financing, as well as labor shortages, NIMBY resistance, and other difficulties in land assembly and permitting approvals (Dietz 2020). All the while, growing demand has pressed against this restricted supply, bidding up prices, and also forcing would-be buyers into rental competition, raising rents and reducing affordability there. The record of pullback in housing construction is stunning (figure 4). It would appear that a spike of two years of overbuilding during the bubble was followed by nine years of construction that barely exceeded one million units per year or much less.

Confusion over Misleading Signs and Interpretations

All this tightening of lending and construction—designed to guard against excesses of the soft market in the bubble years—seems worse in the face of the oncoming tsunami of millennial housing demand. However, it is not clear that preparing for this coming large generation was ever recognized as a priority. Three factors may have prevented or distracted attention.

Lack of Data Linking Demographics and Mortgages

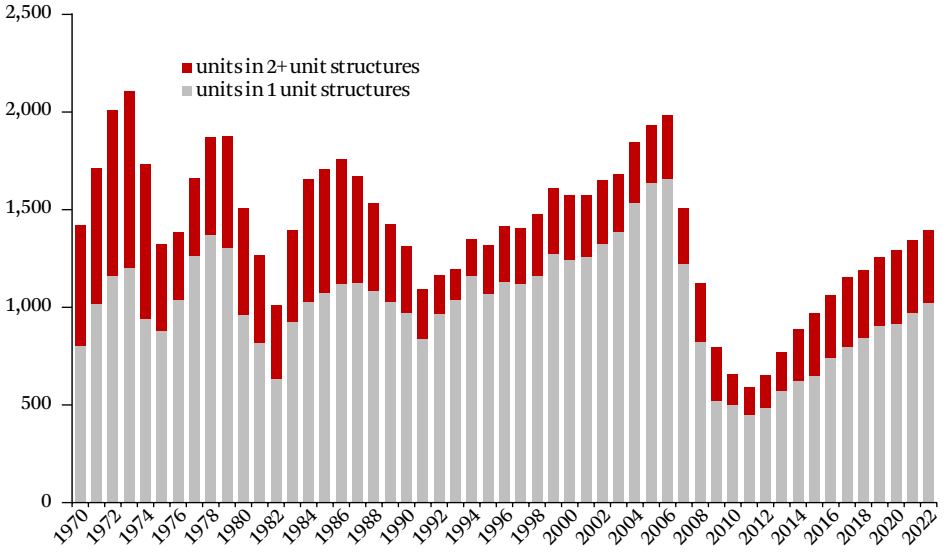
Foremost was the underlying lack of data linking mortgage finance and demographics. The mortgage databases widely relied upon by analysts in housing finance contained no demographic characteristics about the borrowers. Restricted by the Privacy Act of 1974, neither race or age were systematically recorded, at least until 2014.[15] Even though separate databases collected by the Census Bureau do link

13. A CNBC report by Diana Olick in 2015 stressed the extreme increase in paperwork attached to loan applications. The Mortgage Bankers Association determined that the average large bank underwriter who could process 165 loans per month at the peak of the bubble could only complete about thirty-three in 2015.

14. In the opinion of the Urban Institute index managers, "Significant space remains to safely expand the credit box. If the current default risk was doubled across all channels, risk would still be well within the pre-crisis standard of 12.5 percent from 2001 to 2003 for the whole mortgage market" (Urban Institute 2023).

15. CoreLogic supports the key private sector database on mortgages, lacking demographic characteristics. However, under the Home Mortgage Disclosure Act (1975) the federal government sponsors data collection and reporting that links race and mortgage information. Under a new rule in 2015, the HMDA data added expanded

Figure 4. Housing Unit Construction Completion (Thousands)



Source: Authors' tabulation based on historical time series of new residential construction (U.S. Census Bureau n.d.-a).

Note: This figure provides a count of the number of units built each year, based on type of structure (single-family or apartments). Not shown are the number of shipments nationwide of manufactured or mobile homes, which averaged seventy-four thousand per year from 2007 through 2021, but 230,000 per year from 1994 through 2006.

demographics and homeownership, they do not extend to mortgage characteristics relied on by financial analysts for calculating industry risks of default and foreclosure.[16] The lack of householder age in core databases in earlier decades prevented developing trusted models using age with financial data. Moreover, the widely known Mankiw and Weil (1989) debacle discussed earlier may also have discouraged many housing economists from risking further experimentation with the census age data.

Attention Preempted by Emergencies Instead of Long-Term Demographic Trends

A second factor is that both analysts and policy makers were preoccupied by more urgent problems—namely, the long-building foreclosure crisis (Immergluck 2009). An enduring problem is that coming demographic changes, in contrast, were often distant concerns, falling beyond any current term of political office.[17] However, in this case, the unrecognized entry of smaller cohorts into prime ages for homebuy-

demographic information, featuring age, available only beginning in 2018. Public use datasets collected from Fannie Mae and Freddie Mac by the Federal Housing Finance Agency (FHFA) also omitted age of borrowers. However, a new National Mortgage Database project initiated in 2014 by the FHFA proposed to use existing credit bureau data to assemble a one in twenty representative sample of mortgage borrowers that was authorized to collect age, race, and other household demographic characteristics (Watt 2014).

16. Principal are decennial censuses (since 1920 or before), the Housing Vacancy and Homeownership Survey (CPS), including homeownership by age (quarterly since 1965) and the American Community Survey (annual since 2005).

17. A telling anecdote related by Alan Blinder in his fiscal and monetary history is that the future retirement of the large baby boom generation "was basically ignored by Bush and his administration's fiscal policy makers," finding that "the burgeoning deficits of 2000-2007 were ill-timed [because] the leading edge of the populous baby boom generation would start turning sixty-five late in 2010, making huge demands on both Medicare and

ing softened the market base through Levitin and Wachter's "exhaustion of the borrower pool." Ironically, the overlooked demographic change helped collapse prices and may have intensified the wave of foreclosures, thus contributing to the global financial crisis and Great Recession.

Misled by the Lagging Homeownership Rate and Confusion About Millennials

After 2010, much larger young cohorts began to arrive in cities, but the significance of the millennials for housing was uncertain. In the prolonged aftermath of the Great Recession, there was understandable confusion about where the housing market was headed and what policy changes could alter that (Weisman 2015). The most persuasive explanations made key indicators the center of shared understandings, an example of Shiller's (2019) depiction of viral "narrative economics" as a coordinating feature in markets. Accompanying the narrative of new preferences for millennials and urban revival, as described earlier, which misled about the persistence of urban residence preferences displayed during the recession, a reinforcing narrative emerged of abandoned homeownership preference based on foreclosures and falling homeownership rates. The foreclosure crisis certainly could be read as a general warning of the dangers of promoting homeownership, but the deep decline in homeownership rates from their peak in 2005 and continuing twelve years was especially alarming. The negative role of constricted access to mortgage credit was clear to experts in housing finance (Acolin et al. 2016; Urban Institute 2023), but access remained little improved for a decade or more (figure A.2).

Instead, broad attention fixated on key evidence in support of the abandoned homeownership narrative—namely, a graphic display of the homeownership trend that was issued in identical format every three months in periodic news releases for the Census Bureau's homeownership and housing vacancies report (figure 5). These data have vital importance, given their description as "used extensively by public and private sector organizations to evaluate the need for new housing programs and initiatives" (U.S. Census Bureau, n.d.-c). In fact, Shiller (2019, 45, 97) emphasized how such a regularly repeated data indicator and graphic can focus attention through repetition and drum home a popular narrative explaining a trend. In this case, the graphic downturn in homeownership was dramatized by the fresh release of each quarterly report's extension of homeownership decline, initially dropping only 2 percentage points from the peak homeownership rate of 69 percent in 2005 and 2006 (U.S. Census Bureau 2016, table 4) through the recession ending by 2010, but then extending after the recession at even-faster pace of decline, dropping 4 more percentage points over the next six years (finally ceasing in 2016). The decline also was visibly magnified by the graphic's use of a y-axis truncated to a range of only 62 to 70 percent. This long, increasing drumbeat of decline, revealed three months at a time, negatively influenced all parties—builders, lenders, consumers, and policymakers, as well as opinion leaders among columnists—about the wisdom of planning for more homeownership. Because the graphic display was unaccompanied by any explanatory text about the lagged nature of ownership rates, or any current evidence of rising home buying (see figure 1), until 2017 the impact seemed to foster fear of bottomless decline.

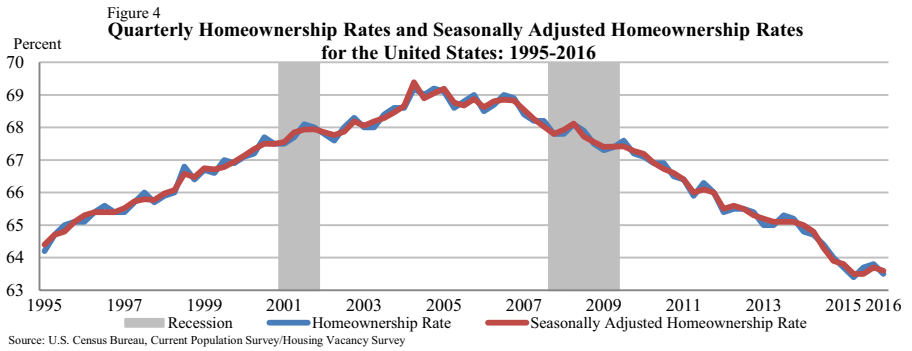
POPULATION-BASED ESTIMATES OF HOUSING DEMAND

In hindsight, and outside these major disruptions, how much housing demand for rentals and owned homes was reasonable to have expected and is now unmet? Our empirical task here is measuring the changes in occupancy status over a succession of five-year intervals, and then comparing that to what might have been expected if conditions of 2000 had continued.

Comparisons of population and housing rely on one of the most basic units of housing de-

Social Security. *Nothing was more predictable than that*: you just had to add 65 to 1945 to get 2010" (Blinder 2022, 238, emphasis added).

Figure 5. Homeownership Trend in Quarterly Press Release Through 2016



Source: U.S. Census Bureau 2016, figure 4.
Note: This figure, example taken from 2016, is a standard part of the press release for the Housing Vacancies and Homeownership report. The figure was repeated quarterly in identical format from 2010 through 2023 (updated three months each time).

mand, which is the number of occupied housing units. The long-established method of headship (or householder) rates is used to convert between population and number of occupied housing units.[18] The tradition in housing research is to first form households as a percentage of population and then form owner and renter occupancies as a share of those households. However, a growing alternative practice is to treat rental and owner occupancies directly as a percentage of the underlying population, that is, per capita not per household, so that the household formation is partitioned into two components summing to total household formations. Householders per capita in an age group equals renters plus owners per capita in the same age group.[19] We aim to describe these outcomes specific to age groups (or racial groups) and specific to the different periods used to describe the population cohorts.

This identity relation of household formation represents actual demand only to the extent that there is sufficient housing supply to accommodate all of the would-be households. The crucial assumption is that an efficient supply response will produce enough units to accommodate the expected preferences for occupancy. However, the record of constricted housing construction after the Great Recession has not been favorable for accommodating (and revealing) the full housing demand among either renters or owners. As shown in figure 4, the downturn in construction beginning in 2007 fell to deeper levels than any time in the last sixty years, falling below one million completions for the first time and remaining below that level several years. A key result was that for at least eight years in the recent decade, newly built units failed to exceed the growth in household occupancies (Joint Center for Hous-

18. Only one person in a unit can be designated householder. Even when married couples share a housing unit, the Census Bureau asks the respondents to choose one person to designate as the reference person (the householder) and they are requested to be one of the people whose name is on the rental lease, mortgage, or deed.

19. Although the convention is to calculate homeownership rates as the percentage of households that are homeowners, that tradition has been faulted for treating household formation as a separate step that precedes the tenure choice of households (Haurin and Rosenthal 2007; Yu and Myers 2010). In practice, this can produce biased interpretations of the trend in homeownership if the household denominator is expanding or shrinking in unobserved ways, or if different ethnic groups follow different traditions of household formation. Housing demand is also more transparent when the sum of owners per capita and renters per capita equals total household formation.

ing Studies 2019), providing no increase in vacancies, which Jonathan Spader (2022) finds approached an historical low.[20]

Owner and Renter Occupancies by Age Before and After the Crash

In analysis to follow, we closely track the observed rates of owner and renter household formations, arranging these in alternative configurations to reveal particular insights. Of particular interest is how greatly the owner and renter formations after 2006 differ from those in the 1990s or bubble of the early 2000s. The changes are concentrated in particular age ranges, reflecting a decade-long recovery after the crash and eventually a sharp upswing.

The age cross-sectional probabilities of owning and renting are observed separately in each census year or survey year, the two upper plots showing per capita homeownership, the bottom plots per capita renters (figure 6). Earlier points in time are grouped in the left-side plots for 1990 through 2005; the right side covers 2006 to 2021. We see a very close similarity of housing occupancy in survey years before the Great Recession (figure 6, left side). Within both owners and renters, the lines are virtually on top of each other. The overall pattern is a rise of homeownership up to age seventy, but among renters a rapid burst of rental formation during their twenties that then declines until it rises slightly in their later years.

This steady consistency of household occupancies broke down after 2006, with the crash of the housing bubble and plunge into the Great Recession. Thereafter, age cross-sectional plots among both renters and owners became much more differentiated across the time periods (figure 6, right side). Viewing the owner occupancies, probabilities by age were highest in 2006, falling to 2011 in the trough of the recession losses,[21] and then falling still further to 2016 (line marked with black dots), when the nation's aggregate ownership rate reached its lowest point. Thereafter, a rebound proceeded to 2021, which is very close to the level of 2011 in most age groups.

It might seem self-evident that a loss in the homeownership rate implies a gain in rentership, and most of the lost homeowners over this period likely were diverted into renting (Myers et al. 2016). However, the rental plot is not symmetrical, that is, with rental increases matching homeowner decreases.[22] The diversion of owners into rentals created greater rental competition, with rents escalating far more than incomes, as noted earlier. Some portion of the expected, would-be renters were dislodged from independent quarters and doubled up with roommates or family members. Overall, the result was lowered household formation.

Active Demand by Cohorts Progressing into Rented or Owned Units

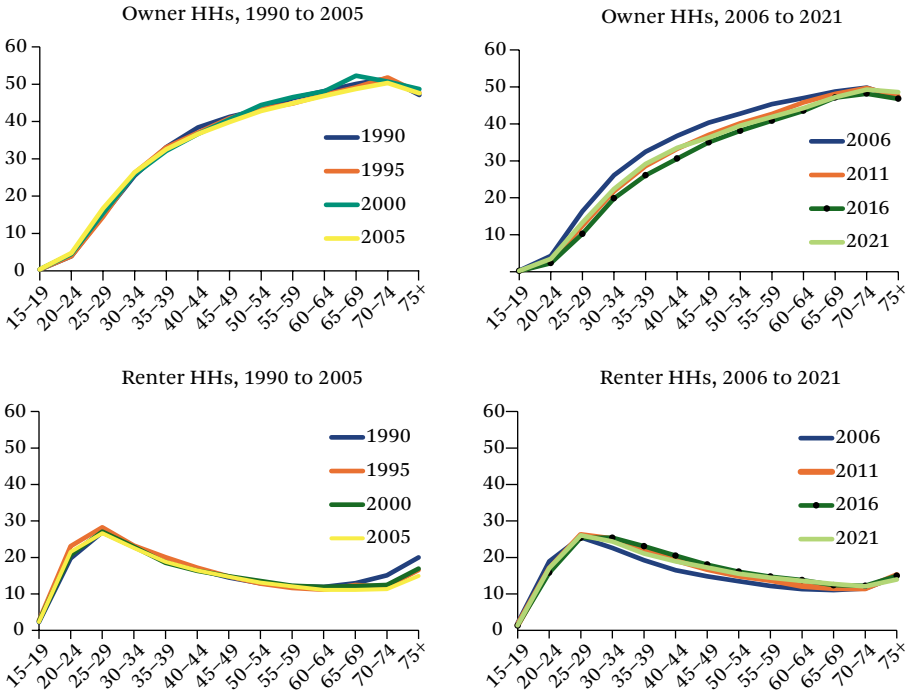
The term household formation may be misleading, because formation connotes an act of recent household status achievement. In fact, most adults are engaged in maintaining previously attained household status, especially

20. A more telling indicator of shortage is simply that rapid increases in rents and house prices also suggested shortage conditions were plaguing the housing market more than a decade after the recession ended. Thus, it does not appear the increase in construction was sufficient to accommodate pent-up demand from earlier in the decade. This strongly suggests that the decade's household formation may have been suppressed below the number expected to accommodate potential demand (Mathews-Hunter 2021).

21. Whereas deep employment losses occurred in 2009, on many indicators the negative effects grew later. The U.S. unemployment rate peaked in 2010, poverty rate peaked in 2011, and real median household income bottomed in 2011 (Myers and Park 2020). On housing measures, house values bottomed in 2011, rents in 2012, and incidence of excess rent burden (30 or 50 percent of income) was highest in 2011. Meanwhile, the homeownership rate declined through 2016.

22. For example, the total household formation per capita at age thirty-five to thirty-nine, summing the owners and renters, declined moderately over the entire period between 2006 and 2021 (–1.53 percent of the age group), with nearly twice the decrease accounted by falling ownership (–3.35) as offset by rising rentership (1.82). On balance, household formation in this age group was reduced by 1.53 percentage points.

Figure 6. Owner and Renter Householders per 100 People, Age Cross-Sections, 1990 to 2021



Source: Authors' analysis based on censuses and ACS PUMS (U.S. Census Bureau 1993, 2003, 2023b), augmented by intercensal estimates (U.S. Census Bureau 2004) and IPUMS CPS (Flood et al. 2023).
Note: Percentages are shown for the share of people in each age group who are the householder of an owned or rented housing unit. These are per capita measures of ownership or rentership, as opposed to the traditional per household measures. The sum of the owner and renter per capita ratios equals total household formation, which is less than 100 because only one householder is permitted to represent each unit. Separate calculations are made for each census or survey year, grouped before and after the Great Recession.

when they are middle age and older. As seen in table 1, 73.5 percent of owners older than fifty-five have lived more than ten years in their current housing unit, as have 33.1 percent of renters. Thus their current rates of renter or owner occupancy do not reflect a formation or recent activity in the housing market.

A better method is needed for estimating and visualizing the housing demand newly expressed in a period. Here we propose to estimate net increases in cohorts' housing occupancies as they newly advance to the next age between periods.[23] Our cohort housing lifecycle method highlights the incremental changes in five-year intervals. A total of six periods are separately estimated, composed of two half-decades in the 1990s, two in the 2000s, and two more in the 2010s.[24] We expect to find a sharp

23. Simple age differences include not only the effect of age but also differences between cohorts. Accordingly, pure age effects marking the housing lifecycle can be extracted only by following cohorts as they age. Very different housing experiences are likely in time intervals preceding and following the Great Recession.

24. The latter are shifted one year later to account for the 2021 "end of decade" required by data disruptions in the 2020 ACS during the onset of the pandemic. This has the added advantage of beginning the decade in 2011 at the low point of housing and economic impacts from the Great Recession. In turn, that is preceded five years earlier by the 2006 peak of the last housing and economic cycle prior to the recession. The first half of that

downturn in active household formation during the recession interval of 2006 to 2011, followed by a recovery from 2011 to 2016 and extended further in 2016 to 2021. Cohorts passing through young adult age groups are likely to make very rapid advances in demand, settling down thereafter. What is not known is how different were the cohort advances in different time periods of boom, bust, or recovery. The six time intervals each could foster a unique lifecycle of housing increases, revealing active demand distinct to each time period. Facilitating comparison, figure 7 affords a visual array of net cohort changes for both owners and renters, within each age group, and across the six intervals. As one example, the cohort arriving at age thirty to thirty-four in 1995 added 12 percentage points to the cohort's accumulated ownership rate per capita since the beginning of the five-year period in 1990. In the same interval, rental occupancy per capita declined by 3 percentage points, yielding a total additional household formation of 9 percent of the cohort population.

The compiled housing lifecycle follows the same general pattern in all periods: net household formations are dominated by people under age forty, renting begins to decline after age thirty, and homeownership rises rapidly through forty but continues to climb slowly. A small but continuous stream of net ownership gains occurs among middle-aged and elderly people, less so in times of recession and early recovery. It is not surprising how similar the three intervals preceding the 2006 mid-decade peak of the housing bubble were, which is consistent with the close similarity found among the age cross-sections pre-recession.

The next two intervals, beginning in 2006 and 2011, correspond to ten years of discouragement about housing in America, first in the Great Recession and then in its lingering impacts of depressed ownership rates. Unlike in earlier periods, virtually no net changes occurred after age forty other than adjustments late in life at age seventy-five or older. Cohort progress was virtually flat for ten years, showing no net housing changes. Yet even in those bleak times, it is remarkable how robust the household formation of people under age thirty was. Growing into young adulthood prompts rapid increase in housing needs as partnerships bond and families grow. Even during the recession interval between 2006 and 2011, sizable shares of people ages twenty to twenty-nine became householders, especially as renters and, despite the depths of the economic recession, this expansion of housing occupancy by cohorts was only about one-quarter less than the norm in the late 1990s (figure 7).

More striking in the interval of 2006 to 2011 was the absence of gains in early middle-aged homeownership between the ages of thirty and fifty-four, contrasting with the previous substantial gains seen from 2000 to 2005 and in the late 1990s. Cohorts traversing this age range instead held on to their rentals, whereas before they vacated rentals while transitioning into homeownership. Reflecting the prolonged effects of the Great Recession, virtually the same pattern was sustained five years later during the protracted recovery from 2011 to 2016. Only a slight net outflow from renting and a slightly larger increase in owning occurred after age thirty-four.

POST-2016 RECOVERY OF PENT-UP DEMAND

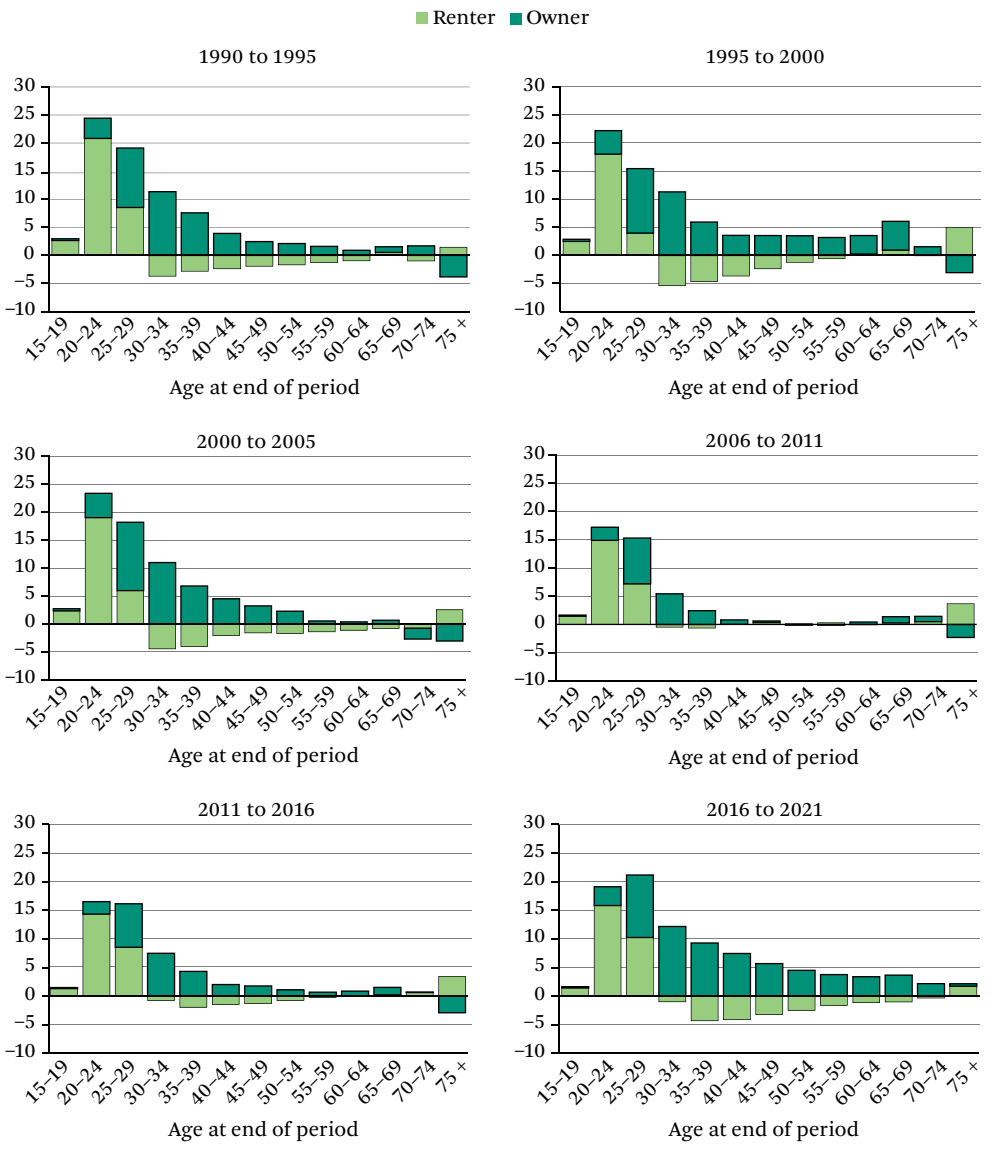
After a decade of frustrated housing attainments, the abrupt and forceful revival of housing demand might seem a mirage. How much of the depressed formations was deferred as pent-up demand and how much of the shortfall was actually recovered? We wonder also how equally was this new progress shared among all age and racial groups?

Rebound of Cohort Progress from 2016 to 2021

The revival of lifecycle progress after 2016 was extraordinary. Evidence was clear that homeownership rates began to rise in 2017, encouraged by a continuing rise in incomes and also motivated by several years of rising house

decade is then represented by 2000 to 2005, which constitutes the boom and bubble period. We find that 2005 and 2006 can equally represent the peak, while each maintains the preferred five-year spacing with preceding or following observations.

Figure 7. Housing Lifecycle Gains of Renting and Owning When Cohorts Advance Five Years



Source: Authors' calculations based on data reported in figure 6.
Note: Instead of the separate age curves displayed for each time period in the preceding figure, this display connects the dots as cohorts grow older between time periods. Plotted are the percentage point gains (or losses) during each five-year interval as all cohorts grow older, advancing in their housing lifecycle into headship of rental and owner households. The net changes plotted reflect active housing demand leading to expansion or contraction in owned or rented units over five years' lifecycle age. This highlights the strong active demand generated at young ages and the relative nonchanges at older ages. It also spotlights the differences in revealed demand between boom, bust, and recovery periods.

prices that raised expectations for future gains.[25] In the rebound from 2016 to 2021, as new construction of multifamily units also began to reach higher volumes, we see a large gain in new household formations among ages twenty to twenty-nine similar to what prevailed before the Great Recession, though this is slightly delayed to age twenty-five to twenty-nine relative to twenty to twenty-four, and still skewed more to rentals at this age than in intervals pre-2006 (figure 7). However, above age thirty, the substantial outflow from renting resumed as before when more households transitioned to owning. Especially noteworthy after 2016 are the unprecedented strong gains in added homeowners from ages thirty-five through sixty-nine. We strongly suspect this must be a middle-age catch-up for a decade's pent-up housing demand incurred during the restraints from 2006 to 2016.

Pent-up demand is often a speculative judgment, but evidence here shows that, relative to pre-2006 norms, the foregone achievements of two consecutive periods (2006 to 2011 and 2011 to 2016) were at least partially fulfilled by the end of the decade, when cohorts advanced at accelerated rates in later age groups. Thus, we could explain the rising ownership in older age groups as largely due to postponed demand carried forward within cohorts.[26] These late arrivals were surely benefited by the lowering of interest rates late in the decade and to 2021. The late arrivals in homeownership might also be marginal buyers whose incomes are more limited, dependent on pooling multiple incomes in the household, including drawing on earnings of grown children. In contrast, at the young end of the housing lifecycle is now broad awareness of the role of privileged family assistance in helping young adults to purchase homes many years earlier than if they had to save their own downpayments (Bhutta et al. 2020; Lee et al. 2020).

How Close Is the New Accumulated Status to Normal?

What have been the net changes for owners and renters in the first two decades of this century, after taking account of the setbacks around the Great Recession and then the major catch-up in the last five years? And how have the major race and ethnic groups fared during this period of prolonged recession and recovery? How close to normal is 2021?

Disproportionate and Undermeasured Impacts on Renters

As of 2021, the Census Bureau estimates the total number of U.S. households as 127.55 million, 83.49 million owners and 44.06 million renters.[27] These totals differ substantially from what would have been expected had the population by age and race group grown as observed over the two decades but the per capita rates of

25. The common user cost model housing economists use to explain homeownership tenure choice, based on prices, rents, and mortgage rates, also includes as its last component "expected price appreciation," which often can dominate (Himmelberg, Mayer, and Sinai 2005). As Karl Case and Shiller (2003) found, average homebuyers carry very high annual figures in their heads for expected appreciation (averaging 10 percent per year), which is roughly three times what might be the actual long-run average. Once prices started rising under the millennial competition for restricted opportunities and pent-up demand by others, this "expected appreciation" factor made the estimated cost of ownership look ever more attractive.

26. Taking one example cohort in figure 7, arriving at age thirty-five to thirty-nine in 2011, instead of the 7-percentage point ownership gain expected over five years in this age span (under the pre-2006 norm), only 2.5 points were achieved during the 2006 to 2011 period, leaving 4.5 points deferred to the next interval from 2011 to 2016. Instead, that also was 1.5 points lower than the expected gain under pre-2006 norms, which now cumulated to 6 points deferred by the cohort when it arrived at its next age (forty-five to forty-nine) in the 2016 to 2021 span. The eventual gain in ownership at that age, 6 points, seems large but was only 3 points greater than the pre-2006 norm expected for increase (3 points) at that age. Thus, the extra 3-point increase observed might be explained as partial catch-up of the 6-point deferred demand accumulated during younger ages and carried forward by the cohort.

27. All figures in this section are retrieved from the Census Bureau PUMS files collected in the ACS (U.S. Census Bureau 2023b).

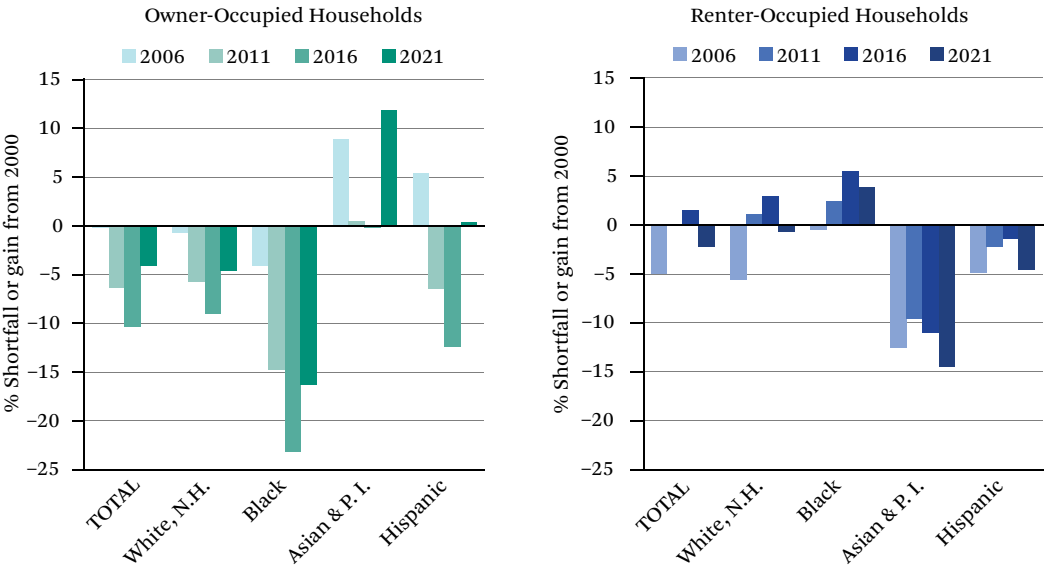
owner and renter household formation by age and race group had maintained their 2000 values (the "expected"). The gap between the observed and expected household totals among owners grew to be 5.04 million short of what would be expected for 2011, at the bottom of the recession, but virtually no difference was found in number of renters expected. The shortfall among owners continued to deepen through 2016, reaching 8.61 million by 2016, but new construction was still lagging and population in the key age range for formations was growing.

In what might seem a paradox, renters bore the brunt of the homeownership declines that continued from 2011 to 2016. Even though the losses appear attributed all to owners and none among renters, in fact, spillovers of would-be homeowners swamped the rental market through a cascade of diverted demand that displaced a nearly equivalent number of previously expected renters (Myers et al. 2016). The excess of unexpected renters rose only to 0.64 million by 2016. Because so few "extra" renters did not begin to balance the shortfall of owners, total household formation through 2016 was reduced by 7.96 million. The lost households are not directly observable but likely constitute the most vulnerable renters that did not survive competition with the large number of diverted, would-be homeowners added to the rental housing market.

Large Differences in Recovery Between Ethnoracial Groups

Not all ethnoracial groups fared equally in this housing competition, and not all benefited equally from the eventual recovery. Figure 8 summarizes how each group fared over successive time intervals. For ease of comparing different size groups, shortfalls of owner and renter-occupied households within each ethnoracial group are measured as a proportion of what was expected for each group had 2000 for-

Figure 8. Household Formation as Proportion of Expected



Source: Authors' calculations based on 2000 census (U.S. Census Bureau 2003) and selected years in the ACS (U.S. Census Bureau 2023b).

Note: The proportion of expected households that were actually observed was calculated by taking the number of observed households less simulated households and dividing by the number of simulated households. This was estimated separately for owners and renters, for each race-ethnic group in each survey year, relative to the 2000 baseline rates of formation.

mation rates been maintained. We measure the depths of the shortfall when it was greatest in 2016 and the recovery as of 2021. As reported in table A.1 in the online appendix, accounting for the simulated figures, the number of owners in the total population fell 10.3 percent below expected but recovered to 4.1 percent below expected. Among Whites, specifically, ownership shortfall was 9.0 percent below expected in 2016 but recovered to only 4.6 percent less. However, among Blacks, shortfall was 23.2 percent less than expected but recovered only weakly to 16.3 percent below expected. Experience was very different among the Asian and Pacific Islander group. Ownership held steady in 2011 and 2016 and then improved with a large surplus fully 11.8 percent above expected. Among Hispanics, shortfall was substantial in 2016 (12.3 percent) and then recovered to a slight surplus 0.4 percent.

Overall, recovery of housing achievements from setbacks of the Great Recession has been very unequal across race and ethnic groups. We find that the Black population recovered only about 30 percent of their steep homeowner losses accrued by 2016, whereas the White population recovered about 49 percent. Hispanics recovered virtually all their losses in homeownership but still had a 4.6 percent reduction among renters; Asian and Pacific Islanders came out 10 percent better in 2021 than in 2000. Unlike all other groups, Blacks not only achieved less of a homeowner recovery than other groups but also continued to sustain a greater number of rental households in 2021 than previously expected.

CONCLUSION

The misalignment of housing and population trends has proven damaging in the twenty-first century, first contributing to the housing bubble, the resulting financial crisis and Great Recession, and later driving acute housing shortages and extreme affordability problems. The first contribution of this article is to revisit the lessons from Kuznets and Easterlin a half century ago about the impacts of long swings in cohort size. We should have seen the millennials coming and formed suitable housing policy in advance. A second contribution is highlighting the long temporal lags of housing occupancies, with homes of older residents selected decades earlier. Active housing change is more common among young adults, but even the homeownership rates of young adults are lagged measurements, reflecting accumulations over preceding years more than the present day.

In particular, third, this lagged accumulation of homeownership rates may have misled about continuing preferences for homeownership. Building on earlier work (Myers, Lee, and Simmons 2020), we demonstrate how the graphic reporting of the nation's downward trend in homeownership rates effectively synchronized misperceptions of continued downward interest in homebuying, a clear example of Shiller's (2019) narrative economics persuading minds with simple messages. The resulting unanimity of pessimistic perception among policymakers, lenders, and industry leaders, along with the blind eye to cohort size effects, surely helped delay timely institutional response that could have expedited supply to meet rising potential demand after the Great Recession.

How best could rising demand and its frustration be estimated? A fault of standard homeownership rates is that they are lagged accumulations that overemphasize accomplishments of the past or mislead about recent preference. A fourth contribution of the study therefore is development of the cohort housing lifecycle depiction of active demand, representing recent net changes in owning and renting by cohorts arriving at each age, replicating this for discrete time periods before and after the recession. This method closely marries population and housing by joining the cohort structure of population size and per capita householder behavior rates. Ten years of delayed housing acquisitions between 2006 and 2016 are found to rebound sharply after 2016, albeit incompletely and especially to the detriment of Black households.

Overall, this study describes the destructive interaction of colliding temporal forces of housing, population, and economy. Whether that was due to simple misfortune, overreaction, or lack of supervisory foresight, the result is the greatest misalignment likely ever witnessed in housing or population. The smallest

cohorts of young adults in thirty years were allowed to create the greatest housing bubble fueled by easy credit, but the remedies for that—after the fact—tightened the credit for buyers and home builders, aimed at curbing the excesses of the bubble years. Unfortunately, that severe tightening was just in time to welcome the largest cohorts in thirty years, the millennials, with the lowest construction in sixty years and the highest-ever housing cost burdens on young Americans. Clearly, much closer connection of population and housing analysis, tracking the duo together, would seem to be imperative.

REFERENCES

Aalbers, Manuel B. 2009. "Why the Community Reinvestment Act Cannot Be Blamed for the Subprime Crisis." *City & Community* 8(3): 346–50.

Acolin, Arthur, Jesse Bricker, Paul Calem, and Susan M. Wachter. 2016. "Borrowing Constraints and Homeownership." *American Economic Review* 106(5): 625–29.

Bailey, Martin Neil, Aaron Klein, and Justin Schardin. 2017. "The Impact of the Dodd-Frank Act on Financial Stability and Economic Growth." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3(1): 20–47. https://doi.org/10.7758/RSF.2017.3.1.02.

Bhutta, Neil, Andrew C. Chang, Lisa J. Dettling, and Joanne W. Hsu. 2020. "Disparities in Wealth by Race and Ethnicity in the 2019 Survey of Consumer Finances." *FEDS Notes.* Washington, D.C.: Board of Governors of the Federal Reserve System.

Blinder, Alan S. 2022. *A Monetary and Fiscal History of the United States, 1962–2021*. Princeton, N.J.: Princeton University Press.

Campbell, Burnham O. 1966. *Population Change and Building Cycles.* Urbana: University of Illinois.

Case, Karl E., and Robert J. Shiller. 2003. "Is There a Bubble in the Housing Market?" *Brookings Papers on Economic Activity* no. 2, 299–362. Washington, D.C.: Brookings Institution.

Dietz, Robert. 2020. "A Decade of Home Building: The Long Recovery of the 2010s." *Eye on Housing.* Washington, D.C.: National Association of Home Builders.

Easterlin, Richard A. 1968. *Population, Labor Force, and Long Swings in Economic Growth*. New York: Columbia University Press.

———. 1987. *Birth and Fortune: The Impact of Numbers on Personal Welfare.* Second Edition. Chicago: University of Chicago Press.

Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. 2023. "IPUMS CPS: Version 11.0 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D030.V11.0.

Francke, Marc, and Matthijs Korevaar. 2022. "Baby Booms and Asset Booms: Demographic Change and the Housing Market." *SSRN Electronic Journal*. https://dx.doi.org/10.2139/ssrn.3368036.

Frey, William. 2021. "America's Largest Cities Saw the Sharpest Population Losses During the Pandemic." Washington, D.C.: Brookings Institution.

Fry, Richard. 2019. "The Number of People in the Average U.S. Household Is Going Up for the First Time in over 160 Years." Washington, D.C.: Pew Research Center.

Gabriel, Stuart A., and Stuart S. Rosenthal. 2015. "The Boom, the Bust, and the Future of Homeownership." *Real Estate Economics* 43(2): 334–74.

Gibson, Campbell, and Kay Jung. 2006. "Historical Census Statistics on the Foreign-Born Population of the United States." Working paper no. POP-WP081. U.S. Census Bureau. Washington, D.C.: U.S. Department of Commerce.

Green, Richard, and Patric H. Hendershott. 1996. "Age, Housing Demand, and Real House Prices." *Regional Science and Urban Economics* 26(5): 465–80.

Haurin, Donald R., and Stuart S. Rosenthal. 2007. "The Influence of Household Formation on Homeownership Rates Across Time and Race." *Real Estate Economics* 35(4): 411–50.

Himmelberg, Charles, Christopher Mayer, and Todd Sinai. 2005. "Assessing High House Prices: Bubbles, Fundamentals and Misperceptions." *Journal of Economic Perspectives* 19(4): 67–92.

Immergluck, Dan. 2009. *Foreclosed: High-Risk Lending, Deregulation, and the Undermining of America's Mortgage Market*. Ithaca, N.Y.: Cornell University Press.

Joint Center for Housing Studies. 2019. "The State of the Nation's Housing." *Research Report.* Cambridge, Mass.: Harvard University.

Kuznets, Simon. 1958. "Long Swings in the Growth

of Population and in Related Economic Variables." *Proceedings of the American Philosophical Society* 102(1): 25–52.

Lee, Hyojung. 2020. "Are Millennials Coming to Town? Residential Location Choice of Young Adults." *Urban Affairs Review* 56(2): 565–604.

———. 2022. "Are Millennials Leaving Town: Reconciling Peak Millennials and Youthification Hypotheses." *International Journal of Urban Sciences* 26(1): 68–86.

Lee, Hyojung, Dowell Myers, Gary Painter, Johanna Thunell, and Julie Zissimopoulos. 2020. "The Role of Parental Financial Assistance in the Transition to Homeownership by Young Adults." *Journal of Housing Economics* 47: 101597. https://doi.org/10.1016/j.jhe.2018.08.002.

Lee, Kwan Ok, and Gary Painter. 2013. "What Happens to Household Formation in a Recession?" *Journal of Urban Economics* 76 (July): 93–109.

Levitin, Adam J., and Susan M. Wachter. 2020. *The Great American Housing Bubble*. Cambridge, Mass.: Harvard University Press.

Mankiw, N. Gregory, and David N. Weil. 1989. "The Baby Boom, the Baby Bust, and the Housing Market." *Regional Science and Urban Economics* 19(2): 235–58.

Matthews-Hunter, Keir. 2021. "Purpose-built Rental Housing and Household Formation among Young Adults in Canadian Cities, 1991–2016." *Housing Studies* 36(10): 1566–99.

Monnet, Eric, and Clara Wolf. 2017. "Demographic Cycles, Migration and Housing Investment." *Journal of Housing Economics* 38(C): 38–49.

Myers, Dowell. 1990. *Housing Demography: Linking Demographic Structure and Housing Markets.* Madison: University of Wisconsin Press.

———. 2016. "Peak Millennials: Three Reinforcing Cycles that Amplify the Rise and Fall of Urban Concentration by Millennials." *Housing Policy Debate* 26(6): 928–47.

Myers, Dowell, Hyojung Lee, and Patrick A. Simmons. 2020. "Cohort Insights into Recovery of Millennial Homeownership After the Great Recession." *Journal of Housing Economics* 47: 101619.

Myers, Dowell, Gary Painter, Hyojung Lee, and JungHo Park. 2016. "Diverted Homeowners, the Rental Crisis and Foregone Household Formation." Washington, D.C.: Mortgage Bankers Association.

Myers, Dowell, and JungHo Park. 2020. "End of Recovery: How Good Did It Get?" Los Angeles: University of Southern California, Price School of Public Policy.

Myers, Dowell, JungHo Park, and Seongmoon Cho. 2021. "Housing Shortages and the New Downturn of Residential Mobility in the US." *Housing Studies* 38(6): 1088–109.

Paciorek, Andrew. 2016. "The Long and the Short of Household Formation." *Real Estate Economics* 44(1): 7–40.

Pitkin, John, and Dowell Myers. 1994. "The Specification of Demographic Effects on Housing Demand: Avoiding the Age-Cohort Fallacy." *Journal of Housing Economics* 3(3): 240–50.

Ruggles, Steven, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. 2024. "IPUMS USA: Version 15.0 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D010.V15.0.

Ryder, Norman B. 1965. "The Cohort as a Concept in the Study of Social Change." *American Sociological Review* 30(6): 843–61.

Shiller, Robert J. 2015. *Irrational Exuberance*, 3rd ed. Princeton, N.J.: Princeton University Press.

———. 2019. *Narrative Economics: How Stories Go Viral and Drive Major Economic Events.* Princeton, N.J.: Princeton University Press.

Spader, Jonathan. 2022. "Homeowner and Rental Vacancy Rates Near Historic Lows." *America Counts: Stories.* Washington: U.S. Census Bureau.

Twenge, Jean M. 2023. *Generations: The Real Differences Between Gen Z, Millennials, Gen X, Boomers and Silents*. New York: Atria Books.

U.S. Census Bureau. 1983. 1980 Decennial Census, Public Use Microdata Samples (PUMS). Washington: U.S. Department of Commerce.

———. 1993. 1990 Decennial Census, Public Use Microdata Samples (PUMS). Washington: U.S. Department of Commerce.

———. 2003. 2000 Decennial Census, Public Use Microdata Samples (PUMS). Washington: U.S. Department of Commerce.

———. 2004. National Intercensal Datasets: 1990–2000. Population Estimates Program. Washington: U.S. Department of Commerce.

———. 2016. "Residential Vacancies and Homeownership in the Second Quarter 2016." Press release no. CB16-122. Washington: U.S. Department of Commerce.

———. 2023a. 2020 Decennial Census, Demographic and Housing Characteristics File (DHC). Washington: U.S. Department of Commerce.

———. 2023b. "American Community Survey, 2005–2022." Washington: U.S. Department of Commerce. https://www.census.gov/programs-surveys/acs.

———. n.d.-a. "New Residential Construction: Historical Time Series." Accessed June 2, 2023. https://www.census.gov/construction/nrc/historical_data/index.html

———. n.d.-b. "Characteristics of New Housing." Accessed June 2, 2023. Accessed June 2, 2023. https://www.census.gov/construction/chars/index.html

———. n.d.-c. "Housing Vacancies and Homeownership." Accessed April 15, 2024. https://www.census.gov/housing/hvs/index.html.

Urban Institute. 2023. "Housing Credit Availability Index." Accessed April 15, 2024. https://www.urban.org/policy-centers/housing-finance-policy-center/projects/housing-credit-availability-index.

Wachter, Susan M., and Arthur Acolin. 2022. "Homeownership for the Long Run," *Journal of Comparative Urban Law and Policy* 5(1): 274–96.

Watt, Melvin L. 2014. "Federal Housing Finance Agency." *Federal Register* 79(73): 21458–61. Accessed April 15, 2024. https://www.govinfo.gov/content/pkg/FR-2014-04-16/pdf/2014-08566.pdf.

Weisman, Jonathan. 2015. "Obama to Outline Proposals to Bolster a Lagging Housing Sector." *New York Times*. January 7.

Woodward, Susan E. 1994. "Economists' Prejudices: Why the Mankiw-Weil Story Is Not Credible." *Regional Science and Urban Economics* 21(4): 531–37.

Yu, Zhou, and Dowell Myers. 2010. "Misleading Comparisons of Homeownership Rates When the Variable Effect of Household Formation Is Ignored." *Urban Studies* 47(12): 2615–40.

Who Is Black on the Block? Black Immigrants and Changing Black Neighborhoods

NIMA DAHIR

In recent decades, the United States has seen a significant rise in Black immigration, reshaping Black neighborhoods and the landscape of Black America. Using census and American Community Survey data, this article examines the relationship between an influx of Black immigrants and changes in neighborhood racial composition and segregation. Findings show an increase in Black immigrants relates to a decline in the Black native population and an increase in White residents within a Black American neighborhood. Furthermore, the presence of Black immigrants relates to native-born Black-White integration by preceding Black entry into White neighborhoods and White entry into Black neighborhoods. This study elucidates intraracial spatial dynamics between Black people, emphasizing the intersecting roles of race and nativity on neighborhood change in a diversifying United States.

Keywords: Black immigrants, neighborhood change, residential patterns

In 2000, a neighborhood in Minneapolis, Minnesota, was home to more than 70 percent native-born Black residents. By 2020, the neighborhood was far more diverse, with only 39 percent native-born Black residents, nearly 20 percent non-Hispanic White, and 13 percent Asian residents. Over that same period, the foreign-born Black population grew from nonexistent to almost 10 percent of the neighborhood.[1] Now, replacing vacant lots, African, Caribbean, Asian, and American restaurants all line the same streets.[2] Although the neighborhood grew more diverse overall, Black residents, foreign- and native-born, still made up a near majority of the neighborhood, far greater than any other group. For all intents and purposes, this neighborhood remains a Black neighborhood but its racial and ethnic character has trans-

Nima Dahir is assistant professor and provost's fellow in sociology at the Ohio State University, United States.

© 2025 Russell Sage Foundation. Dahir, Nima. 2025. "Who Is Black on the Block? Black Immigrants and Changing Black Neighborhoods." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 110–31. https://doi.org/10.7758/RSF.2025.11.1.06. I thank David Grusky, Jackelyn Hwang, Tomás Jiménez, Florencia Torche, the editors and anonymous reviewers, and participants in the RSF Census 2020 Conference for their insightful comments on earlier versions of this article. Direct correspondence to: Nima Dahir, at dahir.13@osu.edu, 238 Townshend Hall, 1885 Neil Avenue Mall, Columbus, OH, 43210, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

1. These are my calculations using the 2000 Census and 2016–2020 American Community Survey. Although Hispanic origin is not determined for foreign-born and native-born Blacks, the remaining 18 percent of the neighborhood is mostly non-Black Hispanic.

2. Changes determined via Google Street View.

formed over these twenty years as its Black immigrant population has grown.

The influx of Black immigrants to this Midwestern neighborhood is not a unique scenario in the United States; over the past few decades, the size and diversity of the Black immigrant population across the country have considerably grown (Hamilton 2019; Tamir 2022; Tesfai 2019). Now, 20 percent of Black people in the United States are an immigrant or have at least one foreign-born parent (Tamir 2022), making Black immigrants and their descendants a sizable share of the category we call Black in the United States.

Other articles in this double issue address the changing racial and ethnic classifications of Americans revealed in the 2020 Census, prompting a reconsideration of all ethnic, racial, and nativity-based classification categories. Here, I contend that Black nativity is an unexamined source of heterogeneity within Black America and Black neighborhoods. As Black immigrants become more prevalent and diverse in the United States in this decade and beyond, I argue for a reconsideration of the theories linking immigration, neighborhood racial composition, and residential segregation to include the role of Black immigrants.

Existing research highlights the important role that immigrants play in neighborhood racial composition and trajectories. In particular, immigrants alter neighborhood racial composition by affecting native-born residential patterns (Crowder et al. 2011; Ellis and Wright 1998; Frey 1995). Furthermore, the influential buffering theory in urban sociology highlights the more complex role that immigrants may play in neighborhood racial trajectories (Ellen 2000; Farley and Frey 1994; Frey and Farley 1996; Logan and Zhang 2010; Santiago 1991). Buffering suggests that immigrants contribute to stable neighborhood diversity by "reduc[ing] the salience of Black neighbors to Whites, even when they live on the same block" (Logan and Zhang 2010, 1072) or diminishing the importance of the Black-White residential dichotomy (Iceland 2004). Although buffering somewhat explains the emergence of stably diverse neighborhoods that other theoretical approaches cannot accommodate, it remains limited by a focus on the residential preferences and choices of White householders (Wright and Ellis 2021) and agnostic about the role of Black immigrants. Given that they are both Black and immigrants, how Black immigrants may change the racial composition and trajectory of a neighborhood remains theoretically ambiguous.

Therefore, in this article, I test how an influx of Black immigrants relates to future changes in the racial composition of a neighborhood. Using the 2000 Census with the 2008–2012 and 2016–2020 American Community Surveys, I first test whether there is Black American in- or out-migration with increases in the Black immigrant population in a neighborhood, taking a particular lens to Black native majority neighborhoods given the relatively high integration of Black immigrants and Black Americans (Crowder 1999; Cutler, Glaeser, and Vigdor 2008; Freeman 2002; Iceland 2009; Scopilliti and Iceland 2008; Tesfai 2019). Next, I consider changes in the number of White and non-Black immigrant residents as Black immigrants move into a neighborhood, thereby examining how Black immigrants may modify our understanding of the role of race and immigration in neighborhood integration. Finally, I test the expectations of the buffering hypothesis as Black immigrant presence increases in a neighborhood.

Results demonstrate evidence of Black native out-migration with an increase in the Black immigrant population, driven by neighborhoods in which native-born Blacks were a majority in the baseline year. In addition, I find that an increase in the Black immigrant population in baseline majority Black native neighborhoods is related to a substantial increase in White residents. I also find increases in the non-Black immigrant share of all neighborhoods with Black immigrant influx. Finally, I demonstrate that Black immigrants, like other immigrants, can play a buffering role in a White neighborhood, preceding the entrance of other Black people (Logan and Zhang 2010). This suggests that nativity alters racial hierarchies in residential patterns and that all immigrants, regardless of race, can mitigate White flight as native-born Black households move in. I also find a new pathway to Black-White coresidence, which I call reverse buffering, wherein Black

immigrants precede the entrance of Whites into Black American neighborhoods.

Altogether, these results suggest that Black immigrants contribute to the diversification of a Black American neighborhood. This article examines intraracial spatial dynamics between Black people and the role that Black immigrants play in neighborhood change as the Black immigrant population grows in the United States. The implications from this study are not limited to Black immigrants and Black neighborhoods, however. I conclude with a discussion of the findings and their implications for the theoretical contours of race and immigrant status and the future of spatial inequality in Black neighborhoods.

BLACK IMMIGRANT RESIDENTIAL PATTERNS

Black immigrants are a diverse group with a long migration history to the United States. Although the early parts of the twentieth century saw growth in the Black immigrant population in the United States, the 1965 Hart-Celler Act was a pivotal moment (Hamilton 2020). By eliminating national origin quotas and making family connections a key basis for admission to the United States, the Hart-Celler Act diversified the immigrants in the United States and considerably increased Black immigration (Hamilton 2020; Waldinger 1989). By 2014, 10 percent of all immigrants in the United States were Black, and Black immigrants made up 9.2 percent of the Black population in the country. Black immigration continues to increase, and because of differential birth rates, Black immigrants constitute a considerable share of the growth of the Black population in the United States (Hamilton 2019).

The Hart-Celler Act mainly increased Black immigration by increasing Caribbean immigration, given their longer history of migration to the United States. In contrast, African immigration to the United States was limited before the 1980s. Two additional acts contributed to the increase in African immigration: the Refugee Act of 1980 and the Immigration Act of 1990. The Refugee Act revised the U.S. definition of a refugee and established an asylum provision in immigration law. Given the considerable upheaval on the African continent in the decades following the independence of many nations, the Refugee Act brought in many African immigrants, with the largest groups coming from Ethiopia, Eritrea, and Somalia (Tesfai 2013). The Immigration Act of 1990 made two changes that affected the presence of African immigrants in the United States; first, the act increased the total immigration cap, increasing the number of immigrants allowed in overall, and, second, it permanently established the Diversity Lottery. The Diversity Lottery was intended to increase immigration from countries that have not had long histories of migration to the United States, and now is the primary visa skilled African professionals use to enter the country (Hamilton 2019). In recent years, both the number and rate of growth of Black immigrants has significantly increased because of the growth of both refugee populations and economic and professional migration (Hamilton 2020), making the current moment an important time to better understand Black immigrants and the future of Black America.

The rapid growth and diversification of the Black immigrant population in the 1990s spurred sociological research on the residential patterns of this group. By virtue of their race and immigrant status, Black immigrants posed a unique test of existing theories of racial segregation and immigrant incorporation. A consistent finding emerges from this literature: Black immigrants are on average both highly segregated from Whites and integrated with native-born Blacks, especially relative to non-Black immigrants (Crowder 1999; Cutler, Glaeser, and Vigdor 2008; Freeman 2002; Iceland 2009; Scopilliti and Iceland 2008; Tesfai 2019). This segregation from Whites has largely been taken as support for the place stratification model of immigrant segregation, which suggests that structural forces limit minority groups' residential opportunities (Logan 1978). The effects of these structural restraints are especially salient for Black immigrants relative to non-Black immigrants, given the importance of race in the housing market (Park and Iceland 2011).

Even though the empirical patterns of high levels of segregation from Whites appear to lend credence to the place stratification model, this literature largely does not consider how

Black immigrants may transform these segregated neighborhoods over time. Some research demonstrates that increasing concentrations of Black immigrants are related to future socioeconomic ascent as the result of an influx of new residents and entrepreneurship in previously declining areas (Candipan and Bader 2022; Tesfai, Ruther, and Madden 2020), but how they relate to changes to the racial composition remains unknown.

Thus, in this article, I consider how Black immigrants change the racial composition of a neighborhood, patterns that can have long-lasting implications for the future of a neighborhood (Logan and Zhang 2010; Hwang 2016). Furthermore, by examining how Black immigrants change Black neighborhoods, we gain theoretical insight into how race and nativity interact to determine neighborhood trajectories in an increasingly diverse United States.

IMMIGRANTS AND NATIVE-BORN RESIDENTIAL PATTERNS

Although little is known about Black immigrants and neighborhood change, much social science research has focused on the impacts of Hispanic and Asian immigrants on racial composition and racialized segregation of neighborhoods. One way immigrants transform the racial composition of neighborhoods is native-born out-migration (Card 2001; Crowder, Hall, and Tolnay 2001; Ellis and Wright 1998). Several theoretical alternatives have been proposed to explain native out-migration as a function of immigrant concentration.

First, the ethnic flight thesis argues that native out-migration occurs with growing concentrations of immigrants in a neighborhood due to the changes they have on the racial and ethnic composition of the neighborhood (Crowder, Hall, and Tolnay 2011; Pais, South, and Crowder 2009; Saiz and Wachter 2011). Although Black residents express higher tolerance for integration than White householders, some indications of animosity toward and aversion to Asian and Hispanic immigrants remain (Charles 2000; Wilson and Taub 2007). In assessing neighborhood out-migration, Kyle Crowder, Matthew Hall, and Stewart Tolnay (2011) find that the likelihood of out-mobility for Black householders increases with the relative size of the non-Black population, a variable that is positively but not exactly correlated with the immigrant size. These results indicate that Black aversion to immigrants may be motivated not by nativity bias but by a preference for same-race neighbors (Krysan and Farley 2002). Thus this perspective suggests that, because of their shared race, Black immigrant influx would lead to less Black native-born out-migration, particularly in neighborhoods with a considerable existing native-born Black population.

Supporting the ethnic flight thesis for White householders, research has found that White householders move out of neighborhoods with growing immigrant populations due to the neighborhoods' changing racial compositions (Crowder, Hall, and Tolnay 2011). Regardless of nativity, White residents avoid large minority neighborhoods due to perceptions about safety, disorder, and amenities (Ellen 2000; Pais et al. 2009; South and Crowder 1998), but this aversion is especially salient for Black neighbors (Krysan 2002; Krysan et al. 2009). Because Black immigrants are both Black and native born, White householders may perceive Black immigrants as less desirable neighbors than both non-immigrant Blacks and non-Black immigrants. This suggests that Black immigrant influx would lead to considerable White out-migration. However, ethnographic accounts have found that, because of their nativity, Black immigrants can be perceived more positively than their Black American counterparts (Kasinitz 1992; Waters 1999); if this holds true in residential preferences, White out-migration may not occur to the same degree as Black immigrants move into a neighborhood.

A second perspective emphasizes labor, housing-market, and socioeconomic conditions changing due to growing immigrant concentrations (Crowder, Hall, and Tolnay 2011; Taub, Taylor, and Dunham 1984). White native-born householders may move out of a neighborhood because of immigrants' relatively low educational attainment and socioeconomic status (White and Glick 2009) and fears about the trajectory of the neighborhood (Taub, Taylor, and Dunham 1984). For Black householders, Crowder and his colleagues (2011) find that immigrant concentration can be associated

with increasing housing costs that lead to Black native out-migration. Because Black immigrants on average outperform or are on par with Black Americans on educational and socioeconomic outcomes (Hamilton 2019, 2020), increases in Black immigrants may lead to Black American out-migration but limit White out-migration.

The varying expectations of these perspectives highlight the theoretical ambiguity of native-born Black and White residential patterns in reaction to Black immigrants. Residential choices are not limited to White and Black householders, however. Although less research has focused on Asian and Hispanic out-migration as immigrants increase in a neighborhood, these groups tend to express strong preferences for a majority coethnic presence (Charles 2000; Clark 2009). For Hispanic householders, some evidence indicates anti-Black residential preference (Charles 2006; Pais, South, and Crowder 2009), and it is strongest among foreign-born Hispanics (Pais, South, and Crowder 2009). This suggests that as Black immigrants increase within a neighborhood, non-Black immigrants would move out.

IMMIGRANTS AND RESIDENTIAL BUFFERING

An alternate way neighborhood racial composition changes is not native-born out-migration but instead the in-migration of various groups. In particular, the buffering theory of residential integration suggests that a pathway to integration between Whites and Blacks exists with the earlier in-migration of Asian and Hispanic residents (Ellen 2000; Farley and Frey 1994; Frey and Farley 1996; Logan and Zhang 2010; Santiago 1991; Kye and Halpern-Manners 2022). As Asian and Hispanic immigrants acculturate socioeconomically, they may have access to previously segregated White neighborhoods. With the entrance of these groups, Black-White integration becomes possible as the likelihood of White flight is lessened as Black residents move in next (Logan and Zhang 2010).

Three main mechanisms motivate this theory. First, these new groups may mitigate White flight by serving as an actual spatial buffer between Black and White households, reducing their proximity within a neighborhood, and thus diminishing the salience of Black households for White residents (Frey and Farley 1996; Parisi, Lichter, and Taquino 2015; Taylor 1998). Second, Asian and Hispanic residents may serve as social buffers or associational brokers by facilitating more contact between Black and White residents, thus minimizing the salience of the Black-White boundary within a neighborhood and diffusing racial animus (Parisi, Lichter, and Taquino 2015, 129; Taylor 1998). Third, the entrance of Asian and Hispanic residents into a neighborhood may affect the perceived racial and ethnic character and diversity of a White neighborhood, thus prompting intolerant White residents to leave. These may be replaced by White householders with a preference for diversity, thereby facilitating Black entrance and reducing Black-White segregation (Parisi, Lichter, and Taquino 2015).

Scholars have found some evidence of Asian and Hispanic in-migration providing a pathway for Black-White integration in what were predominantly White neighborhoods (Logan and Zhang 2010; Parisi, Lichter, and Taquino 2015). If buffering holds in the same way for Black immigrants as it does for Asians and Hispanics, this suggests that the likelihood of White flight would be lessened as Black immigrants move into a neighborhood alongside Black native householders.

Recent critiques of the buffering hypothesis have called for future research to consider how various groups react to Black in-migration, not just White householders. Furthermore, because buffering focuses on White neighborhoods and White residents' preferences, this may mask alternate pathways to neighborhood diversity that originate from Black neighborhoods (Parisi, Lichter, and Taquino 2015; Wright and Ellis 2021).

However, these existing critiques of buffering are also limited by a notion of residential diversity that excludes Black immigrants. The buffering hypothesis emphasizes that immigrants, perceived as Hispanics and Asians, can serve as a middle ground between Blacks and Whites (Parisi, Lichter, and Taquino 2015; Santiago 1991). Because of their ethnicity and nativity, Black immigrants are perceived differently from their Black American counterparts (Waters 1999) and thus may also serve in this buff-

ering capacity. Still, their role in mitigating or entrenching segregation between other groups remains unclear. Thus, taking heed of existing critiques (Wright and Ellis 2021) and extending to consider the presence of Black immigrants, I test whether Black immigrants relate to integration by buffering between native-born Black and White households and propose and test a process called reverse buffering, wherein Black immigrants precede the entrance of Whites into Black American neighborhoods.

DATA AND METHODS

In this article, I exploit the boom of Black immigration in the past two decades by using the 2000 Census and the pooled estimates from the 2008–2012 (2010) and 2016–2020 (2018) American Community Surveys (U.S. Census Bureau 2002, 2013, 2022). I operationalize a neighborhood as a census tract. Using the National Historical Geographic Information System crosswalks (Manson et al. 2022), I normalize all tract boundaries to the 2010 Census for comparability throughout the included years.

Analytic Strategy

I begin by testing the relationship between Black immigrant influx and neighborhood racial change with lagged first-differences models. In these models, I do not measure variables concurrently. Instead, all dependent variables are measured between 2010 and 2018, with the main independent variable of interest being the change in the foreign-born Black population in the earlier period between 2000 and 2010. Although the aims of this article are not causal, I stagger the outcome and independent variables to mitigate concerns that the changes occurring simultaneously are independent of one another. Therefore, the models all take the following form:

$$\Delta Y_{it} = \beta_1 \Delta X_{i,t-1} + \Delta Y_{i,t-1} + \Delta Z_{i,t-1} + \gamma_t + \alpha_i + \gamma_t C_i + \varepsilon_{it} \quad (1)$$

As indicated in the equation, I account for both tract-specific and time-invariant (α_i), and time-specific and tract-invariant (γ_t), unobserved confounders with two-way fixed effects (Wooldridge 2021). Although change can be modeled in various ways, the benefit of this lagged first-differences model is that variation is confined to within tracts and unobserved time-invariant neighborhood characteristics are held constant (Liker, Augustyniak, and Duncan 1985).

In these models, the main independent variable of interest ($\Delta X_{i,t-1}$) is the change in the number of foreign-born Black persons in a census tract from 2000 to 2010. The outcome variables (Y_{it}) are various neighborhood-level measures of racial or nativity composition; the primary outcome of interest is the change in the number of native-born Black persons between 2010 and 2018. To examine changes to the overall racial composition of a neighborhood, I also test changes to the number of non-Hispanic Whites and non-Black immigrants in a neighborhood.

Throughout the models, I control for the existing change in the outcome variables of interest ($Y_{i,t-1}$) to address secular trends. For example, when testing how an influx of Black immigrants between 2000 and 2010 relates to changes in the number of native-born Black persons between 2010 and 2018, I control for the change in the number of native-born Black persons between 2000 and 2010. Thus, holding the baseline changes in the outcome variable constant, my models test any additional explanatory power from the independent variables' change. In addition, I control for a vector of various socioeconomic and housing changes in a neighborhood between 2000 and 2010 ($Z_{i,t-1}$) that may also relate to changes in the racial composition in the later period. This includes baseline changes in population, household income, median home value, percent college-educated, and vacancy. Finally, to account for the regionally concentrated large-scale outmigration of Black residents in many U.S. cities (Frey 2022), I interact the census division (C_i), which divides states into nine subregions with a year indicator in all models. Throughout, I test heterogeneity in results by whether the underlying neighborhood is a majority native-born Black neighborhood to proxy for a Black American neighborhood.

Next, to test neighborhood racial trajectories and the buffering hypothesis, I consider neighborhood racial composition holistically using measures of neighborhood presence (see

Logan and Zhang 2010; Zhang and Logan 2016). I compare each neighborhood's share of a particular group (native-born Black, foreign-born Black, and non-Hispanic White) to the overall share in the analytic sample. Following John Logan and Charles Zhang (2010), if the group's share of the tract population reaches one-quarter of the aggregate share,[3] I consider this group to be present in the neighborhood. For example, across all neighborhoods in the analytic sample, native-born Black people make up 12.1 percent of residents on average. Thus, for native-born Black people to be considered present in a neighborhood, they must make up at least 3.0 percent of the residents.

For this analysis, I estimate multinomial logit models considering the end-state of neighborhood racial composition as a function of earlier Black immigrant influx. To test whether Black immigrants can mitigate White exit and facilitate White-Black integration as Asian and Hispanic immigrants do (Logan and Zhang 2010; Parisi, Lichter, and Taquino 2015), I first consider all neighborhoods in which non-Hispanic Whites were present in 2000 but native-born Black people were not. I then consider the pathways these neighborhoods take. The end states of particular interest are, as shown in the first panel of figure 1: first, White exit/Black presence, where, by 2018, White residents fall below the one-quarter threshold and are no longer considered present in the neighborhood and Black residents are present; second, native-born Black-White integration, where both native-born Black and White residents are present, regardless of what other groups are present; and, third, the reference category, where Whites are present, but native-born Blacks are not, as in 2000. Other, less frequent transitions are excluded from the analysis. I consider the transition probability to each state separately conditional on whether Black immigrants were present in the middle period, 2010.

As an extension of the current literature, I also consider the reverse pathway, starting from neighborhoods in which native-born Blacks are present but non-Hispanic Whites are not. For these neighborhoods, I consider the likelihood of these end states, as shown in the second panel of figure 1: Black native-born exit, where, by 2018, Black native-born residents fall below the one-quarter threshold; and native-born Black-White integration, where both native-born Black and White residents are present, regardless of what other groups are. As before, the reference case is where the presence of non-Hispanic Whites and native-born Blacks is as in 2000, where native-born Blacks are present, but non-Hispanic Whites are not.

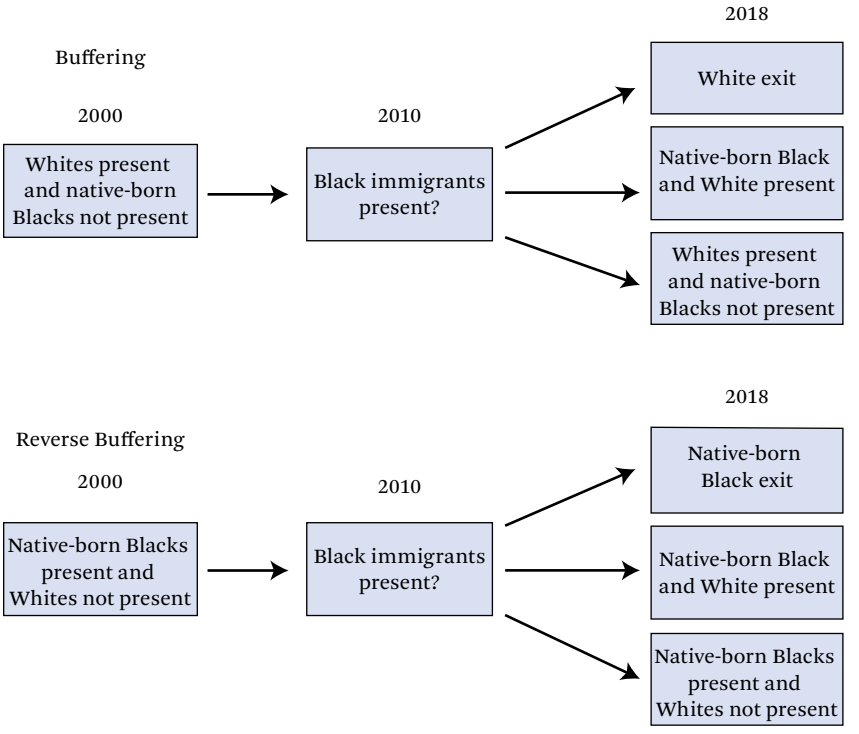
RESULTS

Figure 2 presents shares of native-born Black, non-Hispanic White, and overall immigrants of the neighborhoods in the analytic sample in the three periods of analysis: 2000, 2010, and 2018. To situate the focus on native-born Black neighborhoods, I disaggregate by the share of the neighborhood that was native-born Black in 2000. The groupings are: 0 to 5 percent native-born Black, 5 to 20 percent native-born Black, 20 to 50 percent native-born Black, and more than 50 percent native-born Black. I also present the share of Black immigrants residing in each group.

As expected, in 2000, the majority of Black immigrants (60 percent) lived in neighborhoods with a considerable (more than 20 percent) native-born Black share, a disproportionate share given that these neighborhoods make up only 18 percent of all neighborhoods. Still, many Black immigrants live in neighborhoods with lower native-born Black shares, illustrating the often-ignored diversity of residential locations for Black immigrants. Over time, the highest native-born Black neighborhoods became less so, decreasing from an average of 77 percent native-born Black to 68 percent. Meanwhile, the share of Black immigrants living in these neighborhoods decreased, from an average of 22 percent in 2000 to 18 percent by 2018. These neighborhoods diversified overall also, with increases in the shares of Hispanics, Asians, and the overall foreign-born population and small increases in the average share of non-Hispanic Whites.

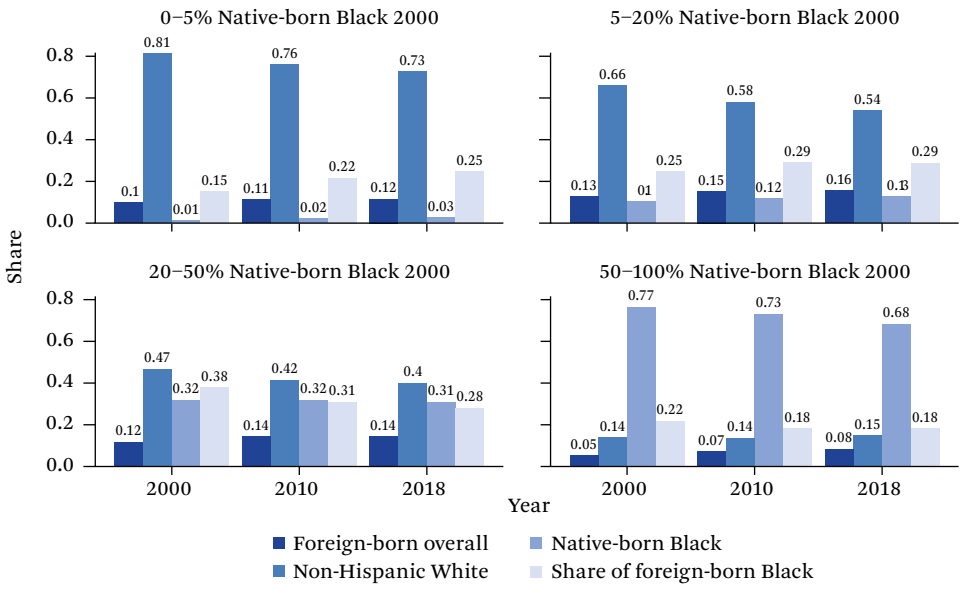
3. In the appendix tables, I consider alternative thresholds for presence.

Figure 1. Pathways of Neighborhood Racial Composition Change



Source: Author's framework.

Figure 2. Sample Shares of Black, White, and Immigrant by 2000 Native-Born Characteristics



Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.

Table 1. Black Immigrant Influx and Black Native Change

	Δ Native-Born Black Persons 2010–2018	
	(1)	(2)
Δ Black immigrant 2000–2010	−0.140***	0.022
	(0.018)	(0.020)
x Majority native-born Black 2000		−0.944***
		(0.045)
Observations	71,420	71,420
R^2	0.115	0.120

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: All models control for census division and baseline changes in native-born Black population, total population, number of non-Black immigrants, income, median home value, percent college-educated, vacancy, and White population.
*p < .05; **p < .01; ***p < .001

Overall Changes in Racial Composition

The descriptive results demonstrate that Black immigrants live in Black neighborhoods that are diversifying over time. To examine this more rigorously, I begin by testing how an influx of Black immigrants relates to future changes in the Black American population in the first column of table 1. Within a neighborhood, an increase of one hundred Black immigrants corresponds to a relative decrease in the Black native population of about fourteen persons. This decrease is considerable, but neighborhoods in which Black Americans are a majority may differ in significant ways from other neighborhoods. Ethnic differentiation between Black Americans and Black immigrants is more prevalent in these neighborhoods because of a stronger Black American cultural identity and solidarity (Waters 1996). Furthermore, majority Black American neighborhoods likely have distinct historical contexts that may shape neighborhood trajectories as immigrants move in.

Thus, in the next column, I disaggregate results by neighborhoods in which Black Americans were a majority in the baseline year, the most canonical of which was home to more than 20 percent of Black immigrants in 2000. I interact the change in the number of Black immigrants with a flag identifying whether a neighborhood is at least 50 percent native-born Black in 2000.[4] Here, I find that in neighborhoods where native-born Blacks were a majority in the baseline year, the relative decrease in the Black native population is strong, of ninety-four native-born Black persons with each hundred-person increase in the Black immigrant population. In contrast, in neighborhoods in which Black Americans were a minority in 2000, Black immigrant influx is unrelated to Black native changes. These results demonstrate a relationship between Black immigrants increasing in a neighborhood and Black American populations, but this varies by the existing demographic composition of the neighborhoods. When Black immigrants move into a neighborhood that has a minority Black native population, they relate to an increase in the diversity of the Black population, with increases in the foreign-born Black populations and no change in the Black native population. However, in neighborhoods that were majority Black, Black immigrants appear to lead to Black American out-migration.

Next, in models 1 and 2 of table 2, I consider how Black immigrant influx relates to changes in the non-Hispanic White population. I find that, in contrast to the Black American population, an increase in the Black immigrant population is unrelated to changes in the number of non-Hispanic Whites in a neighborhood in model 1. However, as in the first set of results, I next disaggregate by whether the baseline

4. In the appendix tables, I consider alternative thresholds.

Table 2. Black Immigrant Influx and Other Change

	Δ White Persons 2010–2018		Δ Non-Black Immigrants 2010–2018	
	(1)	(2)	(3)	(4)
Δ Black immigrant 2000–2010	0.006	−0.220***	0.387***	0.354***
	(0.049)	(0.053)	(0.016)	(0.018)
x Majority native-born Black 2000		1.322***		0.189***
		(0.122)		(0.040)
Observations	71,420	71,420	71,420	71,420
R^2	0.207	0.209	0.187	0.187

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Models 1 and 2 control for baseline change in White population. Models 3 and 4 control for baseline change in non-Black immigrant population. All models contain additional controls for Census division and changes in population, income, median home value, percent college-educated, vacancy, and number of native-born Black persons.
*p < .05; **p < .01; ***p < .001

share of Black Americans is a majority in model 2. In neighborhoods in which Black Americans were a majority in 2000, there is a relative increase of 110 non-Hispanic Whites with every hundred-person increase in Black immigrants in an earlier period. In contrast, there is a comparable decrease of about twenty-two non-Hispanic Whites in native-Black minority neighborhoods. Thus, surprisingly, when considering all neighborhoods, an increase in Black immigrants is not related to any changes in the non-Hispanic White population. This contrasts with theories about racial residential turnover and empirical patterns in the literature about White out-migration as Black people move into a neighborhood (Frey 1980; Pais, South, and Crowder 2009), underscoring that nativity matters when considering race and residential patterns. However, in Black American neighborhoods, an earlier increase in Black immigrants is positively related to future White residents, suggesting that Black immigrants change these neighborhoods in ways that may make them more attractive to new White residents.

In models 3 and 4 of table 2, I consider change in the number of non-Black immigrants as the outcome variable.[5] For each hundred-person increase in the Black immigrant population is a relative increase of thirty-nine in the non-Black immigrant population. In model 4, I show this increase holds regardless of whether the neighborhood is majority Black immigrant in the baseline year. However, the increase is greater in magnitude in majority Black neighborhoods.

Altogether, these results demonstrate that as Black immigrants move into a neighborhood, they contribute to its diversification by reducing the number of native-born Black persons and increasing the number of non-Hispanic Whites and non-Black immigrants. These patterns are most pronounced in neighborhoods where Black natives were a majority in 2000.

Buffering

The first set of results shows that the arrival of Black immigrants relates to changes in the racial makeup of a neighborhood. To better understand the processes underlying these racial changes, I turn to testing the predictions of the buffering hypothesis as it relates to Black immigrants. To restate, the buffering hypothesis

5. For parsimony, I consider all non-Black immigrants together, but results are similar when broken down into ethnoracial groups.

indicates that (Asian and Hispanic) immigrants can facilitate integration between Black and White households by preceding the entrance of Black households into White neighborhoods (Logan and Zhang 2010; Frey and Farley 1996; Parisi, Lichter, and Taquino 2015; Zhang and Logan 2016). In the global neighborhoods produced by their presence, immigrants become "social and spatial buffer(s)" (Kye and Halpern-Manners 2022). Although this hypothesis has been tested in the literature, how Black immigrants, who are both Black and immigrants, may facilitate Black American and White integration remains unknown.

I first explore whether Black immigrants can mitigate White exit and facilitate White-Black integration as Asian and Hispanic immigrants do (Logan and Zhang 2010; Parisi, Lichter, and Taquino 2015) in model 1 of table 3. As stated, in this model, I consider all neighborhoods in which non-Hispanic Whites were present in 2000 but native-born Black people were not, and test, conditional on whether Black immigrants were present in 2010, the neighborhood reaches one of three end states: one, White exit, where, by 2018, White residents fall below the one-quarter threshold and are no longer considered present in the neighborhood and Black residents are present; two, native-born Black-White integration, where both native-born Black and White residents are present, regardless of what other groups are; and the reference category, three, where Whites are present but native-born Blacks are not, as in 2000. Model 1 of table 3 presents odds ratios that can be interpreted as the likelihood of a neighborhood entering states one and two relative to state three.

As shown, relative to remaining a White neighborhood without any native-born Black residents (the reference category), conditional on the change in the Black native-born population in a neighborhood and the change in the non-Black immigrants, a Black immigrant presence in 2010 is related to higher odds of native-Black and White integration in a neighborhood by 2018 and reduced odds of White exit. In this respect, as would be expected by the buffering hypothesis, Black immigrants do appear to facilitate a pathway to native-born Black-White integration by both reducing the likelihood of White flight and facilitating the entrance of Black Americans.

Because the main results also demonstrated racial changes in neighborhoods that were initially Black American neighborhoods, I next consider the reverse pathway in model 2 of table 3, starting from neighborhoods where native-born Blacks are present but non-Hispanic Whites are not. For these neighbor-

Table 3. Neighborhood Transitions by Black Immigrant Presence in 2010

	Non-Hispanic White Neighborhoods (1)		Native-Born Black Neighborhoods (2)	
	White Exit	Black-White	Black Exit	Black-White
Black immigrant presence 2010	0.809***	1.711***	1.216***	1.839***
Log likelihood	−15,043.57	−15,043.57	−1,643.28	−1,643.28

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Odds ratios reported. Non-Hispanic White Neighborhoods refers to neighborhoods in which non-Hispanic White people were present in 2000, that is, their share exceeded one-quarter of the overall average share of non-Hispanic Whites in the sample, and native-born Black people were not present. Similarly, Native-born Black neighborhoods refers to neighborhoods in which the share of native-born Black people exceeded one-quarter of the overall average share of native-born Black people in the sample, and non-Hispanic Whites were not present. Black in Black-White and Black Exit refer to native-born Black people. Both models are conditional on the change of native-born Black, non-Hispanic White people, and non-Black immigrants in the neighborhood.
*$p < .05$; **$p < .01$; ***$p < .001$

hoods, I consider the likelihood of, first, Black native-born exit, where, by 2018, Black native-born residents fall below the one-quarter threshold, and, second, native-born Black-White integration, where both native-born Black and White residents are present, regardless of what other groups are. The reference category is where the presence of non-Hispanic Whites and native-born Blacks is as in 2000, where native-born Blacks are present, but non-Hispanic Whites are not.

In model 2 of table 3, results show that in neighborhoods in which Black immigrants were present in 2010, the likelihood of Black exit by 2018 increases relative to remaining a neighborhood in which native-born Blacks are present without non-Hispanic Whites. This aligns with the first set of results, demonstrating native-born Black out-migration as Black immigrants move into a neighborhood. On the other hand, relative to remaining a neighborhood without Whites, the likelihood also increases of becoming a neighborhood in which both native-born Blacks and non-Hispanic Whites are present. Therefore, even though Black immigrant presence is related to Black Americans leaving their neighborhoods, these results suggest that Black immigrants can also lead to Black-White integration in some cases. By either leading to Black exit or White influx, Black immigrants are related to racial change in Black American neighborhoods.

Mechanism Exploration

Overall, my findings reveal that an increase in the Black immigrant population is related to a considerable change in the racial composition and racial trajectory of a neighborhood. Within a Black neighborhood, Black immigrant influx is associated with a significant decline in the number of Black native-born residents and an increase in White and other immigrant residents, transforming the composition of the neighborhoods. When considering a neighborhood's trajectory, Black immigrants appear to facilitate two pathways to Black-White coresidence by first buffering White flight as Black native-born people move into non-Black neighborhoods and second by reverse buffering, preceding the arrival of Whites in Black neighborhoods.

Although these results are ultimately descriptive, I conclude by considering two potential explanations for these racial changes, particularly in Black American neighborhoods. First, are Black immigrants changing affordability in Black neighborhoods in ways that displace Black native-born people? To answer this question, I test whether, in Black native-born majority neighborhoods, Black immigrant increase in a neighborhood between 2000 and 2010 is related to subsequent changes between 2010 and 2018 in value and rent. Given the vast heterogeneity across metropolitan areas in changing prices, I consider each neighborhood within the context of its metropolitan area. Thus, in these models, changes in the Black immigrant population, rent, and home value are relative to all neighborhoods within the same metropolitan area. I hold constant earlier trends in the White population, overall population, and rent and home value.

Results for these models are presented in table 4. In Black American neighborhoods, an influx of Black immigrants relates to increasing rents (0.333) and home values (0.376). Therefore, Black immigrants are related to neighborhoods becoming less affordable in ways that may lead to Black exit.

Meanwhile, a selection process may be under way. In this case, Black immigrants would be choosing Black neighborhoods that, by virtue of their earlier trends in affordability, would have experienced racial changes regardless of the presence of Black immigrants. To test this, I consider whether, within a metropolitan area, the rank of the growth of the foreign-born Black population between 2000 and 2010 is related to the relative growth rate in rent and home value between 1990 and 2000. I control for population changes and the changes in the number of non-Hispanic Whites between 1990 and 2000. Results are presented in table 5. The relative growth in the foreign-born Black population between 2000 and 2010 is unrelated to the earlier relative growth rate in rent but positively related to median home value. Thus Black immigrants do appear to be more likely to move into Black neighborhoods with increasing home values, suggesting a potential selection process underlying some of the racial changes. However, the lack of relationship with

Table 4. Potential Mechanism 1: Changing Affordability

	Growth in Rent 2010–2018 (1)	Growth in Home Value 2010–2018 (2)
Growth in Black immigrant 2000–2010	0.333***	0.376***
	(0.038)	(0.039)
Observations	4,403	4,403
R^2	0.047	0.076

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Models control for earlier (2000–2010) changes in outcome variable, number of White residents, and population.
*p < .05; **p < .01; ***p < .001

Table 5. Potential Mechanism 2: Selection

	Growth in Black Immigrant 2000–2010	
	(1)	(2)
Growth in rent 1990–2010	0.012	
	(0.006)	
Growth in home value 1990–2010		0.062***
		(0.006)
Observations	4,403	4,403
R^2	0.037	0.055

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Models control for earlier (1990–2000) changes in number of White residents and population.
*p < .05; **p < .01; ***p < .001

rent growth implies that the residential sorting of Black immigrants is not necessarily defined by increasing prices overall, but other factors that may correlate with home value growth.

Therefore, when considering the Black native-born majority neighborhoods where change is most pronounced, Black immigrants are both moving into Black neighborhoods already primed for racial turnover and changing the neighborhoods in which they reside.

The observed selection process regarding home value works against a causal argument between Black immigrant presence and racial change. Still, the residential selection process is in and of itself worthy of study (Krysan and Crowder 2017). Future research should explore how and why Black immigrants are moving into the Black neighborhoods experiencing increases in home value, as this further contributes to our understanding of the intersections of race, nativity, and neighborhoods.

CONCLUSION

This study sheds light on the role of Black immigration in shaping racialized residential patterns and provides insights into the consequences of Black immigrant residential incorporation on neighborhoods. In summary, these findings indicate that an increase in the Black immigrant population is related to substantial changes in a neighborhood's racial composition and racial trajectory. In particular, within a Black native-born majority neighborhood, Black immigrant influx is associated with a considerable decline in the number of Black native-born residents and an increase in White

and other immigrant residents. Furthermore, Black immigrants appear to facilitate two pathways to Black-White residential integration by, first, buffering White flight as Black native-born people move into non-Black neighborhoods and, second, by preceding the arrival of Whites in Black native-born neighborhoods, a process I call reverse buffering.

These findings highlight the spatial implications of the unique intersection of race and nativity that Black immigrants occupy. As shown, ethnicity and nativity uniquely interact with Blackness and determine unique relationships between Black immigrants and their neighborhoods that cannot be interpolated from the impacts of non-Black immigrants or Black Americans. Although the analyses I conducted do not allow for a full examination of the pathways through which these racial changes occur, my initial exploration of potential mechanisms suggests that Black native-born displacement is occurring. However, even though I cannot adjudicate here, Black native-born aversion to immigrants, even if they are the same race, may also be exacerbating these patterns. Regardless of the mechanisms underlying the Black native-born out-migration, a crucial question emerges: where do these native-born Black residents go? Examining the neighborhoods that Black native-born residents move to provides insight into the costs of neighborhood change and the landscape of future inequality for Black native-born people. I call on future research to investigate this question.

In regard to White in-migration, qualitative research has consistently established that White people treat Black immigrants differently than Black Americans in the labor market because of their ethnicity and nativity (Kasinitz 1992; Waters 1999; Pierre 2004), and the results in this article suggest this may extend to the neighborhoods in which they live. Black immigrants may transform the ethnic character of a neighborhood in ways that entice White householders, particularly gentrifiers (Hwang 2016), even if the racial composition of the neighborhood remains the same.

Altogether, as Black immigrants' presence in a neighborhood changes the racial composition of a Black American neighborhood by increasing in non-Black residents, communities may be perceived of as more diverse. Although diversity and segregation are often presented as opposite ends of a spectrum of racialized spatial dominance, they are not necessarily so, and neighborhoods can often be marked by both racial segregation and diversity (Holloway, Wright, and Ellis 2012; Parisi, Lichter, and Taquino 2015). Thus, to laud the "global" neighborhoods that can be the outcome of an immigrant buffering process (Logan and Zhang 2010) may mask the persistent internal spatial stratification in such places, particularly between Black and White residents (Iceland, Sharp, and Timberlake 2013), and the continued exodus of Whites from diverse areas (Logan and Zhang 2010; Parisi, Lichter, and Taquino 2015). To this end, future research should consider how as, Black immigrants contribute to increased diversity within a neighborhood, patterns of overall Black-White segregation are affected over time, a relationship with implications for the future of neighborhoods as Black immigrants move into them.

The findings from this research have considerable implications on what we know about how race, nativity, and neighborhoods interact. Within the urban sociological literature, scholars who have examined Black immigrant segregation have found consistently that Black immigrants are highly segregated from Whites and integrated with native-born Blacks. This has been taken as evidence of the prevailing importance of race in determining neighborhood attainment. However, this conclusion ignores the inherent dynamism of neighborhoods. As shown, Black immigrants, for several potential reasons, are living in neighborhoods that are changing. Therefore, even though race may determine their initial neighborhoods, their nativity is related to the change these neighborhoods undergo. Thus, given that Black immigrants show greater signs of socioeconomic and cultural incorporation, it may be that their neighborhoods change, rather than them changing the neighborhoods in which they reside. The results from this study provide some extensions of spatial assimilation that warrant further exploration.

More generally, these findings have implications for questions of race, immigration, and the future of racialized spatial inequality. Im-

migrant status appears to transform the racialized hierarchies in residential patterns, thus challenging sociological notions of a monolithic Blackness. In addition, the differential behaviors of White households in reaction to Black native- and Black immigrant in-migration make the particular contours of racism upholding racialized spatial inequality clearer. Perceived nativity may moderate how and where anti-Black racism is manifest, thus clarifying how spatial inequality and segregation for Black native-born people is maintained. With these findings, I emphasize the importance of considering race, ethnicity, and nativity in conjunction when studying residential patterns.

Furthermore, these findings highlight the vast intraracial ethnic heterogeneity within the racial category of Black and the consequences of this heterogeneity on neighborhoods. The changes that Black immigrants facilitate within a neighborhood underscore that Black immigrants' relatively high integration with other Black people is not representative of an ethnic enclave story, as Black is a race, not an ethnicity. Ethnic differences between Black people are salient in the change these neighborhoods undergo.

Still, this study is not without limitations. First, given that I am using publicly available data, I cannot discern between individual-level characteristics that might be a source of heterogeneity in the overall patterns I observe. For example, although country of origin and socioeconomic status are likely important factors that may lead to differential outcomes in how Black immigrants change neighborhoods, as suggested by prior research (Pais, South, and Crowder 2009; Taub, Taylor, and Dunham 1984; Tesfai 2019), here, I collapse all Black immigrants. Second, although the national scope of this study provides a glimpse into how neighborhoods are changing across the United States, I cannot fully explore heterogeneity underlying the observed relationships. Future research can dive deep into particular cities and neighborhoods, and situate these findings in larger historical, political, and social contexts.

Third, because race by nativity is publicly available only from 2000, I am limited to observing changes from the past two decades. However, Black immigration to the United States began earlier in the twentieth century (Hamilton 2019). Therefore, changes may have occurred at the neighborhood level far earlier than I can observe in this study. Finally, this study is limited to considering changes at the tract level. Although I observe diversification at the tract, Black immigrants and the remaining Black native-born residents may continue to be clustered at lower levels of aggregation, maintaining segregation and, likely, the clustering of resources. Due to the data and analytic approach, this study is limited to an analysis of the census tract, but future research, particularly qualitative research, could yield a better understanding of the internal dynamics within census tracts.

These limitations notwithstanding, this study provides a theoretical and empirical entry point for future research to unpack and consider the ramifications of Black immigration on neighborhoods, particularly Black neighborhoods, across the United States. The size and diversity of the Black immigrant population has increased massively in the past several decades. As in the neighborhood in Minneapolis, this study demonstrates that Black immigrants are transforming Black neighborhoods across the United States in nuanced ways. Because the Black immigrant population continues to grow and diversify, this article contributes to our understanding of the complex intraracial spatial dynamics between Black people, how Black immigrants are changing neighborhoods, and our existing theoretical notions of race, nativity, and residential patterns.

APPENDIX

In the following, I consider robustness of results to thresholds defining Black American neighborhoods and presence of groups in a neighborhood.

Sensitivity to Majority Native-Born Black

I consider how the results, particularly for changes in Black native-born and non-Hispanic White residents are sensitive to alternative definitions of a Black native-born neighborhood in 2000. In the main text, I use majority as the definition of these neighborhoods. Here, I consider two additional models: first, I consider

whether the socioeconomic status-by-majority intersection varies results. To operationalize socioeconomic status (SES), I consider neighborhoods that are above the median income for Black native-born majority neighborhoods to be high SES, and neighborhoods below the median income to be low SES. In model 3 of tables A.1 and A.2, I show how results vary when interacting with an indicator of whether a neighborhood is majority native-born Black and high or low SES. The omitted category is neighborhoods that were majority native-born Black and high SES in 2000.

In table A.1, model 3 shows that the out-migration of Black native-born residents is most pronounced in the reference category, neighborhoods that were majority native-born Black and high SES in 2000. There is still an out-migration, albeit smaller, in the other majority native-born Black neighborhoods that were low SES in 2000.

In table A.2, model 3 shows a similar pattern: the in-migration of White residents is most pronounced in neighborhoods that were majority native-born Black. There is out-migration in Black minority neighborhoods regardless of the SES.

Next, I consider whether results hold when considering the threshold for a Black native-born neighborhood to be neighborhoods that have greater than a quarter share (25 percent) of native-born Black residents. In model 4 of tables A.1 and A.2, I demonstrate that the patterns of model 2 (the results in the main text) hold when using a lower threshold of 25 percent rather than 50 percent.

Defining Neighborhood Presence

In the second set of results examining how Black immigrant presence relates to the racial trajectory of a neighborhood, I follow John Logan and Charles Zhang (2010) in defining a group as present within a neighborhood if their share exceeds one-quarter of the overall average share. How do results depend on the choice of this criterion?

To test this, I consider two alternative criteria for relative presence. The first is a less de-

Table A.1. Black Immigrant Influx and Black Native Change Sensitivity

	Δ Native-Born Black Persons 2010–2018			
	(1)	(2)	(3)	(4)
Δ Black immigrant 2000–2010	−0.140***	0.022	−1.125***	−0.092***
	(0.018)	(0.020)	(0.050)	(0.023)
x Majority native-born Black 2000		−0.944***		
		(0.045)		
x Majority native-born Black 2000 and high SES				
x Majority native-born Black 2000 and low SES			0.639***	
			(0.089)	
x Minority native-born Black 2000 and high SES			1.147***	
			(0.054)	
x Minority native-born Black 2000 and low SES			1.124***	
			(0.081)	
x More than 25% native-born Black 2000				−0.581***
				(0.034)
Observations	71,420	71,420	71,420	71,420
R^2	0.115	0.120	0.121	0.118

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: All models control for census division and baseline changes in native-born Black population, total population, number of non-Black immigrants, income, median home value, percent college-educated, vacancy, and White population.
*p < .05; **p < .01; ***p < .001

Table A.2. Black Immigrant Influx and White Change Sensitivity

	Δ Native-Born Black Persons 2010–2018			
	(1)	(2)	(3)	(4)
Δ Black immigrant 2000–2010	0.006	−0.220***	1.068***	−0.440***
	(0.049)	(0.053)	(0.136)	(0.061)
x Majority native-born Black 2000		1.322***		
		(0.122)		
x Majority native-born Black 2000 and high SES				
x Majority native-born Black 2000 and low SES			0.099	
			(0.240)	
x Minority native-born Black 2000 and high SES			−1.367***	
			(0.144)	
x Minority native-born Black 2000 and low SES			−0.471*	
			(0.218)	
x More than 25% native-born Black 2000				1.119***
				(0.092)
Observations	71,420	71,420	71,420	71,420
R^2	0.207	0.209	0.209	0.209

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: All models control for census division and baseline changes in native-born Black population, total population, number of non-Black immigrants, income, median home value, percent college-educated, vacancy, and White population.
*p < .05; **p < .01; ***p < .001

manding 15 percent threshold, where the share of the group is at least as large as 15 percent of the overall group's share in all neighborhoods in the analytic sample.

Using this more inclusive criterion, results are similar in direction and magnitude to the main text, as shown in table A.3. From non-Hispanic White neighborhoods, White exit is less likely and Black-White integration is more likely in neighborhoods where Black immigrants were present in 2010. From native-born Black neighborhoods, Black exit is more likely as is Black-White integration.

I use a more demanding threshold of 50 percent in table A.4. Here, presence means that the share of the group is at least as large as one-half of the overall group's share across all neighborhoods. Results differ considerably, as shown in table A.4. From non-Hispanic White neighborhoods, White exit and Black-White integration are both more likely in neighborhoods where Black immigrants were present in 2010 than remaining a neighborhood without native-born Black presence. From native-born Black neighborhoods, Black exit and Black-White integration are both less likely in neighborhoods with Black immigrant presence.

These results demonstrate that the choice of criterion for presence is consequential; although a lower threshold maintains similar results, when a more demanding criterion is instituted, results tell a different story. However, I argue that a 50 percent criterion is too high to best represent the goal of neighborhood presence because it requires, for example, that native-born Black residents become at least 6 percent of a neighborhood and that native-born White residents are at least 35 percent of the neighborhood to be considered present. These requirements may be too high in a typical tract to accurately represent a changed racial and ethnic character in a neighborhood.

Excluding Top Cities of Settlement

Some Black American neighborhoods may be made up fully or mostly of second- or later-

Table A.3. Neighborhood Transitions by Black Immigrant Presence, 10 Percent Threshold

	Non-Hispanic White Neighborhoods (1)		Native-Born Black Neighborhoods (2)	
	White Exit	Black-White	Black Exit	Black-White
Black immigrant presence 2010	0.827***	1.561***	1.028***	1.682***
Log likelihood	−14,151.81	−14,151.81	−1,545.56	−1,545.56

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Odds ratios reported. Non-Hispanic White Neighborhoods refers to neighborhoods in which non-Hispanic White people were present in 2000, that is, their share exceeded 15 percent of the overall average share of non-Hispanic Whites in the sample, and native-born Black people were not present. Similarly, Native-Born Black Neighborhoods refers to neighborhoods in which the share of native-born Black people exceeded 15 percent of the overall average share of native-born Black people in the sample, and non-Hispanic Whites were not present. Black in Black-White and Black Exit refer to native-born Black people. Both models are conditional on the change of native-born Black, non-Hispanic White people, and non-Black immigrants in the neighborhood.
*$p < .05$; **$p < .01$; ***$p < .001$

Table A.4. Neighborhood Transitions by Black Immigrant Presence, 50 Percent Threshold

	Non-Hispanic White Neighborhoods (1)		Native-Born Black Neighborhoods (2)	
	White Exit	Black-White	Black Exit	Black-White
Black immigrant presence 2010	1.774***	1.902***	0.998***	0.593***
Log likelihood	−12,323.43	−12,323.43	−1,888.10	−1,888.10

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Odds ratios reported. Non-Hispanic White Neighborhoods refers to neighborhoods in which non-Hispanic White people were present in 2000, that is, their share exceeded one-half of the overall average share of non-Hispanic Whites in the sample, and native-born Black people were not present. Similarly, Native-Born Black Neighborhoods refers to neighborhoods in which the share of native-born Black people exceeded one-half of the overall average share of native-born Black people in the sample, and non-Hispanic Whites were not present. Black in Black-White and Black Exit refer to native-born Black people. Both models are conditional on the change of native-born Black, non-Hispanic White people, and non-Black immigrants in the neighborhood.
*$p < .05$; **$p < .01$; ***$p < .001$

generation descendants of Black immigrants and these neighborhoods likely change in different ways to other neighborhoods as Black immigrants increase. However, I cannot observe the ethnic origin of the Black population in each tract. To address this limitation, I remove all tracts in the cities that were in the top 5 percent of the number of Black immigrants in 2000 for the main results (table A.5). In these cities, we would expect that the problem noted here would be most pronounced, as they are more likely to have second-generation and greater Black immigrant neighborhoods. However, even without these cities included, patterns remain similar to the overall results (table A.6).

Table A.5. Black Immigrant Influx and Black Native Change Without Top Cities of Settlement 2000

	Δ Native-Born 2010–2018	
	(1)	(2)
Δ Immigrant 2000–2010	−0.176***	0.022
	(0.046)	(0.049)
x Majority native-born 2000		−1.971***
		(0.150)
Observations	62,052	62,052
R^2	0.079	0.084

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: All models control for census division and baseline changes in native-born Black population, total population, number of non-Black immigrants, income, median home value, percent college-educated, vacancy, and White population. Excludes all metropolitan areas in the top 5 percent of Black immigrant presence in 2000.
*p < .05; **p < .01; ***p < .001

Table A.6. Black Immigrant Influx and Other Change Without Top Cities of Settlement

	Δ White Persons		Δ Non-Black Immigrants	
	(1)	(2)	(3)	(4)
Δ Black immigrant 2000–2010	−0.174	−0.377*	0.431***	0.442***
	(0.148)	(0.155)	(0.032)	(0.033)
x Majority native-born Black 2000		2.021***		−0.109
		(0.480)		(0.103)
Observations	62,052	62,052	62,052	62,052
R^2	0.222	0.223	0.309	0.309

Source: Author's calculations based on U.S. Census Bureau 2002, 2013, 2022.
Note: Models 1 and 2 control for baseline change in White population. Models 3 and 4 control for baseline change in non-Black immigrant population. All models contain additional controls for census division and changes in population, income, median home value, percent college-educated, vacancy, and number of native-born Black persons. Excludes all metropolitan areas in the top 5 percent of Black immigrant presence in 2000.
*p < .05; **p < .01; ***p < .001

REFERENCES

Candipan, Jennifer, and Michael M. Bader. 2022. "The Dual Role of Race and Immigration Among Ascending Neighborhoods in U.S. Metropolitan Areas." *Population Research and Policy Review* 41(4): 1725–56. https://doi.org/10.1007/s11113-022-09706-6.

Card, David. 2001. "Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration." *Journal of Labor Economics* 19(1): 22–64. https://doi.org/10.1086/209979.

Charles, Camille Zubrinksy. 2000. "Neighborhood Racial-Composition Preferences: Evidence from a Multiethnic Metropolis." *Social Problems* 47(3): 379–407. https://doi.org/10.2307/3097236.

———. 2006. *Won't You Be My Neighbor: Race, Class, and Residence in Los Angeles*. New York: Russell Sage Foundation.

Clark, William A. V. 2009. "Changing Residential Preferences Across Income, Education, and Age: Findings from the Multi-City Study of

Urban Inequality." *Urban Affairs Review* 44(3): 334–55. https://doi.org/10.1177/1078087408321497.

Crowder, Kyle D. 1999. "Residential Segregation of West Indians in the New York/New Jersey Metropolitan Area: The Roles of Race and Ethnicity." *International Migration Review* 33(1): 79–113.

Crowder, Kyle D., Matthew Hall, and Stewart E. Tolnay. 2011. "Neighborhood Immigration and Native Out-Migration." *American Sociological Review* 76(1): 25–47. https://doi.org/10.1177/0003122410396197.

Cutler, David M., Edward L. Glaeser, and Jacob L. Vigdor. 2008. "When Are Ghettos Bad? Lessons from Immigrant Segregation in the United States." *Journal of Urban Economics* 63(3): 759–74.

Ellen, Ingrid Gould. 2000. *Sharing America's Neighborhoods: The Prospects for Stable Racial Integration*. Cambridge, Mass.: Harvard University Press.

Ellis, Mark, and Richard Wright. 1998. "The Balkanization Metaphor in the Analysis of U.S. Immigration." *Annals of the Association of American Geographers* 88(4): 686–98. https://doi.org/10.1111/0004-5608.00118.

Farley, Reynolds, and William H. Frey. 1994. "Changes in the Segregation of Whites from Blacks During the 1980s: Small Steps Toward a More Integrated Society." *American Sociological Review* 59(1): 23–45.

Freeman, Lance. 2002. "Does Spatial Assimilation Work for Black Immigrants in the US?" *Urban Studies* 39(11): 1983–2003. https://doi.org/10.1080/0042098022000011326.

Frey, William H. 1980. "Black In-Migration, White Flight, and the Changing Economic Base of the Central City." *American Journal of Sociology* 85(6): 1396–417. https://doi.org/10.1086/227170.

———. 1995. "Immigration and Internal Migration 'Flight' from US Metropolitan Areas: Toward a New Demographic Balkanisation." *Urban Studies* 32(4–5): 733–57. https://doi.org/10.1080/00420989550012861.

———. 2022. "A 'New Great Migration' Is Bringing Black Americans Back to the South." *Brookings* (blog), September 12. Accessed April 15, 2024. https://www.brookings.edu/research/a-new-great-migration-is-bringing-black-americans-back-to-the-south.

Frey, William H., and Reynolds Farley. 1996. "Latino, Asian, and Black Segregation in U.S. Metropolitan Areas: Are Multiethnic Metros Different." *Demography* 33(1): 35–50.

Hamilton, Tod G. 2019. *Immigration and the Remaking of Black America*. New York: Russell Sage Foundation.

———. 2020. "Black Immigrants and the Changing Portrait of Black America." *Annual Review of Sociology* 46(1): 295–313.

Holloway, Steven R., Richard Wright, and Mark Ellis. 2012. "The Racially Fragmented City? Neighborhood Racial Segregation and Diversity Jointly Considered." *The Professional Geographer* 64(1): 63–82. https://doi.org/10.1080/00330124.2011.585080.

Hwang, Jackelyn. 2016. "Pioneers of Gentrification: Transformation in Global Neighborhoods in Urban America in the Late Twentieth Century." *Demography* 53(1): 189–213. https://doi.org/10.1007/s13524-015-0448-4.

Iceland, John. 2004. "Beyond Black and White: Metropolitan Residential Segregation in Multi-Ethnic America." *Social Science Research* 33(2): 248–71.

———. 2009. *Where We Live Now: Immigration and Race in the United States*. Berkeley: University of California Press.

Iceland, John, Gregory Sharp, and Jeffrey M. Timberlake. 2013. "Sun Belt Rising: Regional Population Change and the Decline in Black Residential Segregation, 1970–2009." *Demography* 50(1): 97–123.

Kasinitz, Philip. 1992. *Caribbean New York: Black Immigrants and the Politics of Race*. Ithaca, N.Y.: Cornell University Press.

Krysan, Maria. 2002. "Community Undesirability in Black and White: Examining Racial Residential Preferences Through Community Perceptions." *Social Problems* 49(4): 521–43. https://doi.org/10.1525/sp.2002.49.4.521.

Krysan, Maria, Mick P. Couper, Reynolds Farley, and Tyrone A. Forman. 2009. "Does Race Matter in Neighborhood Preferences? Results from a Video Experiment." *American Journal of Sociology* 115(2): 527–59. https://doi.org/10.1086/599248.

Krysan, Maria, and Kyle Crowder. 2017. *Cycle of Segregation: Social Processes and Residential Stratification*. New York: Russell Sage Foundation.

Krysan, Maria, and Reynolds Farley. 2002. "The Residential Preferences of Blacks: Do They Explain Persistent Segregation?" *Social Forces* 80(3): 937–80.

Kye, Samuel H., and Andrew Halpern-Manners. 2022. "Detecting 'White Flight' in the Contemporary United States: A Multicomponent Approach." *Sociological Methods & Research* 51(1): 3–33. https://doi.org/10.1177/00491241198824 54.

Liker, Jeffrey K., Sue Augustyniak, and Greg J. Duncan. 1985. "Panel Data and Models of Change: A Comparison of First Difference and Conventional Two-Wave Models." *Social Science Research* 14(1): 80–101.

Logan, John R. 1978. "Growth, Politics, and the Stratification of Places." *American Journal of Sociology* 84(2): 404–16.

Logan, John R., and Charles Zhang. 2010. "Global Neighborhoods: New Pathways to Diversity and Separation." *American Journal of Sociology* 115 (4): 1069–109. https://doi.org/10.1086/649498.

Manson, Steven, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. 2022. "National Historical Geographic Information System: Version 17.0." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D050.V17.0.

Pais, Jeremy F., Scott J. South, and Kyle Crowder. 2009. "White Flight Revisited: A Multiethnic Perspective on Neighborhood Out-Migration." *Population Research and Policy Review* 28(3): 321–46. https://doi.org/10.1007/s11113-008 -9101-x.

Parisi, Domenico, Daniel Lichter, and Michael Taquino. 2015. "The Buffering Hypothesis: Growing Diversity and Declining Black-White Segregation in America's Cities, Suburbs, and Small Towns?" *Sociological Science* 2: 125–57. https://doi.org /10.15195/v2.a8.

Park, Julie, and John Iceland. 2011. "Residential Segregation in Metropolitan Established Immigrant Gateways and New Destinations, 1990–2000." *Social Science Research* 40(3): 811–21.

Pierre, Jemima. 2004. "Black Immigrants in the United States and the 'Cultural Narratives' of Ethnicity." *Identities* 11(2): 141–70. https://doi .org/10.1080/10702890490451929.

Saiz, Albert, and Susan Wachter. 2011. "Immigration and the Neighborhood." *American Economic Journal: Economic Policy* 3(2): 169–88.

Santiago, Anne M. 1991. *The Spatial Dimensions of Ethnic and Racial Stratification*. Ann Arbor: University of Michigan, Population Studies Center.

Scopilliti, Melissa, and John Iceland. 2008. "Residential Patterns of Black Immigrants and Native-Born Blacks in the United States." *Social Science Quarterly* 89(3): 551–72. https://doi.org/10.1111 /j.1540-6237.2008.00547.x.

South, Scott J., and Kyle D. Crowder. 1998. "Leaving the 'Hood: Residential Mobility Between Black, White, and Integrated Neighborhoods." *American Sociological Review*: 63(1): 17–26.

Tamir, Christine. 2022. "Key Findings about Black Immigrants in the U.S." *Pew Research Center* (blog), January 27. Accessed April 15, 2024. https://www.pewresearch.org/fact-tank/2022 /01/27/key-findings-about-black-immigrants-in -the-u-s.

Taub, Richard P., D. Garth Taylor, and Jan D. Dunham. 1984. *Paths of Neighborhood Change: Race and Crime in Urban America*. Chicago: University of Chicago Press.

Taylor, Marylee C. 1998. "How White Attitudes Vary with the Racial Composition of Local Populations: Numbers Count." *American Sociological Review* 63(4): 512–35.

Tesfai, Rebbeca. 2013. "The Economic Lives of Black Immigrants: An Analysis of Wages, Homeownership, and Locational Attainment in the United States." Philadelphia: University of Pennsylvania.

———. 2019. "Double Minority Status and Neighborhoods: Examining the Primacy of Race in Black Immigrants' Racial and Socioeconomic Segregation." *City & Community* 18(2): 509–28. https:// doi.org/10.1111/cico.12384.

Tesfai, Rebbeca, Matt Ruther, and Janice Madden. 2020. "Precursors to Neighborhood Revitalization? Immigrant Growth and Urban Neighborhood Change in New and Traditional Immigrant Settlement Areas in the United States." *Urban Geography* 41(2): 268–92. https://doi.org/10.1080 /02723638.2019.1647755.

U.S. Census Bureau. 2002. "Census 2000: Summary Population and Housing Characteristics." Washington: U.S. Department of Commerce. Accessed October 20, 2022. https://www.census.gov /library/publications/2002/dec/phc-1.html.

———. 2013. "2008–2012 American Community Survey Statistics." Washington: U.S. Department of Commerce. Accessed October 31, 2022. https:// www.census.gov/newsroom/press-kits/2013 /20131217_acs_5yr.html.

———. 2022. "American Community Survey 2016–2020 5-Year Data Release." Washington: U.S. Department of Commerce. Accessed October 31, 2022. https://www.census.gov/newsroom/press -kits/2021/acs-5-year.html.

Waldinger, R. 1989. "Immigration And Urban Change." *Annual Review of Sociology* 15(1): 211–32. https://doi.org/10.1146/annurev.soc.15.1.211.

Waters, Mary C. 1996. "The Intersection of Gender, Race, and Ethnicity in Identity Development of Caribbean American Teens." In *Urban Girls: Resisting Stereotypes, Creating Identities*, edited by Bonnie J. Leadbeater and Niobe Way, 65–81. New York: New York University Press.

———. 1999. *Black Identities: West Indian Immigrant Dreams and American Realities*. Cambridge, Mass.: Harvard University Press.

White, Michael J., and Jennifer E. Glick. 2009. *Achieving Anew: How New Immigrants Do in American Schools, Jobs, and Neighborhoods.* New York: Russell Sage Foundation.

Wilson, William Julius, and Richard P. Taub. 2007. *There Goes the Neighborhood: Racial, Ethnic, and Class Tensions in Four Chicago Neighborhoods and Their Meaning for America*. New York: Knopf.

Wooldridge, Jeffrey M. 2021. "Two-Way Fixed Effects, the Two-Way Mundlak Regression, and Difference-in-Differences Estimators." *SSRN* 3906345. http://dx.doi.org/10.2139/ssrn.3906345.

Wright, Richard, and Mark Ellis. 2021. "Rethinking the 'Buffering' Theory of Neighborhood Racial Transition." *Sociology Compass* 15(5): e12880. https://doi.org/10.1111/soc4.12880.

Zhang, Wenquan, and John R. Logan. 2016. "Global Neighborhoods: Beyond the Multiethnic Metropolis." *Demography* 53(6): 1933–53. https://doi.org/10.1007/s13524-016-0516-4.

Economic Inequality and the Geography of Activity Space Segregation: Combining Mobile Device Data and Census Data

SIWEI CHENG, YONGJUN ZHANG, AND JENNA SHAW

This article combines daily mobility data collected via mobile device and the American Community Survey to create comprehensive measures of activity space segregation across geographic areas in the United States. We extend conventional measures of spatial segregation to incorporate exposure in individuals' routine activities, weighted by the flows of individuals between census block groups. Our analysis reveals three key findings. First, metropolitan areas vary significantly in the degree of activity space segregation. Second, individuals exhibit a lesser degree of income and racial segregation in their activity space than in their residential space. Third, income inequality at the metropolitan statistical area level is associated with greater isolation for both lowest and highest income groups; economic inequality exerts a more substantial influence on activity space isolation than residential segregation.

Keywords: activity space, segregation, economic inequality, mobile device data, census data

The segregation of individuals from different social groups into distinct physical and social spaces leads to the maintenance and reproduction of inequality. To measure segregation, social scientists have developed various models, especially those that focus on exposure between groups in their residential location (Theil and Finizza 1971; Massey and Denton 1988; Massey 2012; Reardon and Firebaugh 2002; Reardon and O'Sullivan 2004). These measures usually center on the sorting of residential location as a primary source of segregation, taking the distance between two residential communities into account. However, individuals may often interact with others beyond their residential neighborhoods, meaning that residential location and spatial distance may not fully capture the degree of segregation they experience in their everyday activities (Athey et al. 2021; Browning et al. 2021; Cagney et al. 2020; Nilforoshan et al. 2023; Wang et al. 2018; Zhang and Cheng 2024). Building on this

Siwei Cheng is an associate professor in the Department of Sociology at New York University, United States. **Yongjun Zhang** is an assistant professor in the Department of Sociology and Institute for Advanced Computational Science at Stony Brook University, United States. **Jenna Shaw** is a PhD student in the Department of Sociology at New York University, United States.

© 2025 Russell Sage Foundation. Cheng, Siwei, Yongjun Zhang, and Jenna Shaw. 2025. "Economic Inequality and the Geography of Activity Space Segregation: Combining Mobile Device Data and Census Data." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 132–52. https://doi.org/10.7758/RSF.2025.11.1.07. Direct correspondence to: Siwei Cheng, siwei.cheng@nyu.edu, 295 Lafayette St, 4th Fl, New York, New York 10012, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

literature, we modify the conventional spatial isolation index by adding another layer of exposure between communities: connections through the everyday mobility of individuals. Although recent studies have taken a social network approach to measure segregation using geocoded mobility data (Candipan et al. 2021; Echenique and Fryer 2007; Wang et al. 2018), they have not yet examined mobility-based segregation on a national scale or looked into the factors driving variations in segregation across metro areas. Using large-scale data on cross-census block group (CBG) population mobility in 384 U.S. metro areas, we construct measures of exposure to income and racial groups that are weighted by the flows of individuals between CBGs. These spatial and human mobility data, when combined with large-scale national surveys, afford an opportunity to create a more comprehensive and fine-grained measure of activity space segregation across geographic areas in the United States. Finally, we combine the metropolitan statistical area (MSA) measures of income and racial segregation in activity space with a large number of MSA-level covariates to examine the geographic variation of activity space segregation, with a particular focus on how MSA-level economic inequality shapes this geographic variation.

Our empirical analysis reveals substantial variation in income and racial segregation of activity spaces across metropolitan areas. Although the mobility-based isolation both income and racial groups experience tends to be lower than distance-based isolation, racial boundaries impose a more significant constraint on individuals' daily activities than income disparities do. Income inequality at the MSA level is associated with greater relative isolation for both advantaged and disadvantaged racial and income groups. Moreover, although individuals tend to offset some of the residential segregation based on income and race through their daily activities, segregation within their activity space responds more sensitively to economic inequality compared to their residential space. Our results call attention to activity space as an especially pivotal domain of socioeconomic segregation in times of rising economic inequality.

FROM RESIDENTIAL SEGREGATION TO ACTIVITY SPACE SEGREGATION

Individuals from various racial and income groups are distributed unequally into local environments that shape the potential for accessing social and economic resources and group-specific contact (Reardon et al. 2008; Sharkey and Faber 2014). Most work focuses on capturing the local environment as the residential neighborhood, such as the census tract or block group in which an individual resides. An area is viewed as segregated if different groups are disproportionately allocated to residential neighborhoods. Beyond the home residential neighborhood, several studies have explored incorporating the spatial patterning of population distributions into measures of segregation (Grannis 2002; Massey and Denton 1988; Morrill 1991; Wong 2002). For instance, racially or economically homogeneous neighborhoods may also be encircled by similarly homogeneous ones, leading to the spatial concentration of certain racial and income groups. Therefore, group exposure can extend beyond the residential neighborhood into other spatially proximate locations. To account for this patterning, researchers have adapted segregation measures to define the local environment as the combination of the home community and communities that are close to the home community (Reardon and O'Sullivan 2004).

More recently, the literature on activity space has broadened the scope of the local environment to incorporate social spaces that individuals enter through their daily routines of commuting, working, schooling, and other activities (Browning and Soller 2014; Cagney et al. 2020; Jones and Pebley 2014; Wong and Shaw 2011). Spatial proximity appears to be an important factor in activity spaces, given that individuals may be more likely to spend time in places closer to home. Activity space, however, is not simply a function of physical distance between locations. Instead, the scope of a person's daily encounters is determined by social, economic, and structural forces. High-income individuals may be well resourced (for example, owning a car or having access to reliable transportation) to make regular trips to neighborhoods not in close proximity, whereas low-income individuals may struggle with transpor-

tation insecurity that limits their mobility across neighborhoods (Edwards 2018; Murphy et al. 2022); racial minorities may avoid traveling to a nearby, majority-White neighborhood because racial minorities are stigmatized or marginalized in those communities, and members of majorities may feel uncomfortable going into minority neighborhoods (Anderson 2015).

To measure activity space, researchers have designed surveys in which individuals were asked to report their routine trips or activities (Browning et al. 2021; Jones and Pebley 2014). However, survey data are often limited by their relatively small sample sizes, which restricts their ability to analyze variations across geographic areas. To resolve this issue, certain recent studies have relied on digital trace data that track individuals' movements and locations in real time (Athey et al. 2021; Bailey et al. 2018; Candipan et al. 2021; Sampson and Levy 2020; Song et al. 2010; Wang et al. 2018; Zhang et al. 2023). These studies document considerable differences in the everyday travels of individuals to poor and nonpoor neighborhoods depending on the racial and income composition of the home neighborhood (Candipan et al. 2021; Wang et al. 2018). Even though some studies find that activity space may closely match or even exceed the levels of segregation within residential spaces alongside growing economic inequality (Mijs and Roe 2021; Wang, Li, and Chai 2012), others find that activity space is often less segregated than residential space (Athey et al. 2021; Silm and Ahas 2014; Wang and Li 2016), or that there are only weak associations between residential and activity space due to factors such as access to transportation (Zenk et al. 2011; Wang and Li 2016). Together, this literature demonstrates the potential of real-time mobility data to reveal essential patterns of segregation in individuals' daily activities beyond their residential location.

THE GEOGRAPHIC VARIATIONS OF ACTIVITY SPACE SEGREGATION

The degrees and mechanisms of spatial segregation have not been uniform across different areas in the United States. Research on residential segregation indicates that the degree of racial and income segregation at the metropolitan level depends on the composition and intersection of racial and income groups, the political context, the distribution of demographic characteristics such as nativity and age, occupational and industrial composition, economic inequality, schooling, housing, and other local policies (Abramson, Tobin, and VanderGoot 1995; Faber 2020; Massey 2020; Logan, Stults, and Farley 2004; Owens, Reardon, and Jencks 2016; Reardon and Bischoff 2011; Trounstine 2018). Research has also documented the negative influence of residential segregation on the equality of children's socioeconomic opportunities by race and income (Chetty et al. 2014; Sharkey 2013; Sharkey and Faber 2014).

The growing availability of large-scale mobile device data provides a unique opportunity to examine the geographic variations in activity space segregation across the nation. Existing literature has mainly focused on the overall patterns of mobility and segregation in a few large cities or metropolitan areas (Moro et al. 2021; Wang et al. 2018). In contrast, our study is the first to explore the patterns and determinants of the geographic variations of income and racial segregation in individuals' activity space. Through our analyses, we reveal the contextual factors that shape the connectedness (or lack of it) between communities, particularly those that experienced heightened economic inequality.

ECONOMIC INEQUALITY AND ACTIVITY SPACE SEGREGATION

Economic inequality has frequently been linked to segregation. Most of the literature focuses on the impact of inequality on spatial segregation due to residential sorting (Tammaru et al. 2020; Scarpa 2015; Watson 2009; Mutgan and Mijs 2023; Watson 2006; Jargowsky and Wheeler 2017; Quillian 2012). Studies have found that residential segregation has risen steadily alongside income inequality (Reardon et al. 2018; Watson 2009; Taylor and Fry 2012), but more recent literature accounting for bias due to sampling variation within census long form and American Community Survey (ACS) data found that it has actually remained fairly stable or risen only slowly since 1990 (Logan et al. 2020; Reardon et al. 2018). In particular, evidence suggests that residential segregation is

driven mostly by high-income households (Reardon and Bischoff 2011) and households with children given their distinct preferences in schools and other neighborhood resources and features (Reardon et al. 2018; Owens 2016; Bernelius and Vaattovaara 2016). Many studies have also found that racial and ethnic differences play a role in the size of the relationship between economic inequality and residential segregation through discrimination, housing policy, or differential residential preferences (Logan et al. 2020; Reardon et al. 2018, 2008; Huffman and Cohen 2004; Watson 2009; Reardon and Bischoff 2011; Taylor and Fry 2012; Florida and Mellander 2018; Mulder 2013). Components of the built environment, like highways, street networks, and public transportation systems, may influence residential segregation (Reardon et al. 2008), and other cultural and socioeconomic preferences that develop as economic inequality increases may also have an impact (Smith, McPherson, and Smith-Lovin 2014).

However, the literature to date has not captured how individuals experience the impacts of economic inequality on segregation in their daily lives (Järv et al. 2021). The concept of activity space effectively encapsulates various locations where potential segregation may occur, such as residential spaces, workplaces, educational institutions, and places of leisure and other nonemployment activities (Mijs and Roe 2021; Schwanen and Kwan 2012). Some research argues that patterns of residential segregation can expand to activity space segregation, given that people spend significant time in and around their homes (Schwanen and Kwan 2012; Krivo et al. 2013). However, the mechanisms underpinning segregation in daily activities, when outside home locations, might diverge from those propelling residential segregation.

Along with their home, people spend a significant amount of their time at their workplaces (Blair and Lichter 1991). Although some evidence suggests that workplaces are becoming increasingly integrated between groups of varying economic and racial-ethnic groups (Estlund 2003), other work maintains that gaps between the workplaces of economic groups are increasing (Mijs and Roe 2021), and that Blacks specifically are segregated into jobs because of discrimination, residential segregation, and network differences (Hellerstein and Neumark 2008). This may be especially true in areas with a high concentration of Blacks (Huffman and Cohen 2004). The connection between residential and workplace segregation is also mixed, with some studies suggesting they are weakly correlated (Tammaru et al. 2016) and others suggesting they go in opposite directions (Hall, Iceland, and Yi 2019; Ellis, Wright, and Parks 2004). Educational institutions provide another potential space for segregation, with schools often reflecting the inequality of neighborhoods or being more segregated than the neighborhoods themselves (Boterman et al. 2019; Burgess, Wilson, and Lupton 2005).

Activities that are carried out beyond the home, work, and school can also be significant sources of interaction or segregation in activity spaces. Differential preferences in leisure activities (Kamenik, Tammaru, and Toomet 2014; Tammaru, Marcińczak, and Kukk 2018) and religious and cultural institutions (Hellerstein and Neumark 2008) can provide separation between economic and racial groups. Higher-income individuals typically spend more on leisure activities in general (Karonen and Niemelä 2022) and engage in more recreational activities than low-income individuals (Petersen et al. 2021), who often must look for low-cost and easily accessible leisure opportunities (Cantor et al. 2022).

Across these areas, economic inequality may affect the isolation experienced by income groups in different ways. Residential spaces sorted into by low and high income groups often exhibit disparate characteristics, including accessibility to public spaces, public transportation, amenities, and activities (Reardon et al. 2008). The increasing disparities in these resources, as inequality grows, could lead to increased isolation among low income groups in residential spaces. Further, workplace segregation between low-wage and high-wage jobs may increase with inequality (Mijs and Roe 2021), which may further isolate low-income groups. Disparities in leisure activity preferences and options can also worsen with increasing economic inequality (Toger et al. 2023). Although some studies show that individuals' activity choices depend more on how they see their so-

cial status than any actual measure of inequality, inequality does partially explain this distinction (Järv et al. 2021). In addition, rising economic segregation due to economic inequality may be more significant within minority populations (Reardon and Bischoff 2011; Florida and Mellander 2018), combining with existing racial segregation to compound isolation (Sharkey 2013).

RESEARCH QUESTIONS

Our research investigates mobility-based segregation across metropolitan areas, guided by three distinct questions: How does mobility-based segregation by race and income vary across metropolitan areas? How do mobility-based segregation measures differ from distance-based segregation measures? Does economic inequality increase isolation in individuals' activity space, net of other contextual characteristics? To answer these questions, we use a combination of the most recent census data and large-scale daily mobility data.

Data

Our data fall into three categories: community, mobility, and metropolitan.

Community Characteristics

Our basic units of community-level analysis are census block groups (CBG). We obtain CBG-level demographic characteristics via American Community Survey's 2015–2019 five-year data. We retrieve each CBG's racial and income composition data as well as other features such as poverty, education, and unemployment. Based on racial composition, we create a *Race* variable to indicate the predominant race of the community, including Asian, Black, Hispanic, White, and Mixed. For instance, if a CBG's non-Hispanic Whites exceed 50 percent, we treat this CBG as White; if no racial group dominates in a CBG, we treat it as mixed. Similarly, we quantile the median household income (that is, Q1–Q4) to create the *Socioeconomic Status* variable to capture the relative socioeconomic position of each CBG. Q1 indicates the bottom 25 percent, and Q4 economically advantaged communities.[1]

Mobility Data from SafeGraph's Mobile Device Records

To capture individuals' daily movement, we obtain large-scale mobility flows across neighborhoods via SafeGraph COVID-19 Data Consortium, which contains origin-to-destination (O-D) flow data at the CBG level. We focus on 2019 for our empirical analysis to ensure data coverage consistency and to avoid the impact of the COVID-19 pandemic on mobility patterns (Zhang and Cheng 2024). The construction of between-CBG flows takes the following steps. First, SafeGraph uses a mobile device's common nighttime (6 p.m. to 7 a.m. local time) location over the last six-week period at the level of Geohash-7 granularity (153m × 153m) to define the home CBG. Second, SafeGraph tracks detailed mobility flow information from origin to destination places (such as restaurants, schools, hospitals, and churches) based on GPS pings from millions of anonymous mobile devices. Third, SafeGraph then aggregates all devices by home CBGs after applying deferential privacy to device count metrics by adding the Laplacian Noise to anonymize residents at the CBG level.[2] The aggregated data includes the number of daily visits between CBGs, as well as the number of unique devices in each

1. We use the marginal household income distribution instead of the median household income. Based on the ACS five-year estimate and national income distribution in 2019, we compute the rate for income groups including 0–29,999 (Q1), 30,000–59,999 (Q2), 60,000–99,999 (Q3), and 100,000 or more (Q4).

2. We follow existing work (Athey et al. 2021; Zhang and Cheng 2024) in using the residential composition in the destination community as the proxy for individuals' potential exposure in their daily travels. We acknowledge that specific locations within the community, such as restaurants, grocery stores, and libraries, might attract visitors whose demographics differ significantly from those of the community at large. In a recent working paper, Zhang and Cheng (2024) compare group exposure patterns using the composition of residents in a destination community versus using the composition of visitors to specific places. Their analysis suggests that using these two proxies yielded similar findings about mobility patterns in terms of income and racial group exposure.

CBG. Although the SafeGraph data present a valuable opportunity to investigate group exposure in daily life, using the count of unique devices in the SafeGraph data as a proxy for the underlying population may lead to issues with the coverage and representativeness of the sample. In the methodological appendix, we provide a more detailed discussion of these limitations and outline how they affect our analytic strategies.

Metropolitan Area Characteristics

We use the 2015–2019 individual-level data from the ACS obtained from the Integrated Public Use Microdata Series (IPUMS) to construct covariates at the level of metropolitan areas. Individual-level covariates include race and ethnicity, education level, employment and labor-force status, occupation groups, and total personal income measures. Household-level covariates include single-parent household and poverty status and total household income measures. This analysis is based on 15,947,624 unique individuals and 6,989,126 unique households from 261 MSAs, with all other MSAs unidentifiable due to their small sizes in the ACS data. A summary of covariates used in the analysis is shown in table 1.

Table 1. Mean and Standard Deviation of Household- and Individual-Level Covariates Across MSAs

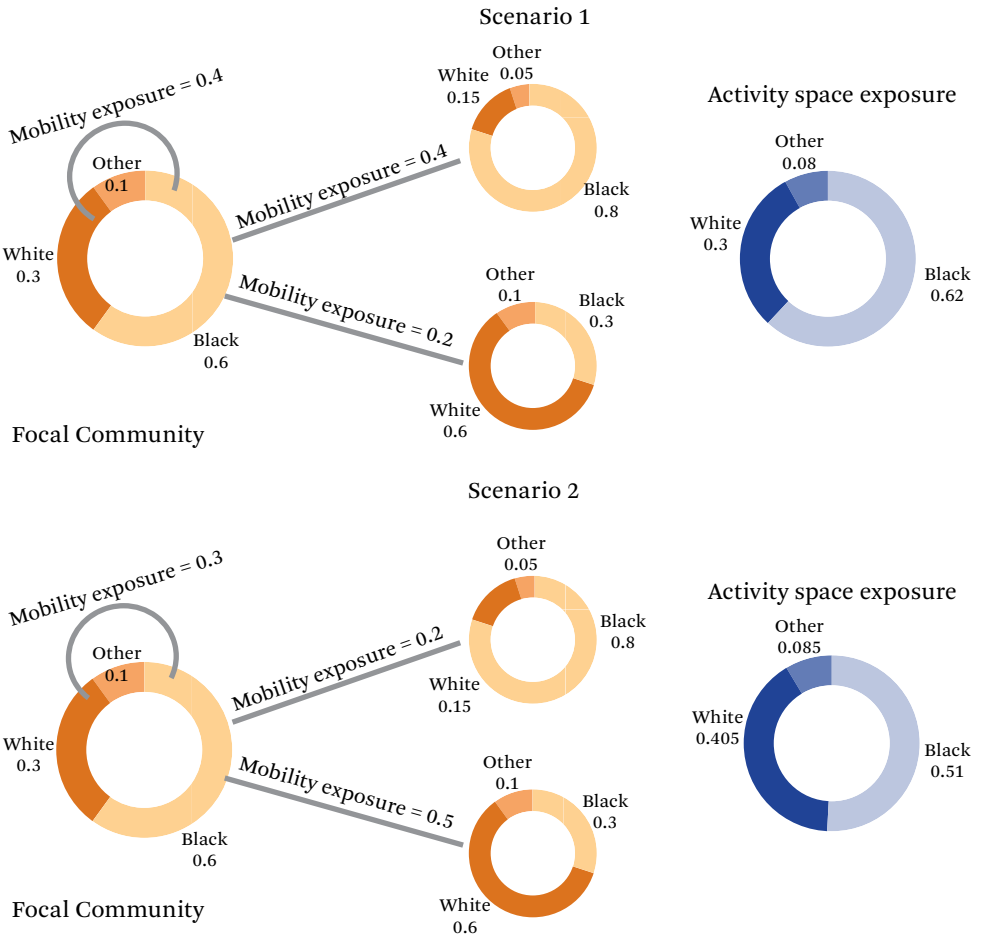
	Mean	Standard Deviation
Panel A. Household-level covariates		
Households	19,553	36,605
Single parent	0.273	0.043
Poverty status	0.127	0.033
Child under five present	0.102	0.025
Zero income	0.017	0.007
Median log income	10.508	0.197
Gini coefficient of log income	0.102	0.017
Variance of log income	5.646	1.712
Panel B. Individual-level covariates		
Individuals	45,349	89,457
Non-Hispanic White	0.663	0.185
Non-Hispanic Black	0.107	0.103
Asian	0.038	0.048
Hispanic	0.160	0.180
Mixed race	0.032	0.019
Other race	0.045	0.051
Foreign born	0.111	0.077
High school	0.688	0.058
Bachelor's degree	0.210	0.061
Advanced degree	0.077	0.030
Out of labor force	0.307	0.047
Unemployment rate	0.027	0.006
Zero income	0.016	0.006
Median log income	10.097	0.155
Gini coefficient of log income	0.076	0.009
Variance of log income	3.048	0.791

Source: Authors' tabulation based on the American Community Survey (Ruggles et al. 2024).
Note: 2015–2019 individual-level data from the American Community Survey. All statistics are weighted.

Measures of Mobility-Based Segregation

To introduce our key measures, we begin with a graphical illustration for mobility-based group exposure in two scenarios (figure 1). The plots depict the racial makeup of a focal community alongside two others visited by its residents. The intensity of within- and between-community travel, labeled mobility exposure, is indicated by the thickness of the lines linking these communities. The plots on the right represent each individual's exposure to racial groups in the activity space, calculated as the weighted average of the racial compositions of the three communities, with weights corresponding to mobility exposure levels. The two hypothetical scenarios shown in this figure involve the same communities but vary in the patterns of mobility. Scenario 1 shows a marked tendency to travel to a community with a higher percentage of Black residents, resulting in increased exposure to Black individuals in activity space relative to residential space (0.62 versus 0.6). Conversely, Scenario 2 depicts greater tendency to travel to a majority White community, leading to reduced exposure to Black individuals (0.51 versus 0.6). This comparison underscores the fundamental aspect of our mobility-based segregation measures, highlighting how individuals with similar residential environments may encounter different racial group exposures based on their mobility patterns.

Figure 1. Graphic Illustration of Mobility-Based Measures of Group Exposure



Source: Authors' tabulation.

We now describe the formalization of the mobility-based exposure measures illustrated in figure 1. First, to capture mobility exposure, we use the *Mobility connectedness index* (MCI) between each pair of CBGs (p and q) in a given period T:

$$MCI_{p,q} = \frac{\sum_{d=1}^{P} Visits_{pqd}}{\frac{1}{P}\sum_{d=1}^{P} Devices_{pd}} \quad (1)$$

where p and q represent two CBGs, d denotes the d–th day, $Visits_{pq}$ indicates the daily visits from p to q, and devices denote the number of unique devices in a given CBG. We normalize MCI by dividing the maximum value of the raw MCI score so that it ranges from 0 to 1 (Zhang and Cheng 2024).

We then follow prior work (Reardon and O'Sullivan 2004; Zhang and Cheng 2024) and define a discrete measure of local mobility exposure ($\tilde{\pi}^{*}_{pm}$) as

local mobility exposure

$$LME_{pm} = \tilde{\pi}^{*}_{pm} = \frac{\sum_{k=1}^{K} \pi_{km} \cdot \tau_k \cdot MCI_{pk}}{\sum_{k=1}^{K} \tau_k \cdot MCI_{pk}} \quad (2)$$

Here K is the number of communities in the mobility network (such as within an MSA), τ_k is the population density of the k–th CBG, π_{km} is the proportion of group m in the k–th CBG. LME to group m can be seen as a weighted average of the CBG-level proportion of group m (shown in the right plots of figure 1), where the weights are proportional to the mobility flows and population density of all communities visited by residents in the home community.

We highlight two important characteristics of our mobility-based exposure measures. First, it is crucial to interpret these metrics not as explicit indicators of interpersonal interactions, but as proxies of group-based exposure that allows for potential social interaction. Second, our measures rely on two assumptions (for a more in-depth discussion of these two assumptions, see Zhang and Cheng 2024). The nonselective mobility assumption is that within the same origin community, individuals traveling between CBGs are not systematically distinct from those who do not. The nonselective exposure assumption is that within the same destination community, individuals do not differ systematically in their exposure to varied racial and income groups. Although the lack of individual-level mobility data precludes direct assessment of these assumptions, at the end of empirical results, we will delve into a more detailed discussion regarding potential deviations from these assumptions. We also conduct sensitivity analysis to assess their potential impact on our findings.

Region-Wide Mobility Exposure

We define the region-wide mobility exposure as

Region-wide mobility exposure:

$$RME_{mn} = \sum_{k=1}^{K} \frac{N_{km}}{N_m} \tilde{\pi}^{*}_{kn}; \quad 3)$$

Here N_{km} is the population of group m in the k–th CBG, and N_{km}/N_m expresses it as a proportion of the total population of group m in the region. Our analysis defines a region as a metropolitan area. In addition, we also compare mobility-based segregation measures with distance-based group exposure measures. We describe our measure of distance-based group exposure in the methodological appendix.

Finally, to capture the degree of group isolation, two measures are considered. First, absolute isolation of group m captures the MSA-wide intragroup exposure of group m. For example, Blacks' absolute isolation can be measured by the MSA-level exposure of Blacks to Blacks. However, this absolute measure does not take into account the marginal composition of group m in MSA. For example, a higher exposure of Black individuals to other Blacks may simply result from a high proportion of Blacks in the MSA. To adjust for compositional differences, we then construct *relative isolation of group m*, defined as the MSA-wide intragroup exposure of group m minus region-wide intergroup exposure between group m and n, as our preferred measure of group isolation. By taking the difference between these two quantities, relative isolation measures net out the influence of the MSA-level marginal composition. For example, Black's relative isolation can be measured by the difference between Blacks' exposure to Blacks and Whites' exposure to Blacks in the same MSA. Relative isolation measures can be computed for both distance- and

mobility-based segregation. We focus here on relative isolation as our key outcome measure.

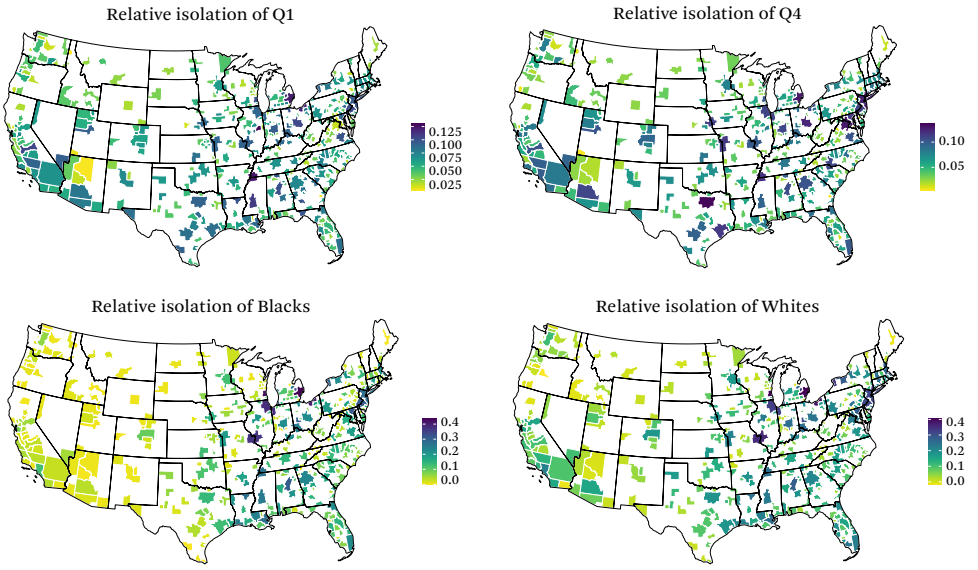
GEOGRAPHIC VARIATIONS IN THE RELATIVE ISOLATION OF INCOME AND RACIAL GROUPS

In figure 2, we present maps illustrating the geographic distribution of income and racial group isolation. These visualizations reveal significant differences in activity space isolation across metropolitan areas. Generally, regions where more advantaged groups (Q4 and Whites) experience higher levels of isolation also see greater isolation among more disadvantaged groups (Q1 and Blacks). However, the degree of this isolation varies considerably from one metropolitan area to another.

A core premise of our research is that an individual's activity space offers a distinct perspective on both intra- and intergroup exposure, setting it apart from traditional distance-based segregation metrics. In our subsequent analysis, we delve deeper into the relationship and disparities between these measurement types at the MSA level. As shown in figure 3, the overall correlation is positive between distance- and mobility-based exposure measures, with the lines marking points where both measures are identical. For income groups, the link between mobility- and distance-based exposure metrics is generally weak, except in the case of intragroup exposure from Q1 to Q1. This implies that the daily mobility patterns of higher-income individuals are not tightly bound by spatial distance. Conversely, when it comes to race, both measurement types align more closely. MSAs with pronounced distance-based exposure to Blacks typically also show heightened mobility-based exposure. However, the strength of this alignment diminishes as distance-based exposure to Blacks increases.

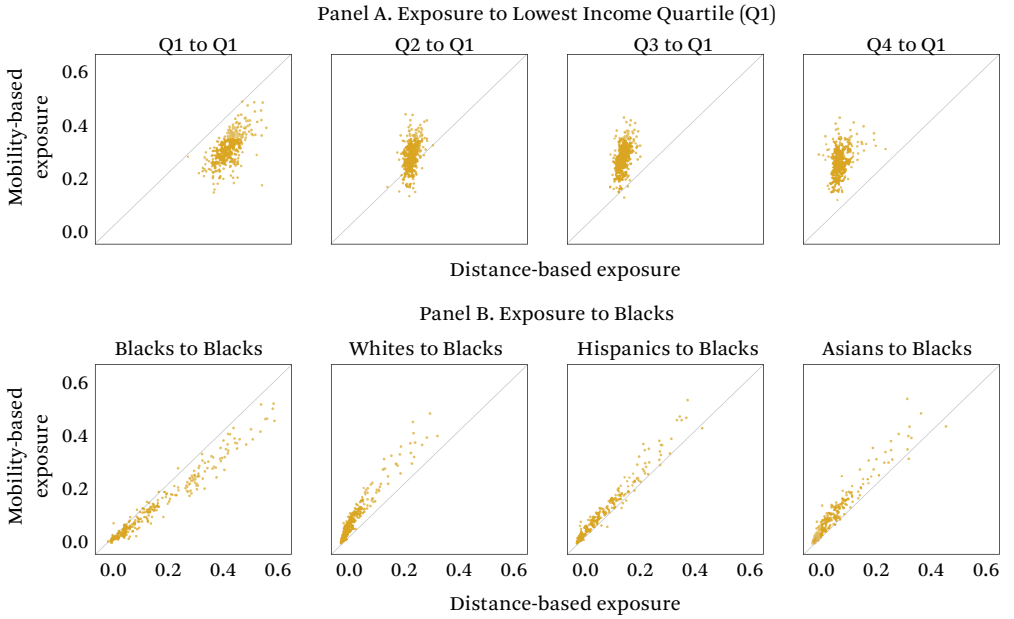
Another critical observation from the exposure patterns of both income and racial groups is the position of the dots in relation to the 45-degree lines. For intragroup exposure (leftmost plot), dots lie below this line, whereas for intergroup exposure (the other three plots), they are positioned above it. This indicates that individuals tend to experience less intragroup exposure in their daily activities than in their residential surroundings. In contrast, they have greater intergroup exposure in their daily activ-

Figure 2. Maps of MSA-Level Relative Isolation Measures



Source: Authors' tabulation based on the American Community Survey (Ruggles et al. 2024).
Note: SafeGraph mobility data matched to census block groups (CBG) in the 2015–2019 American Community Survey. The optimal way to view figure 2 is in color. We refer readers of the print edition of this article to https://www.rsfjournal.org/content/11/1/132 to view the color version.

Figure 3. Comparing MSA-Level Distance- and Mobility-Based Exposure Measures at the MSA Level



Source: Author's tabulation based on the American Community Survey (Ruggles et al. 2024).
Note: SafeGraph mobility data matched to Census block groups (CBG) in the 2015–2019 American Community Survey. The dots represent metropolitan areas.

ity spaces.[3] Essentially, this suggests that although the lowest income group and Blacks might experience isolation within their physical communities, they often engage with more diverse income and racial groups in their daily activities, traveling beyond their immediate surroundings to do so.

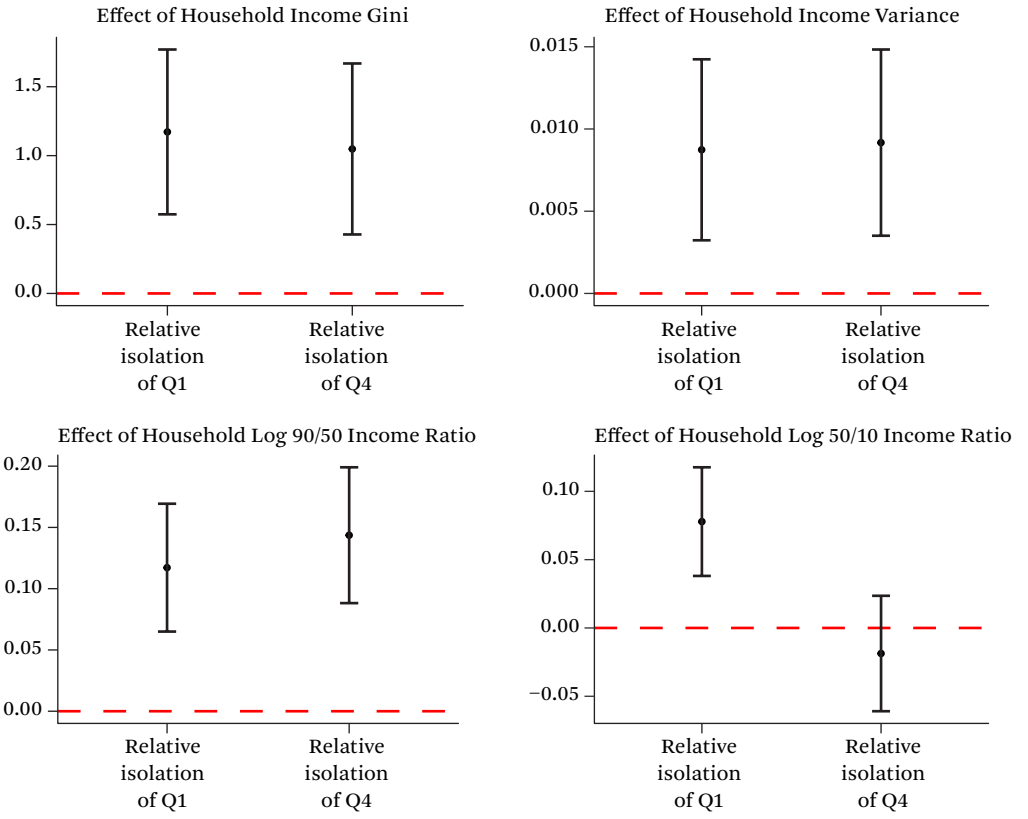
ECONOMIC INEQUALITY AND ACTIVITY SPACE SEGREGATION

Next, we explore the association between MSA-level economic inequality and segregation of income and racial groups. We estimate regression models that predict relative isolation measures at the MSA level using various measures of economic inequality while controlling for a large set of MSA-level characteristics.[4] We measure economic inequality in two ways: first, we use the Gini coefficient and the variance of log income to capture the overall dispersion of household income; second, we use the 90:50 ratio (the ratio between the 90th and 50th percentile of income) and 50:10 ratio (the ratio between the 50th and 10th percentile of income) to capture the potential asymmetric impact at the two ends of the income distribution. The MSA-level controls include median household income, percentage of different racial-ethnic groups, percentage of individuals with a college degree, percentage of individuals with an advanced degree, percentage unemployed, percentage of Black individuals unemployed, percentage of families with zero annual income, percentage of single-parent household, percentage of households with children under five years of age, percentage of households in poverty, percentage of Republican-leaning voters, average population density, percentage mar-

3. These findings are consistent with recent studies that suggested a lower level of experienced racial isolation relative to residential isolation (Athey et al. 2021), but we extended the analysis to a broader set of racial and income groups.

4. Given the limitation that not all MSA can be identified in the ACS data from which we construct MSA-level covariates, we estimate our regression models on the subsample of 258 MSAs that have complete data on all covariates.

Figure 4. Coefficients from Regression Models Predicting Relative Isolation of Q1 and Q4 Income Groups



Source: Authors' tabulations based on the American Community Survey (Ruggles et al. 2024).
Note: SafeGraph mobility data matched to census block groups (CBG) in the 2015–2019 American Community Survey. The error bars show 95 percent confidence intervals. All regression models are weighted by MSA population size. The full regression results are reported in the online supplement.

ried, and percentage foreign born. The full regression results are reported in the online supplement.[5]

Figure 4 shows the coefficients from the regression models predicting relative exposure of Q1 and Q4. The two plots in the upper panel examine how overall dispersion of household income—measured using the Gini coefficient and the variance of log income—affects isolation at the top and bottom of the income distribution. Net of a host of MSA-level characteristics, higher income inequality significantly increases relative isolation of both Q1 and Q4. That is, high- and low-income individuals living in areas with a heightened level of income inequality have a greater tendency to be in contact with their group members during their daily activities.

Income gaps at the higher and lower ends of the spectrum have distinct effects on the segregation of activity spaces for disadvantaged and advantaged groups. To illuminate this asymmetry, the two plots at the bottom of the figure differentiate the impacts of income disparities at the upper (90th percentile) and lower (10th percentile) ends of the spectrum. Notably, larger income gaps at the top end positively increase the isolation of both the highest- and lowest-income groups. This can be attributed to heightened social closure at the top

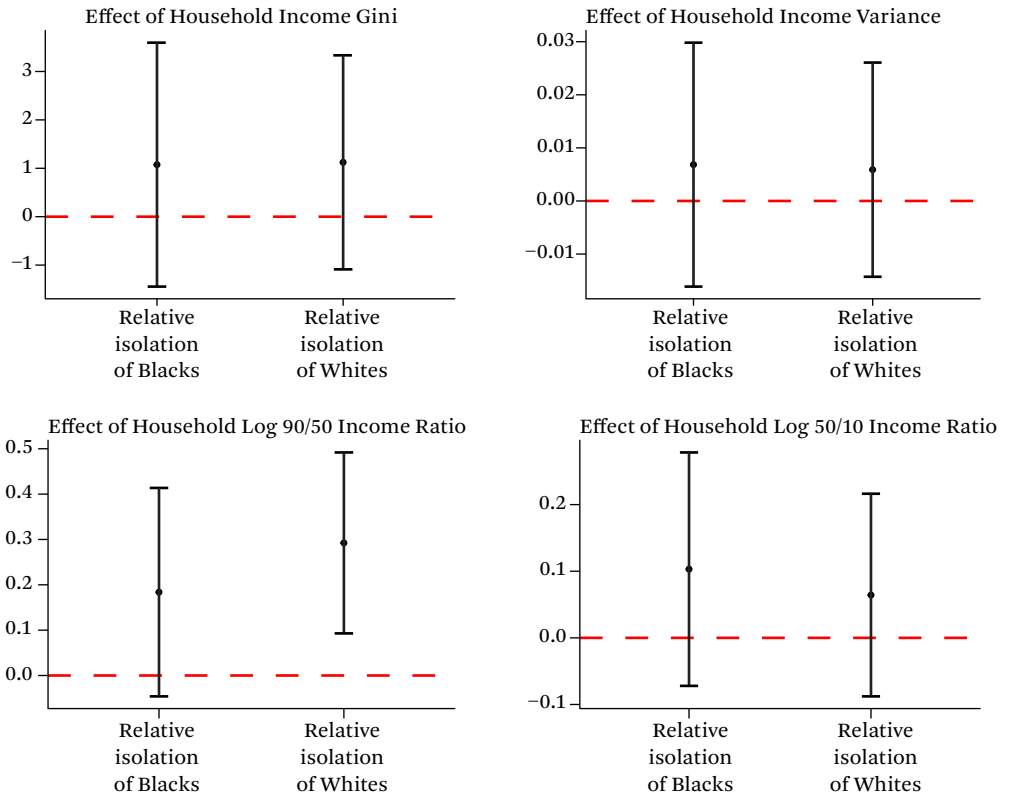
5. For the online supplement, see https://www.rsfjournal.org/content/11/1/132/tab-supplemental.

and the shifts of resources away from the bottom tiers. By contrast, income disparities at the lower end mainly affect the most disadvantaged group. Essentially, the wider the gap between the lowest earners and the median income, the more these disadvantaged groups are marginalized in their daily activities.

Figure 5 illustrates the impact of economic inequality on the isolation within the activity spaces of Black and White populations. Remarkably, overall income inequality does not exhibit a statistically significant influence on racial isolation. Nonetheless, this overall dispersion conceals the asymmetric effects observable at the upper and lower echelons of the income distribution. A pronounced income disparity at the upper end intensifies the relative isolation of White individuals but not of Black individuals. Combining these results with the preceding results concerning income segregation, the findings suggest that, although economic inequality amplifies the isolation of income groups within individuals' activity spaces, the isolation encountered by racial groups remains substantially less influenced by such economic disparities. This also implies that reducing economic inequality alone is not enough to alleviate racial segregation in activity space.

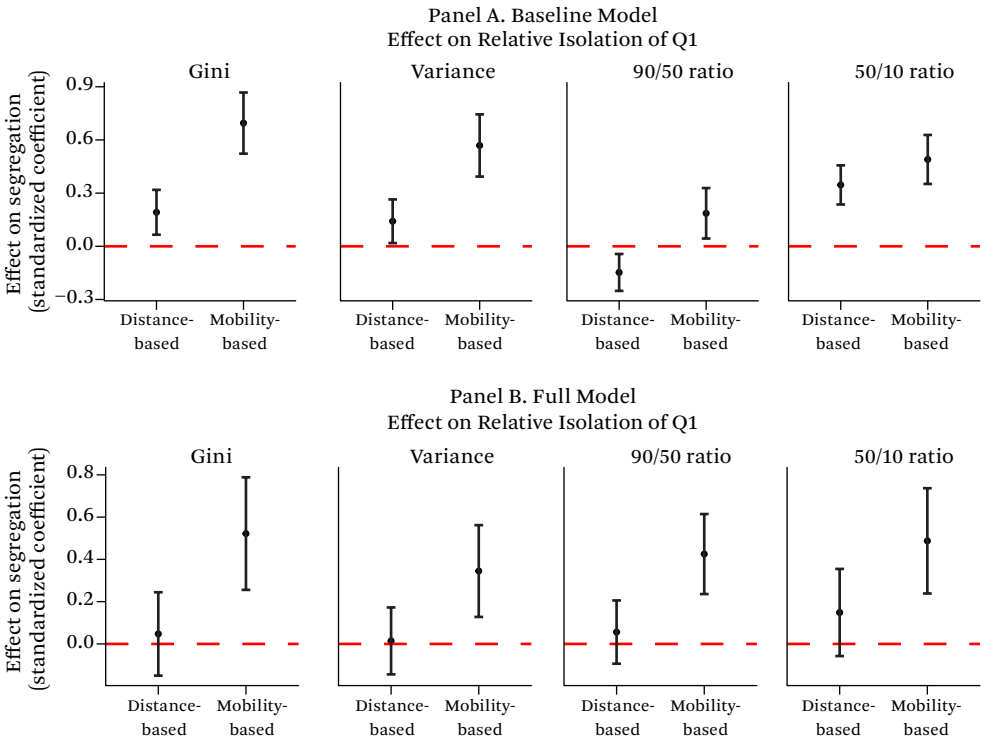
Earlier we demonstrated that the isolation faced by income and racial groups is less pronounced in activity space than in residential space. However, it remains unclear whether economic inequality affects both segregation measures similarly. We now delve into the influence of economic inequality on these mea-

Figure 5. Coefficients from Regression Models Predicting Relative Isolation of Blacks and Whites



Source: Authors' tabulation based on the American Community Survey (Ruggles et al. 2024).
Note: SafeGraph mobility data matched to census block groups (CBG) in the 2015–2019 American Community Survey. The error bars show 95 percent confidence intervals. All regression models are weighted by MSA population size. The full regression results are reported in the online supplement.

Figure 6. Comparing Effects of Income Inequality on Distance- and Mobility-Based Measures of Group Isolation



Source: Authors' tabulation based on the American Community Survey (Ruggles et al. 2024).
Note: SafeGraph mobility data matched to census block groups (CBG) in the 2015–2019 American Community Survey. The error bars show 95 percent confidence intervals. All regression models are weighted by MSA population size. The full regression results are reported in the online supplement.

sures, with a focus on the impact on the lowest income group. Given the differing scales of mobility- and distance-based isolation metrics, we first normalize the inequality indicators and outcomes to achieve a mean of zero and a standard deviation of one. As depicted in figure 6, economic inequality exerts a greater impact on mobility-based isolation than on distance-based measures. Intriguingly, the effects on the distance-based metrics are not statistically significant when other MSA-level characteristics are controlled for. This indicates that, although the lowest-income bracket might increase their interaction with higher-income groups during daily activities to counterbalance residential isolation, their daily mobility-driven interactions with other groups are more significantly hindered by rising economic disparity than their interactions in residential areas.

SENSITIVITY ANALYSES: POTENTIAL DEVIATIONS FROM KEY ASSUMPTIONS

When we introduced our segregation measures, we stressed that measuring mobility patterns at the community level rather than the individual level may mask some important heterogeneity in mobility patterns within origin and destination communities. For example, it may be that, within low-income communities, those with lowest income levels are least likely to travel out of their communities. This deviates from the nonselective mobility assumption discussed earlier and may lead to an underestimation of the actual level of isolation among low-income individuals. On the other hand, if high-income individuals are more likely to be exposed to high-income groups in the destination community, this deviates from the nonselective exposure assumption and can

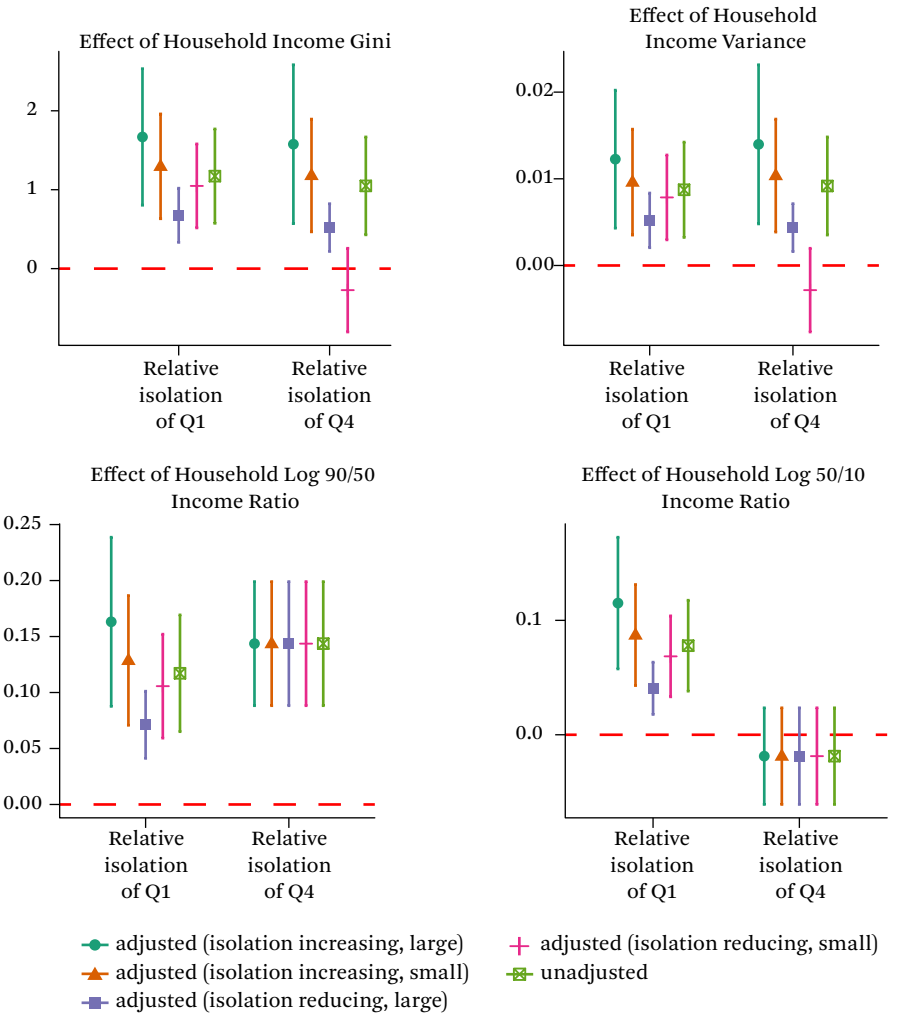
also lead to an understatement of high-income group's isolation in activity space. Table 2 summarizes some possible deviations from these two assumptions and their implications for group isolation, focusing specifically on the case of income. Without individual-level mobility data, we cannot directly assess the influence of such heterogeneity. Instead, as sensitivity analysis, we conduct simulations assuming that such selectivity has a greater influence on relative isolation in MSAs with a larger proportion of high-income households. Specifically, we formulate the influence on relative isolation as a linear function of the proportion of the lowest and highest income quartiles in each MSA. A small impact of selectivity on isolation is defined as a 0.5 percentage increase in relative isolation corresponding to 1 percentage point increase in the proportion of Q1 or Q4, and a large impact as a 2 percentage increase. Figure 7 shows the resulting coefficients on economic inequality assuming different directions (increasing versus decreasing isolation) and sizes (small versus large) of such impact. The figure suggests that the effect of economic inequality on isolation is greater when accounting for the possible isolation-increasing effects of within-community heterogeneity, and this effect gets smaller (but remains mostly statistically significant) when the within-community heterogeneity is assumed to have the effect of reducing isolation. Although our simulations remain speculative, we urge future research to further examine the within-community heterogeneity of mobility-based exposure, particularly when data on individual-level mobility patterns become available.

Table 2. Possible Deviations from Assumptions and Their Implications

	Effect on Mobility-Based Exposure		Effect on Relative Isolation	
	Q1-Q1 Exposure	Q4-Q4 Exposure	Q1 Isolation	Q4 Isolation
Possible deviation from nonselective mobility assumption				
a) In low-income communities, lowest-income individuals are least likely to travel between communities	Increase	No effect	Increase	Increase
b) In low-income communities, lowest-income individuals are most likely to travel between communities	Decrease	No effect	Decrease	Decrease
c) In high-income communities, highest-income individuals are least likely to travel between communities	No effect	Increase	Increase	Increase
d) In high-income communities, highest-income individuals are most likely to travel between communities	No effect	Decrease	Decrease	Decrease
Possible deviation from nonselective exposure assumption				
e) When they travel to a destination community, low-income individuals are more likely to be exposed to low-income groups	Increase	No effect	Increase	Increase
f) When they travel to a destination community, high-income individuals are more likely to be exposed to low-income groups	No effect	Decrease	Decrease	Decrease

Source: Authors' tabulation.

Figure 7. Sensitivity Analysis on Effects of Income Inequality on Income Isolation Under Different Assumptions About Biases in Aggregated Mobility Data



Source: Authors' tabulations based on the American Community Survey (Ruggles et al. 2024).
Note: SafeGraph mobility data matched to census block groups (CBG) in the 2015–2019 American Community Survey. The error bars show 95 percent confidence intervals. All regression models are weighted by MSA population size. The full regression results are reported in the online supplement.

DISCUSSION

This study contributes to the literature on inequality and segregation by examining the geographic variations in the segregation of racial and income groups in their everyday activity space. Despite increasing racial diversity and policy efforts to combat income inequality, racial minorities and low-income individuals continue to live in segregated communities, and the degree and patterns of subgroup segregation vary from place to place. Studies on residential segregation have been conducted extensively, yet only recently have scholars started to incorporate information on experiences of individuals' activity space into measures of intra- and intergroup exposure. Even though recent research has significantly advanced our understanding of activity space segregation patterns, to our knowledge, our study is the first to examine how geographic varia-

tions in activity space segregation are associated with economic inequality—a question that bears crucial policy implications in an era of escalating inequality.

Our empirical analyses, which combined large-scale data collected on mobile devices with recent data from the American Community Survey, yielded three major findings. First, the exposure of disadvantaged groups (that is, Blacks and low-income individuals) to their own group relative to more advantaged groups (Whites and high-income individuals) vary dramatically across metropolitan areas. Second, when we contrasted our mobility-based exposure measures with distance-based exposure measures across metropolitan areas, the degree of isolation experienced by Blacks and low-income individuals in their activity space was less than in their residential space. Relative to that of income groups, the correlation is stronger between Blacks' exposure in their activity space and their exposure in residential space, which suggests that racial boundaries exert a greater constraint on individuals' day-to-day activities than income differences do.

More importantly, our findings underscore that economic inequality intensifies activity space segregation. Net of a host of MSA-level characteristics, higher income inequality increases relative isolation of both the lowest- and highest-income groups. That is, high- and low-income individuals living in areas marked by high income inequality are more prone to be exposed to members of their own economic strata during daily activities. For low-income individuals, this implies that their everyday activities are more confined to comparably low-income communities amid pronounced income inequality. In contrast, high-income individuals manifest a form of social closure under heightened economic disparity, where their resources and social connections become increasingly concentrated in advantaged communities within their activity spaces. When examining income disparities at the upper and lower ends of the income distribution separately, we show that wider income gaps at the upper end amplify the isolation of both the highest- and lowest-income groups, whereas income disparities at the lower end only affect the most disadvantaged group. Additionally, we demonstrate that economic inequality exerts a more pronounced impact on low-income individuals' activity spaces than on their residential spaces. In fact, after accounting for the full range of MSA-level characteristics, the effect on residential space loses statistical significance but the impact on activity space persists. This finding draws attention to activity space segregation as an especially pivotal outcome amidst rising economic inequality.

Synthesizing these findings, our study illuminates that the segregation of activity space by income and race is deeply rooted in their surrounding socioeconomic context. Although individuals generally exhibit reduced exposure to in-group members and greater exposure to out-group members within their activity spaces relative to their residential spaces, group segregation in activity space proves to be more susceptible to local levels of economic inequality. Therefore, a sole focus on residential space in segregation research might overlook a vital mechanism through which economic inequality influences the life chances of disadvantaged groups. More broadly, our findings advocate for policies aimed at reducing racial and income segregation to encompass not only interventions alleviating the impacts of inequality on individuals and families as separate entities but also strategies counteracting the disruptive effects of inequality on the connections (or lack of) between individuals, families, and socioeconomic groups.

METHODOLOGICAL APPENDIX

Here we provide a more detailed discussion of the data limitations and outline how they affect our analytic strategies.

SafeGraph Daily Mobility Data

SafeGraph data collections relies on location-based services from apps that have consented to having their location tracked. Software development kits (SDKs) installed in apps were used to source data from partnerships with more than 120 privacy compliant mobile applications, such as weather and dating apps. The SafeGraph data have been used to analyze patterns of human mobility and their associated socioeconomic consequences (Bonaccorsi et al. 2020; Kang et al. 2020; Xiong et al. 2020; Zhang

and Cheng 2024). At the point-of-interest (POI) level, when compared with the well-established industry benchmark in the United States—Google—the SafeGraph covers approximately 89 percent for an urban zip code and 62 percent for a rural zip code (SafeGraph 2023). On the level of mobile device users, the SafeGraph data represents approximate 10 percent of the entire U.S. population (Kang et al. 2020), and the number of sampled devices was strongly correlated with the census population at the level of counties and metropolitan areas over the last five years (Kang et al. 2020; Li et al. 2023). SafeGraph's coverage rate also fluctuates over time, ranging from 4.5 percent to 14.5 percent between 2018 and 2022, with the most stable period being year 2019 (Li et al. 2023). Hence we focus on 2019 in our analysis to avoid the data coverage inconsistencies and to avoid the impact of the COVID-19 pandemic on mobility patterns.

One limitation of the SafeGraph data sample is the issue of under- and overrepresentation. For example, SafeGraph mobility data are less likely to capture older, low socioeconomic status, and non-White individuals (Coston et al. 2021; Li et al. 2023; Zhang et al. 2023), and the bias also varies by location, time, urbanization, and geographic scale. To mitigate these issues, we focus on urban areas and stratifies communities by racial and income composition. Another limitation is that SafeGraph excludes any information of individual-level mobility patterns, which is necessary to preserve privacy of individual mobile phone users.

Distance-Based Exposure Measures

Much like our mobility-based measure, the distance-based exposure is defined as the local spatial exposure:

Local spatial exposure to group m:

$$\tilde{\pi}_{pm} = \int_{q \in R} \frac{\tau_q \phi(p, q)}{\int_{s \in R} \tau_s \phi(p, s) ds} \pi_{qm} dq \qquad (4)$$

$$\int_{q \in R} w_{p,q} \pi_{qm} \, dq, \qquad (5)$$

where $\phi(p, q)$ is defined as the inverse of the Euclidean distance between communities p and q. Hence it takes into account spatial proximity in defining group-specific exposure in the local environment. The weights $w_{p,q} \left(= \frac{\tau_q \phi(p, q)}{\int_{s \in R} \tau_s \phi(p, s) ds}\right)$ imply that locations that have a higher population density and or are closer to the focal point p are assigned greater importance in determining the group proportion of the local environment of the focal location.

REFERENCES

Abramson, Alan J., Mitchell S. Tobin, and Matthew R. VanderGoot. 1995. "The Changing Geography of Metropolitan Opportunity: The Segregation of the Poor in US Metropolitan Areas, 1970 to 1990." *Housing Policy Debate* 6(1): 45–72.

Anderson, Elijah. 2015. "The White Space." *Sociology of Race and Ethnicity* 1(1): 10–21.

Athey, Susan, Billy A. Ferguson, Matthew Gentzkow, and Tobias Schmidt. 2021. "Estimating Experienced Racial Segregation in US Cities Using Large-Scale GPS Data." *Proceedings of the National Academy of Sciences* 118(46): e202 6160118.

Bailey, Michael, Rachel Cao, Theresa Kuchler, Johannes Stroebel, and Arlene Wong. 2018. "Social Connectedness: Measurement, Determinants, and Effects." *Journal of Economic Perspectives* 32(3): 259–80.

Bernelius, Venla, and Mari Vaattovaara. 2016. "Choice and Segregation in the 'Most Egalitarian' Schools: Cumulative Decline in Urban Schools and Neighbourhoods of Helsinki, Finland." *Urban Studies* 53(15): 3155–71.

Blair, Sampson L., and Daniel T. Lichter. 1991. "Measuring the Division of Household Labor: Gender Segregation of Housework Among American Couples." *Journal of Family Issues* 12(1): 91–113.

Bonaccorsi, Giovanni, Francesco Pierri, Matteo Cinelli, Andrea Flori, Alessandro Galeazzi, Francesco Porcelli, Ana Lucia Schmidt, Carlo Michele Valensise, Antonio Scala, Walter Quattrociocchi et al. 2020. "Economic and Social Consequences of Human Mobility Restrictions Under COVID-19." *Proceedings of the National Academy of Sciences* 117(27): 15530–535.

Boterman, Willem, Sako Musterd, Carolina Pacchi, and Costanzo Ranci. 2019. "School Segregation in Contemporary Cities: Socio-Spatial Dynamics, Institutional Context and Urban Outcomes." *Urban Studies* 56(15): 3055–73.

Browning, Christopher R., Catherine A. Calder, Bethany Boettner, Jake Tarrence, Kori Khan, Brian

Soller, and Jodi L. Ford. 2021. "Neighborhoods, Activity Spaces, and the Span of Adolescent Exposures." *American Sociological Review* 86(2): 201–33.

Browning, Christopher R., and Brian Soller. 2014. "Moving Beyond Neighborhood: Activity Spaces and Ecological Networks as Contexts for Youth Development." *Cityscape* 16(1): 165.

Burgess, Simon, Deborah Wilson, and Ruth Lupton. 2005. "Parallel Lives? Ethnic Segregation in Schools and Neighbourhoods." *Urban Studies* 42(7): 1027–56.

Cagney, Kathleen A., Erin York Cornwell, Alyssa W. Goldman, and Liang Cai. 2020. "Urban Mobility and Activity Space." *Annual Review of Sociology* 46(1): 623–48.

Candipan, Jennifer, Nolan Edward Phillips, Robert J. Sampson, and Mario Small. 2021. "From Residence to Movement: The Nature of Racial Segregation in Everyday Urban Mobility." *Urban Studies* 58(15): 3095–117.

Cantor, Pamela, Monika Polakowska, Amanda Proietti, Victor Tran, Jonathan Lebire, and Laurence Roy. 2022. "Leisure Possibilities of Adults Experiencing Poverty: A Community-Based Participatory Study." *Canadian Journal of Occupational Therapy* 89(2): 103–14.

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States." *Quarterly Journal of Economics* 129(4): 1553–623.

Coston, Amanda, Neel Guha, Derek Ouyang, Lisa Lu, Alexandra Chouldechova, and Daniel E. Ho. 2021. "Leveraging Administrative Data for Bias Audits: Assessing Disparate Coverage with Mobility Data for COVID-19 Policy." In *FAccT '21: Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 173–84. New York: Association for Computing Machinery.

Echenique, Federico, and Roland G. Fryer Jr. 2007. "A Measure of Segregation Based on Social Interactions." *Quarterly Journal of Economics* 122(2): 441–85.

Edwards, Linsey Nicole. 2018. "Time and Efficacy: Neighborhoods, Temporal Constraints, and the Persistence of Poverty." Ph.D diss., Princeton University.

Ellis, Mark, Richard Wright, and Virginia Parks. 2004. "Work Together, Live Apart? Geographies of Racial and Ethnic Segregation at Home and at Work." *Annals of the Association of American Geographers* 94(3): 620–37.

Estlund, Cynthia. 2003. *Working Together: How Workplace Bonds Strengthen a Diverse Democracy*. Oxford: Oxford University Press.

Faber, Jacob W. 2020. "We Built This: Consequences of New Deal Era Intervention in America's Racial Geography." *American Sociological Review* 85(5): 739–75.

Florida, Richard, and Charlotta Mellander. 2018. "The Geography of Economic Segregation." *Social Sciences* 7(8): 123.

Grannis, Rick. 2002. "Discussion: Segregation Indices and Their Functional Inputs." *Sociological Methodology* 32(1): 69–84.

Hall, Matthew, John Iceland, and Youngmin Yi. 2019. "Racial Separation at Home and Work: Segregation in Residential and Workplace Settings." *Population Research and Policy Review* 38(5): 671–94.

Hellerstein, Judith K., and David Neumark. 2008. "Workplace Segregation in the United States: Race, Ethnicity, and Skill." *Review of Economics and Statistics* 90(3): 459–77.

Huffman, Matt L., and Philip N. Cohen. 2004. "Racial Wage Inequality: Job Segregation and Devaluation Across U.S. Labor Markets." *American Journal of Sociology* 109(4): 902–36.

Jargowsky, Paul A., and Christopher A. Wheeler. 2017. "Economic Segregation in US Metropolitan Areas, 1970–2010." 21st Century Cities Initiative, Johns Hopkins University, Baltimore, Maryland. (November 2017). Accessed April 15, 2024. https://21cc.jhu.edu/wp-content/uploads/2018/06/economic-segregation-in-us-metropolitan-areas-1970-to-2010.pdf.

Järv, Olle, Anu Masso, Siiri Silm, and Rein Ahas. 2021. "The Link Between Ethnic Segregation and Socio-Economic Status: An Activity Space Approach." *Tijdschrift voor Economische en Sociale Geografie* 112(3): 319–35.

Jones, Malia, and Anne R. Pebley. 2014. "Redefining Neighborhoods Using Common Destinations: Social Characteristics of Activity Spaces and Home Census Tracts Compared." *Demography* 51(3): 727–52.

Kamenik, Kristiina, Tiit Tammaru, and Ott Toomet. 2014. "Ethnic Segmentation in Leisure Time Activities in Estonia." *Leisure Studies* 34(5): 566–87.

Kang, Yuhao, Song Gao, Yunlei Liang, Mingxiao Li, Jinmeng Rao, and Jake Kruse. 2020. "Multi-scale

Dynamic Human Mobility Flow Dataset in the US During the COVID-19 Epidemic." *Scientific Data* 7(1):1–13.

Karonen, Esa, and Mikko Niemelä. 2022. "Necessity-Rich, Leisure-Poor: The Long-Term Relationship Between Income Cohorts and Consumption Through Age-Period-Cohort Analysis." *Journal of Family and Economic Issues* 43(3): 599–620.

Krivo, Lauren J., Heather M. Washington, Ruth D. Peterson, Christopher R. Browning, Catherine A. Calder, and Mei Po Kwan. 2013. "Social Isolation of Disadvantage and Advantage: The Reproduction of Inequality in Urban Space." *Social Forces* 92(1): 141–64.

Li, Zhenlong, Huan Ning, Fengrui Jing, and M. Naser Lessani. 2023. "Understanding the Bias of Mobile Location Data Across Spatial Scales and Over Time: a Comprehensive Analysis of Safegraph Data in the United States." *PLoS One* 19(1): e0294430. https://doi.org/10.1371/journal.pone.0294430.

Logan, John R., Andrew Foster, Hongwei Xu, and Wenquan Zhang. 2020. "Income Segregation: Up or Down, and for Whom?" *Demography* 57(5): 1951–74.

Logan, John R., Brian J. Stults, and Reynolds Farley. 2004. "Segregation of Minorities in the Metropolis: Two Decades of Change." *Demography* 41(1): 1–22.

Massey, Douglas S. 2012. "Reflections on the Dimensions of Segregation." *Social Forces* 91(1): 39–43.

———. 2020. "Still the Linchpin: Segregation and Stratification in the USA." *Race and Social Problems* 12(1): 1–12.

Massey, Douglas S., and Nancy A. Denton. 1988. "The Dimensions of Residential Segregation." *Social Forces* 67(2): 281–315.

Mijs, Jonathan J. B., and Elizabeth L. Roe. 2021. "Is America Coming Apart? Socioeconomic Segregation in Neighborhoods, Schools, Workplaces, and Social Networks, 1970–2020." *Sociology Compass* 15(6): e12884.

Moro, Esteban, Dan Calacci, Xiaowen Dong, and Alex Pentland. 2021. "Mobility Patterns Are Associated with Experienced Income Segregation in Large US Cities." *Nature Communications* 12(1): 1–10.

Morrill, Richard L. 1991. "On the Measure of Geographic Segregation." *Geography Research Forum* 11: 25–36.

Mulder, Clara H. 2013. "Family Dynamics and Housing: Conceptual Issues and Empirical Findings." *Demographic Research* 29: 355–378.

Murphy, Alexandra K., Karina McDonald-Lopez, Natasha Pilkauskas, and Alix Gould-Werth. 2022. "Transportation Insecurity in the United States: A Descriptive Portrait." *Socius* 8: 23780231221121060.

Mutgan, Selcan, and Jonathan Mijs. 2023. "Income Inequality and Residential Segregation in 'Egalitarian' Sweden: Lessons from a Least Likely Case." *Sociological Science* 10: 348–73.

Nilforoshan, Hamed, Wenli Looi, Emma Pierson, Blanca Villanueva, Nic Fishman, Yiling Chen, John Sholar, Beth Redbird, David Grusky, and Jure Leskovec. 2023. "Human Mobility Networks Reveal Increased Segregation in Large Cities." *Nature* 624(7992): 586–92.

Owens, Ann. 2016. "Inequality in Children's Contexts: Income Segregation of Households with and Without Children." *American Sociological Review* 81(3): 549–74.

Owens, Ann, Sean F. Reardon, and Christopher Jencks. 2016. "Income Segregation Between Schools and School Districts." *American Educational Research Journal* 53(4): 1159–97.

Petersen, Christina Bjørk, Maj Bekker-Jeppesen, Mette Aadahl, and Cathrine Juel Lau. 2021. "Participation in Recreational Activities Varies with Socioeconomic Position and Is Associated with Self-Rated Health and Well-Being." *Preventive Medicine Reports* 24: 101610.

Quillian, Lincoln. 2012. "Segregation and Poverty Concentration: The Role of Three Segregations." *American Sociological Review* 77(3): 354–79.

Reardon, Sean F., and Kendra Bischoff. 2011. "Income Inequality and Income Segregation." *American Journal of Sociology* 116(4): 1092–53.

Reardon, Sean F., Kendra Bischoff, Ann Owens, and Joseph B. Townsend. 2018. "Has Income Segregation Really Increased? Bias and Bias Correction in Sample-Based Segregation Estimates." *Demography* 55(6): 2129–60.

Reardon, Sean F., and Glenn Firebaugh. 2002. "Measures of Multigroup Segregation." *Sociological Methodology* 32(1): 33–67.

Reardon, Sean F., Stephen A. Matthews, David O'Sullivan, Barrett A. Lee, Glenn Firebaugh, Chad R. Farrell, and Kendra Bischoff. 2008. "The Geographic Scale of Metropolitan Racial Segregation." *Demography* 45(3): 489–514.

Reardon, Sean F., and David O'Sullivan. 2004. "Mea-

sures of Spatial Segregation." *Sociological Methodology* 34(1): 121–62.

Ruggles, Steven, Sarah Flood, Matthew Sobek, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Renae Rodgers, and Megan Schouweiler. 2024. "IPUMS USA: Version 15.0 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D010.V15.0.

SafeGraph. 2023. "Accuracy Metrics." Accessed February 2, 2024. https://docs.safegraph.com/docs/accuracy-metrics.

Sampson, Robert J., and Brian L. Levy. 2020. "Beyond Residential Segregation: Mobility-Based Connectedness and Rates of Violence in Large Cities." *Race and Social Problems* 12(1): 77–86.

Scarpa, Simone. 2015. "The Impact of Income Inequality on Economic Residential Segregation: The Case of Malmö, 1991–2010." *Urban Studies* 52(5): 906–22. https://doi.org/10.1177/0042098014529347.

Schwanen, Tim, and Mei-Po Kwan. 2012. "Critical Space-Time Geographies." *Environment and Planning A* 44(9): 2043–48.

Sharkey, Patrick. 2013. *Stuck in Place: Urban Neighborhoods and the End of Progress Toward Racial Equality*. Chicago: University of Chicago Press.

Sharkey, Patrick, and Jacob W. Faber. 2014. "Where, When, Why, and for Whom Do Residential Contexts Matter? Moving Away from the Dichotomous Understanding of Neighborhood Effects." *Annual Review of Sociology* 40(1): 559–79.

Silm, Siiri, and Rein Ahas. 2014. "The Temporal Variation of Ethnic Segregation in a City: Evidence from a Mobile Phone Use Dataset." *Social Science Research* 47: 30–43.

Smith, Jeffrey A., Miller McPherson, and Lynn Smith-Lovin. 2014. "Social Distance in the United States: Sex, Race, Religion, Age, and Education Homophily among Confidants, 1985 to 2004." *American Sociological Review* 79(3): 432–56.

Song, Chaoming, Zehui Qu, Nicholas Blumm, and Albert-László Barabási. 2010. "Limits of Predictability in Human Mobility." *Science* 327(5968): 1018–21.

Tammaru, Tiit, Szymon Marcińczak, Raivo Aunap, Maarten van Ham, and Heleen Janssen. 2020. "Relationship Between Income Inequality and Residential Segregation of Socioeconomic Groups." *Regional Studies* 54(4): 450–61.

Tammaru, Tiit, Szymon Marcińczak, and Kristiina Kukk. 2018. "Social Transformations, Housing and Socio-Economic Segregation in the Fast-Track Reform Countries." In *The Routledge International Handbook of European Social Transformations*. New York: Routledge.

Tammaru, Tiit, Magnus Strömgren, Maarten van Ham, and Alexander M. Danzer. 2016. "Relations Between Residential and Workplace Segregation Among Newly Arrived Immigrant Men and Women." *Cities* 59: 131–38.

Taylor, Paul, and Richard Fry. 2012. "The Rise of Residential Segregation by Income." Washington, D.C.: Pew Research Center.

Theil, Henri, and Anthony J. Finizza. 1971. "A Note on the Measurement of Racial Integration of Schools by Means of Informational Concepts." *Journal of Mathematical Sociology* 37: 351–64. https://doi.org/10.2307/2648047.

Toger, Marina, Umut Türk, John Östh, Karima Kourtit, and Peter Nijkamp. 2023. "Inequality in Leisure Mobility: An Analysis of Activity Space Segregation Spectra in the Stockholm Conurbation." *Journal of Transport Geography* 111: 103638.

Trounstine, Jessica. 2018. *Segregation by Design: Local Politics and Inequality in American Cities*. Cambridge: Cambridge University Press.

Wang, Donggen, and Fei Li. 2016. "Daily Activity Space and Exposure: A Comparative Study of Hong Kong's Public and Private Housing Residents' Segregation in Daily Life." *Cities* 59: 148–55.

Wang, Donggen, Fei Li, and Yanwei Chai. 2012. "Activity Spaces and Sociospatial Segregation in Beijing." *Urban Geography* 33(2): 256–77.

Wang, Qi, Nolan Edward Phillips, Mario L. Small, and Robert J. Sampson. 2018. "Urban Mobility and Neighborhood Isolation in America's 50 Largest Cities." *Proceedings of the National Academy of Sciences* 115(30): 7735–40.

Watson, Tara. 2006. "Metropolitan Growth, Inequality, and Neighborhood Segregation by Income." *Brookings-Wharton Papers on Urban Affair*. Washington, D.C.: Brookings Institution.

———. 2009. "Inequality and the Measurement of Residential Segregation by Income in American Neighborhoods." *Review of Income and Wealth* 55(3): 820–44.

Wong, David W. S. 2002. "Spatial Measures of Segregation and GIS1." *Urban Geography* 23(1): 85–92.

Wong, David W. S., and Shih-Lung Shaw. 2011.

"Measuring Segregation: An Activity Space Approach." *Journal of Geographical Systems* 13(2): 127–45.

Xiong, Chenfeng, Songhua Hu, Mofeng Yang, Weiyu Luo, and Lei Zhang. 2020. "Mobile Device Data Reveal the Dynamics in a Positive Relationship Between Human Mobility and COVID-19 Infections." *Proceedings of the National Academy of Sciences* 117(44): 27087–89.

Zenk, Shannon N., Amy J. Schulz, Stephen A. Matthews, Angela Odoms-Young, JoEllen Wilbur, Lani Wegrzyn, Kevin Gibbs, Carol Braunschweig, and Carmen Stokes. 2011. "Activity Space Environment and Dietary and Physical Activity Behaviors: A Pilot Study." *Health & Place* 17(5): 1150–61.

Zhang, Yongjun, and Siwei Cheng. 2024. "Mobility-Based Segregation." *Open Science Framework*. https://doi.org/10.17605/OSF.IO/2CKA4.

Zhang, Yongjun, Siwei Cheng, Zhi Li, and Wenhao Jiang. 2023. "Human Mobility Patterns Are Associated with Experienced Partisan Segregation in US Metropolitan Areas." *Scientific Reports* 13(1): 9768.

III

Gender and Racial Inequality in Education, Time Use, and Employment

The Deepening Gender Divide in Credentials, 2000–2020: Continuity, Change, and Implications

CLAUDIA BUCHMANN, RACHEL E. DWYER, AND MAN YAO

In the United States, women have earned more bachelor's degrees than men since the mid-1980s. We examine the historical continuities in this trend and its sources, as well as changes since 2000 in gender gaps in advanced credentials, fields of study, types of institutions attended, and financing for higher education. The gender gap in bachelor's degrees has remained stable at a high level over this period and a female advantage in advanced degrees emerged, especially in professional degrees. The deepening gender divide in credentials coincided with rising shares of women attending for-profit institutions and an emerging gender divide in student indebtedness. Thus, women disproportionately carry the promise and bear the costs of educational expansion, with far reaching implications for the future.

Keywords: gender, credentials, higher education, inequality, debt

It is now generally known that women began to earn more college degrees than men in the United States in the mid-1980s. The emergence of this gender divide in credentials has drawn considerable scholarly and policy attention and reflects a complex and significant change in the U.S. gender regime. With greater opportunity and fewer barriers, women were finally able to see their educational attainment match their long-standing higher levels of academic achievement. Women have now outpaced men in earning bachelor's degrees for several decades (Buchmann and DiPrete 2006, DiPrete and Buchmann 2013) such that in 2022, among twenty-five- to twenty-nine-year-olds, 44 percent of women have completed a bachelor's degree compared to only 35 percent of men (NCES 2023a).[1]

Claudia Buchmann is a College of Arts and Sciences Distinguished Professor of Sociology and Faculty Affiliate of the Institution for Population Research at The Ohio State University, United States. **Rachel E. Dwyer** is a professor of sociology and faculty affiliate of the Institute for Population Research at The Ohio State University, United States. **Man Yao** is an assistant professor in the Women's and Gender Studies Program at Denison University, United States.

© 2025 Russell Sage Foundation. Buchmann, Claudia, Rachel E. Dwyer, and Man Yao. 2025. "The Deepening Gender Divide in Credentials, 2000–2020: Continuity, Change, and Implications." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 154–77. https://doi.org/10.7758/RSF.2025.11.1.08. We appreciate the helpful comments of the editors and the participants of the RSF workshop on this special issue, as well as a small grant from the OSU Department of Sociology. Direct correspondence to: Claudia Buchmann, at buchmann.4@osu.edu; Rachel E. Dwyer, at dwyer.46@osu.edu; Man Yao, at many@denison.edu, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

1. Throughout this article, we use the term bachelor's degree to include the bachelor of arts, bachelor of science, bachelor of engineering, bachelor of fine arts, and all other variants.

This article provides an in-depth examination of trends in the female advantage in credentials since 2000, with particular attention to trends from 2010 to 2020, a decade bookended by the Great Recession of 2008 and the COVID pandemic–fueled economic crisis of 2020. Although a large body of research has developed around the female advantage in credentials, to the best of our knowledge, no overall assessment of the gender-specific trends since 2000 has been published. Here we offer a broad view of the gender divide in earning undergraduate and advanced degrees, as well as fields of study, and incorporate two key changes in the higher education landscape in the 2000s: growing diversity in the types of institutions attended, and the growing reliance on financing for higher education through student loan debt. Although the open and diverse system of higher education has long produced significant variation in institutions and financing, regulatory changes and austerity budgets in the 2000s brought a shift toward the treatment of education as a private good. We argue that the female advantage in college credentials must be understood in part within this context. In doing so, we provide a novel analysis that links trends in female enrollment to trends in institutions attended and student debt. We discuss historical continuities in the female advantage in bachelor's degrees in the 2000 to 2020 period relative to the two preceding decades of the 1980s and 1990s and then highlight key dimensions of change in the 2000s. This period brought a gender reversal and new female advantage in doctoral and professional degrees. At the same time, gender divides in institution type and student debt emerged, with women disproportionately contributing to both the growth in enrollment at for-profit colleges and the growth in student debtholders.

We consider the implications of the continuities and changes in the female advantage in credentials. In many ways, the female advantage in college credentials likely translates to advantages in other areas. Inequalities in the United States increasingly fall along the divide between the college educated and those with less education, in terms of work opportunities, wealth accumulation, political participation, and broader measures of well-being (DiPrete and Buchmann 2006; Case and Deaton 2020). At the same time, the costs of higher education have shifted toward individuals and away from public provision by the state (Bleemer et al. 2021). As the majority of bachelor's and advanced degree holders, women disproportionately carry the promise and bear the costs of educational expansion in the United States.

DATA SOURCES

We use a series of administrative records and population-level student surveys to provide trend data from 2000 to 2020 (or the latest year available) and examine gender differences in several outcomes. First, to examine degree attainment and fields of study, we use annual Digest of Education Statistics data from the U.S. Department of Education's National Center for Educational Statistics (NCES). We calculate the proportion of women among those receiving bachelor's, master's, and doctoral or professional degrees from 2000 to 2021 or 2022 and analyze the proportions within different racial and ethnic groups.[2] In some analyses, we report trends separately for doctoral and professional degrees.[3] With these data, a supplemental analysis presents high school status dropout rates from 2006 to 2021. To assess course-taking patterns among high school graduates, we use data from the 2019 High School Transcript

2. Here ethnic and racial categories are based solely on self-reported data. As John Anders and his colleagues (2025, this issue) describe in detail, for a small segment of the population, ethnoracial identities may have changed over the time period of study.

3. Doctoral degrees include Ph.D., Ed.D., and comparable degrees at the doctoral level, except for professional degrees. Some doctoral degrees may focus on practice rather than research and Ph.D.s take on a diversity of jobs with diverse labor-market outcomes (Posselt and Grodsky 2017). Professional degrees are conferred on completion of a program for the recognition, credential, or license required for professional practice. They include chiropractic (D.C. or D.C.M.), dentistry (D.D.S. or D.M.D.), law (J.D.); medicine (M.D.), optometry (O.D.), osteopathic medicine (D.O), pharmacy (Pharm.D.), podiatry (D.P.M., Pod.D., D.P.), or veterinary medicine (D.V.M.) and others, as designated by the awarding institution.

Study (HSTS), a nationally representative survey among high school students in the United States (NAEP 2019).

To examine enrollment patterns across public, private nonprofit, and private for-profit postsecondary institutions, we use data from the Integrated Postsecondary Education Data System (IPEDS). IPEDS includes data from every college, university, and technical-vocational institution participating in federal student financial aid programs and provides the institutional sampling frame for other nationally representative postsecondary surveys provided by NCES.

Finally, to analyze trends in gender gaps in debt-holding, we use data from the National Postsecondary Student Aid Study (NPSAS), a comprehensive, nationally representative survey of undergraduate and graduate students enrolled in postsecondary institutions in the United States collected every four years since 1986 (Radwin et al. 2018).[4] With data from 2003–2004 (NPSAS:04) through 2019–2020 (NPSAS:20), we examine the percentage of students who hold any debt in the academic year surveyed by gender, for undergraduate versus graduate students, and by institution types. In the available NPSAS data, all graduate students are combined together, including master's, doctoral, and professional degrees. Supplemental analyses report trends in total debt held by gender, undergraduate versus graduate student, and institution types. Examining the association between gender and the likelihood of holding debt for undergraduate students, net of demographic controls, we estimate a logistic regression model in which the dependent variable is a binary indicator for whether the student holds any debt in 2019–2020, first for all undergraduate students combined, and then for each major racial and ethnic group separately.

Available data on gender and credentials differentiates along the gender binary without considering the broader and growing gender diversity in the U.S. population (Carpenter, Lee, and Nettuno 2025). We report data for women and men, but we join others in calling for data collection that includes full gender diversity. In an encouraging development, in 2019–2020, for the first time, the NPSAS data included an indicator for students who identify other than as a woman or man, including "genderqueer, gender nonconforming, or a different identity" (Cameron et al. 2021). We reflect on the implications of our findings as well as this and other data challenges for future research.

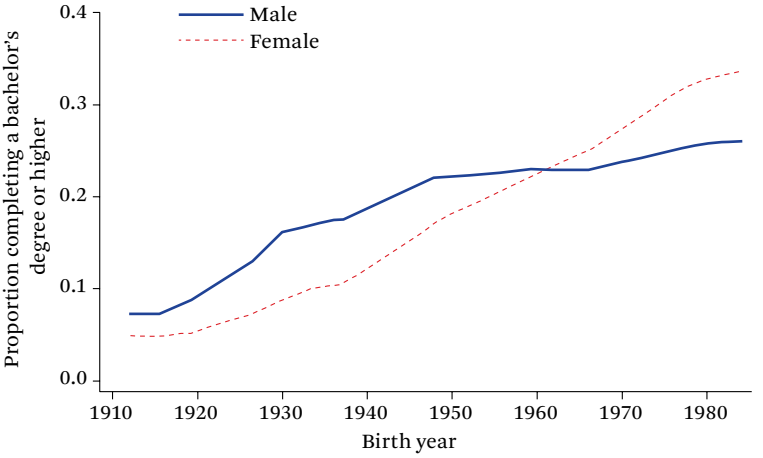
THE CONTINUING FEMALE ADVANTAGE IN BACHELOR'S DEGREES, 2000–2020

Throughout much of the twentieth century, men earned more bachelor's degrees than women. In 1970, 20 percent of men and only 14 percent of women finished college. But then a dramatic change occurred. Figure 1, which shows the proportion of twenty-six to twenty-eight-year-olds with a bachelor's degree by birth cohort, captures the gender reversal in college completion as women born during the late 1950s and early 1960s (who were of college age during the 1980s) overtook men in their rates of completing college. During the same period, men's rate of college completion stagnated and remained essentially flat for fifteen birth cohorts. As a result, between 1970 and 2010, men's college graduation rate had climbed only about 7 percentage points, to 27 percent. In contrast, women's rates skyrocketed from 14 percent in 1970 to 36 percent in 2010. The sources of this gender reversal in college completion have been documented in detail (DiPrete and Buchmann 2013). They include the civil rights and women's movements, which brought about major federal legislation such as the Civil Rights Act of 1964 and Title IX Education Amendments of 1972, as well as large-scale changes in marriage, work, and family life, such as rising rates of divorce and women's labor-market participation, and the advent of the contraceptive pill. These and other forces altered women's incentives and opportunities to pursue higher education.

Figure 2 demonstrates that the female advantage in college completion continued at a stably high level after 2000. Since 2000, women have earned about 57 percent of all bachelor's

4. We use the NPSAS public data through the NCES DataLab (2024) platform, which allows researchers to analyze data online and conduct descriptive and regression analysis on the aggregate level.

Figure 1. Proportion of Twenty-Six to Twenty-Eight-Year-Olds with a Bachelor's Degree



Source: DiPrete and Buchmann 2013. Reprinted with permission.

degrees annually.[5] In 2022, women earned 58.5 percent, but it is unclear whether the uptick demarcates a new upward trend. The female advantage in bachelor's degrees exists for all race and ethnic groups, but differences in the size of the gender gap by race and ethnicity are important. In 2022, women's share of bachelor's degrees was 65.2 percent for Blacks, 62.3 percent for Hispanics, 57.6 percent for Whites, and 55.3 percent for Asians/Pacific Islanders. As figure 2 makes clear, the female advantage in bachelor's degrees over this period remained high and stable for every race and ethnic group available in the data, with only slight fluctuations from year to year.[6]

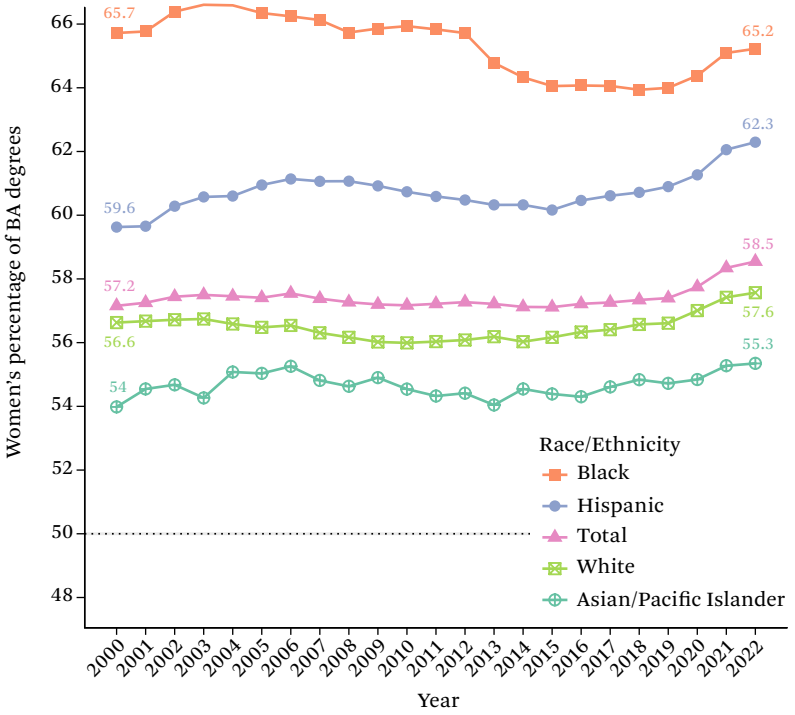
Generally speaking, the successful completion of a college degree depends on individuals' academic skills and preparation, their incentives and educational aspirations, and their ability to manage the financial costs of those credentials. Research has established how educational transitions and academic performance strongly predict college enrollment and completion (Buchmann and DiPrete 2006; DiPrete and Buchmann 2013). High school completion, via either a diploma or certificate of general educational development (GED) is the first step to gaining access to a college education. Since 2006, the trend has been toward convergence in male and female status dropout rates,[7] but

5. In this article, we report women or men as a proportion of degree recipients as consistent with most prior estimates of the female advantage in college completion. These estimates may slightly underreport the female advantage in educational credentials, given that U.S. Census data indicate that since 2000 between the ages of eighteen to thirty-four (Blakeslee et al. 2023), when individuals are most likely to pursue credentials, men outnumber women by 103 to 100.

6. As Thomas DiPrete and Claudia Buchmann (2013, 40) note, the historical trend for Blacks was distinctive in that "Black women have had a consistent advantage, albeit a small one early on, in college completion over Black men for more than seventy years; among Whites, women's advantage in college completion emerged in recent decades." DiPrete and Buchmann also expect incarceration to have a relatively small impact on the gender gap in educational attainment because "young people sentenced to time in jail or prison are disproportionately high school dropouts . . . though this question clearly requires further research" (71) as does the question of whether military service reduces the likelihood of earning a college degree (but for more detail, see MacLean and Elder 2007).

7. The status dropout rate reports sixteen- to twenty-four-year-olds who are not enrolled in high school and who have not completed a high school program or a GED (NCES 2022).

Figure 2. Women's Share of BA Degree Recipients, by Race and Ethnicity



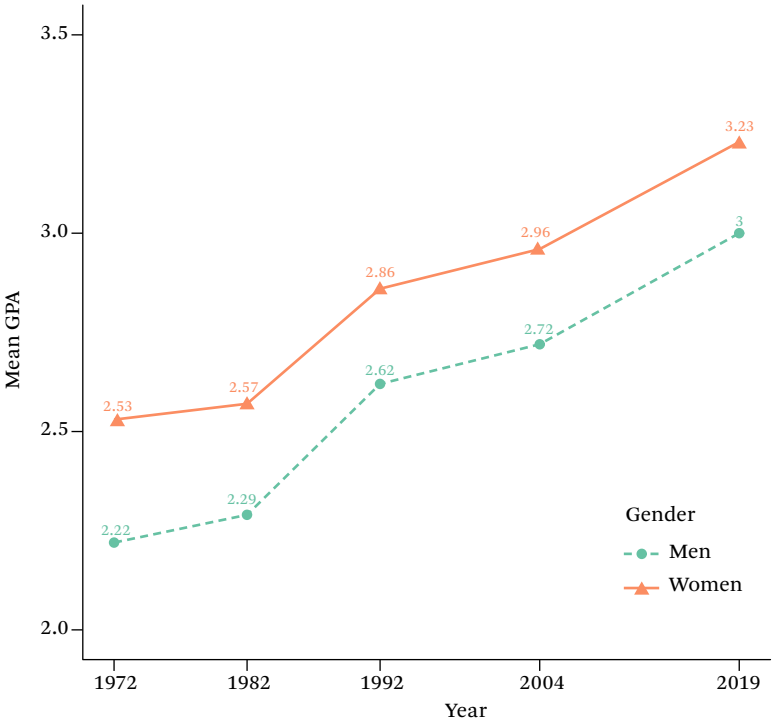
Source: Authors' calculations based on NCES 2023b, table 322.20.
Note: 2000 refers to the 1999–2000 academic year; 2001 refers to the 2000–2001 academic year, and so on.

still more men than women fail to complete high school (figure A.1), and this is the case for all major racial-ethnic groups.

Although earning a high school diploma or GED makes college enrollment possible, performance in high school coursework is a far stronger predictor of enrolling in and completing college. In fact, high school grades and coursework are stronger predictors of completing college than standardized test scores are (Bowen, Chingos, and McPherson 2009; DiPrete and Buchmann 2014). This is because academic performance indicators such as high school grades and rigorous course taking reflect behavioral patterns that align with school success, including doing more homework and completing assignments on time, while avoiding problem behaviors such as skipping classes or getting suspended. These behaviors lay a strong foundation for later behaviors related to success in college.

The female advantage in academic performance in high school continued unabated in the 2010s. Figure 3 shows a sizable and stable female advantage in overall high school grade point average (GPA) that is statistically significant at each timepoint and ranges from 0.23 to 0.30 over the last half century. Figure 4 shows a female advantage in rigorous math and science courses taken in high school. In 2019, about 60 percent of female high school graduates completed calculus, precalculus, statistics, or trigonometry as their highest-level math course versus 54 percent of their male counterparts. A similar gap exists for science, where about 36 percent of female high school graduates earned credits in advanced science courses relative to 29 percent of male graduates. Women's advantage in advanced math and science course taking continues a trend that began in the 1990s, before which males outpaced females in the rigor of high school coursework (DiPrete and Buchmann 2013, 89). These clear indicators of females' better academic perfor-

Figure 3. Mean Grade Point Average for High School Seniors



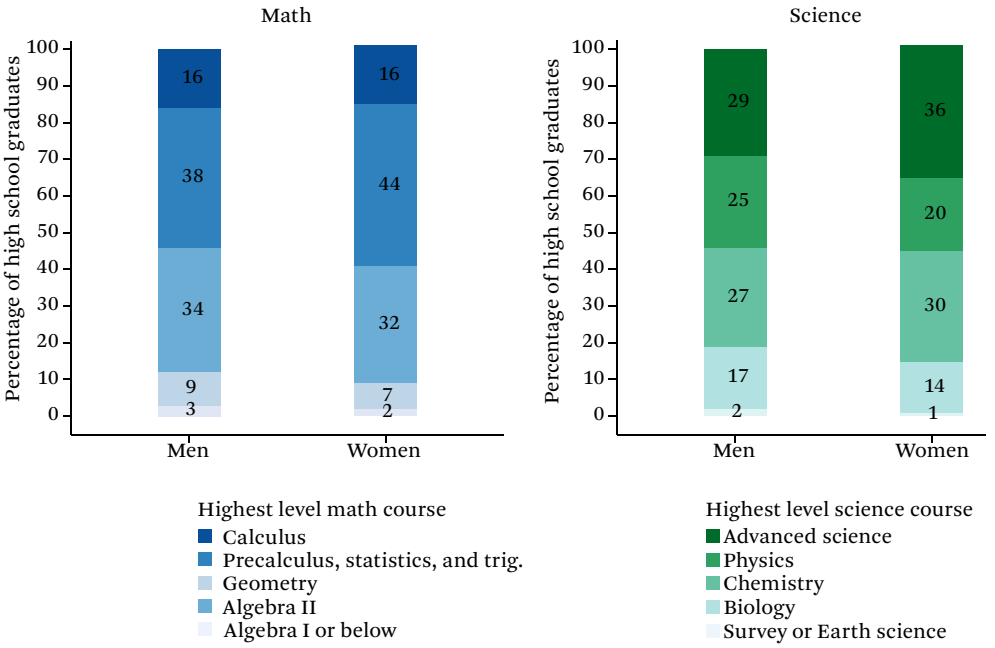
Source: Authors' compilation based on DiPrete and Buchmann 2013 and National Assessment of Educational Progress (NAEP 2019).

mance are central to their greater likelihood of enrolling in and completing college.

Research on the 2000 to 2020 period suggests that the labor-market incentives related to the returns to a college degree, combined with gendered ideas about the division of labor, continue to contribute to the female advantage in college credentials. Gender segregation in occupations likely contributes to gendered differences in evaluating the costs and benefits of college. Female-dominated occupations such as education and health care often require credentials, whereas men have historically had greater access to comparatively well-paid trade and construction jobs, with training more often provided on the job or through trade organizations (Duffy 2011; Dwyer 2013; Dwyer and Wright 2019). Gender segregation in fields of study continued in the 2010s and increased in those linked to occupations in growing areas of the economy, including high tech and care work: by 2021, more than five times as many women received bachelor's degrees in health professions and related programs (227,300 versus 40,700), and more than three times as many men received bachelor's degrees in engineering-related fields (111,700 versus 33,300) (figure A.2).

At the same time, gendered labor-market incentives are only part of the story, as over this period, men's labor-market returns to college degrees have increased (Ashworth et al. 2021; Autor and Wasserman 2013) and the broader returns to higher education (probability of marriage, family standard of living, and insurance against poverty) have continued to rise for both men and women (DiPrete and Buchmann 2006). Due in part to their lack of college and advanced degrees, coupled with their resistance to switch into female-dominated jobs (Yavorsky and Dill 2020), some men are faring quite poorly in the labor market. Since the Great Recession, with the decline of middle skill white- and blue-collar sectors, the share of men in low-skill occupations has increased rel-

Figure 4. Percentage of High School Graduates Across Highest Levels of Math and Science Courses Earned in 2019



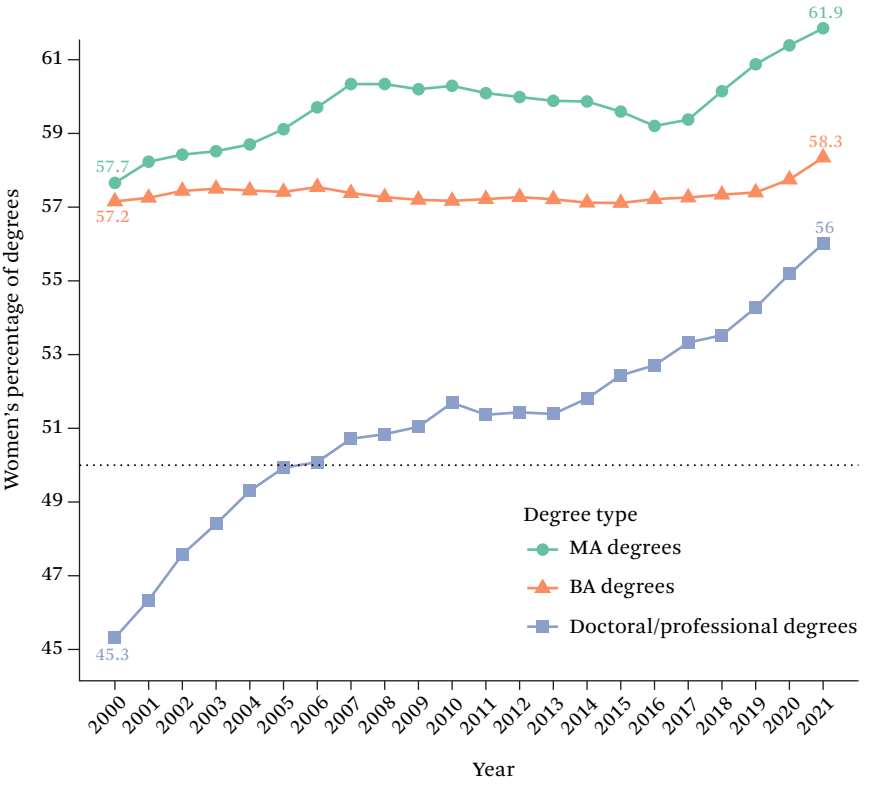
Source: Authors' calculations based on NAEP 2019.
Note: The sum of women's percentage is slightly above 100 because of rounding.

ative to those in high-skill ones (Autor and Wasserman 2013). Given the lower family wealth and income available to Black, Hispanic, and Indigenous young adults, the gendered trade-offs of attending college may be particularly consequential for these men and their families (Fingerman et al. 2015; Fomby and Kravitz-Wirtz 2019). These realities make the ongoing decline in men's educational expectations a cause for concern: since 2001, more women than men have reported that they expect to complete a four-year degree (Buchmann, DiPrete, and McDaniel 2008). Even more striking, more women than men also expect to attend graduate school, and this gender gap has grown over time. According to an analysis of Monitoring the Future data, in 2019, 52 percent of young women were predicted to plan to attend graduate school relative to 40 percent of young men (Young, Beutel, and Burge 2023). This emergence of a gender gap in expectations for graduate school reflects the emergence of a female advantage in doctoral and professional degrees in the 2000s—one of the major changes in the gender divide in credentials since 2000, to which we turn next.

THE GENDER REVERSAL AND NEW FEMALE ADVANTAGE IN ADVANCED CREDENTIALS

A large female advantage in advanced degrees emerged over the first two decades of the twenty-first century. The gender reversal for master's degrees occurred before 2000, just as for bachelor's degrees, but women increased their share of master's degrees from 57.7 percent in 2000 to 61.9 percent in 2021. Their share of doctoral and professional degrees increased even more strikingly, from 45.3 percent in 2000 to 56 percent in 2021, such that the gender gap reversed from a male advantage to a female advantage (figure 5), the last remaining credentials for which men had previously maintained an advantage. The female advantage in master's degrees and doctoral or professional degrees increased for all race and ethnic groups

Figure 5. Women's Share of BA, MA, and Doctoral/Professional Degree Recipients



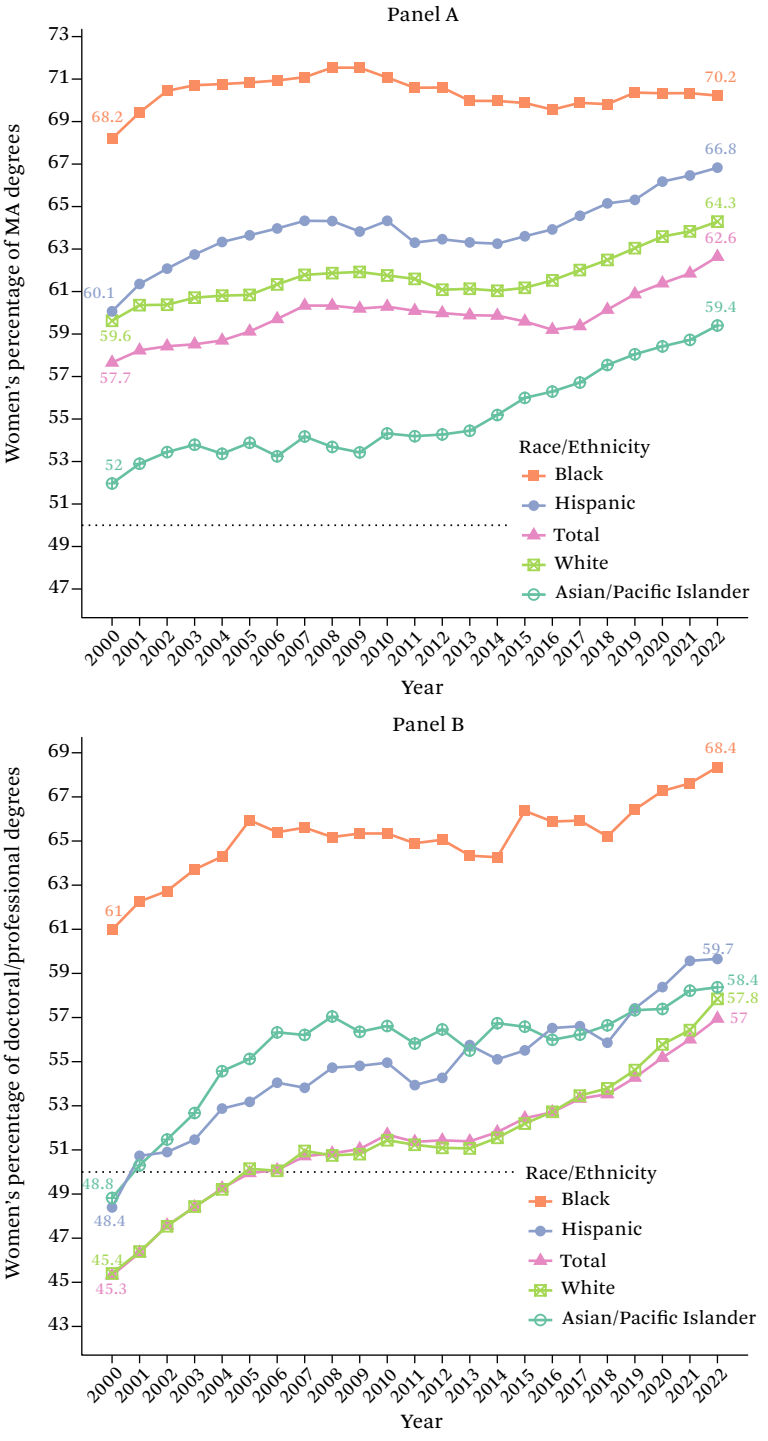
Source: Authors' calculations based on NCES 2022, table 318.10.
Note: The given year is the second of an academic year span: 2000 refers to 1999–2000, 2001 to 2000–2001, and so on.

such that by 2022, women's share of master's degrees was 70.2 percent for Blacks, 66.8 percent for Hispanics, 64.3 percent for Whites, and 59.4 percent for Asians/Pacific Islanders (figure 6). In that same year, women's share of doctoral and professional degrees was 68.4 for Blacks, 59.7 percent for Hispanics, 58.4 for Asians/Pacific Islanders, and 57.8 for Whites.

The gender reversal in advanced degrees over the past twenty years occurred for both doctoral and professional degrees, but was especially large for professional degrees. Figure 7 reports the number of doctoral and professional degrees by gender. The pattern of gender divergence in professional degrees is striking in that since 2013 the number of professional degrees awarded to men stagnated (from 51,872 in 2013 to 49,286 in 2022) and the number awarded to women increased by more than 25 percent (57,273 in 2013 to 77,867 in 2022). For doctoral degrees, women began to pull away from men in 2016, and the gender gap has continued since that time. The U.S. Department of Education projects a continued gender divergence in doctoral and professional degrees, with those awarded to women projected to increase by 30.2 percent and those to men to increase by only 3.2 percent between 2021 and 2032 (NCES 2022, table 318.10).

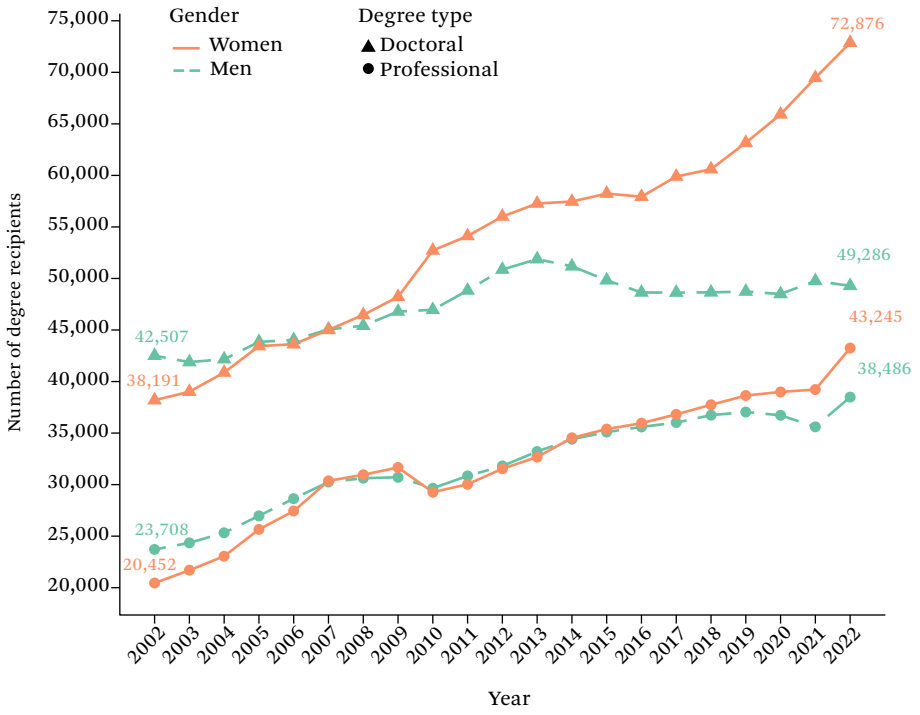
Given that educational expansion has shifted to graduate degrees (Torche 2011), the growing gender divide in graduate degrees is notable. As Julie Posselt and Eric Grodsky (2017, 354) explain, "far from being a site of social equality, graduate and professional credentials are substantially more heritable than are other levels of education." Moreover, the economic returns to graduate credentials constitute a growing share of the overall returns to higher education for both women and men. Ac-

Figure 6. Women's Share of MA (Panel A) and Doctoral/Professional Degrees (Panel B), by Race and Ethnicity



Source: Authors' calculations based on NCES 2023b, table 323.20, 324.20 (with updated 2022 data).
Note: The given year is the second of an academic year span: 2000 refers to 1999–2000, 2001 to 2000–2001, and so on.

Figure 7. Number of Doctoral and Professional Degree Recipients, by Gender



Source: Authors' calculations based on NCES 2023c.
Note: The given year is the second of an academic year span: 2000 refers to 1999–2000, 2001 to 2000–2001, and so on.

cording to Rob Valleta (2015), from 2000 to 2013, relative to high school graduates, the earnings advantage to a graduate credential increased 17 percent over this period, while the earnings advantage for an undergraduate degree increased only 6 percent. Among college graduates of all age groups in 2021, women with a master's, doctoral, or professional degree enjoyed median salaries that were 21.7 percent, 53.3 percent, and 83.3 percent greater than those of bachelor's degree recipients, respectively. Among men, the benefits of advanced degrees over bachelor's degrees for median salaries were 10.5 percent, 24.2 percent, and 94.7 percent, respectively (National Center for Science and Engineering Statistics 2022).

In one sense, the female advantage in advanced credentials represents the logical progression of the gender reversal in college degrees, given that over time women have achieved the credentials that match their academic performance, and that achievements at lower levels of attainment provide access to advanced credentials. And the challenges for at least some men to earn college degrees now also appear to be limiting their earning advanced degrees. At the same time, other shifts in higher education suggest some more ambiguous conclusions for women who are now at the forefront of educational expansion.

EMERGING GENDER DIVIDES IN TYPES OF INSTITUTIONS ATTENDED

The continued female advantage in bachelor's degrees and in advanced credentials occurred during a period marked by a shift toward treating higher education as a private good (Dwyer, McCloud, and Hodson 2012; Houle 2014; Seamster and Charron-Chénier 2017; Cellini and Koedel 2017; Quadlin and Powell 2022). Although higher education in the United States has been understood as both a public and private good, in the 2000s the balance shifted at both the institutional and individual levels. At the institu-

tional level, a striking feature was major expansion of private for-profit institutions due to loosening federal regulations along with organizational and market innovation (Brown et al. 2019). At the individual level, government subsidy of student tuition declined at the state level and student financial aid increasingly came in the form of federal loans with expectation that students and families would shoulder more of the costs of higher education. Notably, for-profit institutions took significant advantage of the expanding federal loan system; for example, admissions officers and materials at these for-profit institutions helped their often-disadvantaged students secure loans (McMillan Cottom 2017; Dawson 2024). Indeed, for-profit colleges depend more heavily on student loans for their tuition dollars than either public or private nonprofit colleges (McMillan Cottom 2017; Cellini and Koedel 2017).[8]

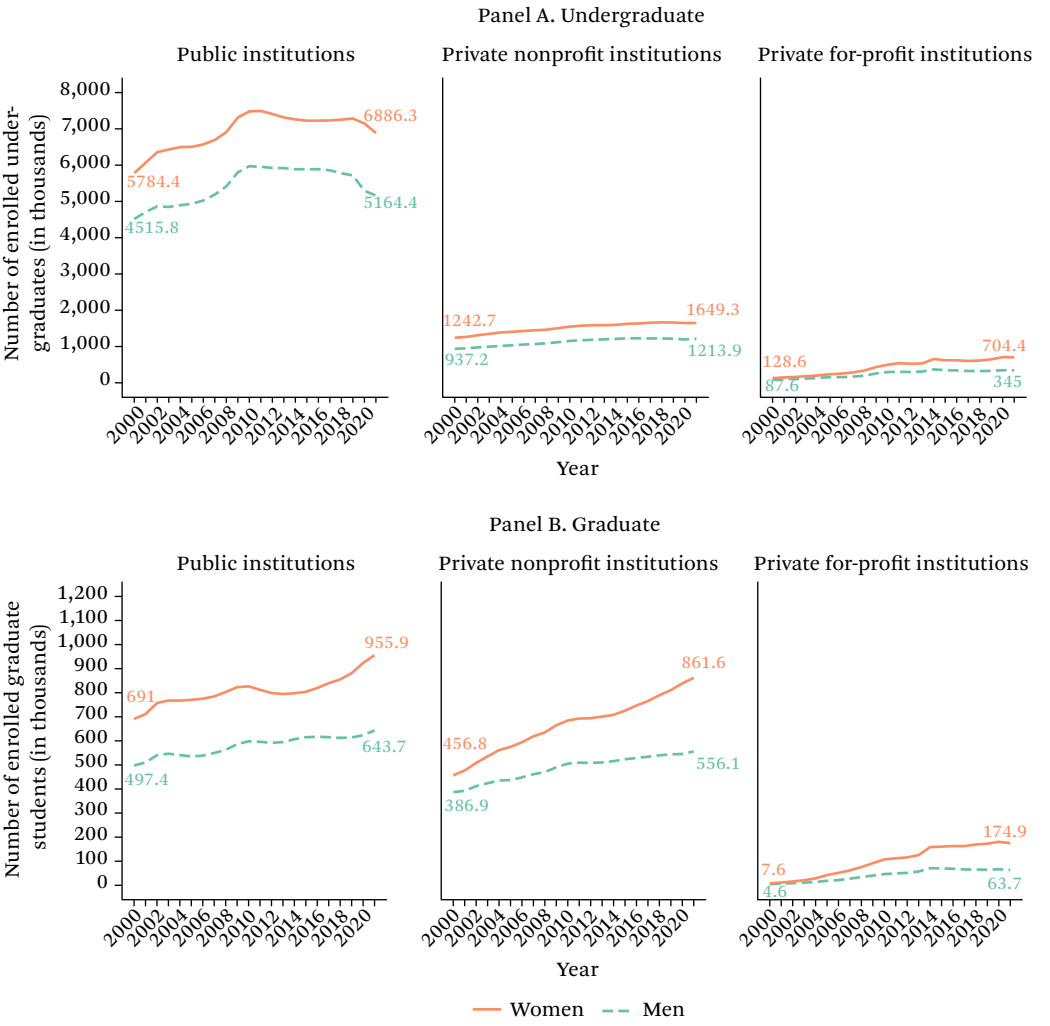
Little research to date has examined the implications of the coincidence of the rise of for-profit institutions of higher education with the growing gender divide in credentials, though some work has highlighted the large presence of women at these institutions (McMillan Cottom 2017; Quadlin, Conwell, and Rouhani 2023; Dawson 2024). Here we build on that research by analyzing gendered trends in undergraduate and graduate enrollment in three institution types: public, private nonprofit, and private for-profit institutions. Figure 8 shows men and women undergraduates (top panel) and graduate students (bottom panel) enrolled in each type of institution from 2000 to 2021. Gender gaps in undergraduate enrollment in public and private nonprofits changed little over the period, but the top right panel shows an emerging female-favorable gender gap in undergraduates in private for-profit institutions such that by 2021, more than twice as many women (704,400) as men (345,000) were enrolled in these institutions (for these findings in percentage terms, see figure A.3). Although the popular image of for-profit universities are those serving undergraduates, the bottom panel of figure 8 shows growing numbers of doctoral and professional students attending for-profit schools and an emerging gender gap in private for-profit graduate enrollment. In 2000, almost no graduate students were enrolled at for-profit institutions, which at that time were more likely to be trade schools than institutions offering graduate degrees. Around 2004, graduate enrollment at for-profit schools began to increase more rapidly for women than for men, opening a gender gap that either grew or stayed stable over the 2010s. Posselt and Grodsky (2017) note that women continue to be more likely to engage in lower-prestige graduate programs than do men despite the increasing female advantage and encourage more research on this issue.[9] Our findings demonstrate this persistence in lower prestige may be driven in part by the expansion of for-profit schools.

Trends in enrollment by institution type reveal an arguably underappreciated dimension in the unevenness of the gender revolution in the 2000s—women have likely borne more than men the costs of the shift towards education as a private good (England, Levine, and Mishel 2020). The growth of women with graduate credentials reflects achievements among the most privileged women but also the challenges of getting ahead in a credential society for lower income women. Research on graduate credentials from for-profit institutions is very limited, but findings on horizontal stratification and returns at the undergraduate level suggest that these degrees yield lower economic rewards than degrees from nonprofit institutions (Cellini and Koedel 2017; Cellini 2021). Because mi-

8. The rise of for-profit colleges and the high debt levels of students attending them led the Barack Obama administration to enact restrictions and some of the most predatory actors were shuttered. However, the Donald Trump administration loosened those restrictions again.

9. In supplemental analyses not shown, we find that the female advantage in advanced degrees developed differently by institutional sector. In the public and private nonprofit sectors, women's enrollment grew strongest in professional degrees, matching the overall trend displayed in figure 8. At for-profit institutions, doctoral degrees grew even more than professional degrees, likely driven by fields in which doctoral degrees likely lead to careers in practice, such as education and business. We join Posselt and Grodsky (2017) in calling for greater attention to institutional diversity in graduate education.

Figure 8. Total Fall Enrollment for Men and Women by Institution Type for Undergraduate and Graduate Students Through 2021



Source: Authors' calculations based on NCES 2023c.
Note: Figures in thousands. Graduate students include all students at master's, doctoral, and professional degree levels.

noritized and low-income women are more likely to attend these institutions, they may be especially subject to the risk of high costs with low rewards (McMillan Cottom 2017; Quadlin, Conwell, and Rouhani 2023; Mickey-Pabello 2024).

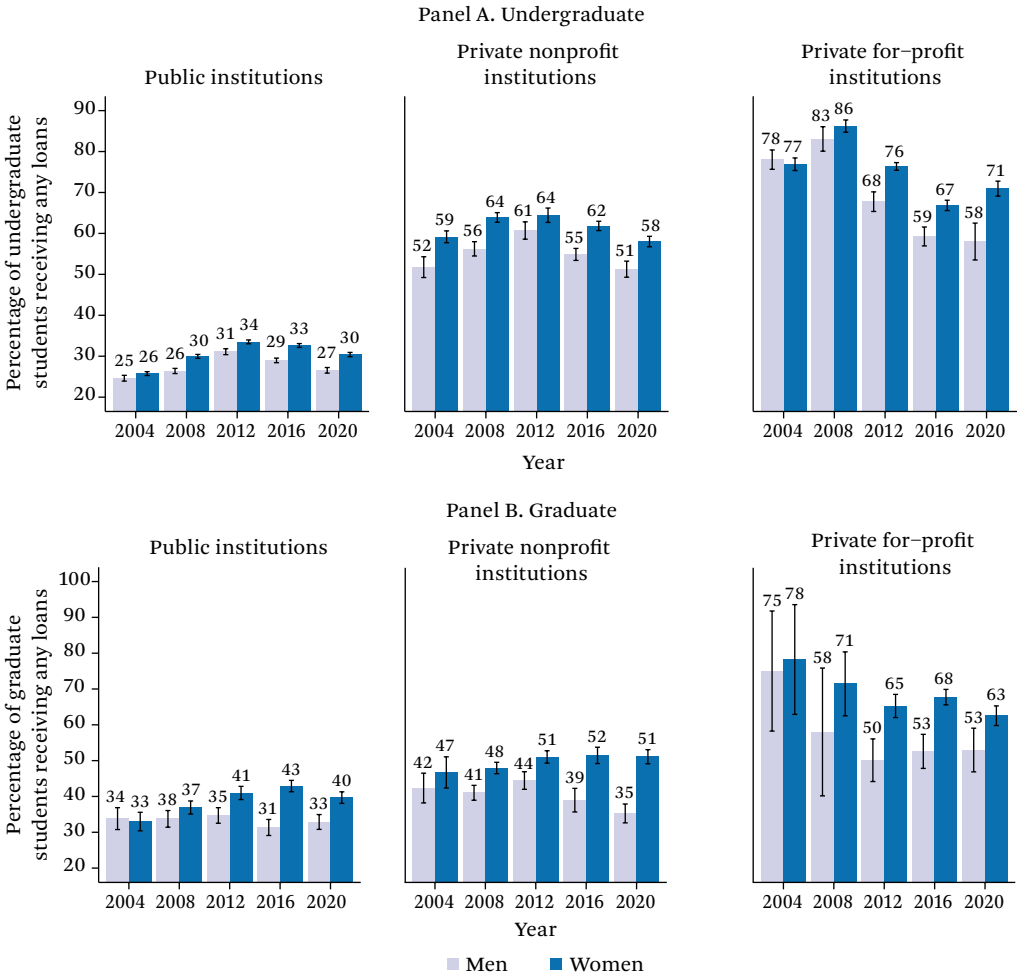
THE EMERGING GENDER DIVIDE IN STUDENT DEBT

At the individual level, in part through their greater representation at for-profit institutions that rely on federal financial aid for tuition dollars, women may also have borne more of the costs of the shift to student loan debt overall. Increasing concerns over college financing drive public debates over the value of college, but there has been comparatively little attention to this broader context in discussions of the gender divide in credentials (Dwyer, Hodson, and McCloud 2013; Quadlin and Powell 2022). We find evidence of emerging gender gaps in student indebtedness with women an

increasing percentage of debt-holders. Figure 9 shows the percentage of men and women undergraduates (top panel) and graduate students (bottom panel) holding any debt for public institutions, private nonprofit institutions, and private for-profit institutions from 2004 to 2020. For all three institution types, debt-holding increased most from 2004 to 2008, then stabilized from 2008 to 2012 after the Great Recession and declined slightly between 2012 to 2016 (Green 2018). Aversion to debt after the Great Recession may have increased when criticisms of the student loan system were a subject of public debate. Despite a small decline in debt-holding from 2016 to 2020 in public and private nonprofit institutions, debt-holding at private for-profit institutions rebounded after the Trump administration loosened the Obama-era restrictions. These findings suggest that the pattern of for-profit institutions contributing to rising indebtedness in the 2000 to 2010 period has continued (Brown et al. 2019).

Strikingly, the 2000s brought a gender rever-

Figure 9. Percentage of Undergraduate and Graduate Students Holding Debt, by Gender and Institution Type



Source: Authors' calculations based on NCES 2023d.

Note: Academic years 2003–2004, 2007–2008, 2011–2012, 2015–2016, and 2019–2020. Graduate students include those attending master's, doctoral, and professional degree programs at the time of interview. Error bars present 95 percent confidence intervals.

sal in debt-holding to match the female advantage in degrees overall. In 2004, women were more likely to carry debt than men only at private non-profit institutions (59 percent to 52 percent). By 2020, women were more likely than men to carry student debt in public and private for-profit sectors as well. In public institutions, a gender gap opened in 2008, with 30 percent of women and 26 percent of men holding debt. In private for-profit institutions, a gender gap in debt-holding opened for the first time in 2012 with 76 percent of women versus 68 percent of men holding student debt, a larger gap than that among the other institution types. From 2012 to 2016, the gender gap grew in both the public and private nonprofit sectors and held steady at for-profit colleges, even as debt-holding declined modestly in each sector. The rebound in debt-holding at for-profits from 2016 to 2020 occurred entirely among women, increasing the gender gap in that sector to 13 percentage points.

Although still a comparatively small proportion of all credentials, shifts in graduate degrees represent the leading edge of change in the U.S. credential society (Pyne and Grodsky 2020). Strikingly, we find the emergence of a gender divide in student indebtedness over the same period during which women became the majority of graduate degree recipients. The bottom panel of figure 9 reports the percentage of male and female graduate students who hold debt, for public, private nonprofit, and private for-profit institutions. Here graduate students include those in any master's, doctoral, and professional degree program. Debt-holding increased slightly from 2004 to 2020 in the public and private nonprofit sectors.[10] However, debt-holding was substantially higher in the for-profit sector relative to the other two sectors, and that disparity was greater for graduate students than for undergraduate students. This finding reflects the total absence of funded graduate study in the for-profit sector. Just as for undergraduates, however, the percentage holding debt dropped from 2008 to 2012 after greater regulation of that sector, but remained higher than in the other two sectors.

Now focusing on the patterns for men and women, a gender gap in debt-holding for graduate students emerged in every institutional sector. In 2004 there was no gender gap in debt-holding for graduate students in any institutional sector but starting in 2012, higher percentages of women carried debt relative to men in every institutional sector, and those gaps persisted through 2020. Again, just as for undergraduate students, the gender gap is even larger when we account for the fact that women make up an increasingly disproportionate percentage of graduate students, especially in degree programs that tend to be student funded, including master's degrees and professional degrees, as well as those at for-profit institutions.

Overall trends in the average amounts of debt held (see figure A.4) follow similar patterns to those for debt-holding, though no total amounts in any institutional sector showed any decline from 2012 to 2016. Notably, average debt levels were comparable at private nonprofit and for-profit institutions, despite the much lower status and return to for-profit degrees. Gender gaps in debt levels among debt-holders are fewer than in the likelihood to hold any debt. The gender gap in debt thus occurs primarily as a result of differences in the likelihood of taking on any debt at all, suggesting that one consequence of the gender gap in credentials is that on average women are a financially disadvantaged group who rely more on financial aid. Women and men who need to take on debt take on similar average amounts of debt.[11]

Given that the female advantage in credentials results in a broader population of women attending college than men, we conduct a multivariate analysis of 2020 data to determine whether the undergraduate gender gap in debt-holding persists net of sociodemographic char-

10. Overall debt-holding among graduate students in the two nonprofit sectors were more similar than for undergraduates, reflecting more similar costs and funding models in graduate programs than in undergraduate programs.

11. One reason studies often find more variation in debt-holding than debt levels among debtors is that student loan offers are capped at standard levels, limiting variability (Goldrick-Rab 2016).

acteristics.[12] Table 1 presents the results of logistic regression analyses predicting debt-holding with controls for sociodemographic characteristics and institution type. The model for all students shows a gender gap in debt-holding among women and men with students in for-profit colleges the most likely to take on debt. The race-specific models reveal a gender gap in debt-holding for each group.[13] Thus, women are more likely to hold debt than similarly situated men.

Gender differences in student debt may be both a cause and a consequence of the gender divide in college credentials. The rising cost of education in recent decades may be a source of women's continued outpacing of men in earning credentials, given that financial considerations are a key reason many Americans do not attend or complete college. According to a 2021 survey of adults without a four-year college degree by the Pew Research Center, 42 percent cited their inability to afford one (Parker 2021). Women and men may differentially evaluate the risks and benefits of investing in college because of different labor-market and marriage opportunities (Dwyer, Hodson, and McCloud 2013). Moreover, different conventions of masculinity and femininity result in greater family support for daughters than for sons into young adulthood and reinforce expectations of self-sufficiency and independence for men compared to women (DiPrete and Buchmann 2013). For all of these reasons, men may be less willing than women to take on debt to attain educational credentials.

Causal factors aside, any gender differences in student debt also represent an important consequence of the gender divide in college credentials. Because women make up a larger proportion of the college-going population, they and their families disproportionately bear the costs of college. Moreover, as educational expansion among women developed in the 2000s, a growing number of them attended for-profit institutions, which offer worse employment and earnings outcomes than nonprofit ones (Cellini 2021).

IMPLICATIONS

Although the female-favorable gender gap in bachelor's degrees remained stable over the first two decades of the twenty-first century, a large female advantage in advanced degrees emerged over the same period and has grown especially large for professional degrees. In light of the fact that the economic returns to graduate credentials constitute a growing share of the overall returns to higher education, these are important markers of women's continued educational advancement made possible by their higher academic performance and educational aspirations. In contrast, men's stagnant rates of college completion over the same period have limited some men's ability to acquire advanced degrees and advance in the labor market. Finally, the slow growth in college degrees among men, who make up about half the U.S. working-age population, has reduced the nation's competitiveness in the global economy; the United States has fallen to twelfth among OECD countries in the share of tertiary-educated twenty-five to thirty-four-year-olds (OECD 2022).

The diverging educational pathways of American men and women have far-reaching impacts because the returns to a college degree extend beyond stable employment and higher earnings and include a higher probability of marriage, insurance against poverty (DiPrete and Buchmann 2006), and a healthier and longer life (Case and Deaton 2020). These pathways may also be related to other significant developments discussed by other articles in this double issue. Women's increasing receipt

12. Public NPSAS data does not provide adequate sample sizes to analyze the smaller population of graduate students.

13. The gender gap in debt-holding is not significantly different between these racial-ethnic groups, except that debt-holding of Hispanic students is significantly smaller than that of White students. Supplemental analyses (not shown) find that Black students are the most likely to take debt relative to all other racial-ethnic groups within each gender. And in analyses separated by institution type, the gender gap in debt-holding is the largest in for-profit colleges. We also added a category for nonbinary students (first collected in 2020) and find no significant differences in the likelihood of holding debt relative to men or women.

Table 1. Logistic Regression Models Predicting Odds Ratios of Debt-Holding Among Undergraduate Students

	All	White	Black	Hispanic	Asian	Other
Gender (Ref: Male)						
Female	1.321***	1.418***	1.324***	1.136*	1.225***	1.243*
	(0.037)	(0.049)	(0.102)	(0.069)	(0.114)	(0.127)
Race and Ethnicity (Ref: White)						
Black	1.794***					
	(0.069)					
Hispanic	0.733***					
	(0.022)					
Asian	0.617***					
	(0.031)					
American Indian or Alaska Native	0.675*					
	(0.114)					
Native Hawaiian /Other Pacific Islander	0.945					
	(0.221)					
Multiracial	0.895					
	(0.051)					
Institutional type (Ref: Public)						
Private nonprofit	1.745***	1.614***	1.711***	2.475***	1.412*	1.974***
	(0.042)	(0.073)	(0.211)	(0.206)	(0.196)	(0.264)
Private for-profit	4.773***	3.557***	3.034***	10.438***	8.120***	5.548***
	(0.245)	(0.326)	(0.455)	(2.185)	(2.599)	(1.176)
Degree program (Ref: Certificate; associate's degree; not in a degree program or others)						
Bachelor's degree	3.092***	2.776***	3.262***	4.049***	3.609***	2.839***
	(0.235)	(0.302)	(0.354)	(0.588)	(0.854)	(0.550)
Institution level (Ref: Less than two-year)						
Four-year	0.673***	0.823	0.640	0.584	0.215**	0.675
	(0.071)	(0.132)	(0.165)	(0.164)	(0.106)	(0.226)
Two-year	0.447***	0.540***	0.346***	0.418***	0.127***	0.583
	(0.041)	(0.076)	(0.088)	(0.418)	(0.063)	(0.174)
School year (Ref: First year)						
Second year	1.266***	1.192***	1.277**	1.275***	1.594**	1.009
	(0.041)	(0.053)	(0.090)	(0.087)	(0.221)	(0.127)
Third year	1.202***	1.139*	1.114	1.400***	1.348*	1.278
	(0.054)	(0.071)	(0.134)	(0.118)	(0.177)	(0.200)
Fourth year	1.028	0.949	0.903	1.469***	1.008	1.052
	(0.042)	(0.050)	(0.106)	(0.131)	(0.136)	(0.180)
Fifth year and unclassified	0.849*	0.711***	0.666	1.284	1.623	0.827
	(0.065)	(0.071)	(0.149)	(0.202)	(0.416)	(0.287)
U.S. born	1.95***	2.050***	2.077***	2.067***	1.505***	2.610***
	(0.086)	(0.145)	(0.191)	(0.164)	(0.150)	(0.483)
Constant	0.173	0.152***	0.351***	0.096***	0.321*	0.118***
	(0.018)	(0.025)	(0.100)	(0.022)	(0.147)	(0.041)
N	79,700	38,800	12,000	18,500	5,800	4,600

Source: Authors' calculations based on Cameron et al. 2021.

Note: Other racial groups include American Indian or Alaska Native, Native Hawaiian/other Pacific Islander, and Multiracial. They are combined due to lack of sufficient sample sizes to run models separately.

*$p < .05$; **$p < .01$; ***$p < .001$

of credentials from the 1980s onward may be related to their ability to close prior gender gaps in job tenure between the mid 1980s and late 1990s (Lachanski 2025, this issue), though this conjecture needs empirical investigation. At the same time, men's lack of college degrees may be related to their increasing precarity later in the life course. For example, Hyunjoon Park, Matthew Sheen, and Paula Clark (2025) find that at older ages, men without a college degree are more likely to live alone than their more educated counterparts.

Another striking feature of the 2000 to 2020 period was the expansion of for-profit institutions in the United States and concomitant increases in women's undergraduate and graduate enrollment at these institutions. Although for-profit enrollment still represents a small share of all higher education enrollments, the high level of debt-holding among students at those institutions means that a substantial proportion of the growing indebtedness among women occurs at these schools. Related to these institutional changes and the fact that the costs of higher education have increasingly come to be a private good, a gender divide emerged in student indebtedness over the same period during which women became the majority of graduate and professional degree holders. Today, as the majority degree holders, women disproportionately carry the promise and bear the costs of educational expansion in the United States.

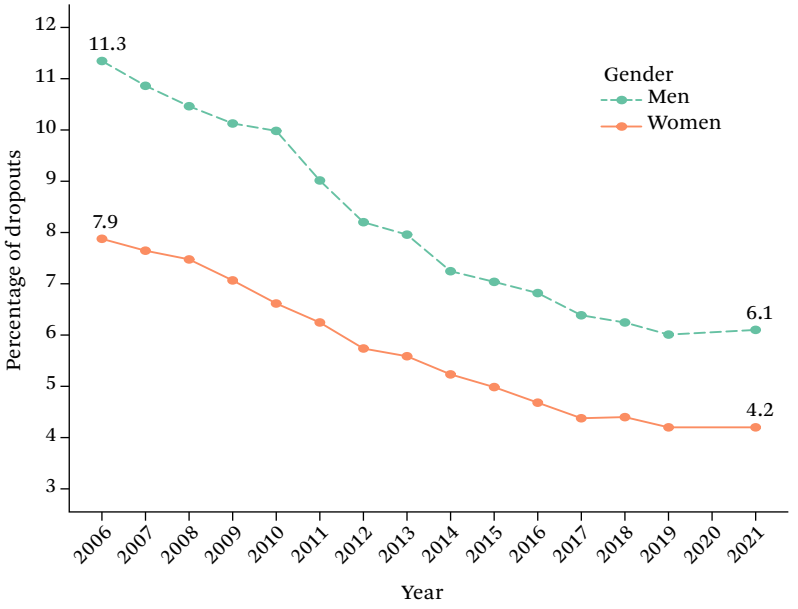
Clearly many questions remain and thus we highlight particularly urgent directions for future research on the growing gender divide in educational credentials. First, future research should focus on the causes and consequences of gender differences in college and advanced degree receipt by race, ethnicity, socioeconomic status, and nativity, with a particular focus on low-income and minoritized populations. Second, as population-level data sources become available, a focus on sexual and gender minority (SGM) populations would be valuable given that research about educational experiences and attainment of this growing population in the United States is still quite limited (Stacey, Reczek, and Spiker 2022). Finally, it is important to continue to expand research on the growing heterogeneity among women degree holders in terms of institutions attended, debt-holding, and degree returns. As the female advantage in credentials continues, the population of highly educated women has become much more diverse than highly educated men. These differences in selection have significant implications for understanding both the promises and the costs of higher education for women relative to men, as well as for sexual and gender minority populations (Conwell and Quadlin 2022). Research has identified differential repayment rates across student populations to be a particularly important aspect of the costs of higher education, with minoritized students and students who attended for-profit institutions taking longer to repay loans and facing higher rates of default (Brown et al. 2019; Houle and Addo 2019). Research also highlights the implications of these realities for the racial wealth gap (Seamster and Charron-Chénier 2017; Houle and Addo 2019, 2022). Our work and that of others (Quadlin, Conwell, and Rouhani 2023; Dawson 2024) suggest implications for the gender wealth gap, and the gender-by-race wealth gap.

The gender divide in for-profit enrollment presents both cautions and opportunities in the next decade. The highly disproportionate female enrollment at for-profit institutions combined with high debt levels at those institutions underscores how the costs of declining public investment in higher education have fallen disproportionately on less advantaged women. Yet, after a time of growing prominence, for-profit institutions may now be facing significant headwinds. Increased public scrutiny has led to greater regulatory attention and rules that make it more difficult for these schools to encourage high levels of student debt while providing degrees with low returns. Moreover, some nonprofit colleges are competing with for-profit colleges by offering a wide range of practice credentials, micro-credentials, and, perhaps most important, remote educational programs. A few nonprofit public systems have even moved toward purchasing and absorbing formerly for-profit institutions, with significant debate over what such acquisitions mean for the nonprofit purchasers (Blumenstyk 2017). Finally, for-profit universities also face the demographic change challenging all

U.S. institutions of higher education: a declining number of college-aged young adults, with 2025 representing what some have called a demographic cliff as a smaller postmillennial cohort becomes college age.

The growing gender divide in educational credentials raises important questions for researchers, policymakers, and educators who want to improve educational performance and attainment and for educational institutions striving to respond to the needs of their students. The large, diverse system of higher education in the United States offers many pathways to educational credentials, but students also face numerous challenges in earning them, and the costs have become principal among the challenges (Goldrick-Rab 2016; Quadlin and Powell 2022). We have highlighted both the opportunities and costs for women who, as the majority of college students and degree recipients, must manage the risks of educational expansion in a time of lowered state subsidy and expanded allowances to for-profit institutions. Of course, men's lower rates of earning bachelor's degrees and advanced credentials also entail risks, especially for lower-income and minoritized men, and researchers and policymakers should seek to understand the sources and solutions for men's stagnant enrollment and completion rates. The growing gender divide in credentials was spurred at least in part by greater equity and access for women. In the next decade and beyond, policymakers, politicians, and educators should support the equity-enhancing possibilities of higher education rather than its stratifying and exclusionary risks.

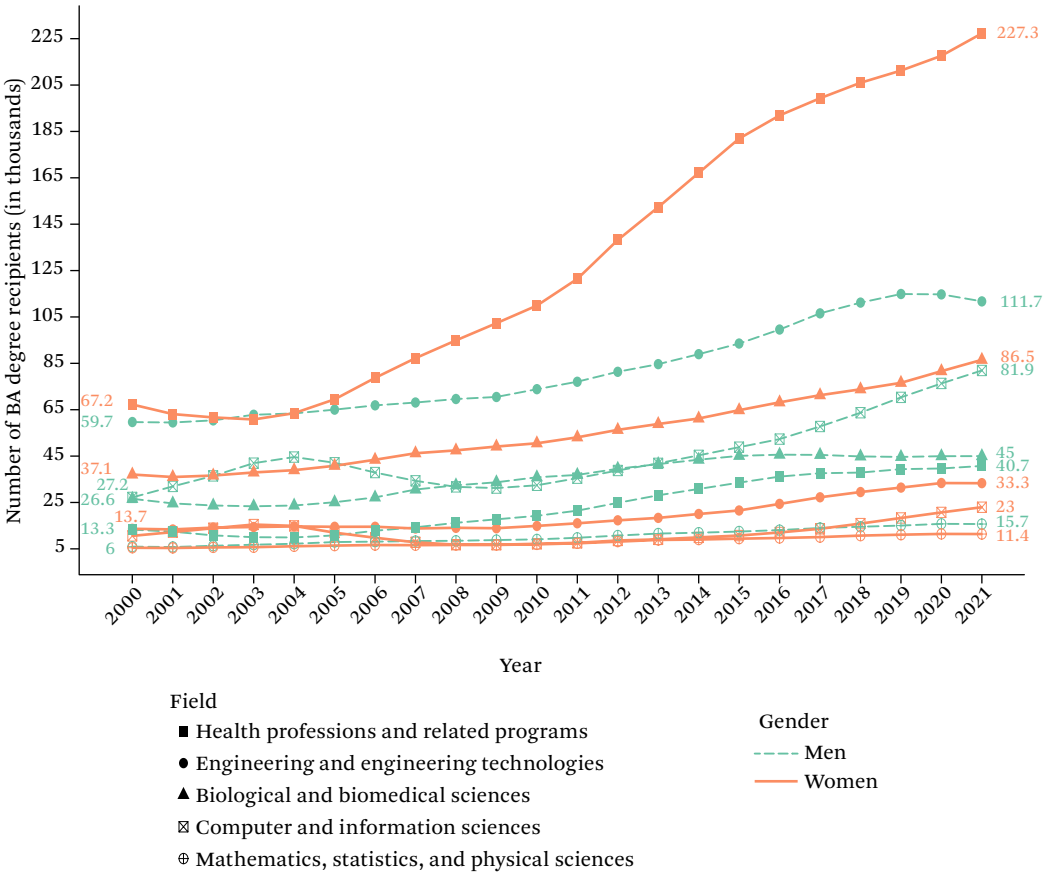
Figure A.1. High School Status Dropout Rate by Gender



Source: Authors' calculations based on NCES 2022, table 219.80.

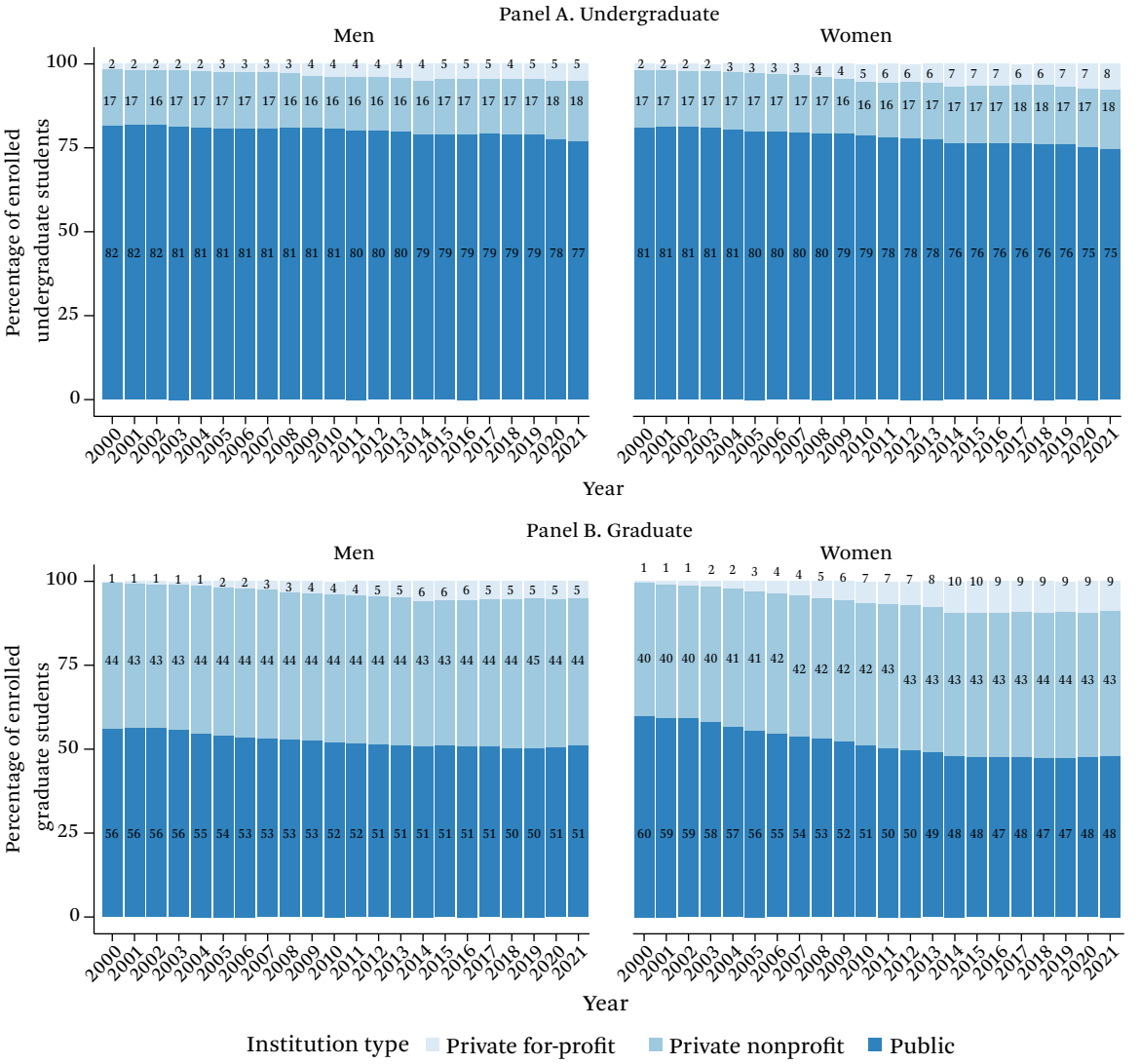
Note: Data for 2020 were not reported by NCES. Status dropouts are sixteen- to twenty-four-year-olds who are not enrolled in school and who have not completed a high school program, regardless of when they left school and whether they ever attended school in the United States. People who have received equivalency credentials, such as the GED, are counted as high school completers. Data are based on sample surveys of the entire population residing within the United States, including both noninstitutionalized persons (such as those living in households, college housing, or military housing located within the United States) and institutionalized persons (such as those living in prisons, nursing facilities, or other health-care facilities).

Figure A.2. Number of BA Degree Recipients by Field and Gender



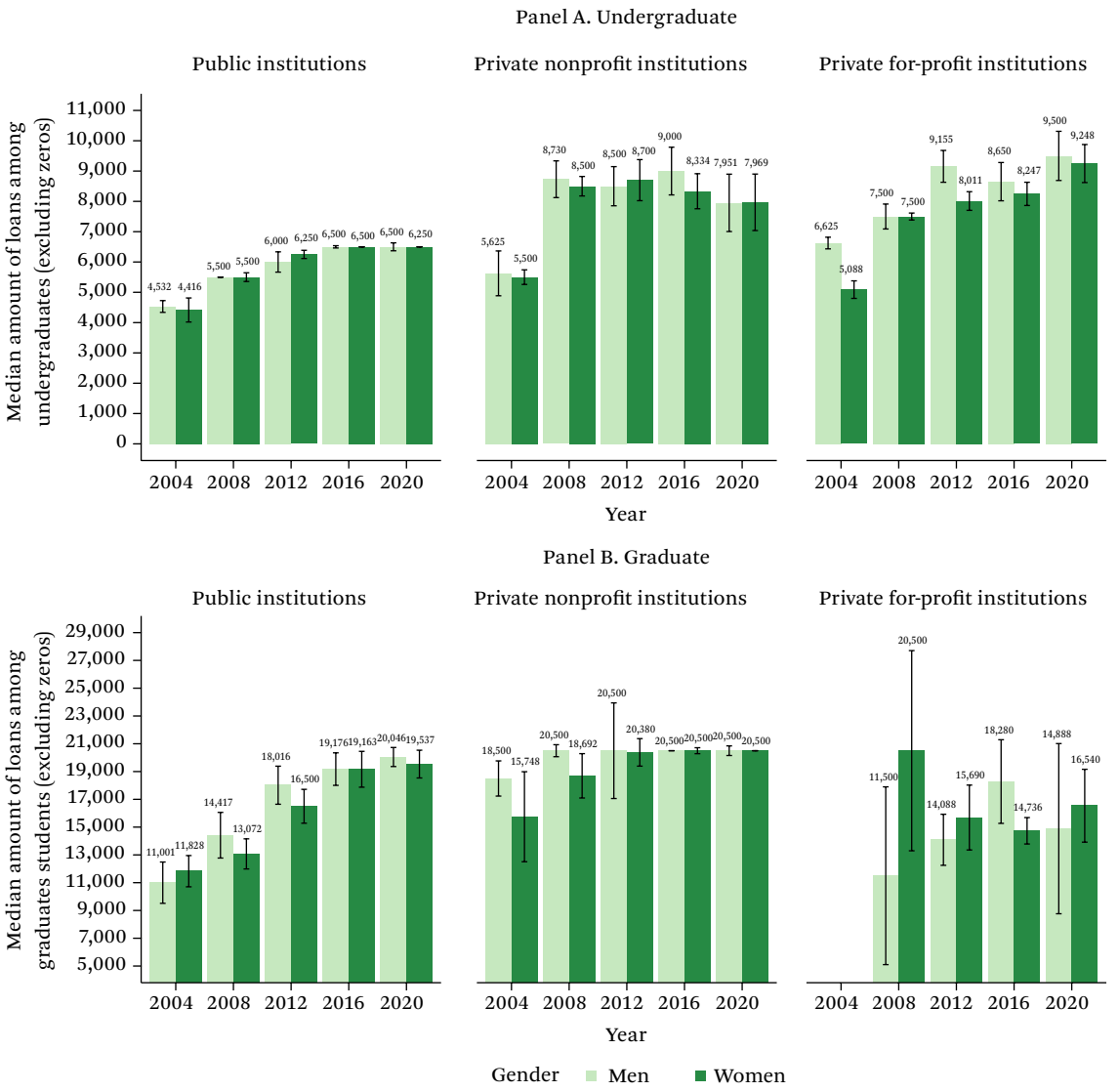
Source: Authors' calculations based on NCES 2022, tables 325.20, 325.35, 325.45, 325.60, 325.65.
Note: Figures in thousands. 2000 refers to the 1999–2000 academic year; 2001 refers to the 2000–2001 academic year, and so on.

Figure A.3. Total Undergraduate and Graduate Student Fall Enrollment for Men and Women by Institution Type, 2000–2021



Source: Authors' calculations based on NCES 2023c.

Figure A4. Debt Amounts Held by Undergraduate and Graduate Students



Source: Authors' calculations based on NCES 2023d.

Note: Error bars present 95 percent confidence intervals. 2004 denotes the 2003–2004 academic year, and so on. For undergraduate students, debt amount includes Parent PLUS loans. For graduate students, debt amount does not include Parent PLUS loans and includes Direct PLUS loans to graduate students. NPSAS did not report the debt amount among graduate students at for-profit institutions in 2004 because the standard error represents more than 50 percent of the estimate. Graduate students include those attending master's, doctoral, and professional degree programs.

REFERENCES

Anders, John, Mary E. Campbell, Craig Wesley Carpenter, and Luna Chandna. 2025. "Ethnoracial Transformations? Linking Administrative Data to Explain Changes in Identification." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 65–84. https://doi.org/10.7758/RSF.2025.11.1.04.

Ashworth, Jared, V. Joseph Hotz, Arnaud Maurel, and Tyler Ransom. 2021. "Changes Across Cohorts in Wage Returns to Schooling and Early Work Experiences." *Journal of Labor Economics* 39(4): 931–64.

Autor, David, and Melanie Wasserman. 2013. "Wayward Sons: The Emerging Gender Gap in Labor Markets and Education." Commissioned Report for the NEXT Initiative. Washington, D.C.: The Third Way Foundation.

Blakeslee, Laura, Zoe Caplan, Julie A. Meyer, Megan A. Rabe, and Andrew W. Roberts. 2023. "Age and Sex Composition: 2020." Census Brief no. C2020BR-06. Washington: U.S. Census Bureau. Accessed October 2, 2023. https://www2.census.gov/library/publications/decennial/2020/census-briefs/c2020br-06.pdf.

Bleemer, Zachary, Meta Brown, Donghoon Lee, Katherine Strair, and Wilbert Van der Klaauw. 2021. "Echoes of Rising Tuition in Students' Borrowing, Educational Attainment, and Homeownership in Post-Recession America." *Journal of Urban Economics* 122 (March): 103298. https://doi.org/10.1016/j.jue.2020.103298.

Blumenstyk, Goldie. 2017. "Purdue's Purchase of Kaplan Is a Big Bet—and a Sign of the Times." *The Chronicle of Higher Education*, April 28.

Bowen, William G., Matthew M. Chingos, and Michael McPherson. 2009. *Crossing the Finish Line: Completing College at America's Public Universities*. Princeton, N.J.: Princeton University Press.

Brown, Meta, Rajashri Chakrabarti, Wilbert Van der Klaauw, and Basit Zafar. 2019. "Understanding the Evolution of Student Loan Balances and Repayment Behavior: Do Institution Type and Degree Matter?" *Economic Policy Review* 25(1): 1–23.

Buchmann, Claudia, and Thomas A. DiPrete. 2006. "The Growing Female Advantage in College Completion: The Role of Parental Resources and Academic Achievement." *American Sociological Review* 71(4): 515–41.

Buchmann, Claudia, Thomas A. DiPrete, and Anne McDaniel. 2008. "Gender Inequalities in Education." *Annual Review of Sociology* 34(1): 319–37.

Cameron, Margaux, T. Austin Lacy, Peter Siegel, Joanna Wu, Ashley Wilson, Ruby Johnson, Rachel Burns, and Jennifer Wine. 2021. *2019–20 National Postsecondary Student Aid Study (NPSAS:20): First Look at the Impact of the Coronavirus (COVID-19) Pandemic on Undergraduate Student Enrollment, Housing, and Finances (Preliminary Data).* NCES 2021-456. Washington: U.S. Department of Education, National Center for Education Statistics. Accessed July 31, 2023. https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2021456.

Carpenter, Christopher S., Maxine J. Lee, and Laura Nettuno. 2025. "Gender Minority Status and Family Inequality in the United States." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 65–85. https://doi.org/10.7758/RSF.2025.11.2.04.

Case, Anne, and Angus Deaton. 2020. *Deaths of Despair and the Future of Capitalism*. Princeton, N.J.: Princeton University Press.

Cellini, Stephanie Riegg. 2021. "For-Profit Colleges in the United States: Insights from Two Decades of Research." In *The Routledge Handbook of the Economics of Education.* Oxford: Routledge.

Cellini, Stephanie Riegg, and Cory Koedel. 2017. "The Case for Limiting Federal Student Aid to For-Profit Colleges." *Journal of Policy Analysis and Management* 36(4): 934–42.

Conwell, Jordan A., and Natasha Quadlin. 2022. "Race, Gender, Higher Education, and Socioeconomic Attainment: Evidence from Baby Boomers at Midlife." *Social Forces* 100(3): 990–1024.

Dawson, Caleb E. 2024. "Precarity and the Predatory Inclusion of Black Women by For-Profit Colleges." *Critical Sociology*. First published online February 26, 2024. https://doi.org/10.1177/08969205231223164.

DiPrete, Thomas A., and Claudia Buchmann. 2006. "Gender-Specific Trends in the Value of Education and the Emerging Gender Gap in College Completion." *Demography* 43(1): 1–24.

———. 2013. *The Rise of Women: The Growing Gender Gap in Education and What It Means for American Schools*. New York: Russell Sage Foundation.

———. 2014. "The Secret Behind College Completion: Girls, Boys and the Power of Eighth Grade

Grades." Commissioned Report for the NEXT Initiative. Washington, D.C.: The Third Way Foundation.

Duffy, Mignon. 2011. *Making Care Count: A Century of Gender, Race, and Paid Care Work*. New Brunswick, N.J.: Rutgers University Press.

Dwyer, Rachel E. 2013. "The Care Economy? Gender, Economic Restructuring, and Job Polarization in the U.S. Labor Market." *American Sociological Review* 78(3): 390–416.

Dwyer, Rachel E., Randy Hodson, and Laura McCloud. 2013. "Gender, Debt, and Dropping Out of College." *Gender and Society* 27(1): 30–55.

Dwyer, Rachel E., Laura McCloud, and Randy Hodson. 2012. "Debt and Graduation from American Universities." *Social Forces* 90(4): 1133–55.

Dwyer, Rachel E., and Erik Olin Wright. 2019. "Low-Wage Job Growth, Polarization, and the Limits and Opportunities of the Service Economy." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 5(4): 56–76. https://doi.org/10.7758/RSF.2019.5.4.02.

England, Paula, Andrew Levine, and Emma Mishel. 2020. "Progress Toward Gender Equality in the United States Has Slowed or Stalled." *Proceedings of the National Academy of Sciences*, 117(13): 6990–97.

Fingerman, Karen L., Kyungmin Kim, Eden M. Davis, Frank F. Furstenberg Jr., Kira S. Birditt, and Steven H. Zarit. 2015. "I'll Give You the World: Socioeconomic Differences in Parental Support of Adult Children." *Journal of Marriage and Family* 77(4): 844–65.

Fomby, Paula, and Nicole Kravitz-Wirtz. 2019. "Family Systems and Parents' Financial Support for Education in Early Adulthood." *Demography* 56(5): 1875–97.

Goldrick-Rab, Sara. 2016. *Paying the Price: College Costs, Financial Aid, and the Betrayal of the American Dream*. Chicago: University of Chicago Press.

Green, Erica L. 2018. "DeVos Ends Obama-Era Safeguards Aimed at Abuses by For-Profit Colleges." *New York Times*, April 10.

Houle, Jason N. 2014. "A Generation Indebted: Young Adult Debt Across Three Cohorts." *Social Problems* 61(3): 448–65.

Houle, Jason N., and Fenaba R. Addo. 2019. "Racial Disparities in Student Debt and the Reproduction of the Fragile Black Middle Class." *Sociology of Race and Ethnicity* 5(4): 562–77.

———. 2022. *A Dream Defaulted: The Student Loan Crisis Among Black Borrowers*. Cambridge, Mass.: Harvard University Press.

Lachanski, Michael. 2025. "U.S. Trends in Job Stability by Sex, Race, and Ethnicity from 1996 to 2020." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 224–46. https://doi.org/10.7758/RSF.2025.11.1.11.

MacLean, Alair, and Glen H. Elder Jr. 2007. "Military Service in the Life Course." *Sociology* 33(1): 175–96.

McMillan Cottom, Tressie. 2017. *Lower Ed: The Troubling Rise of For-Profit Colleges in the New Economy*. New York: The New Press.

Mickey-Pabello, David. 2024. "The Anti-Affirmative Action Avalanche: The Rise of Underrepresented Minority Enrollment at For-Profit Institutions." *Sociology of Education* 97(1): 37–57.

National Assessment of Educational Progress (NAEP). 2019. "High School Transcript Study 2019." Washington: U.S. Department of Education, National Center for Education Statistics. Accessed April 20, 2023. https://www.nationsreportcard.gov/hstsreport/#closerlook.

National Center of Education Statistics (NCES). 2022. "Digest of Educational Statistics." Washington: U.S. Department of Education, National Center for Education Statistics.

———. 2023a. "The Condition of Education." Washington: U.S. Department of Education, Institute of Education Sciences.

———. 2023b. "Digest of Educational Statistics." Washington: U.S. Department of Education, National Center for Education Statistics.

———. 2023c. "Integrated Postsecondary Education Data System (IPEDS)." Washington: U.S. Department of Education, National Center for Education Statistics.

———. 2023d. "2019–20 National Postsecondary Student Aid Study (NPSAS:20)." Washington: U.S. Department of Education, National Center for Education Statistics.

———. 2024. "Datalab." Washington: U.S. Department of Education, Institute of Education Statistics. Accessed April 20, 2024. https://nces.ed.gov/datalab.

National Center for Science and Engineering Statistics. 2022. *National Survey of College Graduates: 2021.* NSF 23-306. Alexandria, Va.: National Science Foundation.

Organization for Economic Cooperation and Devel-

opment (OECD). 2022. *Education at a Glance 2022: OECD Indicators*. Paris: OECD Publishing.

Park, Hyunjoon, Matthew Sheen, and Paula Clark. 2025. "Living Alone for Black and White Men and Women over Four Decades, 1980–2019." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 26–45. https://doi.org/10.7758/RSF.2025.11.2.02.

Parker, Kim. 2021. "What Is Behind the Growing Gap Between Women and Men in College Completion?" Washington, D.C.: Pew Research Center.

Posselt, Julie R., and Eric Grodsky. 2017. "Graduate Education and Social Stratification." *Annual Review of Sociology* 43(1): 353–78.

Pyne, Jaymes, and Eric Grodsky. 2020. "Inequality and Opportunity in a Perfect Storm of Graduate Student Debt." *Sociology of Education* 93(1): 20–39.

Quadlin, Natasha, Jordan A. Conwell, and Shiva Rouhani. 2023. "The Economic Context of Higher Education Expansion: Race, Gender, and Household Finances Across Cohorts and Generations." *Journal of Family and Economic Issues*. Published online July 1, 2023. https://doi.org/10.1007/s10834-023-09918-8.

Quadlin, Natasha, and Brian Powell. 2022. *Who Should Pay? Higher Education, Responsibility, and the Public*. New York: Russell Sage Foundation.

Radwin, David, Johnathan G. Conzelmann, Annaliza Nunnery, T. Austin Lacy, Joanna Wu, Stephen Lew, Jennifer Wine, and Peter Siegel. 2018. *2015–16 National Postsecondary Student Aid Study (NPSAS:16): Student Financial Aid Estimates for 2015–16 (NCES 2018–466)*. Washington: U.S. Department of Education, National Center for Education Statistics. Accessed April 20, 2023. http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2018466.

Seamster, Louise, and Raphaël Charron-Chénier. 2017. "Predatory Inclusion and Education Debt: Rethinking the Racial Wealth Gap." *Social Currents* 4(3): 199–207.

Stacey, Lawrence, Rin Reczek, and R. Spiker. 2022. "Toward a Holistic Demographic Profile of Sexual and Gender Minority Well-being." *Demography* 59(4): 1403–30.

Torche, Florencia. 2011. "Is a College Degree Still the Great Equalizer? Intergenerational Mobility Across Levels of Schooling in the United States." *American Journal of Sociology* 117(3): 763–807.

Valleta, Rob. 2015. "Higher Education, Wages, and Polarization." *FRBSF Economic Letter* 2015-02. Accessed April 18, 2024. https://www.frbsf.org/wp-content/uploads/el2015-02.pdf.

Yavorsky, Jill E., and Janette S. Dill. 2020. "Unemployment and Men's Entrance into Female-Dominated Jobs." *Social Science Research* 85 (January): 1–20.

Young, S. Abby, Ann M. Beutel, and Stephanie W. Burge. 2023. "High Hopes: Gender Trends in Educational Expectations for Graduate and Professional School, 1976–2019." *Sociological Quarterly* 64(3): 493–519.

How Ethnoracial Groups Spend Their Time

SARAH JAMES AND ELIZABETH WRIGLEY-FIELD

We know strikingly little about how time use varies across ethnoracial groups in the United States. We describe the daily lives of 210,586 White, Black, Hispanic, and Asian people in the nationally representative American Time Use Survey (2003–2019). Activities are similarly unpleasant for all groups, but White people spend the most time on highly pleasant leisure activities, Asian people spend the most time in unpleasant ways, and Black people spend the most time doing affectively neutral activities, such as watching television. These patterns show continuity in across recent decades and in harmonized historic data. Black people spend the most and Hispanic people the least time alone. We conclude that time diaries are a promising resource for exploring nuances in the texture of ethnoracial groups' daily experiences.

Keywords: race-ethnicity, time use, u-index, unpleasant experience, emotions, leisure

How do people in the United States spend their time? The broad contours of most adults' lives are similar: they spend most waking hours of most days of the week doing paid work (and sometimes also work toward formal schooling); sleep for many hours a day; and divide the remainder among travel, leisure, caregiving, and other forms of household labor. At the population level, time use patterns are dominated by activities that take large amounts of time on many days per week, occur repeatedly, and typically involve fixed commitments lasting many years—for example, engaging in paid work or raising children. These activities play such an outsized role in structuring daily time use that even relatively limited variation in them (for ex-

Sarah James is a survey statistician in the Demographic and Decennial Research Group of the Center for Economic Studies at the U.S. Census Bureau, United States. **Elizabeth Wrigley-Field** is associate professor in the Department of Sociology and the Minnesota Population Center at the University of Minnesota, United States.

© 2025 Russell Sage Foundation. James, Sarah, and Elizabeth Wrigley-Field. 2025. "How Ethnoracial Groups Spend Their Time." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 178–200. https://doi.org/10.7758/RSF.2025.11.1.09. This research received support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development of the National Institutes of Health under awards T32HD095134, P2CHD041023, and R01HD053654, as well as from a University of Minnesota Grant-in-Aid award. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. Any opinions and conclusions expressed herein are those of the authors and do not reflect the views of the U.S. Census Bureau. We are grateful for the data harmonization efforts of IPUMS Time Use at the University of Minnesota and the Centre for Time Use Research at the University College London that made this research possible. Direct correspondence to: Sarah James, at sarah.a.james@census.gov, 4600 Silver Hill Rd, Suitland, MD 20233, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

ample, in the portion of a subpopulation that has young children) can produce meaningful differences in time use in the aggregate. On the other hand, smaller variations in daily schedules on the margins of those major fixed activities can also add up to meaningful differences in the textures of people's daily lives. For example, variations in how people spend their leisure time typically affect a smaller portion of each day than time doing paid work, but these variations add up to meaningful differences when they are summed across days and across groups. Both types of variation are a product of constraints—in material needs, neighborhood characteristics, and the availability and needs of others, to name a few—and of the choices that people make amid these constraints.

It is striking that there is little systematic analysis of time use for distinct racial groups in the United States. Chadwick Curtis, Julio Garín, and Robert Lester (2022) come closest, measuring racial disparities in a theoretical model of overall utility. Other studies "control for" race without truly analyzing it. Recently, scholars of health (Gee et al. 2019) and of racism (Kwate 2017) have noted the clear need for such analyses, and others have developed a theoretical model of how differences in time use and control over time may structure racial disparities in health outcomes (Colen et al. 2023). Yet a recent systematic review of time use research never mentions race or racism (Cornwell, Gershuny, and Sullivan 2019). This gap is surprising: in the United States, racial stratification structures patterns of daily life through pathways like access to economic opportunities, the physical and social geographies of residential neighborhoods, and household structures. For example, in the New York metro area, recent decades have seen increases in the share of White adults with short commutes to high-paying jobs and the share of Black and Hispanic adults with long commutes to low-wage jobs (McLafferty and Preston 2019). These variations in life experience may inform distinctive preferences, goals, and constraints across groups. Yet we do not know how ethnoracial differences in time use patterns combine to produce differences in daily life across ethnoracial groups or whether these differences are stable.

How much time do ethnoracial groups spend on core activities such as work, housework, and leisure? With whom do they spend their time? In what contexts do they carry out these activities? How do people feel while doing them? Perhaps most important, how do activities and emotions combine to produce inequities in quality of life? We argue that how people spend their time and the way they feel during these daily activities generates important differences in typical experiences for different racial groups, a consequential domain of racial stratification that has been too little studied. To address these limitations, we use the nationally representative American Time Use Survey to lay out the contours of what 210,586 White, Black, Hispanic, and Asian people did each day in the 2000s and 2010s, who they did it with, where they did it, and how they felt while it was happening. Then we use the American Heritage Time Use Survey to situate contemporary disparities in patterns going back to 1965.

In the course of this analysis, we establish several new stylized facts about aspects of daily life in the United States. Our results reveal continuity in daily experiences in the 2010s compared to earlier time periods. These patterns, though long-standing, have not been explored previously. We find important differences in time use across groups. For example, White people spend the most time on highly pleasant leisure activities, Asian people spend the most time in unpleasant ways, and Black people spend the most time doing affectively neutral activities, such as watching television. Black people also spend the most, and Hispanic people the least, time alone. These findings indicate that time use is, and has long been, a fundamental aspect of racial differences in life experiences in the United States.

BACKGROUND

The last half century has seen economic and cultural shifts in how Americans spend their time. For example, from the 1960s to the 2000s, leisure time became more available to less-educated Americans but also declined in quality (Sevilla, Gimenez-Nadal, and Gershuny 2012). In recent decades, researchers have also documented a growing "time squeeze" of in-

creasing conflict between the time demands of work and of other elements of life. This shift has occurred across national context with changes in working hours and the life-course timing of carework obligations (Ford et al. 2021).

Despite these broad narratives about changes in Americans' time use, we know little about whether these changes have been similar for members of different racial groups. The dearth of research in this area is particularly striking in comparison to the robust field of research on gender differences in time use since the mid-twentieth century. Although women's and men's time use has become more similar since the mid-1960s (Bianchi et al. 2012; Sayer 2016), daily unpleasantness decreased from 1965 to 2005 for men only (Krueger 2007).[1] Over the same period, civil rights movements restructured American institutions of daily life but racial stratification has persisted and re-emerged in new forms (Derenoncourt et al. 2022; Katz, Stern, and Fader 2005; Logan 2013; Reardon and Owens 2014). These changes are certainly as substantial as the concurrent shift in gender norms, but research has largely neglected exploring whether or how ethnoracial groups' daily experiences have changed over time. Indeed, given these countervailing trends, it is unclear whether to expect convergence or divergence in daily life across ethnoracial groups. A few studies of gender differences do consider race—for example, the gender gap in housework is smallest for Black couples and largest for Hispanic couples (Sayer and Fine 2011)—but we have limited information about differences beyond highly gendered activities.

Pathways Suggesting Ethnoracial Differences in Time Use

There are several reasons to expect systematic differences in how racial groups spend their time.

First, time is structured by employment in ways that differ for ethnoracial groups. Labor-force participation rates (Groshen and Holzer 2021), paid work time (Perry-Jenkins and Gerstel 2020), and work schedules (McCrate 2012) all vary across ethnoracial groups. Outsized rewards to long work hours have increased in recent decades (Weeden, Cha, and Bucca 2016), which may exacerbate racial pay gaps in a manner similar to their role in gender pay gaps (Goldin 2014).

Second, residential racial segregation affects how ethnoracial groups spend their time. For example, Black and Hispanic people spend more time traveling to shop or work because they live in neighborhoods with fewer retail stores (Schuetz, Kolko, and Meltzer 2012; Zenk et al. 2005) that lack nearby economic opportunities (McLafferty and Preston 2019). These differences are exacerbated by use of slow public transportation (Kwate 2017; Holt and Vinopal 2023). Additionally, differences in housing stock, neighborhood amenities, and perceived public safety create differences in time spent indoors versus outdoors, such as in green space (Kephart 2022) and in public versus in private spaces (Kwate 2017).

Third, ethnoracial groups differ in the type and timing of major demographic events such as family formation and mortality, criminal justice system involvement, and patterns of coresidence. These differences mean that ethnoracial groups have different networks of people to spend time with across the life course. For example, Black people are more likely than White people to live alone (Park, Sheen, and Clark 2025). Differences in patterns of coresidence also have implications for carework across ethnoracial groups: Hispanic women are most likely to live with children, Black women have the highest rates of coresidence with dependent elders before midlife, and Black and Hispanic women are more than twice as likely than White women to live with grandchildren at midlife (Ice 2023).

Fourth, administrative burdens impose substantial losses of time, as well as leading people

1. For example, between 1965 and 2012, the gender gap in time doing paid work declined by more than half and the gender gap in housework declined by about 75 percent among people age twenty-five to fifty-nine (Sayer 2016). Yet contemporary gender inequities remain: women still do 60 percent more housework (Bianchi et al. 2012) and more carework than men (Dukhovnov and Zagheni 2015).

to be unable to access services and benefits to which they are entitled (Herd and Moynihan 2019; Herd et al. 2023; Jackson 2020). Recent analyses show that low-income people spend substantially more time waiting to access basic services than high-income people do, and high-income Black people wait as long as low-income people, aggregated across racial groups (Holt and Vinopal 2023).

Fifth, chronic exposure to stressors changes people's preferences on how they spend their time due to overactivation of the stress response system (Friedman et al. 2017). Relative to their White counterparts, Black and Hispanic adults experience higher levels of overall stress, acute life events, relationship stressors, financial stressors, neighborhood violence and disorder, and discrimination (Sternthal, Slopen, and Williams 2011). Even though Black people report more psychological distress, less life satisfaction, and lower happiness than White people, Black people also report fewer depressive or anxious systems, fewer psychiatric disorders, and higher levels of flourishing (Williams 2018)—the so-called Black-White mental health paradox (Brown, Mitchell, and Ailshire 2020; Thomas Tobin et al. 2022). The psychosocial stress of being a member of a minoritized group may also contribute to differences in how people choose to spend their time. For example, the effortful hypervigilance of managing (typically White people's) perceptions during daily activities (Williams 2018) may cause minoritized groups to change their daily activities to minimize this stress (Hornbuckle 2021): Black men are less likely to do physical activity in neighborhoods they perceive to be whiter (Ray 2017), and Black and Hispanic adults who experience discrimination report high levels of attention to their appearance to minimize negative interactions (American Psychological Association 2016). Yet research on daily experiences among minoritized groups has been limited to examining researcher-defined lists of experiences that are assumed to be stressful for all people or stressors that occur in particular domains (such as discrimination at work). The omission of smaller daily activities from these lists means that these estimates miss important details.

Contribution

In sum, we know surprisingly little about the broader contours of time use across racial groups, despite strong evidence that pathways such as residential racial segregation, social and kin networks, varied preferences, and psychosocial stress would cause differences. Likewise, existing evidence of inequities in ethnoracial groups' daily affect considers only selected experiences, meaning that we do not understand total differences across groups. To address these limitations, we proceed in three steps. First, we use nationally representative time diary data from the American Time Use Survey to describe continuity and change in daily time use across the 2000s and 2010s. Then we consider the emotions that people felt during these daily activities. Across this work, we compare the daily lives of White, Black, Hispanic, and Asian people, extending research that has largely focused on White-Black differences and rarely included Asian people. Finally, we explore how daily experiences differ across ethnoracial groups in the 2000s relative to the 2010s. We situate these contemporary patterns of daily affect to trends in daily unpleasantness since 1965, using the American Heritage Time Use Survey. We conclude by contextualizing these findings in prior research, discussing the strengths and weaknesses of our approach, and offering future directions for this work.

WHAT PEOPLE DO EACH DAY

To describe patterns of time use, we analyze 4.4 million daily activities of 210,586 people who completed the American Time Use Survey (ATUS) between 2003 and 2019. ATUS is a nationally representative time use study of the noninstitutionalized civilian population collected annually by the Bureau of Labor Statics among a subset of participants in the Current Population Survey age fifteen and older. In a telephone interview, respondents completed a twenty-four-hour recall time diary of their activities from 4 a.m. the prior day to 4 a.m. on the interview day. We obtained ATUS data from IPUMS Time Use at the University of Minnesota (Hofferth et al. 2022). Table 1 describes this analytic sample (column 1), as well as the datasets we use in other parts of the analysis. Online

Table 1. Datasets and Size of Analytic Samples

Survey	American Time Use Survey (ATUS)	ATUS Well-Being Module	American Historical Time Use Survey (AHTUS)
About dataset	Nationally representative time use study of the noninstitutionalized civilian population collected annually by the Bureau of Labor Statistics among a subset of participants in the Current Population Survey age fifteen and older.	Special module administered to a subset of ATUS participants (see left column) to collect information on emotional states during daily activities. Fielded in 2010, 2012, and 2013.	Harmonized series of time use surveys spanning 1930 to 2018. Includes ATUS data (see left column) from 2003 onward.
Used in	What People Do Each Day	How People Feel During Daily Activities	Historical and Contextual Variation
Total analytic sample size	210,586	37,088	155,891

Source: Authors' tabulation.
Note: Sample sizes are weighted to be nationally representative.

appendix A shows the demographic characteristics of each analytic sample.[2]

Measures

Time diary respondents describe their daily activities in an open-ended manner, and researchers assign these activities to various activity codes. To ensure that our analyses are comparable with the datasets we analyze elsewhere in this article, we use the seventy-six categories of daily activities harmonized by the Centre for Time Use Research at the University College London. These categories include all activities reported in all surveys. We further collapse these seventy-six activities into sixty-four activities with sufficient sample size to examine ethnoracial group differences.

To simplify our presentation of time spent in daily activities, we group the sixty-four daily activities into six groups (see figure 1). We developed these groups inductively, considering both which activities have similar levels of unpleasantness (discussed later) and the content of the activities. We consider elective leisure activities, eating and drinking, carework, neutral downtime, domestic work, work or urgent tasks, sleep, and personal care time. We borrow the term "neutral downtime" from Alan Krueger (2007) for its evocative terminology but include a slightly different set of activities. As in prior research, neutral downtime is dominated by watching television, which makes up two-thirds to three quarters of neutral downtime for all groups (see online appendix B).

We also consider where activities took place and with whom they were done. Respondents report where activities occurred for activities other than sleep or personal care. We measure whether activities were done in private spaces (own or others' homes) or at one's own home. We analyze with whom people did daily activities other than sleep, personal care, and work (data on with whom respondents work is available after 2010 only). We consider several types of people with whom respondents spent their time: no one (time alone), with a spouse or romantic partner, with a child under age five, with a child under age eighteen (including a child under age five), with a coresident child, with extended family (such as parents, grandparents, or cousins), and with friends.

Ethnoracial group includes categories for non-Hispanic White, non-Hispanic Black, His-

2. See online appendix (https://www.rsfjournal.org/content/11/1/178/tab-supplemental).

Figure 1. Unpleasantness of Daily Activities

Source: Authors' calculations based on American Time Use Survey Well-Being Model, 2010, 2012, 2013 (Flood et al. 2023).

Note: Estimates and 95 percent confidence intervals. Average u-index values across 160 race-specific u-index calculations (using 160 replicate weights). Confidence intervals represent the uncertainty in the u-index estimate from using 160 different replicate weights.

panic, non-Hispanic Asian, and other ethnoracial group (including American Indian, Alaskan Native, Hawaiian, Pacific Islander, and multiracial).[3] We do not show results for the final group because of its small size and heterogeneity. For brevity, we omit the modifier non-Hispanic in the presentation of results.

We present unadjusted and adjusted estimates. Adjusted estimates account for sex (male, female), age, age squared, educational attainment (less than high school education, high school graduate or GED, some college education, college graduate, and any postgraduate education), employment status (full-time employment, part-time employment, not working but not retired, retired), nativity (native or foreign born), marital status (married; widowed, separated, or divorced; or never married), number of children under age eighteen residing in the respondent's household, urban (defined as living in a Census-designated metropolitan area, reference) versus rural residence, Census region (Northeast, South, Midwest, West), ten-year group (2003–2009 [referred to as 2000s in the presentation of results] and 2010–2019 [referred to as 2010s in the presentation of results]), and the month and day of the week about which the time diary was collected.

Analytic Strategy

We use count models to describe the activities on which ethnoracial groups spent their time. We model the number of minutes spent on various types of activities, where these activities took place, and with whom they occurred. The distribution of minutes in all activities was overdispersed, with some activities having an excess of zeros. Thus we used negative binomial models to model number of minutes spent on sleep, personal care, elective leisure, eating and drinking, neutral downtime, domestic work and errands, at home, in private spaces, alone, with extended family, and with friends and zero-inflated negative binomial models to model the number of minutes spent on work and urgent tasks, with a spouse or partner, with children under age five, with children under age eighteen, and with a coresident child.

Results: Daily Activities Differ by Race and Ethnicity

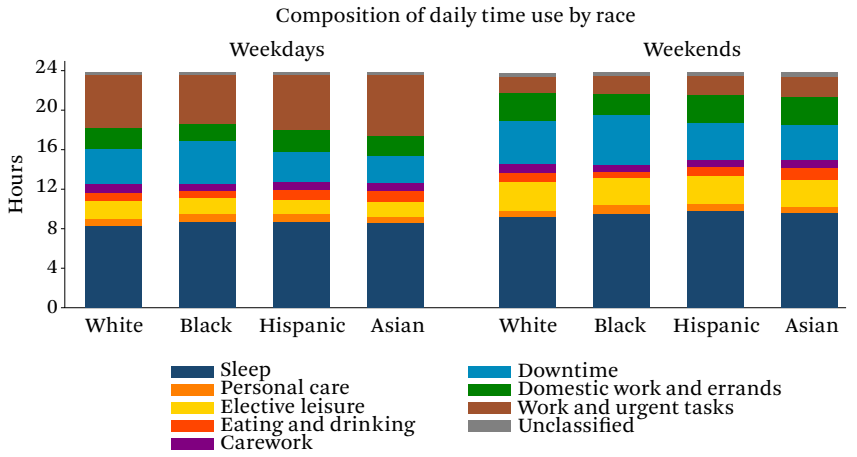
Each ethnoracial group's time use is distinctive in its own way, though most differences are small. Everyone's time is constrained by the rhythms of daily life (sleeping, caring for oneself and others, some form of work or functional tasks, and leisure time). As in many other key population-level outcomes (Permanyer, Sasson, and Villavicencio 2023; Salganik et al. 2020), variation within groups is much more substantial than variation across groups, yet the variation across groups is socially meaningful. In the case of time use, small aggregate differences can reflect differences in the (relatively small) portion of each racial group that has a very different pattern of time use than others (such as the proportion with very few work hours) or, sometimes, differences that are relatively few minutes but potentially consequential to daily experience (such as the difference between fifteen minutes or fifty minutes of weekday commuting time).

Figure 2 shows the overall pattern of daily time use for White, Black, Hispanic, and Asian people on weekdays and weekends. These allocations underscore that meaningful differences—such as Black Americans having the most downtime and the least time spent on work and other urgent tasks, and Asian Americans showing the reverse—occur in the context of broadly shared patterns, such a cadence in which sleep, leisure, and domestic work expand on weekends, when paid work time contracts.

Figure 3 shows how Black, Hispanic, and Asian people's time spent on a given activity per day compares with White people's in the same activity; we use White people as a baseline because they are the largest group. Online appendix C transforms these values, presenting them as ratios relative to White people's time use. We show both unadjusted measures (open shapes) and adjusted measures (shaded shapes). These two sets of estimates convey different information. The unadjusted rates show the total differences in time use across ethnoracial groups, which are created by large structural differences across groups (such as level of

3. We use the ethnoracial group names provided by ATUS.

Figure 2. Daily Activities by Race/Ethnicity on Weekdays and Weekends



Source: Authors' calculations based on American Time Use Survey 2003–2019 (Flood et al. 2023).
Note: Weighted, unadjusted descriptive values of time use across all sampled activities on weekdays and weekends from the American Time Use Survey 2003–2019.

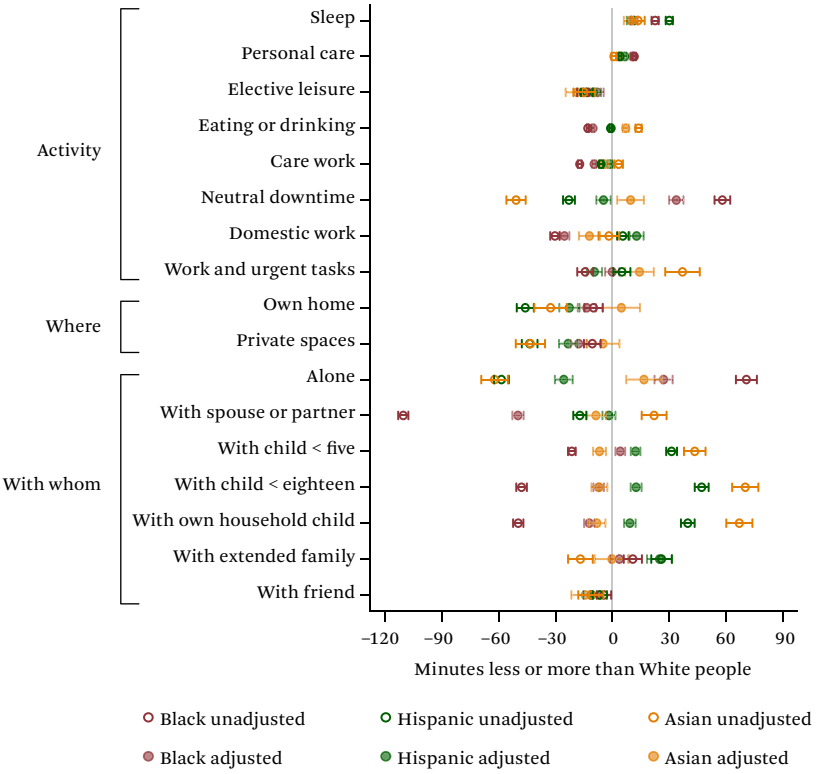
labor-force participation) as well as individual preferences. These unadjusted estimates speak most directly to the question of how time is experienced differently across ethnoracial groups. The adjusted rates account for a robust (but imperfect) set of covariates related to these structural differences, with the goal of estimating differences in time use between people whose circumstances are broadly similar but whose ethnoracial identity differs. These adjusted estimates—and specifically, differences across ethnoracial groups in these estimates—address whether ethnoracial differences in time use are solely driven by, for example, differences in family structure or employment.

White people spend the most time doing the most pleasant elective leisure activities, in private spaces, and with friends and sleep slightly less than minoritized groups (figure 3). Additionally, White people have the most fragmented time, doing 3 to 10 percent more activities per day than other racial-ethnic groups. Adjusted number of daily activities and 95 percent confidence intervals are White 18.9 (18.8, 18.9), Black 17.2 (17.2, 17.3), Hispanic 18.2 (18.1, 18.3), Asian 18.3 (18.2, 18.5).

Black people spend more time on neutral downtime, less time with a spouse or partner, and more time alone than White people. Black people spend fifty-eight minutes more each day on neutral downtime than White people (unadjusted, figure 3), about 25 percent more than White people, because they do fewer of both highly pleasant and highly unpleasant activities.

Whom Black people spend time with also differs from White people. Black people spend less than half as much time with a spouse or partner each day than White people (unadjusted, figure 3), a difference of an hour and fifty minutes. For context, this large disparity is similar in magnitude to the hour and forty-three minute per day decline in housework that women have experienced since 1965 (Bianchi et al. 2000). Black people do not make up much of this difference by spending time with other family members or friends: Black people also spend the most time alone of any ethnoracial group, spending, on average, nearly five hours (294 minutes) alone each day—or one hour eleven minutes more time alone each day than White people (unadjusted, figure 3), about 23 percent more time alone than White people). These differences persist across the spectrum of alone time (figure 4): Black people are both substantially less likely than other racial groups to spend no time alone on average (fewer than 5 percent of Black people compared with, at the other extreme, 10 percent of Hispanic people) and are also more likely than any other ethnora-

Figure 3. Ethnoracial Differences in Time Spent on Daily Activities



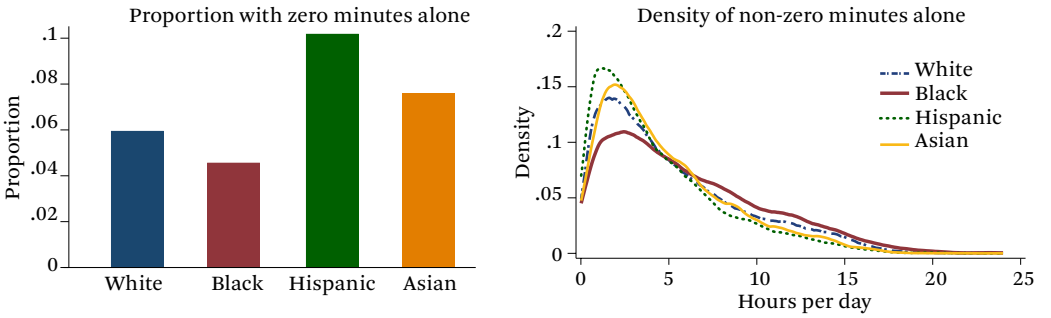
Source: Authors' calculations based on American Time Use Survey 2003–2019 (Flood et al. 2023).
Note: Unadjusted and adjusted predicted values and 95 percent confidence intervals from the American Time Use Survey 2003–2019. Authors' calculations of marginal effects from count models of time spent on daily activities: negative binomial models of number of minutes spent on sleep, personal care, elective leisure, eating and drinking, neutral downtime, domestic work and errands, at home, in private spaces, alone, with extended family, and with friends and zero-inflated negative binomial models to model the number of minutes spent on work and urgent tasks, with spouse or partner, with children under age five, with children under age eighteen, and with a coresident child. Estimates are adjusted for sex, age, age squared, educational attainment, employment status, nativity, marital status, any coresident children under age eighteen, urban-rural residence, census region, ten-year group, month, and day of week.

cial group to spend the bulk of their waking hours alone. These large differences in time alone are striking and admit to different interpretations, as we elaborate on in the discussion.

Although a portion of disparities in neutral downtime, alone time, and time with spouse or partner reflect differences in household sociodemographic characteristics such as household composition and labor-force status—for example, that Black people are more likely than White people to live alone (Park, Sheen, and Clark 2025)—accounting for these factors does not fully explain these differences. In adjusted results (figure 3), relative to White people, Black people have thirty-four more minutes per day of neutral downtime (15 percent more than White people), spend fifty minutes less with a spouse or partner each day (75 percent as much time as White people), and spend twenty-seven more minutes per day alone (9 percent more than White people). Additionally, Black people spend about 29 percent more time on personal care, about 19 percent less time eating or drinking, and 16 percent less time doing domestic work each day than White people do (adjusted).

Hispanic people spend more time with children and with extended family members than White people, and than all other groups after

Figure 4. Ethnoracial Differences in Time Spent Alone



Source: Authors' calculations based on American Time Use Survey 2003–2019 (Flood et al. 2023).
Note: American Time Use Survey 2003–2019. Weighted, unadjusted descriptive values of time spent alone across all sampled activities.

adjusting for covariates, consequently spending less time alone (figure 3). Before adjusting for sociodemographic covariates, Hispanic people spend thirty-one more minutes per day with children under age five (49 percent more time), twenty-six minutes more with extended family (31 percent more time), and fifty-eight minutes less alone (19 percent less time) than White people. Time with children is time that respondent's main activity—such as eating dinner—is done with a child. It does not include secondary childcare such as supervising a child while cooking dinner. Although a portion of these differences are explained by household and demographic characteristics, differences remain even after adjusting for covariates. In adjusted estimates, Hispanic people spend 19 percent more time with young children, 29 percent more time with extended family, and 8 percent less time alone than White people (see online appendix C).

Asian people work about fourteen minutes more per day and spend about seven minutes more per day eating and drinking than White people (adjusted values, figure 3). Additionally, before accounting for demographic covariates, Asian people spend fifty-one minutes less on neutral downtime, and with somewhat less of this neutral downtime being television watching than for other groups (online appendix B); thirty-two minutes less in their own homes; forty-three minutes less in private spaces; and sixty-two minutes less alone each day than White people due to spending more time with spouse or partner and children (figure 3). The compositional factors accounted for in our demographic covariates fully account for differences in neutral downtime, time in own home, and time in private spaces. Difference in time with others are reversed and have substantially smaller magnitudes after adjusting for covariates. Adjusted estimates indicate that Asian people spend seventeen fewer minutes per day alone than White people do (figure 3).

HOW PEOPLE FEEL DURING DAILY ACTIVITIES

In 2010, 2012, and 2013, a subset of ATUS participants were selected to participate in a Well-Being Module that collected information on emotional states during daily activities. Over these years, 37,088 people were asked about the degree to which they were happy, in pain, sad, stressed, tired, or found meaning during three randomly selected daily activities. We use data on emotional states during 102,796 daily activities with nonmissing information across emotion measures. We pool data from these three survey years (U.S. Bureau of Labor Statistics 2017).

Measures

Respondents who participated in the Well-Being Module reported the degree to which they felt happy, in pain, sad, stressed, tired, or found meaning during three randomly selected daily activities using a Likert scale ranging from 0 (not at all) to 6 (very).

We measure the unpleasantness of sixty-four daily activities using the u-index (Kahne-

man and Krueger 2006), a measure of the proportion of time spent by a population in an unpleasant state. The u-index has the advantage of measuring emotions in a way that is comparable across people who use different ranges of the available Likert scale. It considers which emotion a given person rated most strongly rather than the absolute level of how strongly that emotion was rated. We calculate the u-index for the population of the United States using respondents' reports of being happy, in pain, sad, and stressed during daily activities. This set of emotions has been used in similar prior work (Krueger 2007). First, we identify whether a respondent's strongest reported emotion during a given activity was strictly negative, that is, whether the emotion for which they endorsed the highest rating was negative (pain, sad, or stressed). Fifteen percent of activities are rated as unpleasant. Then we produce population-level estimates of the share of time spent in an unpleasant state while doing the activity, as specified by the Bureau of Labor Statistics (2014, 5–7). We calculate these rates separately by ethnoracial group when showing race-specific u-indices (online appendix D).

Specifically, we estimate the population average level of unpleasantness that all Americans experienced during their eligible activities[4] during a day ($\bar{U}$) as follows:

$$\bar{U} = \frac{\sum_i \sum_k w_{ik} U_{ik}}{\sum_i \sum_k w_{ik}} \quad (1)$$

In this equation, i is the respondent, k is the sampled activity, U is whether the activity is unpleasant, and w_{ik} is the survey weight for activity k for respondent i. We repeat this series of calculations 161 times, once using the nationally representative pooled survey weights from the primary ATUS Well-Being Module and again for each of the 160 replicate weights. Then we average these estimates and calculate their standard deviations across the replicates to produce the final population-level u-index values and their associated 95 percent confidence intervals (figure 1).

Analytic Strategy

We describe which activities have higher and lower levels of unpleasantness and how these values differ by race. We also analyze ethnoracial differences in rates of reporting only positive emotions during all sampled activities (a binary indicator) using logit models. All analyses include the sociodemographic covariates described previously (see "What People Do Each Day").

Results: Daily Emotions Differ Across Groups

We begin by exploring which activities are more unpleasant than others (figure 1). We underscore that these measures are population-level measures of total unpleasantness in the entire population during a given activity, not individual-level analyses. From least to most unpleasant, they are as follows:

- Elective leisure activities, such as recreation, religious activities, time with friends, and exercise, are rated as least unpleasant. Among total time spent on these activities in the United States population, these activities are for the most part are unpleasant less than 10 percent of the time. Several aspects of childcare have very low unpleasantness (such as playing, reading, talking to, or doing sports with children), likely because these are respondents' primary activities only.
- Eating and drinking, not at a restaurant, is unpleasant about 10 percent of the time. Because eating and drinking are biological necessities, we treat them as a distinct activity.
- Carework includes child, adult, and pet care. Ten to 14 percent of this time is unpleasant.
- Neutral downtime is a diverse group of less-pleasant leisure activities that are for the most part passive activities: watching television and videos (the bulk of the category), listening to music, reading, using computers, conversation, and relaxing.[5] Activities in this category have high vari-

4. Sleep and select personal care activities were not eligible for inclusion in the ATUS Well-Being Module.

5. Again, we borrow this terminology from Krueger (2007) but include a slightly different set of activities.

ability in their unpleasantness, ranging from spending about 10 to near 20 percent of time doing the activity in an unpleasant state.

- Domestic work and errands include household tasks such as cooking, gardening, shopping, and laundry. Between 12 and 25 percent of the time spent doing these activities is unpleasant.
- Work and urgent tasks are the most unpleasant daily activities. This group includes both tasks that are routinely scheduled (work, commuting, education) or likely urgent (home repair, medical care, homework, looking for work). These activities are typically unpleasant more than 20, and up to 60, percent of the time.
- Two activities are not classified into any affect-activity group. Other travel includes all other travel not related to specific activities otherwise defined, so we could not determine the purpose of this travel. Short course or occasional training could include a wide range of activities that are either elective (such as a photography course) or obligatory (such as job training).

In general, activities whose timing is imposed by others are rated as more unpleasant than activities whose scheduling is chosen. One example that illustrates this pattern is listening to music: listening to chosen music using a CD-ROM or other device is unpleasant less than 10 percent of the time, whereas listening to the radio (as one's primary activity) is unpleasant nearly 20 percent of the time. These estimates have overlapping confidence intervals, but the point estimates illustrate the broader pattern.

We do not identify systematic differences in the unpleasantness of daily activities by ethnoracial group. Online appendix D shows the race-specific unpleasantness several exemplar activities.

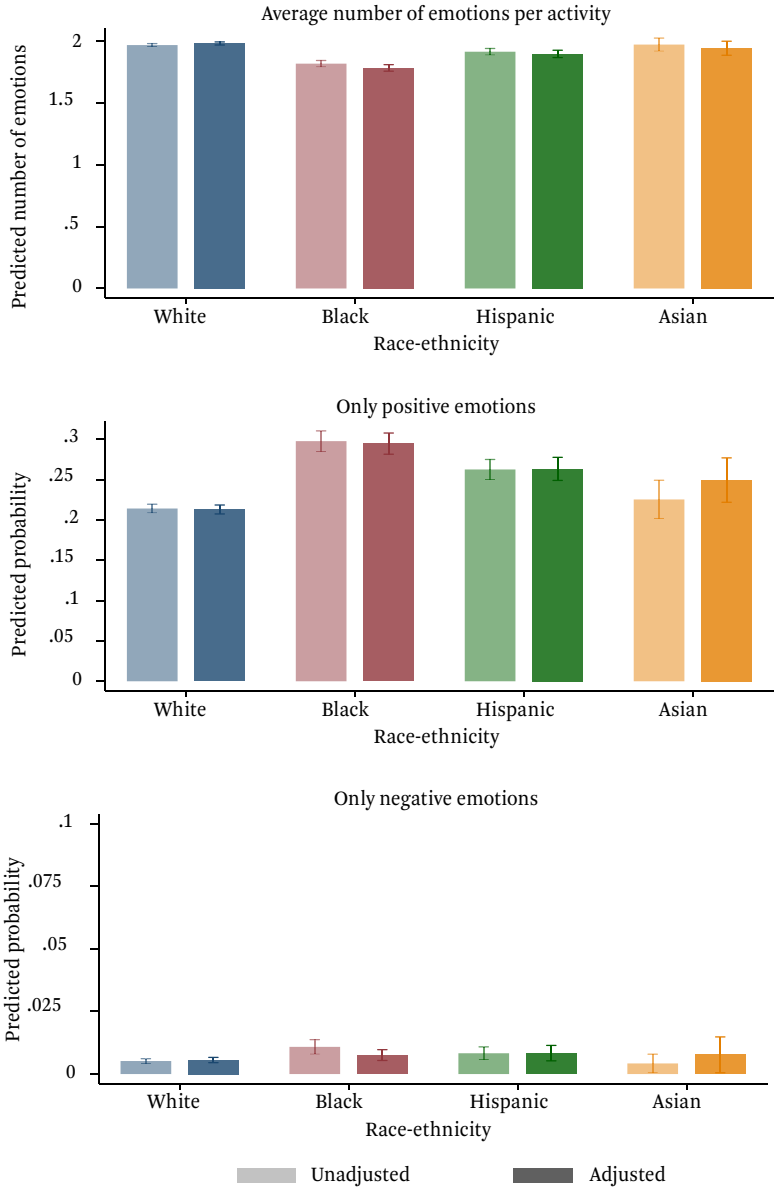
However, Black and Hispanic people report fewer emotions per activity than White people (figure 5, top panel). Minority groups are more likely to report only positive emotions across all sampled activities (figure 5, middle panel). It is not clear whether this pattern indicates avoidance of negative emotions or a preference for reporting fewer emotions: ATUS asks about only one positive emotion, happiness, which is also the most frequently reported emotion. Similarly, Black and Hispanic people are more likely to report only negative emotions across all sampled activities (about 1 percent of the sample, figure 5, bottom panel). Rates of reporting only positive emotions in all activities are highest for Black people (figure 5, middle panel) and are consistent across sex, age, and employment levels (not shown).

These findings on reported emotions are perhaps consistent with the Black-White mental health paradox, whereby Black people have more stressful experiences but report better mental health than White people (Brown, Mitchell, and Ailshire 2020; Thomas Tobin et al. 2022; Williams 2018). Consistent with this paradox, people of color are more likely to report only positive emotions during daily activities than White people. However, Black and Hispanic people are also more likely to report only negative emotions during their activities, though this was rare for all groups. These differences occur in part because people of color reported fewer emotions during activities than White people did, suggesting greater within-group heterogeneity in emotional experience.

HISTORICAL AND CONTEXTUAL VARIATION

We continue to use data on contemporary time use from ATUS and the ATUS Well-Being Module. To add historic context, we add data from the American Heritage Time Use Survey (AHTUS), a harmonized series of time use surveys spanning 1930 to 2018. Studies were harmonized by the Centre for Time Use Research at the University College London and are available through IPUMS Time Use at the University of Minnesota (Fisher et al. 2018). We analyze data from all people age eighteen and older collected in years for which information on respondents' race is available: 1965–1966 (Multinational Comparative Time-Budget Research Project), 1975 (American's [*sic*] Use of Time: Time Use in Economic and Social Accounts), 1992–1994 (National Human Activity Pattern Survey), 1994–1995 (National Time-Diary Study),

Figure 5. Ethnoracial Differences in Emotions



Source: Authors' calculations based on American Time Use Survey Well-Being Model, 2010, 2012, 2013 (Flood et al. 2023).

Note: Unadjusted and adjusted estimates and 95 percent confidence intervals from the American Time Use Survey Well-Being Model, 2010, 2012, 2013.

1998–2001 (Family Interaction, Social Capital, and Trends in Time Use Study and National Survey of Parents), and 2003–2012, 2018 (American Time Use Survey). In total, we analyze the daily unpleasantness of 155,891 people who completed time diaries between 1965 and 2018.

Measures

Analyses of ATUS and the ATUS Well-Being Module use the same set of measures described earlier. Because the historic AHTUS data is harmonized with these contemporary data, we are able to use a similar set of covariates in our his-

toric analyses. Sex, age, age squared, educational attainment, employment status, number of coresident children under age eighteen, census region, month in which the time diary was completed, and the day of week about which the diary was collected are measured the same way as in the ATUS. Three measures are unavailable in the historic data (nativity, urban-rural residence, and whether people who are not working are retired), and three more are slightly different due to historic data limitations. In the historic AHTUS, consistent information on race at all time periods is limited to White, Black, and Other Race (not specified). We compare all White and all Black respondents at each period, omitting the Other group due to its small size and heterogeneity. In AHTUS, partnership status indicates whether the respondent was currently married or unmarried. Covariates for the time trend include 1960s (1965–1966), 1970s (1975), 1990s (1992–1994, 1994–1995, 1998–2001), 2000s (2003–2009), and 2010s (2010–2012, 2018).

Analytic Strategy

To describe differences in daily unpleasantness by ethnoracial group, we calculate the share of each person's day spent in an unpleasant state. Specifically, we apply the population average u-index score described earlier to each person's mix of daily activities in the larger 2003–2019 ATUS sample (or, for historic analyses, the larger 1965–2018 AHTUS sample).[6] Analytically, we multiply the time spent in each activity by its u-index (the population average proportion of time spent in an unpleasant state during that activity), sum across all activities to get total minutes spent in an unpleasant state, and divide by the length of the waking day (the individual's total time spent on activities other than sleep and personal care).[7] Then we model group differences in the proportion of the waking day spent in an unpleasant state using ordinary least squares regressions with the sociodemographic covariates described previously. In analyses of change over time, we interact ethnoracial group with ten-year period.

We emphasize that we use the same u-index values for everyone in the population because we did not find differences in the unpleasantness of particular activities across groups. Thus differences in daily unpleasantness reflect the time each group spends on activities and does not indicate that members of a particular group find an activity to be more or less unpleasant.

To aid in interpreting the results to follow, we offer an example of how to interpret a difference in daily unpleasantness. Spending an additional 1 percent of the waking day in an unpleasant state is about ten minutes of unpleasant time, presuming a sixteen-hour waking day that allocates eight hours for sleep and personal care. These 9.6 minutes of unpleasantness might come from fifteen additional minutes seeking medical care, unpleasant 66 percent of the time; thirty additional minutes doing paid work, unpleasant 32 percent of the time; or forty-two minutes cleaning, unpleasant 23 percent of the time (see figure 1).

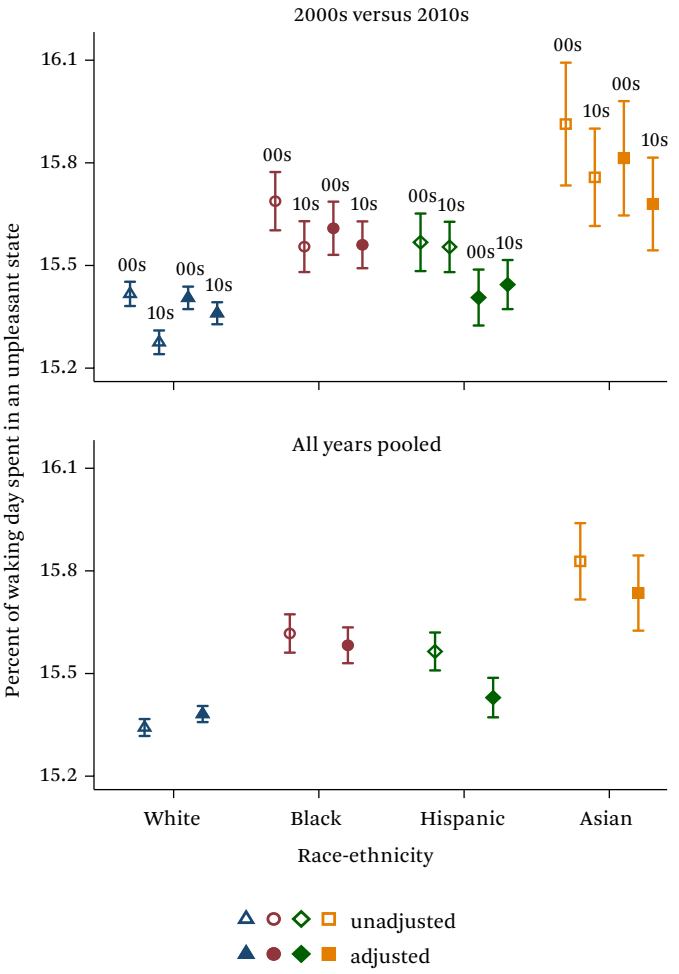
Results: Continuity of Ethnoracial Differences in Daily Life

Total daily unpleasantness is higher for minoritized groups than for White people (figure 6, bottom panel). Unadjusted estimates reveal higher daily unpleasantness for Black, Hispanic, and Asian people compared to White people. Adjusting for sociodemographic characteristics, Black and Asian people have higher daily unpleasantness than White people. Across specifications, Asian people spend the largest share of their waking days in an unpleasant state. Disparities in daily affect for minoritized groups relative to White people are driven by differences in daily activities, because people of all groups rate the same activities as similarly unpleasant (see "How People Feel During Daily Activities").

6. Despite the large time gap in applying the contemporary ATUS u-index ratings historically, contemporary ATUS affect data are similar to the limited affect measures available in historic time use datasets (Robinson 2013). Contemporary u-index measures have been applied historically in prior research (Krueger 2007).

7. We use waking day to refer to the daily activities for which unpleasantness was measured in ATUS/AHTUS, as in research on daily unpleasantness (Krueger 2007). However, this terminology is somewhat inaccurate, given that the so-called waking day excludes both time spent sleeping and time doing personal care activities.

Figure 6. Daily Unpleasantness by Ethnoracial Group

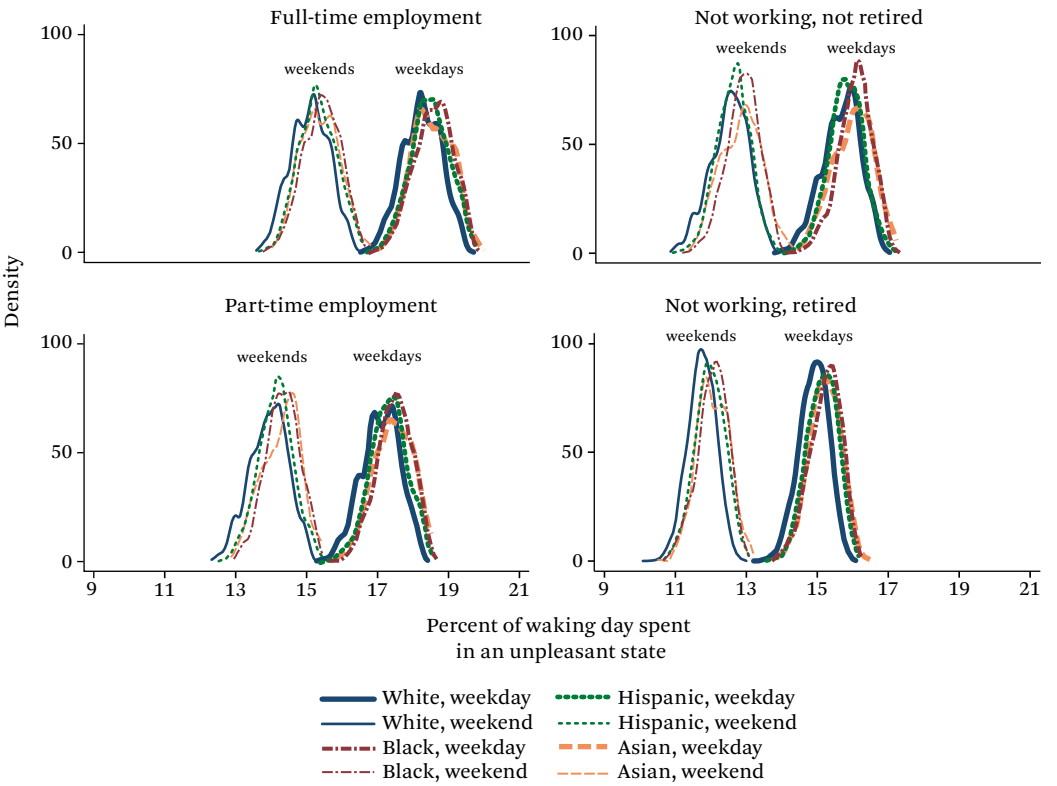


Source: Authors' calculations based on American Time Use Survey, 2003–2019 (Flood et al. 2023).
Note: Unadjusted and adjusted predicted values and 95 percent confidence intervals from the American Time Use Survey, 2003–2019. Predicted level of daily unpleasantness from ordinal least squares regressions of the proportion of the waking day spent in an unpleasant state. Estimates are adjusted for sex, age, age squared, educational attainment, employment status, nativity, marital status, any coresident children under age eighteen, urban-rural residence, census region, ten-year group, month, and day of week. Models comparing the 2000s and 2010s include an interaction term for ethnoracial group × ten-year group.

Inequities in unpleasant time have remained stable across the 2000s and 2010s (figure 6, top panel). Minoritized groups' unpleasant time does not vary significantly between the 2000s and the 2010s. White people's daily unpleasantness is slightly higher in the 2000s than in the 2010s before adjusting for covariates, but these differences are explained by population composition.

To better understand these patterns, we also compare the distribution of daily unpleasantness by ethnoracial group across employment levels (figure 7). These distributions have two peaks because the weekday-weekend structure provides a distinctive cadence to unpleasant time for all ethnoracial groups: weekdays (thick lines) are more unpleasant than weekends (thin lines), as the composition of

Figure 7. Distribution of Daily Unpleasantness by Ethnoracial Group and Employment Status

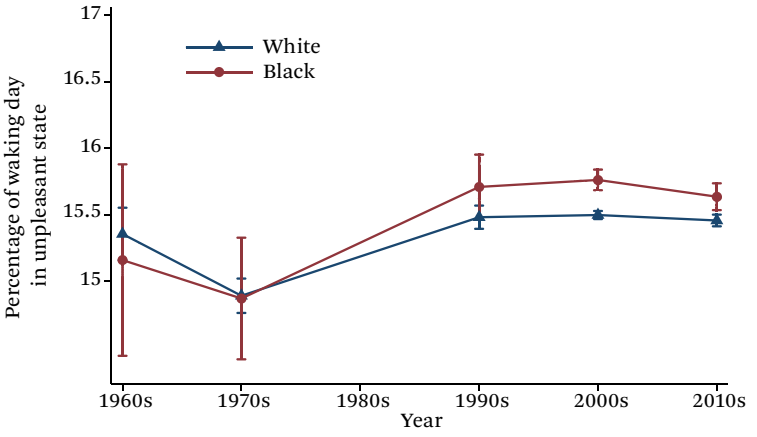


Source: Authors' calculations based on American Time Use Survey 2003–2019 (Flood et al. 2023).
Note: Adjusted predicted values from the American Time Use Survey 2003–2019. Authors' calculations of kernel density estimates of the predicted level of daily unpleasantness from ordinal least squares regressions of the proportion of the waking day spent in an unpleasant state. Estimates are adjusted for sex, age, age squared, educational attainment, employment status, nativity, marital status, any coresident children under age eighteen, urban-rural residence, census region, ten-year group, month, and day of week.

activities that people do each day differs on weekdays and weekends. Most people have more choice in how they spend their weekend time than their weekday time. Employed people's weekends have a similar level of unpleasantness as the weekdays of retired people. Yet figure 7 also underscores that weekends are substantially more enjoyable than weekdays even among retired people, which might reflect the importance of shared time with loved ones (who are in the workforce) or cultural cadences of errands and leisure that persist from working life into retirement—possibilities that raise evocative questions about what exactly makes time pleasant. Amid these shared daily rhythms, ethnoracial differences persist: on both weekdays and weekends, and for people of all employment levels, White people (solid lines) have lower daily unpleasantness than minoritized groups (dashed lines).

Figure 8 situates these disparities historically, presenting results for simplified racial groups. Though small sample sizes in early years make estimates imprecise, beginning in the 2000s, Black people's daily lives are more unpleasant than those of White people. However, it is not possible to determine whether this is a true change over time or an artifact of the switch in historic datasets to the American Time Use Survey beginning in the 2000s and continuing through the 2010s.

Figure 8. Historic Trends in Daily Unpleasantness



Source: Authors' calculations based on American Heritage Time Use Survey 1965–2018 (Fisher et al. 2018).

Note: Adjusted predicted values and 95 percent confidence intervals from the American Heritage Time Use Survey 1965–2018. Predicted level of daily unpleasantness from ordinal least squares regressions of the proportion of the waking day spent in an unpleasant state. Estimates are adjusted for sex, age, age squared, educational attainment, employment status, marital status, any coresident children under age eighteen, census region, ten-year group, month, and day of week. Model includes an interaction term for ethnoracial group × ten-year group.

MODERATION BY SEX

Because research on daily unpleasantness has to date focused on sex differences (Krueger 2007), we also investigated whether sex moderated each of our findings. We confirmed that daily activities vary by sex and that most racial differences are consistent by sex. Patterns differed for a few activities, however. White women spend more time alone than White men, but this pattern is reversed for Black people, such that Black men spend more time alone than Black women. White men spend more time eating and drinking than White women. Additionally, Black and Hispanic men spend more time with friends than Black and Hispanic women, respectively. We also found that rates of reporting only positive emotions during daily activities did not vary by sex. Because we did not identify racial differences in the degree to which activities are rated as unpleasant, we did not test for sex moderation of those (nonexistent in the aggregate) racial differences. Finally, we found that White, Hispanic, and Asian men have about 1 percentage point higher daily unpleasantness than same-group women (online appendix E). After adjusting for sociodemographic covariates, differences are attenuated such that men have about 0.25 percentage point more daily unpleasantness than same-group women.

DISCUSSION

Time is a fundamental social good with a finite limit, arguably the resource that people most wish to have more of or more control over. Recent years have seen increasing calls for research on the ethnoracial patterning of time use (Gee et al. 2019; Kwate 2017), and theoretical frameworks suggest that time use is foundational to racial inequities in outcomes such as population health (Colen et al. 2023). Yet little empirical research has explored patterns of time use across racial groups outside limited domains, such as patterns of full-time versus part-time employment. This gap is particularly surprising given extensive research on inequities in time use and daily activities by gender, another key characteristic of stratification in

the United States. We argue that time use data represent an underused resource for understanding how daily life does—and does not—vary across subpopulations.

In this work, we analyze the time use patterns of more than two hundred thousand White, Black, Hispanic, and Asian people to understand whether and how patterns of daily activities vary by race and ethnicity. These differences can also create inequities in quality of life, although some may also reflect distinctive preferences that need not map neatly onto inequalities.

We found that some important aspects of time use show little variation across ethnoracial groups, highlighting how deeply constraining the core structures of time use are for all people. Moreover, despite the major social changes in the United States over the last half century, we find broad historical continuity in daily unpleasantness across the population: the portion of the day spent in unpleasant activities has hovered between roughly 15 and 15.5 percent of the waking day for both White and Black people from the 1960s to the 2010s. These relatively small differences can be consequential for experience, yet one might also have expected a larger shift over a period in which so many aspects of daily life have altered. Although the historical estimates are imprecise, we find similar continuity using robust data from the 2000s to 2010s. Our results offer suggestive evidence that population-level historical shifts have not been of much greater magnitude than the differences between racial groups' unpleasant time today.

At the same time, other elements of time use show meaningful differences. The balance of time between more unpleasant obligatory activities and more pleasant leisure time varies across groups. Asian people spend the largest portion of their days in an unpleasant state, whereas White people spend the least time. Asian people's disproportionate unpleasant time reflects that they both spend the most time in unpleasant activities (notably, paid work) and spend the least time in the most enjoyable activities (elective leisure). These findings are particularly notable given that Asian people have been less consistently included in research on daily life in the United States, suggesting the need for better understanding of their experiences. We also find variations within people's unconstrained leisure time in the split between highly pleasant and affectively neutral leisure activities. White people spend the most time doing the most pleasant leisure activities, and Black people spend the most time doing affectively neutral activities such as watching television. However, these differences across groups are small relative to, for example, all ethnoracial groups' difference in unpleasant time on weekdays versus weekends—even among people who are retired from the workforce.

Our analyses also uncovered several new stylized facts about how ethnoracial groups spend their time. For example, we showed that Black people spend the most time alone and Hispanic people spend the least alone. High levels of time alone are associated with higher risks of loneliness (Danvers et al. 2023). Yet solitude can also have psychological benefits (Long and Averill 2003) and too little time alone can also be its own source of stress (Buchanan, McFarlane, and Das 2024). Some research suggests that time alone is a "distinct 'experiential niche' having unique potentials and liabilities" (Larson 1990, 155), and other research suggests that time alone can dampen both positive and negative emotions (Nguyen, Ryan, and Deci 2018). Time alone might be broadly beneficial to the extent that people choose the contexts that they prefer, or deleterious if people have much more, or less, time alone than they would like. The benefits and drawbacks of substantial time alone also depend on the ready alternatives; for example, social support can reduce suicidal ideation, but negative social interactions can intensity it (Lincoln et al. 2012). The striking differences we uncovered in time alone merit further investigation in the context of other research finding that ethnoracial differences in social support vary with gender and life stage (Silverstein and Waite 1993).

The lack of research that includes all daily activities, and especially measures of how people feel during their activities, to systematically explore racial differences has left important aspects of daily life unexplored. Categories of activities that are prespecified by researchers may miss important nuances that appear when the

categories are developed from respondent-provided information (in this case, about how often time spent doing various activities is unpleasant). For example, broad categories of free time cannot capture the distinctive trade-offs between elective leisure and neutral downtime.

These findings offer a new area for racial stratification research. Given long-standing inequities in educational attainment, income, and occupation across ethnoracial groups (Bloome and Western 2011; Wilson, Sakura-Lemessy, and West 1999), we expected to find the largest differences in time spent on activities related to market work (including main work, second jobs, commuting, education, and so on). We did identify differences in work-related time use, but differences in neutral downtime were equally large, and with whom people spent their time varied more across groups than their activities. These findings raise questions about the constraints and preferences that produce these patterns: Which structural conditions facilitate White people spending the most time on the most pleasant activities, even after accounting for socioeconomic resources? Do Black people spend more time alone and on neutral downtime activities by preference or due to constraints in the availability of people, money, energy, and neighborhood amenities? Which aspects of family networks lead Hispanic people to spend more time with young children and extended family than other ethnoracial groups? Do differences in occupation or self-employment explain why Asian people work more than other groups? Future research should decompose these differences to determine which factors create differences in daily activities across groups.

Limitations

First, we acknowledge that applying contemporary measures of unpleasant activities historically requires the strong assumption that the experiential nature of daily activities has remained constant for the last half century, though this approach has been used (Krueger 2007).

Second, we caution against interpreting the u-index of a given activity as a measure of the average level of unpleasantness for that activity for everyone in the population. Unpleasantness is measured among people who do a given activity, and we apply it to other people who do the activity (the same target population). Yet people likely select out of activities they find most unpleasant, as feasible, so unpleasantness would likely be higher if the entire population were queried about all activities. Further, although we measured the unpleasantness of sixty-four unique daily activities, our activities may not have been specific enough to detect differences between the experiences of minoritized groups and White people. For example, witnessing police stops affects White and non-White adolescents differently (Jackson et al. 2021), and time with family may elicit different emotions across ethno-cultural contexts (Trieu 2016).

Third, information about emotions was not assessed for time spent sleeping or doing personal care activities, so we were not able to make estimates of total unpleasant time across the twenty-four-hour day. A large literature shows that non-White people sleep less and more poorly than White people (Billings et al. 2021). Understanding the degree to which people make trade-offs between sleep and other activities is important to comprehensively understanding time use, particularly time use during the waking day.

Fourth, the ATUS and AHTUS have very limited information on secondary activities done in conjunction with primary activities. Thus, we were not able to examine patterns of multitasking.

Fifth, research using time diaries faces recall bias, as respondents are asked to remember the previous day's activities. Ecological momentary assessment using new technologies that capture daily activities in real time (Krueger et al. 2009) offer promising opportunities for future research in this area.

Finally, our ability to make historic conclusions was hampered by small sample sizes and limited to Black-White comparisons, given limited information on ethnoracial identity.

Future Work Using Time Use Data to Study Daily Emotional Experiences

Population-level research on stress and daily experiences has often used surveys with broad questions about typical emotional states. In

this work, we take the relatively unconventional approach of assessing daily emotional during specific daily activities using time diaries. We join other recent perspectives (Kwate 2017; Gee et al. 2019; Colen et al. 2023) that encourage using these data to explore key questions about daily life, including about how daily life may be structured differently across subpopulations. This approach offers several promising opportunities, including establishing theoretical and methodological practices for such work. We conclude by identifying some key remaining questions.

Theoretically, it is not clear how different measures of emotional experience are relevant to other outcomes. For example, we find that the most positive daily experiences are leisure activities, and White people spend the most time doing those activities. Black people spend the least time doing those activities but are also the most likely to report feeling only positive emotions during their daily activities. How do we reconcile these seemingly contradictory findings? And how do these findings inform research using other sources of reported data on emotions, like survey responses about typical emotional states? Which measures should we be using, and when?

Methodologically, time use data also provide a rich opportunity to explore the temporal component of daily emotions and provide a new lens for understanding the timing of daily activities. How do emotions from one activity bleed over into subsequent activities? How can enjoyable activities provide a buffer against challenging experiences? To what degree do people choose their daily activities based on their expected emotional tenor? Additionally, there is much opportunity to explore the analytic consequence of the use of the waking day (subtracting time spent on sleep and personal care) as the denominator in time use analyses. People adjust how much they sleep based on activities that they either need or wish to do. Sleep duration is both cause and consequence of mental health, and future work should more systematically integrate the study of sleep with the study of how time is spent during waking life to develop holistic measures of time use and well-being.

To conclude, we underscore that time diaries are a unique type of granular quantitative data that reveal life as it is experienced, day in and day out. Daily activities structure health and emotions; the contexts in which people spend their days shape relationships. Though many studies that describe the texture of daily life use qualitative data, time use data offer a compelling opportunity to explore how constraints and choices intersect in producing daily behaviors and experiences at a scale that facilitates subgroup comparisons. We hope that the results in this article will inspire much more exploration of these questions.

REFERENCES

American Psychological Association. 2016. "Discrimination Linked to Increased Stress, Poorer Health." Press Release. Washington, D.C.: American Psychological Association. Accessed April 18, 2024. https://www.apa.org/news/press/releases/2016/03/impact-of-discrimination.

Bianchi, Suzanne M., Melissa A. Milkie, Liana C. Sayer, and John P. Robinson. 2000. "Is Anyone Doing the Housework? Trends in the Gender Division of Household Labor." *Social Forces* 79(1): 191–228.

Bianchi, Suzanne M., Liana C. Sayer, Melissa A. Milkie, and John P. Robinson. 2012. "Housework: Who Did, Does or Will Do It, and How Much Does It Matter?" *Social Forces* 91(1): 55–63.

Billings, Martha E., Robyn T. Cohen, Carol M. Baldwin, Dayna A. Johnson, Brian N. Palen, Sairam Parthasarathy, Sanjay R. Patel, et al. 2021. "Disparities in Sleep Health and Potential Intervention Models: A Focused Review." *Chest* 159(3): 1232–40.

Bloome, Deirdre, and Bruce Western. 2011. "Cohort Change and Racial Differences in Educational and Income Mobility." *Social Forces* 90(2): 375–95. https://doi.org/10.1093/sf/sor002.

Brown, Lauren L., Uchechi A. Mitchell, and Jennifer A. Ailshire. 2020. "Disentangling the Stress Process: Race/Ethnic Differences in the Exposure and Appraisal of Chronic Stressors Among Older Adults." *The Journals of Gerontology: Series B* 75(3): 650–60.

Buchanan, Tom, Adian McFarlane, and Anupam Das. 2024. "Gender Differences in Desired Alone Time Among Canadian Parents of Young Children." *Applied Research in Quality of Life* 19(1): 1–19.

Colen, Cynthia G., Kelsey J. Drotning, Liana C. Sayer,

and Bruce Link. 2023. "A Matter of Time: Racialized Time and the Production of Health Disparities." *Journal of Health and Social Behavior* 65(12): 00221465231182377.

Cornwell, Benjamin, Jonathan Gershuny, and Oriel Sullivan. 2019. "The Social Structure of Time: Emerging Trends and New Directions." *Annual Review of Sociology* 45(1): 301–20.

Curtis, Chadwick, Julio Garín, and Robert Lester. 2022. "Working, Consuming, and Dying: Quantifying the Diversity in the American Experience." *Journal of Economic Dynamics and Control* 138 (May): 104357.

Danvers, Alexander F., Liliane D. Efinger, Matthias R. Mehl, Peter J. Helm, Charles L. Raison, Angelina J. Polsinelli, Suzanne A. Moseley, and David A. Sbarra. 2023. "Loneliness and Time Alone in Everyday Life: A Descriptive-Exploratory Study of Subjective and Objective Social Isolation." *Journal of Research in Personality* 107 (December): 104426.

Derenoncourt, Ellora, Chi Hyun Kim, Moritz Kuhn, and Moritz Schularick. 2022. "Wealth of Two Nations: The U.S. Racial Wealth Gap, 1860–2020." Working Paper no. 30101. Cambridge, Mass.: National Bureau of Economic Research. Accessed April 18, 2024. https://www.nber.org/papers/w30101.

Dukhovnov, Denys, and Emilio Zagheni. 2015. "Who Takes Care of Whom in the United States? Time Transfers by Age and Sex." *Population and Development Review* 41(2): 183–206.

Fisher, Kimberley, Jonathan Gershuny, Sarah M. Flood, Joan Garcia Roman, and Sandra L. Hofferth. 2018. "American Heritage Time Use Survey Data Extract Builder: Version 1.2 [dataset]." Minneapolis, Minn: IPUMS. https://doi.org/10.18128/D061.V1.2.

Flood, Sarah M., Liana C. Sayer, Daniel Backman, and Annie Chen. 2023. "American Time Use Survey Data Extract Builder: Version 3.2 [dataset]." College Park: University of Maryland and Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D060.V3.2.

Ford, Tiffany N., Jennifer M. Silva, Morgan Welch, and Isabel V. Sawhill. 2021. "No Time to Spare: Exploring the Middle Class Time Squeeze." Washington, D.C.: Brookings Institution. Accessed April 18, 2024. https://www.brookings.edu/articles/no-time-to-spare-exploring-the-middle-class-time-squeeze.

Friedman, Alexander, Daigo Homma, Bernard Bloem, Leif G. Gibb, Ken-ichi Amemori, Dan Hu, Sebastien Delcasso, et al. 2017. "Chronic Stress Alters Striosome-Circuit Dynamics, Leading to Aberrant Decision-Making." *Cell* 171(5): 1191–205.e28.

Gee, Gilbert C., Anna Hing, Selina Mohammed, Derrick C. Tabor, and David R. Williams. 2019. "Racism and the Life Course: Taking Time Seriously." *American Journal of Public Health* 109 (S1): S43–47.

Goldin, Claudia. 2014. "A Grand Gender Convergence: Its Last Chapter." *American Economic Review* 104(4): 1091–119.

Groshen, Erica L., and Harry J. Holzer. 2021. "Labor Market Trends and Outcomes: What Has Changed Since the Great Recession?" *The Annals of the American Academy of Political and Social Science* 695(1): 49–69.

Herd, Pamela, Hilary Hoynes, Jamila Michener, and Donald Moynihan. 2023. "Introduction: Administrative Burden as a Mechanism of Inequality in Policy Implementation." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 9(5): 1–30. https://doi.org/10.7758/RSF.2023.9.5.01.

Herd, Pamela, and Donald P. Moynihan. 2019. *Administrative Burden: Policymaking by Other Means*. New York: Russell Sage Foundation.

Hofferth, Sandra L., Sarah M. Flood, Matthew Sobek, and Daniel Backman. 2022. "American Time Use Survey Data Extract Builder: Version 3.1 [dataset]." IPUMS. College Park: University of Maryland and Minneapolis: University of Minnesota. https://doi.org/10.18128/D060.V3.1.

Holt, Stephen B., and Katie Vinopal. 2023. "Examining Inequality in the Time Cost of Waiting." *Nature Human Behaviour* 7(4): 545–55.

Hornbuckle, Lyndsey M. 2021. "Running While Black: A Distinctive Safety Concern and Barrier to Exercise in White Neighborhoods." *Preventive Medicine Reports* 22 (June): 101378.

Ice, Erin. 2023. "Bringing Family Demography Back In: A Life Course Approach to the Gender Gap in Caregiving in the United States." *Social Forces* 101(3): 1143–70.

Jackson, Dylan B., Juan Del Toro, Daniel C. Semenza, Alexander Testa, and Michael G. Vaughn. 2021. "Unpacking Racial/Ethnic Disparities in Emotional Distress Among Adolescents During Witnessed Police Stops." *Journal of Adolescent Health* 69(2): 248–54.

Jackson, Michelle. 2020. *Manifesto for a Dream: Inequality, Constraint, and Radical Reform*. Redwood City, Calif.: Stanford University Press.

Kahneman, Daniel, and Alan B. Krueger. 2006. "Developments in the Measurement of Subjective Well-Being." *Journal of Economic Perspectives* 20(1): 3–24.

Katz, Michael B., Mark J. Stern, and Jamie J. Fader. 2005. "The New African American Inequality." *Journal of American History* 92(1): 75–108. https://doi.org/10.2307/3660526.

Kephart, Lindsay. 2022. "How Racial Residential Segregation Structures Access and Exposure to Greenness and Green Space: A Review." *Environmental Justice* 15(4): 204–13.

Krueger, Alan B. 2007. "Are We Having More Fun Yet? Categorizing and Evaluating Changes in Time Allocation." *Brookings Papers on Economic Activity* 2007(2): 193–215.

Krueger, Alan B., Daniel Kahneman, David Schkade, Norbert Schwarz, and Arthur A. Stone. 2009. "National Time Accounting: The Currency of Life." In *Measuring the Subjective Well-Being of Nations: National Accounts of Time Use and Well-Being*, edited by Alan B. Kreuger, 9–86. Chicago: University of Chicago Press.

Kwate, Naa Oyo A. 2017. "The Race Against Time: Lived Time, Time Loss, and Black Health Opportunity." *Du Bois Review: Social Science Research on Race* 14(2): 497–514.

Larson, Reed W. 1990. "The Solitary Side of Life: An Examination of the Time People Spend Alone from Childhood to Old Age." *Developmental Review* 10(2): 155–83.

Lincoln, Karen D., Robert Joseph Taylor, Linda M. Chatters, and Sean Joe. 2012. "Suicide, Negative Interaction and Emotional Support Among Black Americans." *Social Psychiatry and Psychiatric Epidemiology* 47(12): 1947–58.

Logan, John R. 2013. "The Persistence of Segregation in the 21st Century Metropolis." *City & Community* 12(2): 160–68.

Long, Christopher R., and James R. Averill. 2003. "Solitude: An Exploration of Benefits of Being Alone." *Journal for the Theory of Social Behaviour* 33(1): 21–44.

McCrate, Elaine. 2012. "Flexibility for Whom? Control over Work Schedule Variability in the US." *Feminist Economics* 18(1): 39–72. https://doi.org/10.1080/13545701.2012.660179.

McLafferty, Sara, and Valerie Preston. 2019. "Who Has Long Commutes to Low-Wage Jobs? Gender, Race, and Access to Work in the New York Region." *Urban Geography* 40(9): 1270–90.

Nguyen, Thuy-vy T., Richard M. Ryan, and Edward L. Deci. 2018. "Solitude as an Approach to Affective Self-Regulation." *Personality and Social Psychology Bulletin* 44(1): 92–106.

Park, Hyunjoon, Matthew Sheen, and Paula Clark. 2025. "Living Alone for Black and White Men and Women: Changes over Four Decades, 1980–2019." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(2): 26–45. https://doi.org/10.7758/RSF.2025.11.2.02.

Permanyer, Iñaki, Isaac Sasson, and Francisco Villavicencio. 2023. "Group- and Individual-Based Approaches to Health Inequality: Towards an Integration." *Journal of the Royal Statistical Society Series A: Statistics in Society* 186(2): 217–40.

Perry-Jenkins, Maureen, and Naomi Gerstel. 2020. "Work and Family in the Second Decade of the 21st Century." *Journal of Marriage and Family* 82(1): 420–53.

Ray, Rashawn. 2017. "Black People Don't Exercise in My Neighborhood: Perceived Racial Composition and Leisure-Time Physical Activity among Middle Class Blacks and Whites." *Social Science Research* 66 (August): 42–57.

Reardon, Sean F., and Ann Owens. 2014. "60 Years After Brown: Trends and Consequences of School Segregation." *Annual Review of Sociology* 40(1): 199–218.

Robinson, John P. 2013. "As We (Still) like It: Socializing, Religion, Kids Remain Our Favourite Daily Activities." Working paper no. PWP-MPRC-2013-204. College Park: Maryland Population Research Center.

Salganik, Matthew J., Ian Lundberg, Alexander T. Kindel, Caitlin E. Ahearn, Khaled Al-Ghoneim, Abdullah Almaatouq, Drew M. Altschul, et al. 2020. "Measuring the Predictability of Life Outcomes with a Scientific Mass Collaboration." *Proceedings of the National Academy of Sciences* 117(15): 8398–8403.

Sayer, Liana C. 2016. "Trends in Women's and Men's Time Use, 1965–2012: Back to the Future?" In *Gender and Couple Relationships*, edited by Susan M. McHale, Valarie King, Jennifer Van Hook, and Alan Booth, 43–77. National Symposium on Family Issues. Cham: Springer International.

Sayer, Liana C., and Leigh Fine. 2011. "Racial-Ethnic Differences in U.S. Married Women's and Men's

Housework." *Social Indicators Research* 101(2): 259–65.

Schuetz, Jenny, Jed Kolko, and Rachel Meltzer. 2012. "Are Poor Neighborhoods 'Retail Deserts'?" *Regional Science and Urban Economics* 42(1): 269–85.

Sevilla, Almudena, Jose I. Gimenez-Nadal, and Jonathan Gershuny. 2012. "Leisure Inequality in the United States: 1965–2003." *Demography* 49(3): 939–64.

Silverstein, Merril, and Linda J. Waite. 1993. "Are Blacks More Likely Than Whites to Receive and Provide Social Support in Middle and Old Age? Yes, No, and Maybe So." *Journal of Gerontology* 48(4): S212–22.

Sternthal, Michelle J., Natalie Slopen, and David R. Williams. 2011. "Racial Disparities in Health: How Much Does Stress Really Matter?" *Du Bois Review: Social Science Research on Race* 8(1): 95–113.

Thomas Tobin, Courtney S., Christy L. Erving, Taylor W. Hargrove, and Lacee A. Satcher. 2022. "Is the Black-White Mental Health Paradox Consistent across Age, Gender, and Psychiatric Disorders?" *Aging & Mental Health* 26(1): 196–204. https://doi.org/10.1080/13607863.2020.1855627.

Trieu, Monica M. 2016. "Family Obligation Fulfillment Among Southeast Asian American Young Adults." *Journal of Family Issues* 37(10): 1355–83. https://doi.org/10.1177/0192513X14551174.

U.S. Bureau of Labor Statistics. 2014. "American Time Use Survey (ATUS) Data Dictionary: 2010, 2012, and 2013 Well-Being Module Data." July. Accessed April 22, 2024. https://www.bls.gov/tus/dictionaries/wbmintcodebk.pdf.

———. 2017. "American Time Use Survey Well-Being Module Microdata Files." Last modified December 7, 2017. Accessed April 22, 2024. https://www.bls.gov/tus/data/wbdatafiles_1013.htm.

Weeden, Kim A., Youngjoo Cha, and Mauricio Bucca. 2016. "Long Work Hours, Part-Time Work, and Trends in the Gender Gap in Pay, the Motherhood Wage Penalty, and the Fatherhood Wage Premium." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 2(4): 71–102. https://doi.org/10.7758/RSF.2016.2.4.03.

Williams, David R. 2018. "Stress and the Mental Health of Populations of Color: Advancing Our Understanding of Race-Related Stressors." *Journal of Health and Social Behavior* 59(4): 466–85. https://doi.org/10.1177/0022146518814251.

Wilson, George, Ian Sakura-Lemessy, and Jonathan P. West. 1999. "Reaching the Top: Racial Differences in Mobility Paths to Upper-Tier Occupations." *Work and Occupations* 26(2): 165–86.

Zenk, Shannon N., Amy J. Schulz, Barbara A. Israel, Sherman A. James, Shuming Bao, and Mark L. Wilson. 2005. "Neighborhood Racial Composition, Neighborhood Poverty, and the Spatial Accessibility of Supermarkets in Metropolitan Detroit." *American Journal of Public Health* 95(4): 660–67.

Unstable Work Schedules and Racial Earnings Disparities Among U.S. Workers

JULIE Y. CAI AND MARYBETH J. MATTINGLY

Research demonstrates large and persistence disparities in earnings by race-ethnicity, with white and Asian families generally faring far better than black and Hispanic families. One emerging but underexplored factor that may contribute to racial earnings disparities is unstable work hours. Wage workers often face earnings consequences when volatility is frequent, involuntary, or unanticipated. Leveraging the panel design of the monthly Current Population Survey, we follow a group of hourly workers across a four-month period to assess whether volatility (both magnitude and direction) in the first three months observed relates to their subsequent earnings in the fourth month of observation. We consider how this unfolds when they remain in the same job and when they switch jobs. Substantial volatility, either when work hours increase or decrease, is associated with lower earnings in the near future, both within- and between-jobs. However, when facing more volatile work schedules and substantial changes in month-to-month hours, black workers earn less than white workers when they remain in the same job. This difference is not observed among job changers.

Keywords: earnings inequality, unstable work schedules, racial wage gap, precarious work

The growing consensus is that job quality is crucial to many facets of workers' lives and the pandemic-altered labor market. In addition, related equity issues have put work volatility and wages at the forefront of social science research. Interest in understanding the economic effects of intrayear labor-market churn and particularly work-schedule instability has increased over the past decade; both affect not only workers' well-being but also employers' efficiency and the economy more broadly. Over the past two decades, the United States has undergone drastic changes in labor-market structures that have hampered job quality across

Julie Y. Cai is an economist at the Center for Economic and Policy Research, United States. **Marybeth J. Mattingly** is an assistant vice president for the Federal Reserve Bank of Boston's Regional & Community Outreach Department, United States.

© 2025 Russell Sage Foundation. Cai, Julie Y., and Marybeth J. Mattingly. 2025. "Unstable Work Schedules and Racial Earnings Disparities Among U.S. Workers." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 201–23. https://doi.org/10.7758/RSF.2025.11.1.10. We thank the session participants of the 2023 Population Association of America annual meeting and all anonymous referees for their helpful comments on previous drafts. Cai thanks the Institute for New Economic Thinking for the support. The views expressed are those of the authors and do not reflect those of the Center for Economic and Policy Research, the Federal Reserve Bank of Boston, the Federal Reserve System, or its Board of Governors. Direct correspondence to: Julie Cai at cai@cepr.net, 1611 Connecticut Ave., NW 4th Floor, Washington, DC 20009; Marybeth Mattingly at beth.mattingly@bos.frb.org, 600 Atlantic Ave., Boston, MA 02210, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

many low-wage sectors. The deregulation and privatization of industry has also placed downward pressure on not only wages, but also on work hours for low-income and middle-class workers (Hacker 2008).

Between the early and mid-2010s, U.S. job growth was more concentrated in lower-wage sectors, including food service, retail trade, and administrative support services. More than two of every five jobs created during this period were in low-wage industries (NELP 2014). Due to business shutdowns at the onset of the COVID-19 pandemic, some workers holding jobs in these sectors faced a high risk of losing their jobs (Hardy, Hokayem, and Roll 2021). The remaining workforce who maintained their jobs kept communities safe and enabled us to meet our basic needs such as food and medical care. However, many of the jobs in these sectors entail not only low pay but also unanticipated work scheduling at the employer's discretion (Alexander and Haley-Lock 2015; Kalleberg, Reskin, and Hudson 2000; Lambert 2008). Further, these are sectors where employee retention can be low as workers seek opportunities with even just slightly better working conditions or wages (Lane 1999; Schweitzer and Khattar 2021). Consequently, hours volatility or employment churn often mark low-wage workers' labor-market experience (Choper, Schneider, and Harknett 2022).

Job churning and in-job hours insecurity have been prevalent within the low-wage market (Howell and Kalleberg 2019). Even in the economic recovery following the Great Recession, low-income workers did not realize positive wage growth until the latter part of the 2010s (Piketty, Saez, and Zucman 2018). However, the pandemic further complicated the economic benefits that had slowly flowed to low-wage workers. They were overwhelmingly the backbone of the workforce at the onset of the pandemic—working in food, retail, warehouses, transportation, and health-care services—and they were more likely people of color and less-educated women (Chaganti et al. 2020). The stagnated wage growth that black and brown workers experienced during the 2000s coupled with the labor shortage in low-wage service occupations that emerged during the pandemic recovery signal a need to better understand the relationship between volatile hours and long-term earnings.

Despite some progress, racial earning disparities persist in the United States (Aeppli and Wilmers 2022; Cheng et al. 2019; Semyonov and Lewin-Epstein 2009; Wilson and Rodgers 2016). Ample research in the past two decades provides evidence that these racial differences are mostly attributable to occupation segregation, educational attainment, individual characteristics, and other unobserved characteristics (Goldin and Katz 2010; Mandel and Semyonov 2016; Mouw and Kalleberg 2010). Although these characteristics are pivotal, recent research on work schedules points to another key consideration. In-job work scheduling changes and month-to-month job-to-job or episodic employment may entail frequent work hours volatility, which can affect workers' economic well-being, especially that of hourly workers and less advantaged workers. Also, racial and ethnic inequities in work scheduling was evident even before the pandemic (Storer, Schneider, and Harknett 2020).

Yet the research on labor-market experiences does not explain the link between the volatility low-wage workers encounter and their earnings and leaves open numerous pressing questions, such as what, if anything, can be done to reduce racial and ethnic differences in economic well-being. Work-hours volatility may contribute to a more nuanced understanding of the racial earnings differences observed beyond what is attributable, for example, to occupational segregation, educational attainment, and total work hours. However, researchers have not conducted longitudinal research to quantify this relationship (if there is any) and to unpack how the association varies by workers' race and ethnicity.

To bolster this knowledge, the present study uses nationally representative, longitudinally linked data to follow a group of workers over four months to assess whether hours volatility between months one and three connects to workers' subsequent earnings at month four and to determine whether the earning effects of hours volatility vary by race and ethnicity. We contribute to ongoing research by disentangling within-job hours volatility from between-job hours variability and by determining how

each affects workers' earnings. The study findings have implications for policy development that would reduce unexpected work-schedule instability at the workplace. Finally, we consider changes across periods between 2005 and 2022. This promotes an understanding of how income consequences of hour volatility evolve over time, with a focus on the recent COVID-19 pandemic and recovery from it.

We find that after adjusting for average hours worked, a significant negative relationship remains between month-to-month hours volatility and workers' earnings. Hours volatility—when greater in magnitude and higher in frequency—is correlated with lower income in month four than those with stable hours, net of other factors. That is, when workers face schedule unpredictability that falls in the top tercile of the volatility distribution, or have at least a 20 percent surge or dip in their hours, their earnings are substantially lower. There appears to be racial disparity in earnings according to various experiences of volatility. Specifically, even with a steady job, black workers earn substantially less than their white counterparts when experiencing frequent scheduling instability. Last, we find that the overall pattern holds across different time periods: workers of color have a larger earnings penalty when facing greater unstable work schedules. The significant black-white earnings differences emerged from the Great Recession period persisted through the economic expansion and continued during the recent pandemic years.

BACKGROUND

To understand the link between work-hour instability and a worker's subsequent economic well-being, we briefly review two related areas of research. First, a growing body of literature has examined the prevalence of work-hour precarity in the United States and the heterogeneity therein by race or ethnicity, with some studies focused specifically on low-wage service sectors. Second, we review another line of work that provides a portrait of wage inequality over time and plausible contributing factors. The section ends with a discussion of various measures researchers have used to study the unpredictable, involuntary work schedule changes workers face.

Unstable Work Hours Before and During the Pandemic

Although job growth in the aftermath of the Great Recession was strong by many measures, jobs in low-wage industries expanded nearly twice as much as in some mid-wage industries (NELP 2014). In the economic recovery following the pandemic, food-service work and low-wage health care and education aides are among the job categories that remain vacant (Gould and Kassa 2021). Thus far, the trends observed during the two recoveries corroborate the prior claims that labor-market structures and job characteristics have changed over the last few decades (Kalleberg, Reskin, and Hudson 2000). This is not entirely surprising given the well-documented decline in union jobs, financialization, and firm restructuring in the United States, which transformed the job market and increased the number of workers in the low-wage service and care sectors, making jobs less regular and stable, with fewer nonwage benefits (Western and Rosenfeld 2011). Social scientists have long described these features as evidence of precarious work (Kalleberg 2011).

One other equally important but underresearched facet of precarious work is hours insecurity. When the hours workers are scheduled are unpredictable and sometimes unknown until days or even hours in advance and changes are frequent or unanticipated, the impacts on workers' lives are often detrimental, which may trigger higher job turnover (Choper, Schneider, and Harknett 2022). Even in the years with economic expansion immediately before the pandemic, job churn, inconsistent work hours, and the resulting income instability were common in the lives of workers holding nonmanagerial jobs in the retail service and home health-care sectors (Clawson and Gerstel 2014; Morduch and Schneider 2017). Irregular work hours are a major source of short-term income instability or substantial income drop (Brown et al. 2014; Morduch and Schneider 2014).

The income insecurity that these low-wage workers experience could be the result of in-job hours variability, job-to-job transitions, or both. As the economy paused to address the pandemic, some of these workers in low-wage sectors faced heightened risk of job loss.

Hourly workers with minimal employment-related benefits, people of color, women, and immigrants disproportionately held these jobs (Chaganti et al. 2020); indeed, workers holding jobs in frontline industries were significantly more likely to lose a job during the pandemic (Hardy, Hokayem, and Roll 2021). The remaining workers in food, retail, warehouses, transportation, and health-care services continued in-person work and faced heightened risk of viral exposure.

Many of the jobs, then dubbed essential, not only paid less with few benefits but also entailed unanticipated or last-minute changes in hours worked (Kalleberg, Reskin, and Hudson 2000; Lambert 2008). Scheduling accommodated shifting demands, and in the pandemic context, workers might have been called on to cover for coworkers unable to work due to health or family caregiving needs. Thus, service workers continuously faced involuntary scheduling changes at the pandemic's onset (Schneider 2021). Despite the decrease in overall hours instability in 2022, involuntary hours volatility remained elevated for workers of color, less-educated workers, and those at the bottom of wage distribution, net of other characteristics (Cai 2023).

Furthermore, occupation segregation may have exacerbated disparities in volatility given concentration in low-wage markets, in which service and low-wage health-care jobs are disproportionately held by women and workers of color. In fact, the pandemic recession is the first time in U.S. history that women lost nearly two million more jobs than men. Furthermore, hospitality and food service jobs are primarily occupied by women (U.S. Department of Labor 2022); and a disproportionate number of black and Hispanic women are in home health aide occupations (Goubert, Cai, and Appelbaum 2021). The pandemic amplified horizontal segregation based on gender and race, with the leisure, hospitality, education, and health services sectors undergoing significant job losses.

Racial-Ethnic Differences in Work Volatility and Earnings

Due to the swift response of government measures to mitigate pandemic-induced economic consequences, such as expanded unemployment insurance (UI) and generous child benefits, various groups managed to weather the negative consequences of labor-market churn. However, others, such as some single individuals without dependents and undocumented immigrants, did not directly benefit from these public policies. Before the pandemic, even with the support of social insurance programs, the majority of U.S. workers relied on earned income as their primary financial resource, though many suffered from income instability and insufficiency (Finnigan 2018; Morduch and Schneider 2014).

Volatility in work (caused by changes in jobs or work hours) and thereby earnings is among the most important drivers of household income instability. In fact, nearly 70 percent of individuals experiencing unstable incomes did so as a result of either irregular work schedules or periods of unemployment in 2012 (Brown et al. 2014). Yet most individuals report that they would prefer a stable but low income to a somewhat greater overall income with poor job security or work hours stability (Hill et al. 2013; Morduch and Schneider 2017). Economic insecurity and instability are not experienced evenly across populations. Frequent instability of work hours (either between jobs or within jobs) contributes to substantial income fluctuations, particularly for lower-income families without sufficient savings. Among those raising children, Hispanic parents are more likely than their white counterparts to encounter earnings shocks, a decline of 20 percent or more in total earnings from one month to the next (Cai and Fremstad 2021). Such income fluidity can significantly undermine workers' savings in the long run and hinder upward mobility (Hill et al. 2017).

Experimental studies have documented racial discrimination in the labor market (Pager 2003; Pager and Shepherd 2008). Devah Pager (2003), for example, found that Hispanic and black job applicants have a lower likelihood of receiving a callback than their white counterparts with comparable qualification, and the penalty is more salient for black job seekers (Quillian et al. 2017). In another scenario, even being exposed to social networks at a similar rate, black applicants' propensity to attain referrals appeared to be lower, which accounted

for a nontrivial portion of explaining their lower likelihood in receiving a job offer relative to their white counterparts (Pedulla and Pager 2019). Further, for incumbent workers, even when staying at the same firm, manager discretion may put certain groups of workers in a more disadvantaged position (Lambert and Henly 2012). Although, empirically, the limited available studies suggest mixed results (Ruetschlin and Asante-Muhammad 2015; Swanberg, Watson, and Eastman 2014; Finnigan and Hunter 2018), recent work using detailed firm-level data reveals racial bias may exist in today's service-sector jobs when it comes to precarious scheduling (Storer, Schneider, and Harknett 2020).

Historically, racial disparity in earnings has been largely attributable to human capital, occupation, or other demographic characteristics (Goldin and Katz 2010; Mouw and Kalleberg 2010). Even after considering these factors, black workers earn less than white workers (Wilson and Rodgers 2016). It is certainly plausible that a number of other factors could contribute to the racial difference in earnings, such as unobserved characteristics, different access to opportunities, school quality during childhood, and interpersonal and structural barriers. However, studies on racial earnings disparity over time generally conclude that racial difference has widened again since 2000, following a decade of black-white wage convergence (Mandel and Semyonov 2016; Couch and Daly 2002). The latter is during a time in which occupation segregation shrank and more equal employment distribution across industry was observed. Nonetheless, scheduling instability or inequality has been mostly neglected in this discussion.

Qualitative research with interviews of human resource staff responsible for hiring or having information about turnover for several types of jobs in retail, hospitality, and services in several major U.S. companies shows that managers tended to perform a series of scheduling practices that may favor certain types of workers (Lambert 2008). For instance, the study reveals that, at the time of hiring, many employers put more weight on candidates who expressed availability or flexibility across a wide span of work hours and might further favor those who are more on the clock to meet labor demand (Lambert 2008). This favoritism is evident in other case studies in which authors reported that a worker's schedule might be highly determined by staffing constraints and the budget at the moment, which led to substantial manager discretion in giving some workers more favorable schedules (Lambert and Henly 2012), regardless of whether the decision was conscious or unconscious (Wood 2018). Further, work using three differing samples, including personal interviews with front-line workers, also documented that relative to white workers, black workers confronted or perceived significant discrimination in various ways, as noted by more unfavorable treatment in the workplace (Deitch et al. 2003). Given that managerial roles are overwhelmingly held by white employees, nonwhite workers in the low-wage labor market are likely to encounter a manager of a different race-ethnicity (Stainback and Tomaskovic-Devey 2009). Although this is not evidence of discrimination, for this and other reasons, we hypothesize possible racial difference in the association of earnings to scheduling volatility.

Work-hour instability may be an important factor that can contribute to our understanding of these disparities. It is plausible that beyond occupational effects and human capital, there might be a link between work-hour instability and workers' subsequent earnings. Workers may not be able to improve their economic well-being, particularly when instability in hours worked or labor-market flow is frequent.

Variations in work hours may mirror some patterns observed in poverty. Relative to their white counterparts, individuals of color have much higher chances of encountering an episodic poverty spell over a three-year period, with family income falling below their poverty threshold for two consecutive months—about 5 to 22 percentage points higher (Warren and Tettenhorst 2022). Earnings contribute a large portion of a worker's income stream, especially for low-wage workers. The disproportionate representation of people of color holding nonmanagerial service jobs may explain some of the persistent disparities in episodic poverty rates.

Two potential mechanisms explain why vol-

atility might be linked to lower earnings. Work-hour volatility may entail spikes, dips, or both within a short period. It is reasonable to expect that modest instability might not be harmful to one's economic well-being. However, constant fluctuations in the number of hours worked could be a source of economic insecurity, especially for those paid by the hour. In fact, instability and insecurity in work schedules are associated with workers' financial insecurity and material hardship (Golden 2015; Schneider and Harknett 2019). Further, even if workers gain hours in the same jobs, the length of time they can maintain those hours is often unknown.

On the other hand, today's private employers may impose last-minute cancellations or on-call jobs to minimize their administrative costs. Research reveals that nearly half of retail workers between the ages of twenty-six and thirty-two reported a difference of about ten hours between weeks (Lambert, Fugiel, and Henly 2014). This was further confirmed in a more recent study (Schneider and Harknett 2019). Workers with unfavorable scheduling are increasingly experiencing higher job turnover (Choper, Schneider, and Harknett 2022). Another recent study using quarterly data finds that one out of two low- or moderate-income households may experience job instability over the course of one year, and approximately 15 percent experience job loss without subsequent job gains during the same year (Cai et al. 2023). Individuals may voluntarily transition out of jobs because of the instability and may face an unemployment spell afterward, resulting in lower subsequent earnings. Others may have unstable employment involuntarily and face unemployment. Although some may have the means to offset a period of not working and wait for a better job, others may have to accept the first job they can find. Given known differences in savings by race (Aladangady, Chang, and Krimmel 2023; Bandelj and Grigoryeva 2021), it is more likely that people of color will need to transition faster into a new job that may offer only lower earnings.

Measuring Unstable Scheduling

Even though researchers have increasingly realized the importance of hour instability for workers' economic well-being, fewer studies have investigated economic outcomes resulting from short-term hour instability or employment churn, partly because of limited suitable national-level survey data. Even with longitudinal datasets, such as NLSY and PSID, respondents are usually surveyed annually or biannually. This makes such data less appropriate for studying such topics as short-term or frequent hour instability. The SHIFT project has started to recruit respondents for a group of targeted low-wage service-sector workers, who are mostly affected by hour insecurity and have less power in the labor market, more frequently within a shorter period. Nationally representative data sets fielded by the Census Bureau include the Current Population Survey (CPS) data, which have a rotation panel that follows workers across four consecutive months and collects information on hours worked in each month within that four-month time window. Additionally, the SIPP data are based on detailed labor-market information and benefit receipt every four months or monthly over the course of a year, depending on the panel selected.

Hours volatility could stem from either job-to-job transitions or within-job hours variability, both of which may influence the variability of hours worked from month to month and, consequently, financial security. Studies on work-hour instability have mostly measured employment changes based on between-job instability (job loss or gain), nonstandard work schedule (full and part time), day and night shifts, and frequent job changes (Morduch and Schneider 2017; Wolf et al. 2014). However, relying solely on measures such as nonstandard work schedules or job transitions may not sufficiently capture unanticipated aspects of hours instability; in other words, it may not portray the nuances of the magnitude of such instability.

Looking specifically at within-job hours instability, some research has used dichotomous variables in surveys that asked directly whether respondents had experienced job shocks or whether their hours worked had varied since the previous survey (Finnigan and Hale 2018; Lambert, Fugiel, and Henly 2014). Additionally, the difference between the maximum and minimum numbers of hours workers reported hav-

ing worked each week is another measure the researchers have been using to understand within-job instability (Schneider and Harknett 2019).

Although this type of measure captures respondents' perceptions of hour variability they might have experienced, it tends to underestimate the actual volatility an individual might encounter in the labor market. It may not be the most effective way to understand short-term variation if a worker works some number of hours between the reported maximum and minimum range and that information is not used; researchers cannot quantify the magnitude of such variation over time. In addition, reported varying hours tend to be positively correlated with more desirable flexibility according to the respondents' choice (Lambert, Fugiel, and Henly 2014), signaling that this type of dummy variable might not be the best approach for understanding the unfavorable volatility that some workers experience because of involuntary variations in hours. Beyond direct survey questions asking about respondent households' employment or hour status, another line of research draws on longitudinal data to quantify the actual variability in number of hours a worker might work over time. To date, only one study has examined short-term work instability using this approach (LaBriola and Schneider 2020).

In the spirit of this recent work, the present study contributes to the ongoing research by capturing month-to-month hour variability to understand how the magnitude of volatility shapes workers' earnings. Further, we also conceptualize variability by calculating substantial surges or dips in month-to-month hours a worker experiences. We move beyond how hours volatility is perceived to understand the income implications of how it is experienced.

DATA AND METHODS

We use the monthly files of the Current Population Survey collected by the U.S. Census Bureau and made easily available to researchers by the University of Minnesota (Flood et al. 2022). The CPS interviews the same addresses over four consecutive months and resurveys them for another four months after an eight-month gap. We select workers observed across four continuous months, regardless of their first appearance or second entry in the sample. We limit the sample to adult civilians ages nineteen and older who reported being employed and paid hourly at the start of the interview between 2005 to 2022.[1] We do not include workers who miss work or work part time due to any of the following reasons: taking a vacation, attending school, taking family leave, experiencing chronic health problems, having civil duties or other personal obligations. This sample selection mostly rules out workers who voluntarily work reduced hours or switch from working to not working by their own choice. Following earlier research (LaBriola and Schneider 2020), we also exclude workers who have only proxy labor-market status instead of their own report. The final analytic sample consists of 267,013 unique worker observations.

Explanatory Variables

As the main focus in the study, the concept of volatility is conceptualized in two ways: the magnitude of hours variability across a three-month period, and the direction of hours variability. We use the initial three-months of data to compute the work hours instability index, instead of all four months, to have clear temporal ordering between predictors and outcome examined. Specifically, hours variability is measured using the standard deviation of arc percentage change approach. It is operationalized in the following form:

$$v_i = \sqrt{var\left[\frac{HRs_{it} - HRs_{it-1}}{Y}\right]}$$

where v_i is the average volatility index for worker i across the first three months of their appearance in a given four-month time window. HRs_{it} and $HRs_{it\text{-}1}$ denote weekly hours worked for all jobs worker i reported at month t and t-1, respectively. The denominator, Y, uses

1. Despite unique identifiers, previous studies suggest using other demographic information to double-verify that the same respondent is followed through months. Hence we use the information on respondents' race, ethnicity, and sex variable to identify further those misclassified as the same person.

a midpoint approach (midpoint between HRs_{it} and $HRs_{it\text{-}1}$) to reduce the impact of large changes in total hours worked between months. As a sensitivity check, we also use the coefficient of variation approach, by dividing the standard deviation of a worker's hours by their average hours across the three-month period (results available on request). Both approaches are used in prior studies on income volatility (Gennetian et al. 2015; Ziliak, Hardy, and Bollinger 2011). We restrict the analytic sample to wage workers only, recognizing that the intensity or extent of instability that workers experience may matter quite differently for salaried employees. We define low, moderate, and high volatility using the instability-index terciles and apply them as a key predictor in the regression analysis. Our second set of predictors is four exclusive categories indicating unstable hours throughout, having hours spike only (defined as having 20 percent or more surge in hours from one month to the next), hours dip only (defined as having 20 percent or more decline in month-to-month hours), and both spike and dip.

Outcome Variable

Our primary outcome of interest is workers' reported weekly earnings at the last month observed (the fourth reference month). Earnings are adjusted for inflation to 2020 dollars and are log-transformed.

Control Variables

We include a set of associated covariates that may affect one's earnings, including workers' ages (nineteen through twenty-four, twenty-five through thirty-five, thirty-six through fifty-four, and fifty-five or above), sex, marital status, parenthood status, and education level (one of four categories: less than high school, high school diploma, some college, and college and above), job-related factors, such as the average number of hours worked, whether a job is covered by a union, occupation, industry, and region of residence. To separate the observed volatility within a job from that associated with labor-market transition, we create an indicator denoting whether workers ever change jobs within the four-month period.

METHODS

We begin with a series of descriptive charts illustrating patterns of volatility and earnings over time. We then turn to our multivariate analyses. To address the first question—whether the hours' volatility relates to workers' subsequent earnings—we ran two sets of models using ordinary least square estimation to predict workers' earnings during the fourth reference month for each of the key predictors. Each set of models includes two specifications. First, we include workers' demographic and job-related characteristics. We then further include state of residence and time fixed effects in the model. The model estimated is

$$Y_{it4} = \beta_0 + \beta_1 Volatility_i + \beta X_i + \beta Z_i + \gamma_s + \mu_t + \varepsilon_{ist4} \quad (1)$$

where Y_{it4} is earnings reported by worker i in state j at time t4. $\beta_1 Volatility_i$ is one of the two measures for hour instability of worker i. X_i is a list of covariates representing worker i's other sociodemographic background, including race and ethnicity, sex, age, marital status, education level, parenthood status. Z_i is a vector of control representing worker i's job-related characteristics, including average hours worked, union coverage, occupation, and industry. γ_s consists of state indicators. μ_t denotes month and year fixed effects. We run models separately for those who maintained the same jobs and those who changed jobs to better understand possible differences between within-job work-hour variability and volatility associated with labor-market flow. In our second question, we add interaction terms to test whether and how racial disparity in earnings varies by volatility experience.

$$Y_{it4} = \beta_0 + \beta_1 Volatility_i + \beta_2 Race_i + \delta(Volatility_i * Race_i) + \beta X_i + \beta Z_i + \gamma_s + \mu_t + \varepsilon_{ist4} \quad (2)$$

where δ represents a set of coefficients of interest, which test how racial differences in earnings vary by volatility. Last, the study covers how the described relationship changed over time and whether any disparity was significant at specific times. To this end, we constructed

four time indicators: pre–Great Recession [GR] (2005–November 2007), Great Recession (December 2007–June 2009), post-GR recovery and economic expansion (July 2009–February 2020), and pandemic and post-pandemic recovery (March 2020–2022). Using our preferred specifications with states, time-fixed effects, and a full set of covariates, we reestimate the linear models of the interactions between volatility indicators and race/ethnicity for each period separately to assess whether any racial-ethnic groups exhibit lower or higher earnings at specific times.

DISTRIBUTION OF WAGES AND UNSTABLE WORK HOURS

Table 1 reports descriptive statistics of the main variables of interest for the whole sample and separately by workers' work-hours variability pattern. About 30 percent of the sampled wage workers experienced at least one substantial hours surge or dip, defined as 20 percent increase or decrease in work hours. For those with only hours drop without substantial hours gain, the month-to-month instability index is more than triple the sample average. Not surprisingly, those experiencing both hours surge and dip have an even higher volatility index. Reported earned income at month four does not vary much from the average for those with stable hours throughout and appears to be descriptively higher for those gaining substantial hours without a major drop. However, compared with the average, those with an hours drop have lowest earnings, followed by workers having both major ups and downs in their hours. Nine in ten workers remained in the same employment spell across the time window examined. Roughly 15 percent of the sampled workers had a union job. Workers with the most volatile hours had less education and were more often service or blue-collar job holders. Other basic demographic characteristics reveal that nearly three in four workers were in their prime years (ages twenty-five to fifty-four), and older workers make up around 20 percent of the sample. On average, the analytic sample consists of more than 60 percent white workers. Black and Hispanic workers make up 16 and 14 percent, respectively. Another 9 percent were Asian American or Pacific Islander (AAPI) or other race.

We proceed by showing the pattern, across time, in volatility and earnings. The three panels of figure 1 show trends for all workers, workers experiencing volatility, and workers with consistent hours. Our analyses revealed that an estimated 67 percent of wage workers experienced volatility nationwide (result available on request). All groups of workers experienced average wage increase in the prosperous period before the COVID-19 pandemic. These continued through the pandemic as these workers were often essential to meeting individuals and families' basic needs. The patterns were generally similar for those experiencing volatility and those with stable hours, though during the Great Recession it appears that those with instability had lower earnings, on average. At the peak of the pandemic, those with volatile hours were better off than those with stable hours, and although both groups have realized earnings declines since then, workers with volatility have plateaued at somewhat higher weekly earnings. However, the results observed so far are descriptive and it is plausible that a number of other sociodemographic or job factors affect the association between volatility and earnings.

Figure 2 illustrates patterns in earnings by the type of hours instability experienced, namely, experiencing hours surge only, experiencing hours dip only, having both surge and dip, or having stable hours throughout. From 2016 through before the pandemic, those with volatility (regardless of surge or dip) experienced relatively higher wage growth, with workers facing hours surges but not dips surpassing the wages of those with stable hours. This is not surprising as the surge represents an increase and there was no obvious return to lower hours. Workers having substantial hours cut or confronting both frequent ups and downs in hours realized noticeable lower earnings over the period examined.

The panels of figure 3 report trends in work hours volatility and earnings by race-ethnicity. Although volatility spiked during the pandemic for all wage workers, the spike was more acute for people of color, most notable among His-

Table 1. Summary Statistics by Volatility Experience

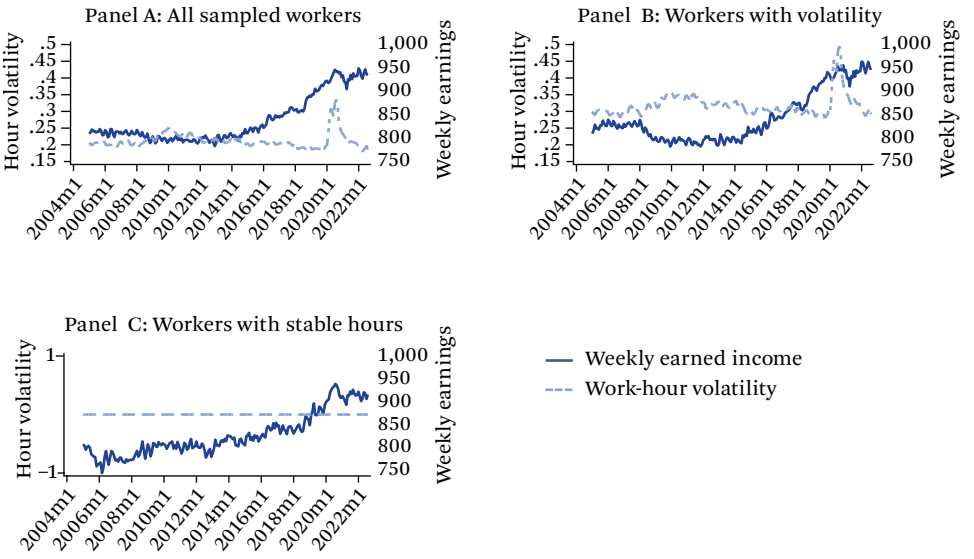
	All	Stable Hours	Spike Only	Dip Only	Spike and Dip
Hours instability index	0.18	0.06	0.29	0.59	0.65
	(0.40)	(0.17)	(0.23)	(0.81)	(0.41)
Earnings per week	839.70	846.74	855.14	794.85	817.54
	(516.04)	(495.89)	(562.49)	(549.21)	(580.41)
Stay with the same job	0.90	0.92	0.89	0.75	0.90
Average hours worked	40.01	40.14	41.12	38.04	40.19
	(9.67)	(8.29)	(11.55)	(12.77)	(12.79)
Job covered by union	0.15	0.14	0.17	0.15	0.16
Worker characteristics					
Female	0.50	0.51	0.48	0.48	0.48
Age: 19–24	0.07	0.07	0.09	0.09	0.08
Age: 25–35	0.27	0.26	0.27	0.27	0.27
Age: 36–54	0.45	0.46	0.45	0.45	0.45
Age: 55 and older	0.21	0.21	0.19	0.19	0.20
White	0.61	0.61	0.62	0.58	0.60
Black	0.16	0.16	0.15	0.17	0.16
Hispanic	0.14	0.14	0.13	0.15	0.14
Others	0.09	0.09	0.09	0.09	0.09
Less than high school	0.09	0.09	0.10	0.11	0.11
High school diploma	0.34	0.34	0.33	0.34	0.33
Some college	0.36	0.36	0.36	0.35	0.35
College or above	0.21	0.21	0.21	0.20	0.21
Unmarried	0.55	0.55	0.57	0.58	0.57
Have children present	0.34	0.33	0.34	0.34	0.35
Broad occupation categories					
Professional and related	0.25	0.25	0.23	0.22	0.23
Services and related	0.20	0.19	0.23	0.23	0.25
Sales and related	0.08	0.08	0.08	0.08	0.08
Office and administrative support	0.17	0.19	0.13	0.12	0.11
Blue-collar jobs	0.30	0.29	0.33	0.34	0.33
Percentage		70	11	12	7
Observations	267,013	189,520	29,054	30,786	17,653

Source: Authors' calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).

Note: Mean (SD) or proportion presented. Work-hour volatility is calculated as the standard deviation of the arc percent change of household's total work hours. A substantial hours-surge or hours-cut is defined as an increase or decrease in work hours by at least 20 percent from one month to the next. Earnings constant in 2020 dollars.

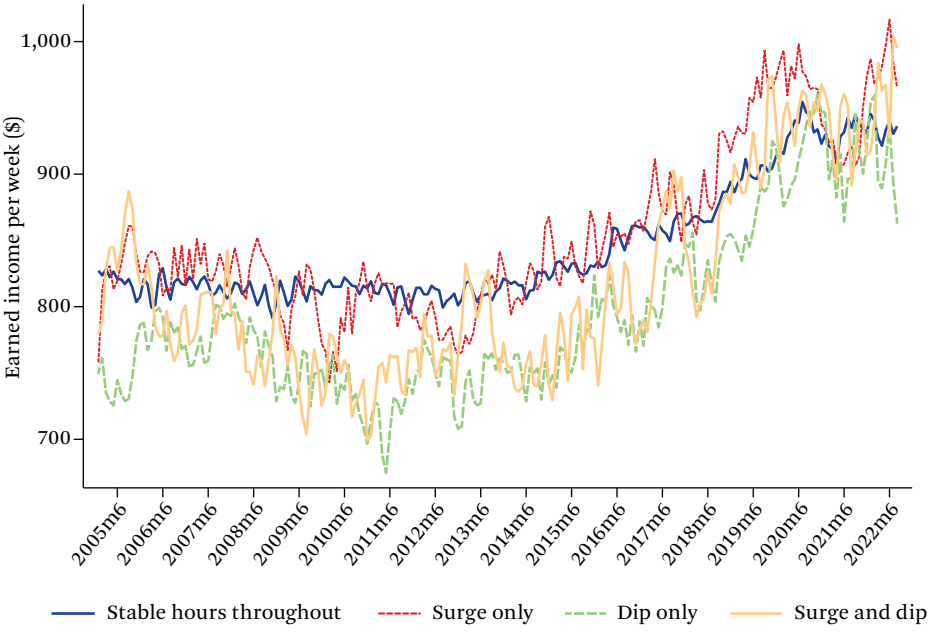
panic workers and those identifying as Asian American or other racial-ethnic group. This is a bit different than the longer-term trend showing black and Hispanic workers with the greatest variability. Wages, which were already highest among white and Asian workers, grew for all groups, but most slowly among Hispanic workers.

Figure 1. Trends in Volatility and Earnings Over Time



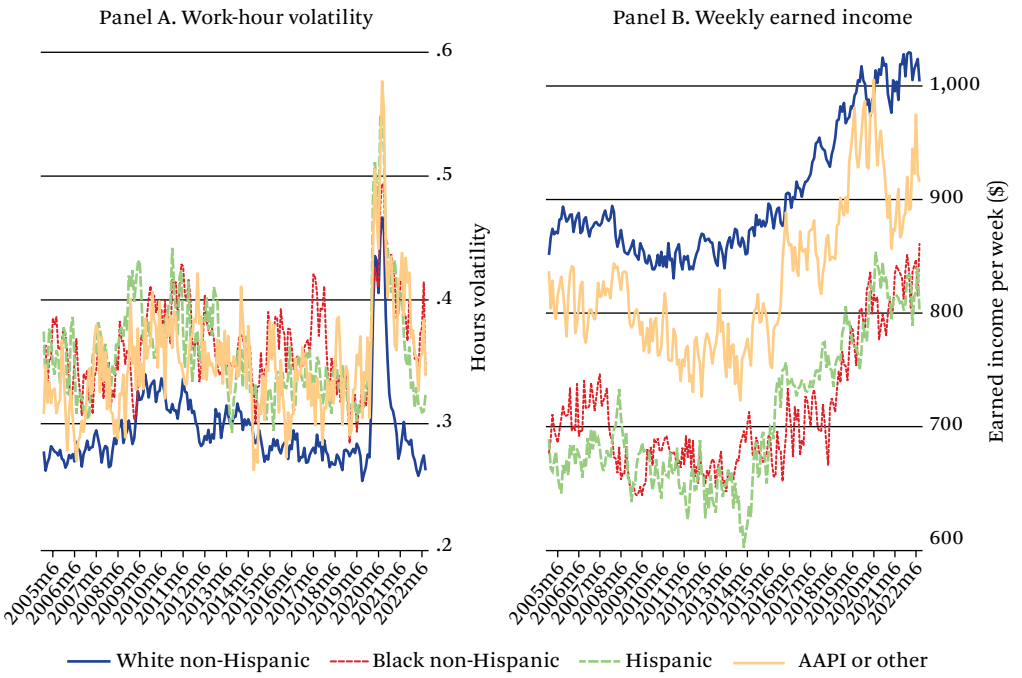
Source: Authors' calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).

Figure 2. Trends in Earnings by Hours Volatility Experience



Source: Authors' calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).

Figure 3. Trends in Volatility and Earnings, by Race-Ethnicity



Source: Authors' calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).

Greater Volatility Links to Lower Earnings

Turning to our multivariate analyses, we find a clear relationship between work-hour volatility and subsequent weekly earnings, as shown in table 2. Greater volatility is associated with lower earnings among both those who remain in their jobs and those experiencing job instability, though the relationship is somewhat stronger for those who change jobs. For those who stayed in the same job, compared to their peers with stable hours, experiencing higher instability (top tercile of instability-index distribution) was associated with 7 percent lower earnings, whereas for those who switched jobs, the top tercile in volatility was associated with 18 percent lower earning than those who changed jobs but had stable hours. This may suggest that those who change jobs experience reduced hours, whether by choice or constraint. The other demographic and control variables illustrate the expected relationships. The regressions in table 2 also point to consistent racial-ethnic disparities, with black and Hispanic workers realizing the lowest wages.

Frequent Scheduling Instability Correlated with Lower Earnings

As models 2 and 4 in table 2 show, when disaggregating volatility into different patterns: surge only, dip only, both surge and dip, with stable hours throughout as the reference, we find similar patterns observed earlier that job changers have larger earnings penalty. As we would expect, those facing both hours spike and dip and those with only substantial hours drop have lower earnings. Relative to working stable hours throughout, when instability is frequent or unanticipated, regardless of direction, it is associated with lower earnings.

Table 3 reports how racial differences in earnings vary by volatility experience. Racial disparity is significant in earnings when volatility happens within a job. For white workers, both surge and dip in volatility correlated with 7 percent lower earnings. For black workers, the same volatility was associated with a higher earnings penalty, at about 12 percent. In addition, when only having hours spike, Hispanics workers' earnings penalty was lower than that

Table 2. Linear Regressions Predicting Earnings

	Model 1 Within Job	Model 2 Within Job	Model 3 Between Jobs	Model 4 Between Jobs
Second tercile, instability	−0.03***		−0.18***	
	(0.00)		(0.01)	
Third tercile, instability	−0.07***		−0.18***	
	(0.00)		(0.01)	
Ref: Stable hours throughout				
Hours surge only		−0.05***		−0.13***
		(0.00)		(0.01)
Hours dip only		−0.09***		−0.10***
		(0.00)		(0.01)
Both surge and dip		−0.09***		−0.21***
		(0.00)		(0.01)
Black	−0.10***	−0.10***	−0.06***	−0.06***
	(0.00)	(0.00)	(0.01)	(0.01)
Hispanic	−0.10***	−0.09***	−0.06***	−0.07***
	(0.00)	(0.00)	(0.01)	(0.01)
AAPI or other	−0.06***	−0.06***	−0.04***	−0.04**
	(0.00)	(0.00)	(0.01)	(0.01)
Female	−0.15***	−0.15***	−0.15***	−0.16***
	(0.00)	(0.00)	(0.01)	(0.01)
Age: 25–35	0.14***	0.14***	0.12***	0.12***
	(0.00)	(0.00)	(0.01)	(0.01)
Age: 36–54	0.23***	0.23***	0.19***	0.19***
	(0.00)	(0.00)	(0.01)	(0.01)
Age: 55 or older	0.21***	0.21***	0.15***	0.15***
	(0.00)	(0.00)	(0.01)	(0.01)
Have children present	0.02***	0.02***	0.00	0.00
	(0.00)	(0.00)	(0.01)	(0.01)
Unmarried	−0.04***	−0.04***	−0.04***	−0.04***
	(0.00)	(0.00)	(0.01)	(0.01)
High school diploma	0.14***	0.14***	0.13***	0.13***
	(0.00)	(0.00)	(0.01)	(0.01)
Some college	0.19***	0.19***	0.15***	0.15***
	(0.00)	(0.00)	(0.01)	(0.01)
College or above	0.34***	0.34***	0.24***	0.24***
	(0.00)	(0.00)	(0.02)	(0.02)
Average hours worked	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Job covered by union	0.15***	0.16***	0.28***	0.28***
	(0.00)	(0.00)	(0.01)	(0.01)
Constant	5.44***	5.44***	5.89***	5.88***
	(0.02)	(0.02)	(0.05)	(0.05)
Occupation controls	x	x	x	x
Industry controls	x	x	x	x
Year and month fixed effects	x	x	x	x
State fixed effects	x	x	x	x
Observations	240,165	240,165	26,849	26,849
R^2	0.38	0.38	0.38	0.38

Source: Author's calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).
AAPI = Asian American and Pacific Islander. Robust standard errors in parentheses.
† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

Table 3. Earnings Consequence of Volatility by a Worker's Race and Ethnicity

	Model 1 Within Job	Model 2 Between Jobs	Model 3 Within Job	Model 4 Between Jobs
Second tercile, instability	−0.03***	−0.19***		
	(0.00)	(0.02)		
Third tercile, instability	−0.07***	−0.18***		
	(0.00)	(0.01)		
Black	−0.09***	−0.07***	−0.10***	−0.07***
	(0.00)	(0.02)	(0.00)	(0.01)
Hispanic	−0.11***	−0.07***	−0.10***	−0.07***
	(0.00)	(0.02)	(0.00)	(0.01)
AAPI other	−0.06***	−0.04†	−0.06***	−0.03
	(0.01)	(0.02)	(0.00)	(0.02)
Black x volatility, second tercile	−0.00	0.05		
	(0.01)	(0.04)		
Hispanic x volatility, second tercile	0.02*	0.03		
	(0.01)	(0.04)		
AAPI other x volatility, second tercile	0.01	0.01		
	(0.01)	(0.04)		
Black x volatility, third tercile	−0.03***	0.02		
	(0.01)	(0.02)		
Hispanic x volatility, third tercile	0.02***	0.01		
	(0.01)	(0.02)		
AAPI other x volatility, third tercile	−0.01	−0.01		
	(0.01)	(0.02)		
Hours surge only			−0.04***	−0.14***
			(0.00)	(0.01)
Hours dip only			−0.07***	−0.17***
			(0.00)	(0.01)
Both surge and dip			−0.07***	−0.23***
			(0.01)	(0.02)
Surge only x Black			−0.01	−0.02
			(0.01)	(0.03)
Surge only x Hispanic			0.03**	−0.01
			(0.01)	(0.03)
Surge only x AAPI other			−0.00	−0.03
			(0.01)	(0.03)
Dip only x Black			−0.01	0.02
			(0.01)	(0.02)
Dip only x Hispanic			0.01	0.01
			(0.01)	(0.02)
Dip only x AAPI other			−0.03*	−0.02
			(0.01)	(0.03)
Both surge and dip x Black			−0.05***	0.04
			(0.01)	(0.04)
Both surge and dip x Hispanic			0.02	−0.06
			(0.01)	(0.04)
Both surge and dip x AAPI other			−0.02	−0.05
			(0.02)	(0.05)

Table 3. (*continued*)

	Model 1 Within Job	Model 2 Between Jobs	Model 3 Within Job	Model 4 Between Jobs
Female	−0.15***	−0.15***	−0.15***	−0.16***
	(0.00)	(0.01)	(0.00)	(0.01)
Age: 25–35	0.14***	0.12***	0.14***	0.12***
	(0.00)	(0.01)	(0.00)	(0.01)
Age: 36–54	0.23***	0.19***	0.23***	0.19***
	(0.00)	(0.01)	(0.00)	(0.01)
Age: 55 or older	0.21***	0.15***	0.21***	0.16***
	(0.00)	(0.01)	(0.00)	(0.01)
Have children present	0.02***	0.00	0.02***	0.00
	(0.00)	(0.01)	(0.00)	(0.01)
Unmarried	−0.04***	−0.04***	−0.04***	−0.04***
	(0.00)	(0.01)	(0.00)	(0.01)
High school diploma	0.14***	0.13***	0.14***	0.13***
	(0.00)	(0.01)	(0.00)	(0.01)
Some college	0.19***	0.15***	0.19***	0.15***
	(0.00)	(0.01)	(0.00)	(0.01)
College or above	0.34***	0.24***	0.34***	0.24***
	(0.00)	(0.02)	(0.00)	(0.02)
Average hours worked	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Job covered by union	0.15***	0.28***	0.16***	0.28***
	(0.00)	(0.01)	(0.00)	(0.01)
Hours instability index			−0.05***	0.06***
			(0.01)	(0.01)
Constant	5.44***	5.89***	5.45***	5.81***
	(0.02)	(0.05)	(0.02)	(0.05)
Occupation controls	x	x	x	x
Industry controls	x	x	x	x
Year and month fixed effects	x	x	x	x
State fixed effects	x	x	x	x
Observations	240,165	26,849	240,165	26,849
R^2	0.38	0.38	0.38	0.38

Source: Author's calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).

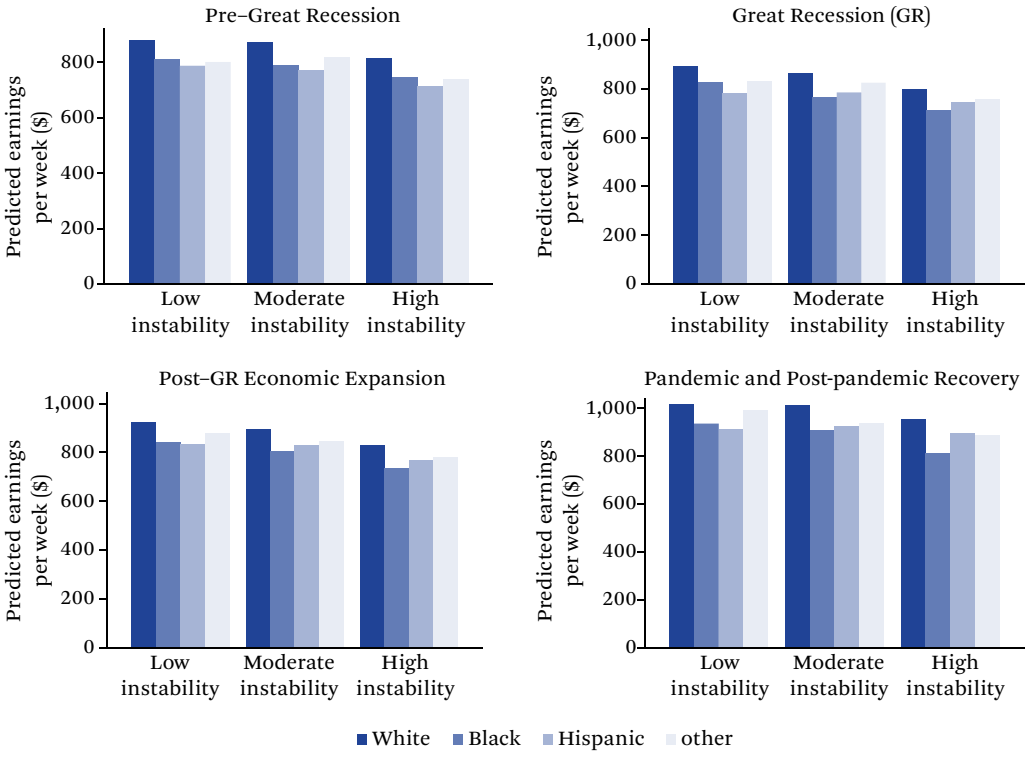
AAPI = Asian American and Pacific Islander. Robust standard errors in parentheses.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

of white workers. However, for those who switched jobs, we do not find any significant race differences in the association of earnings with volatility. Again, it may be that job changes are associated with voluntary or involuntary decreases in hours triggering the shock.

Given the observed racial-ethnic differences in the effect of within-job hours volatility, we next estimate models limited to those staying in the same job across four time periods, before the Great Recession, during the Great Recession, after the Recession and Recovery-Expansion, and during the pandemic and post-pandemic recovery. We illustrate findings from these models in figure 4 and the full models are reported in table A.1.

Figure 4. Racial Differences in the Relationship Between Volatility and Earnings, by Time Periods



Source: Authors' calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).
Note: Full models are available in table A.1.

A pattern is consistent across time: lower earnings are evident with higher instability. Although whites always face the smallest penalties, other groups show variation across time within groups. For example, before the Great Recession, Hispanic workers faced the greatest earnings penalties with greater volatility. During the Great Recession and onward from there, black workers appeared to have earned lower income immediately after facing greater unpredictability.

Robustness

We conduct a variety of robustness checks. First, we replicate analysis using an alternative measure—the coefficient of variation method—to capture hours volatility. The relationship between hours instability and earnings operates in the same direction, and the point estimates are nearly identical. Specifically, black workers are consistently found to earn less than their white counterparts when facing within-job greater variability in work hours. Second, because we estimate earnings at the fourth month observed using the first three-month work hours, to rule out any possibility that large hours shock between the third and fourth month may affect the earnings at the fourth, we compute a dichotomous variable indicating whether a worker experiences any substantial hours surge and dip. The inclusion of this additional control variable when replicating our analyses yields no substantive differences in the results. In addition, slightly less than one-third of workers do not have any form of instability in work hours, thus, we also run the analysis by restricting the sample to workers with instability experience. This yields highly similar findings with larger magnitude observed (all results available on request).

DISCUSSION AND CONCLUSION

Over the past few decades, the compositional shift in the U.S. workforce toward more service-sector jobs often made work less stable. Both the adoption of on-call scheduling practices in many retail and services jobs and the involuntary employment instability influence workers' nonwork lives, but, more important, might affect their financial well-being. Studies on unpredictable scheduling and job churn have revealed significant different experiences various types of workers face, with people of color experiencing a higher likelihood of encountering lay-offs and scheduling instability on the job. Research on earnings or the wage gap according to a worker's race has generally revealed the difference of an occupation or class divide. No study has documented the disproportionate consequences of frequent involuntary hours instability for workers' economic well-being, as measured through their earnings, and how the relationship differs by racial groups and across time.

To complement this knowledge, we draw insights from both lines of research and take advantage of the rotation panel design from the CPS, one of the few data sets that provide information on workers' hours worked on a monthly basis. We analyze the associations between month-to-month variability in work hours and workers' earnings, separating the effects stemming from in-job schedule changes from those having variable hours because of job switching. Besides the attention paid to various groups of workers according to their race and ethnicity, we further estimate how the relationship evolves through time, ranging from the time before the Great Recession to the most recent years during the COVID-19 pandemic recovery.

This analysis provides new knowledge to our understanding on work schedule uncertainty and its implications for workers' economic security in several ways. First, in the U.S. workforce, inconsistent work hours has become a common phenomenon for hourly workers. About four in six wage workers experience involuntary month-to-month hours instability. Second, we find that work hours instability, when frequent and involuntary, may reduce subsequent earned income, even after we account for a worker's individual and job characteristics, including average hours worked. This finding is more salient for those experiencing job transitions than for those facing frequent in-job hours variability.

Third, although we find evidence of race-based disparity in earnings as a result of hours volatility, this result is only significant when the instability is within a job. Specifically, when staying in the same job, relative to white workers, black workers have been found to have substantially lower earnings when facing greater month-to-month hours instability, in both magnitude and direction. That is, the implications of work hours instability seem to be greater for black workers than white workers, at least in terms of earnings. Additionally, this is in a context where black workers face more work-hour volatility than white workers; thus they are more likely to be in the group with lower earnings and suffer a greater penalty for being in that group.

Finally, the results suggest variation of this relationship across time, spanning from the Great Recession and the pandemic recovery. During periods of economic hardship, Hispanic workers seem to experience greater earnings in the context of hours instability. This may be because they represent those in industries that may be less sensitive to recessions or that, in the context of a slimmer workforce, instability is associated with higher average hours. In general, black workers have a larger earnings penalty when facing greater volatility. The descriptive finding that workers identifying as Hispanic and AAPI see greater variability in hours worked, both during the pandemic and its recovery, may confirm that low-wage service sectors employing overwhelmingly workers of color underwent drastic layoffs and erratic work hours. Also, that AAPI workers are more likely to run small businesses may have put them in a more precarious situation during the pandemic period due to high cost of the lockdown and the subsequent sharp decline in demand.

The findings regarding race-based earnings differences as a function of within-job hours volatility may have direct policy implications that could help promote workplace equity. Unlike wages, work hours are still largely unregulated in the U.S. private-sector job market,

which may further marginalize disadvantaged workers with less bargaining power and those in regions where worker organizing and worker protections are relatively weak. To combat such a phenomenon and improve job quality across places, policymakers might consider measures such as the Fair Workweek Ordinance, in which employers are mandated to give workers notice of any changes in hours at least two weeks in advance, provide predictable pay for any employer-driven changes to workers' original schedules, and release available hours to current employees before hiring, among several other provisions. Currently, only a handful of municipalities and one state have implemented similar measures. Although a few earlier studies, through qualitative interviews and empirical analysis, suggest the law's positive effects on workers' health and parenting outcomes (Ananat, Gassman-Pines, and Fitz-Henley 2022; Loustaunau et al. 2020; Schneider and Harknett 2019), more research is needed to understand more thoroughly its effectiveness in stabilizing hours worked and boosting workers' economic well-being. Research could also take account of compliance burden, and how to mitigate it.

Several limitations of the study are worth mentioning. First, because the analysis relies on the data's longitudinal design, some groups of respondents may be more likely to drop out of the survey and may not be linked across the four-month window. The analysis could understate the magnitude of the negative relationship between hours instability and earned income. It is also worth noting that work-hour volatility may not necessarily be a characteristic of a poor-quality job because it could entail solely an increase in hours, leading to a better earnings situation. However, the negative relationship that emerged in the study suggests that regardless of directional shift, when hours variability is frequent and involuntary, workers fare no better in terms of their economic well-being. More research is needed to understand this association. Second, although the current analysis controls for a worker's job-related characteristics, the observed relationship between hours instability and a worker's subsequent earnings—in particular, the racial difference emerging among job stayers—could emerge because of some other workplace factors. However, the current data do not provide fine-grained information about workers' employers, their direct managers, or their job tenure at a workplace, which might influence the wages workers receive. The findings warrant future research to understand why significant earning differences might exist for workers with different racial and ethnic backgrounds, the extent to which these differences are shaped by employer-specific characteristics, such as direct supervisors, working in urban versus rural areas.

Last, even after we adjusted for a rich array of covariates, the results still leave the portion of the racial differences observed in the association of earnings to variable work schedules unexplained. Despite the significant association found, a few limitations should be considered in contextualizing this particular set of results. For example, certain factors that are omitted from the current analysis, such as a criminal record, other unmeasured abilities, or different level of access to opportunities, may contribute to the observed significant racial disparity in the relationship between work hours instability and earnings. Regardless of what scientists believe about the human cultures, researchers and policymakers should also consider that people's belief and values may shape their decisions. Without further accounting for all of these variables, we cannot confirm whether any form of race-based workplace discrimination exists.

Because one of the critical determinants of living standards for workers, particularly those paid hourly, is earned income, racial differences in work remain one of the most enduring aspects of income inequality. Unpredictable scheduling issues and related racial disparity are relatively less developed as a dimension of precarious work. Future research could consider applying a propensity score matching approach to examine economic outcomes for workers with similar backgrounds and the same level of volatility experience. Researchers may also consider conducting field experiments to detect whether any form of discrimination might influence low-wage and hourly workers' labor-market experience. Finally, we acknowledge that this study does not touch on

decomposition analysis. Along the lines of wage inequality research, future work could disaggregate various factors to better understand the ways in which demographics, human capital, occupation, and variable work schedules drive wage inequality, that is, whether the racial disparity is driven by composition differences or by differential returns to characteristics.

With that in mind, this study adds to the effort to address the salient insufficiency of data on short-term work instability and research intended to help understand how involuntary or unanticipated hour volatility influences workers' economic well-being. The results expand our understanding of the growing spread of work-hour volatility and add a new layer of considering racial and ethnic equity in terms of workers' wages. Although closing the racial earnings gap thoroughly remains arduous, the negative relationship between unanticipated work-schedule volatility and workers' earnings unveils one more plausible policy solution to advance equity at the workplace.

Table A.1. Models Predicting Racial Differences in the Relationship Between Volatility and Earnings, by Time Periods

	Model 1 Pre–Great Recession	Model 2 Great Recession (GR)	Model 3 Post–GR Economic Expansion	Model 4 Pandemic and Post-pandemic Recovery
Hours volatility, second tercile	−0.01†	−0.03***	−0.03***	−0.04***
	(0.01)	(0.01)	(0.00)	(0.01)
Hours volatility, third tercile	−0.05***	−0.08***	−0.08***	−0.04***
	(0.01)	(0.01)	(0.00)	(0.01)
Black	−0.08***	−0.08***	−0.10***	−0.09***
	(0.01)	(0.01)	(0.01)	(0.02)
Hispanic	−0.12***	−0.14***	−0.10***	−0.12***
	(0.01)	(0.02)	(0.01)	(0.01)
AAPI or other	−0.09***	−0.07***	−0.05***	−0.03*
	(0.01)	(0.02)	(0.01)	(0.01)
Black x volatility, second tercile	0.01	−0.01	−0.00	0.00
	(0.02)	(0.02)	(0.01)	(0.03)
Hispanic x volatility, second tercile	0.01	0.06*	0.01	0.05†
	(0.02)	(0.03)	(0.01)	(0.02)
AAPI other x volatility, second tercile	0.03	0.04	0.01	−0.03
	(0.02)	(0.03)	(0.01)	(0.03)
Black x volatility, third tercile	−0.03	−0.05*	−0.02*	−0.05*
	(0.02)	(0.02)	(0.01)	(0.02)
Hispanic x volatility, third tercile	−0.01	0.06**	0.02*	0.04*
	(0.02)	(0.02)	(0.01)	(0.02)
AAPI other x volatility, third tercile	0.00	0.00	−0.01	−0.05*
	(0.02)	(0.02)	(0.01)	(0.02)
Average hours worked	0.02***	0.02***	0.02***	0.02***
	(0.00)	(0.00)	(0.00)	(0.00)
Job covered by union	0.15***	0.13***	0.16***	0.12***
	(0.01)	(0.01)	(0.00)	(0.01)
Female	−0.15***	−0.16***	−0.15***	−0.15***
	(0.01)	(0.01)	(0.00)	(0.01)
Age: 25–35	0.13***	0.14***	0.14***	0.12***
	(0.01)	(0.01)	(0.01)	(0.01)

Table A.1. (*continued*)

	Model 1 Pre–Great Recession	Model 2 Great Recession (GR)	Model 3 Post–GR Economic Expansion	Model 4 Pandemic and Post-pandemic Recovery
Age: 36–54	0.21***	0.21***	0.23***	0.21***
	(0.01)	(0.01)	(0.01)	(0.01)
Age: 55 or older	0.17***	0.18***	0.23***	0.19***
	(0.01)	(0.01)	(0.01)	(0.01)
Have children present	0.01†	0.02*	0.02***	0.02*
	(0.01)	(0.01)	(0.00)	(0.01)
Unmarried	–0.03***	–0.03***	–0.04***	–0.05***
	(0.01)	(0.01)	(0.00)	(0.01)
High school diploma	0.13***	0.13***	0.14***	0.14***
	(0.01)	(0.01)	(0.00)	(0.01)
Some college	0.19***	0.19***	0.19***	0.19***
	(0.01)	(0.01)	(0.00)	(0.01)
College or above	0.32***	0.33***	0.34***	0.35***
	(0.01)	(0.01)	(0.01)	(0.01)
Constant	5.45***	5.45***	5.43***	5.58***
	(0.05)	(0.05)	(0.02)	(0.04)
Occupation controls	x	x	x	x
Industry controls	x	x	x	x
Year and month fixed effects	x	x	x	x
State fixed effects	x	x	x	x
Observations	37,349	22,606	153,096	27,114
R^2	0.38	0.38	0.39	0.33

Source: Authors' calculations based on the monthly Current Population Survey 2005–2022 accessed through IPUMS (Flood et al. 2022).

AAPI = Asian American and Pacific Islander. Robust standard errors in parentheses.

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

REFERENCES

Aeppli, Clem, and Nathan Wilmers. 2022. "Rapid Wage Growth at the Bottom Has Offset Rising US Inequality." *Proceedings of the National Academy of Sciences* 119(42): e2204305119.

Aladangady, Aditya, Andrew C. Chang, and Jacob Krimmel. 2023. "Greater Wealth, Greater Uncertainty: Changes in Racial Inequality in the Survey of Consumer Finances." *FEDS Notes*, October 18. https://doi.org/10.17016/2380-7172.3405.

Alexander, Charlotte, and Anna Haley-Lock. 2015. "Underwork, Work-Hour Insecurity, and a New Approach to Wage and Hour Regulation." *Industrial Relations: A Journal of Economy and Society* 54(4): 695–716.

Ananat, Elizabeth O., Anna Gassman-Pines, and John A. Fitz-Henley. 2022. "The Effects of the Emeryville Fair Workweek Ordinance on the Daily Lives of Low-Wage Workers and Their Families." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 8(5): 45–66. https://doi.org/10.7758/RSF.2022.8.5.03.

Bandelj, Nina, and Angelina Grigoryeva. 2021. "Investment, Saving, and Borrowing for Children: Trends by Wealth, Race, and Ethnicity, 1998–2016." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 7(3): 50–77. https://doi.org/10.7758/RSF.2021.7.3.03.

Brown, Alexandra, David Buchholz, Matthew B. Gross, Jeff Larrimore, Ellen A. Merry, Barbara J. Robles, Maximilian D. Schmeiser, and Logan Thomas. 2014. *Report on the Economic Well-*

Being of US Households in 2013. No. 89200. Washington, D.C.: Board of Governors of the Federal Reserve System.

Cai, Julie. 2023. "Work-Hour Volatility by the Numbers: How Do Workers Fare in the Wake of the Pandemic?" Issue Brief no. 23-2. Boston, Mass.: Federal Reserve Bank of Boston. Accessed April 19, 2024. https://www.bostonfed.org/publications/community-development-issue-briefs/2023/work-hour-volatility-by-the-numbers-how-do-workers-fare-in-the-wake-of-the-pandemic.aspx.

Cai, Julie Y., and Shawn Fremstad. 2021. "Most Children Live in Households That Experience One or More Substantial Declines in Earnings During the Year: The Child Tax Credit Should Be Restructured to Help Them." Washington, D.C.: Center for Economic and Policy Research.

Cai, Julie, Christopher Wimer, Lawrence Berger, and Matthew Maury. 2023. "Intra-Year Employment Instability and Economic Well-Being Among Urban Households: Mitigating Effects of the Social Safety Net." *Children and Youth Services Review* 148: 106855. https://doi.org/10.1016/j.childyouth.2023.106855.

Chaganti, Sara, Erin Graves, Amy Higgins, Marybeth Mattingly, Sarah Savage, and Catherine Tonsberg. 2020. "The Effects of the Novel Coronavirus Pandemic on Service Workers in New England." Issue Brief no. 2020-1. Boston, Mass.: Federal Reserve Bank of Boston. Accessed April 19, 2024. https://www.bostonfed.org/publications/community-development-issue-briefs/2020/the-effects-of-the-novel-coronavirus-pandemic-on-service-workers-in-new-england.

Cheng, Siwei, Christopher R. Tamborini, Chang-Hwan Kim, and Arthur Sakamoto. 2019. "Educational Variations in Cohort Trends in the Black-White Earnings Gap Among Men: Evidence from Administrative Earnings Data." *Demography* 56(6): 2253–77.

Choper, Joshua, Daniel Schneider, and Kristen Harknett. 2022. "Uncertain Time: Precarious Schedules and Job Turnover in the US Service Sector." *ILR Review* 75(5): 1099–32.

Clawson, Dan, and Naomi Gerstel. 2014. *Unequal Time: Gender, Class, and Family in Employment Schedules*. New York: Russell Sage Foundation.

Couch, Kenneth, and Mary C. Daly. 2002. "Black-White Wage Inequality in the 1990s: A Decade of Progress." *Economic Inquiry* 40(1): 31–41.

Deitch, Elizabeth A., Adam Barsky, Rebecca M. Butz, Suzanne Chan, Arthur P. Brief, and Jill C. Bradley. 2003. "Subtle Yet Significant: The Existence and Impact of Everyday Racial Discrimination in the Workplace." *Human Relations* 56(11): 1299–324.

Finnigan, Ryan. 2018. "Varying Weekly Work Hours and Earnings Instability in the Great Recession." *Social Science Research* 74 (August): 96–107.

Finnigan, Ryan, and Jo Mhairi Hale. 2018. "Working 9 to 5? Union Membership and Work Hours and Schedules." *Social Forces* 96(4): 1541–68.

Finnigan, Ryan, and Savannah Hunter. 2018. "Occupational Composition and Racial/Ethnic Inequality in Varying Work Hours in the Great Recession." In *Race, Identity and Work*, vol. 32, edited by Ethel L. Mickey and Adia Harvey Wingfield, 165–93. Leeds, UK: Emerald Publishing. https://doi.org/10.1108/S0277-283320180000032011.

Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, and Michael Westberry. 2022. "Integrated Public Use Microdata Series, Current Population Survey: Version 10.0 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D030.V10.0.

Gennetian, Lisa A., Sharon Wolf, Heather D. Hill, and Pamela A. Morris. 2015. "Intrayear Household Income Dynamics and Adolescent School Behavior." *Demography* 52(2): 455–83.

Golden, Lonnie. 2015. "Irregular Work Scheduling and Its Consequences." Briefing paper no. 394. Washington, D.C. Economic Policy Institute.

Goldin, Claudia, and Lawrence F. Katz. 2010. *The Race Between Education and Technology*. Cambridge, Mass.: Harvard University Press.

Goubert, Anais, Julie Yixia Cai, and Eileen Appelbaum. 2021. "Home Health Care: Latinx and Black Women Are Overrepresented, But All Women Face Heightened Risk of Poverty." Washington, D.C.: Center for Economic and Policy Research.

Gould, Elise, and Melat Kassa. 2021. "Low-Wage, Low-Hours Workers Were Hit Hardest in the COVID-19 Recession: The State of Working America 2020 Employment Report." Washington, D.C.: Economic Policy Institute.

Hacker, Jacob S. 2008. *The Great Risk Shift: The New Economic Insecurity and the Decline of the American Dream*. Oxford: Oxford University Press.

Hardy, Bradley, Charles Hokayem, and Stephen Roll. 2021. "Crashing Without a Parachute: Racial and

Educational Disparities in Unemployment During COVID-19." *The Annals of the American Academy of Political and Social Science* 698(1): 39–67.

Hill, Heather D., Pamela Morris, Lisa A. Gennetian, Sharon Wolf, and Carly Tubbs. 2013. "The Consequences of Income Instability for Children's Well-Being." *Child Development Perspectives* 7(2): 85–90.

Hill, Heather D., Jennifer Romich, Marybeth J. Mattingly, Shomon Shamsuddin, and Hilary Wething. 2017. "An Introduction to Household Economic Instability and Social Policy." *Social Service Review* 91(3): 371–89.

Howell, David R., and Arne L. Kalleberg. 2019. "Declining Job Quality in the United States: Explanations and Evidence." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 5(4): 1–53. https://doi.org/10.7758/RSF.2019.5.4.01.

Kalleberg, Arne L. 2011. *Good Jobs, Bad Jobs: the Rise of Polarized and Precarious Employment Systems in the United States, 1970s–2000s*. New York: Russell Sage Foundation.

Kalleberg, Arne L., Barbara F. Reskin, and Ken Hudson. 2000. "Bad Jobs in America: Standard and Nonstandard Employment Relations and Job Quality in the United States." *American Sociological Review* 65(2): 256–78.

LaBriola, Joe, and Daniel Schneider. 2020. "Worker Power and Class Polarization in Intra-Year Work Hour Volatility." *Social Forces* 98(3): 973–99.

Lambert, Susan J. 2008. "Passing the Buck: Labor Flexibility Practices That Transfer Risk Onto Hourly Workers." *Human Relations* 61(9): 1203–27.

Lambert, Susan J., Peter J. Fugiel, and Julia R. Henly. 2014. "Schedule Unpredictability Among Early Career Workers in the US Labor Market: A National Snapshot." Chicago: Employment Instability, Family Well-Being, and Social Policy Network.

Lambert, Susan J., and Julia R. Henly. 2012. "Frontline Managers Matter: Labour Flexibility Practices and Sustained Employment in US Retail Jobs." In *Are Bad Jobs Inevitable? Trends, Determinants and Responses to Job Quality in the Twenty-First Century*, edited by Chris Warhurst, Francoise Carré, Patricia Findlay, and Chris Tilly, 143–59. Basingstoke, UK: Palgrave-Macmillan.

Lane, Julia. 1999. "The Low-Wage Labor Market: Challenges and Opportunities for Economic Self-Sufficiency. The Role of Job Turnover in the Low-Wage Labor Market." Washington: U.S. Department of Health and Human Services. Accessed April 19, 2024. https://aspe.hhs.gov/reports/low-wage-labor-market-challenges-opportunities-economic-self-sufficiency-role-job-turnover-low-wage.

Loustaunau, Lola, Larisswa Petrucci, Amelia Coffey, Eleanor Lauderback, H. Elizabeth Peters, Ellen Scott, and Lina Stepick. 2020. "Combating Unstable Schedules for Low-Wage Workers in Oregon." Washington, D.C.: Urban Institute.

Mandel, Hadas, and Moshe Semyonov. 2016. "Going Back in Time? Gender Differences in Trends and Sources of the Racial Pay Gap, 1970 to 2010." *American Sociological Review* 81(5): 1039–68.

Morduch, Jonathan, and Rachel Schneider. 2014. "Spikes and Dips: How Income Uncertainty Affects Households." US Financial Diaries. Accessed April 19, 2024. https://www.usfinancialdiaries.org/issue1-spikes.

———. 2017. *The Financial Diaries: How American Families Cope in a World of Uncertainty*. Princeton, N.J.: Princeton University Press.

Mouw, Ted, and Arne L. Kalleberg. 2010. "Occupations and the Structure of Wage Inequality in the United States, 1980s to 2000s." *American Sociological Review* 75(3): 402–31.

National Employment Law Project (NELP). 2014. "The Low-Wage Recovery: Industry Employment and Wages Four Years into the Recovery." Data Brief. New York: NELP. Accessed April 19, 2024. https://www.nelp.org/wp-content/uploads/2015/03/Low-Wage-Recovery-Industry-Employment-Wages-2014-Report.pdf.

Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology* 108(5): 937–75.

Pager, Devah, and Hana Shepherd. 2008. "The Sociology of Discrimination: Racial Discrimination in Employment, Housing, Credit, and Consumer Markets." *Annual Review of Sociology* 34(1): 181–209.

Pedulla, David S., and Devah Pager. 2019. "Race and Networks in the Job Search Process." *American Sociological Review* 846(6): 983–1012.

Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. 2018. "Distributional National Accounts: Methods and Estimates for the United States." *Quarterly Journal of Economics* 133(2): 553–609.

Quillian, Lincoln, Devah Pager, Ole Hexel, and Arnfinn H. Midtbøen. 2017. "Meta-Analysis of Field Experiments Shows No Change in Racial Discrimination in Hiring Over Time." *Proceedings of the National Academy of Sciences* 114(41): 10870–75.

Ruetschlin, Catherine, and Dedrick Asante-Muhammad. 2015. "The Retail Race Divide: How the Retail Industry Is Perpetuating Racial Inequality in the 21st Century." New York: Demos. Accessed April 19, 2024. https://www.demos.org/sites/default/files/publications/The%20Retail%20Race%20Divide%20Report.pdf.

Schneider, Daniel. 2021. "Unstable, Unpredictable, and Insufficient: Work Scheduling in the Service Sector in New England." Issue Brief. Boston, Mass.: Federal Reserve Bank of Boston. Accessed April 19, 2024. https://www.bostonfed.org/publications/community-development-issue-briefs/2021/unstable-unpredictable-and-insufficient-work-scheduling-in-the-service-sector-in-new-england.aspx.

Schneider, Daniel, and Kristen Harknett. 2019. "Consequences of Routine Work-Schedule Instability for Worker Health and Well-Being." *American Sociological Review* 84(1): 82–114.

Schweitzer, Justin, and Rose Khattar. 2021. "It's a Good Jobs Shortage: The Real Reason So Many Workers Are Quitting." Washington, D.C.: Center for American Progress. Accessed April 19, 2024. https://www.americanprogress.org/article/its-a-good-jobs-shortage-the-real-reason-so-many-workers-are-quitting.

Semyonov, Moshe, and Noah Lewin-Epstein. 2009. "The Declining Racial Earnings' Gap in United States: Multi-Level Analysis of Males' Earnings, 1960–2000." *Social Science Research* 38(2): 296–311.

Stainback, Kevin, and Donald Tomaskovic-Devey. 2009. "Intersections of Power and Privilege: Long-Term Trends in Managerial Representation." *American Sociological Review* 74(5): 800–20.

Storer, Adam, Daniel Schneider, and Kristen Harknett. 2020. "What Explains Racial/Ethnic Inequality in Job Quality in the Service Sector?" *American Sociological Review* 854(4): 537–72.

Swanberg, Jennifer E., Elizabeth Watson, and Meridith Eastman. 2014. "Scheduling Challenges Among Workers in Low-Wage Hourly Jobs: Similarities and Differences Among Workers in Standard-and Nonstandard-Hour Jobs." *Community, Work & Family* 17(4): 409–35.

U.S. Department of Labor. 2022. "Bearing the Cost: How Overrepresentation in Undervalued Jobs Disadvantaged Women During the Pandemic." Fact Sheet. Washington: U.S. Department of Labor.

Warren, Lewis, and Alexander Tettenhorst. 2022. "Poverty Dynamics, 2017–2019." *Current Population Report* no. P70BR-179. Washington: U.S. Census Bureau.

Western, Bruce, and Jake Rosenfeld. 2011. "Unions, Norms, and the Rise in US Wage Inequality." *American Sociological Review* 76(4): 513–37.

Wilson, Valerie, and William M. Rodgers III. 2016. "Black-White Wage Gaps Expand with Rising Wage Inequality." Washington, D.C.: Economic Policy Institute.

Wolf, Sharon, Lisa A. Gennetian, Pamela A. Morris, and Heather D. Hill. 2014. "Patterns of Income Instability Among Low-And Middle-Income Households with Children." *Family Relations* 63(3): 397–410.

Wood, Alex J. 2018. "Powerful Times: Flexible Discipline and Schedule Gifts at Work." *Work, Employment and Society* 326(6): 1061–77.

Ziliak, James P., Bradley Hardy, and Christopher Bollinger. 2011. "Earnings Volatility in America: Evidence from Matched CPS." *Labour Economics* 18(6): 742–54.

U.S. Trends in Job Stability by Sex, Race, and Ethnicity from 1996 to 2020

MICHAEL LACHANSKI

How have inequalities in job stability evolved in the twenty-first century between demographic groups? I compute expected job tenures, akin to life expectancy in demographic research, for the population as a whole and by subgroups defined by selected ascribed characteristics (sex, race, and ethnicity) over biennial periods from 1996 to 2020. Racialized inequalities at hiring were the most persistent and large: white workers maintained an expected job tenure advantage at hiring relative to black workers in all periods. Inequalities in expected job tenure by sex were minimal at the time of hiring, but a male advantage emerges at the one-year mark in most periods. Hispanic workers maintained large advantages in expected job tenure relative to non-Hispanic workers in some periods and small disadvantages in others.

Keywords: labor markets, social inequality, job loss, job insecurity, employee tenure

How has job stability by ascribed characteristics like sex, race, and ethnicity evolved over time? Wages and duration are the key attributes of a job, but the considerable literature on wage inequalities in the U.S. private sector over the last three decades has been accompanied by only a handful of articles tackling the evolution of employment duration inequalities

Michael Lachanski is a doctoral candidate at the Population Studies Center at the University of Pennsylvania, United States.

© 2025 Russell Sage Foundation. Lachanski, Michael. 2025. "U.S. Trends in Job Stability by Sex, Race, and Ethnicity from 1996 to 2020." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 11(1): 224–46. https://doi.org/10.7758/RSF.2025.11.1.11. The author gratefully acknowledges funding from NIH T32 HD007242 grant, the Institute of Education Sciences under PR/Award #3505B200035, IPUMS-INDIRA 2022, the International Max Planck Research School for Population Health and Data Science (IMPRS-PHDS), and the 2023 Otto Pollak Fund while working on this research. This project would not have been possible without considerable guidance from Sam Preston. The author received helpful comments from Xi Song, Diego Alburez-Gutierrez, Irma Elo, Michel Guillot, David Neumark, Manuelita Ureta, Eugenio Paglino, Rehana Odendaal, Andres Villatoro, Joyce Kim, Wendy Roth, Herb Smith, Michael Cline, Emilio Parrado, Jonah Davids, Rebecca Johnson, Phyllis Moen, Julie Cai, Tim Riffe, Jennie Brand, Tom VanHeuvelen, Eddie Hunsinger, Fabio Rojas, Minjae Kim, Byungkyu Lee, Xavier St-Denis, Ivan Williams, Jose Monteiro Da Silva, Masoud Movahed, Bob Schoen, Michael Davis, Jere Behrman, Erlend Fleisje, and participants at the IPUMS NDIRA 2022 conference, the 2023 IMPRS-PHDS Annual Academy, the 2023 Russell Sage Foundation Conference on the 2020 Census, the 2023 ASA Annual Conference, and the Rationality and Society Committee of the ASA. Editors Zhenchao Qian and Trevon Logan gave detailed feedback that substantially improved the article. Jikai "Kyrie" Yang provided great research assistance. Three anonymous reviewers also gave helpful suggestions on an earlier draft. Direct correspondence to: Michael Lachanski, at mikelach@sas.upenn.edu, Population Studies Center, 3718 Locust Walk, McNeil Building, Philadelphia, PA 19104, United States.

Open Access Policy: *RSF: The Russell Sage Foundation Journal of the Social Sciences* is an open access journal. This article is published under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

(Diebold, Neumark, and Polsky 1997, 206; Farber 2010; Hollister 2011; Hollister and Smith 2014; Baum 2022; Molloy, Smith, and Wozniak 2024, 36). This article adopts David Neumark's (2000, 1) definition of job stability as the expected duration of jobs, that is, the expected job tenure with a current employer. The main contribution is to operationalize this notion using formal demographic methods. These methods yield the expected job tenure, along with two related summary measures, for both the overall population and specific subgroups: men, women, blacks, whites, Hispanics, and non-Hispanics. I subsequently visualize how these summary measures evolved over the last quarter century to track continuity and changes in private-sector job stability within and between these groups.[1]

Population-level trends in private-sector job stability are important for several reasons. First, job stability proxies for related concepts such as income security, job security, and employment stability (Swinnerton and Wial 1995, 304; Alderotti et al. 2021; Molloy, Smith, and Wozniak 2024, 36).[2] Second, researchers believe that workers prefer more stable employment arrangements (Bidwell 2013). From these two premises it follows that falling job stability is suggestive of declining job security, rising employment instability, declining income security, and falling worker power relative to their employers. Third, the fraction of workers with long tenures in equilibrium has substantial macroeconomic consequences (Hall 1982). Economistic theories of employment search and matching typically suggest that better employer-employee (employment relationship) matches lead to longer lasting jobs, all else equal. Higher job stability can reflect new efficiencies in how workers and employers meet (Autor 2001; Kroft and Pope 2014; Pries and Rogerson 2022). Fourth, in the last few decades, evidence has accumulated that declining job stability contributes to declining fertility (Oppenheimer 1988; Karabchuk 2020; Alderotti et al. 2021; Clark and Lepinteur 2022). Finally, economic sociologists believe that job stability sheds light on how labor markets are organized. Workers in more coordinated and social democratic systems, such as in Germany, France, and Belgium, are expected to have longer expected job tenures. Market-oriented and liberal systems such as the United States, Canada, and Ireland, on the other hand, are expected to yield shorter ones (Hall and Soskice 2001; Witt and Jackson 2016; Roberts and Kwon 2017; St-Denis and Hollister 2023, 21).

Group differences in job stability provide special insight into the structure of labor-market inequalities beyond pecuniary remuneration for several reasons (Diebold, Neumark, and Polsky 1997; Pries and Rogerson 2022; Molloy, Smith, and Wozniak 2024). First, searching for employment is costly. Low job stability for a group sheds light on otherwise hidden costs of labor-market participation borne by that group (Wilson 1987, 1996; Jargowsky 1997). Second, better employer-employee matches and more relative worker power should yield greater job stability (Bidwell 2013; Molloy, Smith, and Wozniak 2024, 36). Persistent advantages in job stability for a group point to either elevated worker power or a superior matching process for that group. Third, recent research has advanced the masked instability hypothesis, claiming that increasing population-level job instability is masked by women's greater labor-force attachment (St-Denis and Hollister 2023). Women who would have previously left their employment relationships shortly after marrying young in previous generations now delay marriage and childbirth, sometimes indefi-

1. All code and data required to replicate this article are available at the linked OpenICPSR repository (Lachanski 2024; https://www.openicpsr.org/openicpsr/project/207601/version/V6/view).

2. Indeed, Giammarco Alderotti and his colleagues (2021) define employment stability as a combination of high job stability and low unemployment such that workers can obtain long-term employment. Job security typically refers to workers' perceptions about their ability to retain their current jobs (Neumark 2000, 1–2; Kalleberg 2009, 7). Although they are conceptually distinct, employment stability, job stability, and job security are typically thought to be highly related. Researchers would be skeptical, for instance, if an analysis showed that a job security proxy and job stability were anticorrelated (Molloy, Smith, and Wozniak 2024, 36, 62–65). This article focuses on job stability.

nitely, and tend to maintain their employment relationships even after marriage and childbirth (Hollister and Smith 2014). Increasing female job stability potentially offsets declines in male job stability. Taking the literature on North American job instability seriously requires examining trends separately by sex (St-Denis and Hollister 2023, 19).[3]

Despite a wave of research in the 1990s concerned with the evolution of job stability for the population as a whole and by sociodemographic group, and continued general interest in the topic, Matissa Hollister (2011, 314) reports that research on "employment instability . . . lost its momentum" prior to the Great Recession. As a result of both changing methods and researchers' choices of topics, researchers know little about the evolution of job stability in the United States for different demographic groups in the twenty-first century. I am not aware of any research since Hollister (2011) describing the evolution of the employment duration distribution by race or ethnicity before and after the Great Recession (Molloy, Smith, and Wozniak 2024; Baum 2022; Pries and Rogerson 2022; Hyatt and Spletzer 2017, 2016; Hollister and Smith 2014). Using novel administrative hiring records and new methods adapted from formal demography, I fill this gap in this article. Specifically, I point estimate parameters of period tenure table models for the U.S. population overall, by sex, and for selected racial and ethnic groups from 1996 to 2020. A tenure table does for the length of a job what a life table does for the length of a human life; it summarizes how long an employer-employee relationship will last at current rates of decrement under synthetic vintage assumptions (Silcock 1954; Stewman 1988; Lachanski 2023). The objective of this article is to use tenure table model estimates to explore trends in job stability for the population overall and inequalities in job stability by ascriptive characteristics.

BACKGROUND

Early research on U.S. job stability focused on measurement debates around the distribution of the length of employment relationships (Hall 1982; Ureta 1992).[4] A second wave of research, summarized in Neumark (2000), focused on population trends and the evolution of differentials from the 1980s to the 1990s (Hollister 2011). A new wave of research in the wake of the Great Recession has documented how job tenures have evolved in the twenty-first century (Hollister and Smith 2014; Hyatt and Spletzer 2016, 2017; Pries and Rogerson 2022; Molloy, Smith, and Wozniak 2024). I review the second and most recent waves of research on population-level trends followed by the more limited research on group differences. Then I discuss the theoretical frameworks social scientists have proposed to summarize trends in the tenure distribution as well as measurement issues.

Researchers in the 1990s became increasingly concerned that job stability was falling over time and that long-term employment was disappearing. Francis Diebold, David Neumark, and Daniel Polsky (1997) and Neumark, Polsky, and David Hansen (1999) document considerable group heterogeneity in both the level and

3. In addition, more practical uses of expected job tenure are related to the remediation of group inequalities. As Charles Baum (2022, 544) points out, estimating the penalties in wrongful termination lawsuits requires a group-specific estimate of how long a given employment relationship would have lasted had their employment continued. Estimates of the job survival times by group, such as black workers with a college degree employed in the automotive industry, help set a baseline for such investigations.

4. Robert Hall (1982) finds that substantial numbers of workers would obtain lifetime employment, which he defines as twenty years or more with a single employer. His analysis concludes that black and white males had similar opportunities to get lifetime jobs, but that women were severely disadvantaged when it came to securing such employment. Manuelita Ureta (1992) argues that Hall's method generates distorted employment stability estimates when labor force participation varies over time. Because women had been entering the labor force in the 1970s through the 1980s, Hall's method likely underestimates how long women's employment relationships would survive. Using a statistical model for employer-employee separation rates, Ureta reports that black workers faced substantially lower job stability than white workers and that the gap between men and women's job stability was lower than Hall estimates.

change in job separation rates from the 1980s to the mid-1990s, but only small declines in job stability for the overall working population. For instance, Diebold, Neumark, and Polsky (1997) report that blacks have greater tenure-specific probabilities of job survival than whites in the 1980s and early 1990s whereas Neumark, Polsky, and Hansen (1999, S58) find that "blacks have experienced the strongest declines in job stability, with rather pronounced declines among more tenured workers and in the aggregate" over the period from 1983 to 1995. They also find "evidence of more recent declines in job stability . . . more so for blacks and men than for women." Overall, this line of research documents that black workers' job stability was declining both in absolute terms and relative to whites from the 1980s through the 1990s. Over the same period, male workers' job stability was declining both in absolute terms and relative to females. Hollister and Kristin Smith (2014) argue that male and single women's population job tenures have continued to decline into the Great Recession, but that married women's job tenures since the 1980s increased, yielding only small changes in the population's mean tenure.

An area of consensus is that private-sector long-term employment relationships have declined for men since the 1970s (Farber 2010; Hollister and Smith 2014; Hyatt and Spletzer 2016; Molloy, Smith, and Wozniak, 2024). Neumark, Polsky, and Hansen (1999, S58) report declines in job retention "especially for older, more tenured workers" but argued that this did not constitute a secular trend. Katherine Stone (2013) reports that population-level stability in contingent work has concealed a growing prevalence of short-term work in the older population. A comparative study by Ryo Kambayashi and Takao Kato (2017, 364–67) indicates that, from 1982 to 2007, the protective effect of seniority in Japan against job loss for men remained stable while declining in the United States. Recent work by Raven Molloy, Christopher Smith, and Abigail Wozniak (2024) finds that mid-career separations for male workers have increased since the 1970s.

More recent research finds that, in the twenty-first century, jobs with short tenures make up a smaller fraction of the labor force than in the previous century (Hyatt and Spletzer 2016, 2017). Henry Hyatt and James Spletzer (2016, 370) argue that fluctuations in hiring over time can explain these trends. Michael Pries and Richard Rogerson (2022, 267–68) point out that job separation hazard, especially for employment relationships with less than six months of tenure, has also declined substantially.

Trends in Job Stability: Theory and Measurement

Three social forces, neither mutually exclusive nor collectively exhaustive, have been found to influence trends in job stability. The first is the tendency for managers to adopt practices and technologies leading to "greater numerical flexibility" in the number of workers employed starting in the late 1970s (St-Denis and Hollister 2023, 2; Cappelli 1999; Farber 2010; Hollister and Smith 2014). The gig economy, deunionization, outsourcing, increasing firm power, and automation-driven labor market disruption are all contributors to this ongoing "flexibilization" (Kalleberg 2009; Bidwell 2013; St-Denis and Hollister 2023). Researchers arguing for the centrality of flexibilization posit that small changes in job stability at the national level conceal larger offsetting trends for U.S. subpopulations. Job stability for single women and private-sector males has declined, but public-sector long-term employment remains robust and married women have become increasingly likely to remain with their employer after marriage and childbirth (Farber 2010; Hollister and Smith 2014). Drivers of the increase in female labor-force attachment include: the passage of the Family Medical Leave Act in 1993 "mandating 12 weeks of unpaid leave at the time of a birth, adoption, or to care for an ill family member" (Hollister and Smith 2014, 163) and increasing finetuning of fertility (Goldin and Katz 2002). Together, the stability of public-sector employment and married women's increasing labor-force attachment mask instability at the population level. These researchers agree that population-level flexibilization and increasing labor-force attachment of (especially married) women have closed sex gaps in the realized tenure distribution, but they do not usually make clear predictions about the evolution of other group inequalities or male-female

inequalities after the Great Recession (Hollister and Smith 2014; St-Denis and Hollister 2023). The strongest evidence supporting the central role of flexibilization remains the decline in long-term employment relationships for men since the 1970s (St-Denis and Hollister 2023).

A second perspective, first proposed by David Autor (2001, 1), points out that improving workforce analytics technologies should (eventually) lead to superior employer-employee matches over time. Economists expect superior matches to last longer on average (Pries and Rogerson 2022; Molloy, Smith, and Wozniak 2024). Screening increases the quality of each hire, potentially resulting in fewer but longer lasting hires (Pries and Rogerson 2022, 265). This perspective has considerable support from macroeconomic modeling exercises based on administrative datasets of U.S. employee job tenures, which have found falling job separation hazards since the late 1990s. Microlevel evidence from firms that adopt screening technologies also supports this perspective (Pries and Rogerson 2022; Autor and Scarborough 2008).

A third perspective centers labor-market dynamism as the key determinant of mean job tenure over time (Hyatt and Spletzer 2016; St-Denis and Hollister 2023). The concept of labor-market dynamism encompasses a variety of phenomena, including the creation and closure of firms, as well as changes within firms such as the development of new job positions and the obsolescence of existing ones. A long literature links these aspects of dynamism to greater job mobility and therefore less job stability (Haveman and Cohen 1994). Greater dynamism, potentially arising from higher levels of innovation or the economy nearing full employment, would tend to reduce job stability (Silcock 1954; St-Denis and Hollister 2023). Hyatt and Spletzer (2016, 365) hypothesize that population aging and declining U.S. innovation is leading to fewer new job openings and less reallocation of workers between firms. Together, these changes reduce labor-market dynamism and thus increase job stability. Screening reduces job separation hazards mainly at low tenures whereas declining labor market dynamism would tend to affect job separation hazards over the entire tenure distribution (Pries and Rogerson 2022). Hyatt and Spletzer argue that the overall distribution of tenure lengths has shifted right, suggesting a substantial role for declining business dynamism.

Although accounts emphasizing screening and secular declines in dynamism predict an increase in the length of expected job tenure at the population level over time, there is no obvious reason for either of these social forces to alter group differences in the job tenure distribution over the period studied. The limited empirical evidence available suggests a kind of neutrality in the effects of screening across groups. In a case study, Autor and David Scarborough (2008) find that new workforce analytics technology increased job tenures for black and white workers but had no significant impact on the difference in eventual tenures for black and white workers. Little research relates group differences in expected job tenures to labor market dynamism.

Recent research tends to investigate the realized distribution of job tenures at a given point in time using pooled cross-sections, modeling changes in the median or mean using time fixed effects (Ureta 1992; Neumark, Polsky, and Hansen 1999; Farber 1998, 2000, 2010). A problem with this population regression approach is that the cross-sectional distribution of tenure is affected as much by the history of new hires as by job separation conditions (Molloy, Smith, and Wozniak 2024, 57–61). A regression analysis with mean job tenure from repeated cross-sections on the left side and explanatory variables on the right side will confound changes in hiring and changes in job separations over time. For instance, a decline in hiring for a group will increase that group's mean job tenure even if job separation conditions remain the same. Charles Baum (2022, 543) summarizes the weaknesses of the snapshot approach for understanding the distribution of the length of employment relationships, writing that "inferring tenure duration from active spells using median or average years of service for a company is akin to projecting life expectancy using the population's current median age. An average population age of, say, 40 years, would tell us little about life expectancy."

In contrast with the snapshot approach, methods based on tracking cohorts of workers over time can yield valid employer-employee

period separation rates. One challenge for panel-based methods is that in the United States, publicly available datasets either do not have population representative samples or contain population representative samples for only a few cohorts (Jaeger and Stevens 1999; Hyatt and Spletzer 2016; Baum 2022; Pries and Rogerson 2022; Lachanski 2023). Whether using panels or repeated cross-sections, analysts typically consider group differences by incorporating race and ethnicity as controls on the right side of the population regression (Farber 2010, 235–37; Hollister and Smith 2014; Hyatt and Spletzer 2016, 366; Pries and Rogerson 2022; Molloy, Smith, and Wozniak 2024). In the population regression approach, differences in coefficients reflecting ascriptive characteristics are reported conditional on other controls, such as time trends, occupation, industry, and education. This procedure is helpful for understanding how ascriptive characteristics contribute to population-level trends but has the potential to obscure inequalities between ascriptive groups.[5] For instance, it could be that, conditional on educational attainment, there are no racialized inequalities in job stability. Nonetheless, because the distribution of education differs by race, substantial inequalities in job stability by race persist (Hollister 2011; Lundberg et al. 2021).[6] Hollister (2011, 314) remarks that research in the early 2000s "tended not to examine trends by demographic subgroups beyond gender."[7] As a result of methodological and substantive choices since then, researchers still know little about how job stability in the twenty-first century has evolved for the groups I investigate in this article: black workers, white workers, male workers, female workers, Hispanic workers, and non-Hispanic workers.

METHOD

This article describes the evolution of inequalities in job stability by ascriptive group. I model job stability for each group using a novel demographic approach that treats jobs as if they are a population subject to a decrement process. Specifically, I use tenure tables, analogous to life tables for human populations, to estimate period survival curves $p(x)$ and period expected years of remaining tenure for a job with tenure x, e_x.[8] Period measures do not capture the survival experience of any specific cohort, population, or subpopulation but instead summarize the tenure distribution that would arise if rates of decrement held constant for a long time. For a human population, simple measures derived from life tables like life expectancy and life expectancy at a particular age (conditional life expectancy) capture cumulative mortality conditions for the human population. Decreases (increases) in these measures over time indicate that the balance of hazards has increased (decreased). For the population of jobs, measures derived from tenure tables like the ex-

5. By contrast, researchers tend to study job tenures separately by sex, obviating this critique.

6. This article focuses on trends in job stability in ascribed characteristics rather than achieved characteristics like education. In appendix B, I briefly discuss trends in job stability for different education-sex groups to show that key main text results are not confounded by education.

7. For instance, little research in the 2010s directly investigated ethnic differences in job stability, such as Hispanic versus non-Hispanic job tenure distributions (for a rare example of such research, see Farber 2010). Christopher Tamborini and Andrés Villarreal (2021) focus on differential job loss and underemployment among the immigrant population, which is disproportionately Hispanic, but do not directly address ethnic differences.

8. Earlier research focuses on estimating the survival curve rather than the full tenure table model (Swinnerton and Wial 1995, 1996; Diebold, Neumark, and Polsky 1996, 1997; Neumark, Polsky, and Hansen 1999; Heisz 2005; St-Denis and Hollister 2023). The tenure table model was proposed as an idealized model of the survival distribution of jobs by Herbert Silcock (1954), but data and estimation difficulties prevented researchers from computing period tenure table models for populations of employment relationships until recently (Stewman 1988; Lachanski 2023). A more typical approach, pursued in K. F. Lane and J. E. Andrew (1955), for example, was to present the tenure table as an idealized model and then estimate job survival times using a parametric model—for example, an exponential distribution (Stewman 1988). More recent work has applied survival analysis to longitudinal job tenure data, as in Baum (2022).

pected tenure of a job with tenure x, e_x, captures job stability after tenure x. Increases in e_x over time indicate that job stability has increased after tenure x. Decreases in e_x over time indicate that job stability has decreased after tenure x. Just as a trend in life expectancy captures the evolution of mortality conditions, trends in summary measures of job stability like the expected job tenure capture how employer-employee separation conditions have evolved over time.

A second tenure table parameter I use in this article is l_x.[9] In a human life table, l_x captures the size of a cohort at time x that was of initial size l_0. Demographers sometimes compute l_x/l_y, which captures the probability of surviving to x for someone who has already survived to y at period rates.[10] In the tenure table model, l_x/l_y captures the fraction of employment relationships that have already survived to y and will continue to survive to x at period rates. The job survival curve $p(x)$ describes the probability of survival from hiring to tenure x and can be computed from the l_x function as $p(x) = l_x/l_0$.

I estimate the tenure table parameters in each period for the population overall and each subpopulation of interest using variable-r methods. The variable-r methods I use require two surveys of workers' job tenure and a count of hires between both surveys for all individuals from the desired subpopulation. Detail on how these methods are used for estimation in the presence of data error are presented in appendix A (for details, see Lachanski 2023). From the estimated tenure table models, I extract three summary measures of job stability: the expected duration of a job at the time of hiring e_0, the expected duration of a job conditional on it already having persisted for a year e_1, that is, given that a job already has a year of tenure, and the conditional probability of "lifetime employment" l_{20}/l_5, which prior literature has defined as a job that lasts twenty years (Hall 1982, 721; Ureta 1992).[11] The first two measures capture the expected tenure for a new employment relationship and an employment relationship that has survived for one year, respectively. The lattermost measure captures the probability of being in a lifetime employment relationship given that one has spent five years on the job. I discuss trends in e_0 and e_1 in the main text. I discuss trends in l_{20}/l_5 in online appendix B to conserve space.[12] Ascriptive job stability inequalities are investigated by comparing estimated tenure table summary measures over time for different sex, race, and ethnic groups.[13] Just as life expectancy inequalities between groups capture mortality disadvantages, expected job tenure inequalities compactly re-

9. Technically, l_x and ${}_nL_x$ are the estimated parameters of the tenure table. Once these key parameters are obtained, $p(x)$ and e_x are then determined endogenously.

10. Formally, l_x is defined as the survival curve. The l_x parameter can then be multiplied by S to track the survival of an entire hypothetical vintage or population of initial size $l_0 = S$. A typical value for S is 100,000 (Keyfitz and Caswell 2005). The probability of an individual member of a cohort surviving to x is then numerically equivalent to the relative frequency l_x/l_0. When the population under investigation is large, the ratio l_x/l_0 also captures the fraction of the cohort that will survive to age x at period rates. This equivalence, which I exploit throughout the article, can be justified by an appeal to the law of large numbers when S is sufficiently large.

11. The idea behind this nomenclature is not that twenty years spans the entire career or a lifetime of work but simply that it was unlikely that anyone would have two jobs spanning twenty or more years in a lifetime. See St-Denis (2021, 245, 359–61) for a critique of the use of twenty years to demarcate what constitutes a "lifetime" job.

12. Online appendixes B and C can be found at https://www.rsfjournal.org/content/11/1/224/tab-supplemental.

13. The study of group differences in job tenures found its earliest incarnation in organizational demography (Silcock 1954; Stewman 1988). For instance, Herbert Silcock (1954) reports differences in job separation hazards by sex, skill, and marital status. Organizational demography's research efforts are distinguished from the present effort on two dimensions. First, although constructing a national tenure table to track the mortality of jobs was an early ambition of organizational demographers (Stewman 1988, 180–81), appropriate data for this task did not become available until the twenty-first century. Second, that work tended to focus on fitting a (typically

Table 1. Human Populations Versus Employment Relationships as Populations

Humans	Employment Relationships
Ego of the population: human	Ego of the population: employment relationship
Enter world when: born	State entered when: hired
Single Decrement Process (SDP): mortality	SDP: Employer-employee separation
SDP summarized in period life table	SDP summarized in period tenure table
Time dimension of ego: age	Time dimension of ego: employment tenure
Absorbing state: death	Absorbing state: separation/job separation
Life expectancy	Expected employment duration or expected employment tenure or expected job duration or expected job tenure at hiring or expected tenure at hiring
Life expectancy at age x	Expected employment duration at tenure x
Survival curve	Employment relationship survival curve
Age-specific mortality rate	Tenure-specific separation rate
Ascribed characteristic example: sex	Ascribed characteristic example: sex of employee
Attained characteristic example: married	Attained characteristic example: college-educated
Probability of survival to age y conditional on survival to age x	Probability of employment relationship continuing to tenure y conditional on the employment relationship reaching x years of tenure

Source: Author's tabulation.

Note: The table analogizes human population processes like birth and death to the processes that jobs go through. Humans are created by being born, subject to mortality process varying by age, and then die. Similarly, jobs are created when workers are hired, subject to a separation process, and then destroyed. Just as life expectancy can be computed for human lives and varies by age, the expected job tenure also varies with the length of time that a job has survived for. Notice that the ego of the population under investigation is an employment relationship; unemployed workers do not factor into the analysis.

flect group differences in job separation conditions.

Data and Measurements

A simple mapping from concepts arising in the demographic study of nonstable human populations to the nonstable population of jobs in the U.S. economy is presented in table 1. The variable-*r* method requires two counts of workers for a group of interest by tenure at different points in time and counts of population-appropriate hires between each point in time. The IPUMS Current Population Survey Job Tenure Supplement (IPUMS CPS JTS) includes consistently measured counts of workers by job tenure by race, sex, and ethnicity biennially from 1996 to 2020 (Flood et al. 2022). Hires for a variety of sociodemographic groups are available from the U.S. Census Bureau's Quarterly Workforce Indicators (QWI) from 1994. I use both the QWI annual hires for the population and each group from 1996 to 2019 and the biennial IPUMS CPS JTS from 1996 to 2020 in my main analysis.

Specifically, I use the QWI's count of accessions (hires) for the population, males and females, blacks, and whites, and Hispanics and non-Hispanics. Only employees in privately owned firms are included in the QWI hiring series. Thus I drop all public-sector workers from the IPUMS CPS JTS sample as well. Railroad workers and some agricultural jobs are ex-

parametric) completed length of service curve for particular industries or firms (Stewman 1988, 174–78; O'Reilly III et al. 1989, 28–30). The development of indirect estimation methods in demography was generally ignored by organizational demographers. By contrast, this research applies indirect point estimation methods to new datasets to obtain nonparametric tenure table models that reflect national, population-level trends in job separation rates for each group.

Table 2. IPUMS CPS JTS Broad Age Group Analytic Sample Case Counts

Panel A. Case Counts Overall, by Sex, Race, and Ethnicity

Year	Total	Male	Female	Black	White	Hispanic	Non-Hispanic
1996	42,765	21,403	21,362	3,811	37,177	3,036	39,729
1998	45,880	23,008	22,872	4,156	39,527	3,825	42,055
2000	46,713	23,505	23,208	4,432	40,026	4,377	42,336
2002	53,076	26,379	26,697	4,707	45,763	4,717	48,359
2004	51,091	25,411	25,680	4,204	43,625	4,943	46,148
2006	51,142	25,665	25,477	4,338	43,342	5,374	45,768
2008	50,202	24,907	25,295	4,304	42,286	5,387	44,815
2010	47,538	23,204	24,334	4,147	39,992	5,257	42,281
2012	46,233	22,995	23,238	4,032	38,612	5,237	40,996
2014	46,144	23,059	23,085	4,008	38,540	5,589	40,555
2016	44,559	22,201	22,385	4,316	36,595	5,558	39,001
2018	42,310	21,270	21,040	3,865	34,701	5,415	36,895
2020	40,940	20,521	20,419	3,723	33,500	5,617	35,323

Panel B. Case Counts by Tenure for the Overall Population

Year	[0, 1)	[1, 2)	[2, 5)	[5, 10)	[10, 15)	[15, 20)	20+
1996	9,645	4,881	8,391	8,405	4,449	3,005	3,999
1998	11,024	5,026	9,538	8,197	5,017	2,874	4,204
2000	10,804	5,177	9,893	8,055	5,207	2,925	4,652
2002	10,858	6,238	12,014	9,410	5,720	3,335	5,501
2004	9,713	5,377	12,057	9,999	5,212	3,412	5,321
2006	10,572	5,333	10,955	10,526	5,007	3,602	5,147
2008	9,494	5,484	11,041	9,968	5,406	3,225	5,584
2010	7,329	4,866	11,345	9,651	5,861	3,023	5,463
2012	7,909	4,392	9,734	9,913	5,884	3,024	5,377
2014	7,945	4,574	9,707	9,817	5,716	3,195	5,310
2016	8,167	4,401	9,734	8,593	5,229	3,335	4,927
2018	7,442	4,210	9,504	7,964	5,085	3,100	4,814
2020	7,214	3,167	9,283	7,996	4,544	2,858	4,028

Source: Author's calculations using the IPUMS CPS JTS (Flood et al. 2022).
Note: I drop all missing, ineligible, unincorporated self-employed, and unpaid worker cases before computing case counts.

cluded from the QWI. I attempt to correct for this potential bias by dropping farmers and rail transportation occupations from the IPUMS CPS JTS sample. Hiring by race and ethnicity are only available for the population aged fourteen and over in the QWI. U.S. Census privacy protections prevent them from releasing more granular age categories for hiring by race and ethnicity. Therefore, I include IPUMS CPS JTS data for the population of workers age fifteen and older in the main analysis to make the estimands comparable across all group comparisons (Lundberg et al. 2021). In appendix B, I include analogous results broken down for the overall population and by sex for the nineteen- to sixty-four-year-old age group.[14] Table 2 pres-

14. The QWI and IPUMS CPS JTS sampling frames are not precisely aligned in our racial comparisons: expected job tenures are biased for both whites and blacks because the sampling frame for IPUMS CPS JTS respondents

ents case counts from the IPUMS CPS JTS in our final analytic sample. All our year-subpopulation cells are large, with cell sample sizes typically in the thousands.

Rather than working with single years of tenure, I abridge the tenure data to intervals of [0,1), [1, 2), [2, 5), [5, 10), [10,15), . . ., [25,30), and a final interval from 30 to 40. This solves two problems. First, the variable-*r* method I use requires a nonzero population in each tenure cell to estimate between survey tenure-specific growth rates, a condition that is met for all subpopulations I study after abridging the data. Second, respondents on job tenure surveys exhibit digit preference in the form of a tendency to overreport job tenures ending in multiples of five (Diebold, Neumark, and Polsky 1997; Neumark, Polsky, and Hansen 1999; Farber 2010; Bidwell 2013). Abridging reduces the influence of digit-preference (Hobbs 2004; Lachanski 2023). In a simulation study in online appendix C, I show that inequalities in computed summary measures of job stability between subpopulations can capture group differences in employer-employee separation conditions under realistic levels of digit-preference after abridging.

RESULTS

To understand the persistence or change in job stability over time, I use the variable-*r* method to estimate period tenure tables for the population as a whole and selected groups from 1996 to 2020. Next, for the population as a whole and each subpopulation I investigate three measures: expected job tenure, expected job tenure conditional on being one year on the job, and the probability of lifetime employment (twenty years or more) with a single employer conditional on having spent five years with that employer. In table 3, I present an example of the period tenure tables output by the variable-*r* method for the U.S. population overall and three subpopulations: females, whites, and the Hispanics over the period between the January 2004 survey and that of January 2006. I report the number of jobs reaching tenure x, $J(x)$, as estimated in each survey and estimates for l_x, $p(x)$, and e_x. I call this the 2004 to 2006 between-survey period as a shorthand and refer to all other between survey periods analogously.

Period tenure tables for the population of employer-employee relationships can be interpreted exactly like period life tables for the population of humans. For instance, at decrement rates holding during the 2004 to 2006 between-survey period, the average new employer-employee relationship would last for 1.18 years (= e_0), but a relationship that had already existed for a year would be expected to live around 5.14 years (= e_1). For females, the respective estimates are 1.19 and 4.92 years respectively. For white workers, the estimates are 1.29 years and 5.22 years, respectively. Similarly, the probability of a worker reaching the twenty-year mark with an employer conditional on spending five years with them are l_{20}/l_5 = 1,257,130/6,884,721 = 0.18 for the population as a whole at 2004 to 2006 rates. For Hispanics and whites overall, the estimates are: 148,648/1,257,442 = 0.12 and 1,052,896/5,552,394 = 0.19. I present trends in e_0 and e_1 over time in figures 1 through 4. I discuss trends in l_{20}/l_5 in appendix B.

Figure 1 presents the results for the population, showing both expected job tenure in the top panel and expected job tenure conditional on making it to one year on the job in the bottom panel for each between survey period. The top panel shows that the expected job tenure has trended upward over the whole period but declined starting in the 2010 to 2012 between-survey period. This trend also appears in the conditional expected job tenure, which started at 4.60 years and rose to 5.65 years at the end of the period.

Figure 2 investigates group differences by sex. The trend in expected job tenure is shown in the top panel and conditional expected employment tenure in the bottom panel, for males and females. The expected job tenure and the conditional expected job tenure trend upward for males and females over the period. Both series exhibit drops in expected tenure during re-

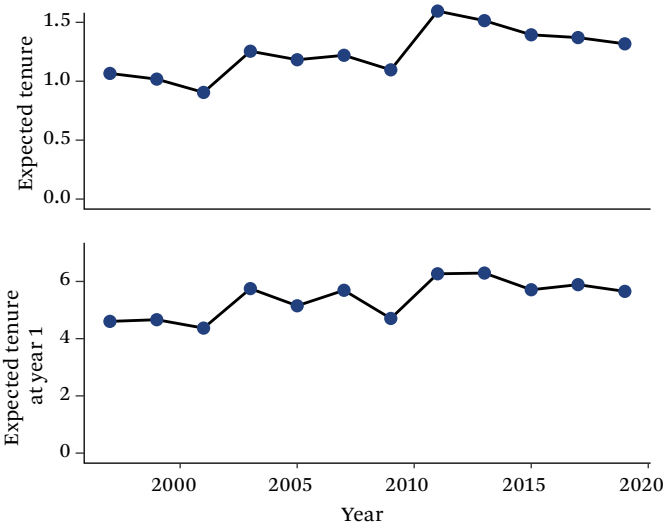
draws from workers aged fifteen and older rather than aged fourteen and older as in the QWI. On the other hand, the QWI does not include hiring data for workers aged one hundred and older whereas the IPUMS CPS JTS in principle does. I expect the bias induced by age mismatches between the IPUMS CPS JTS and QWI to be slight.

Table 3. Period Tenure Table Examples for U.S. Population and Selected Subpopulations, 2004–2006 Between-Survey Period

Panel A. Population					
Job tenure x	2004 J(x)	2006 J(x)	l_x	$p(x)$	e_x
0	21,152,071	23,411,304	95,756,011	1.00	1.18
1	11,496,213	11,746,980	17,558,372	0.18	5.14
2	25,153,717	19,652,203	11,304,264	0.12	6.91
5	19,787,769	20,514,039	6,884,721	0.07	7.71
10	9,117,908	9,097,601	3,314,384	0.06	9.29
15	5,548,128	5,993,016	1,841,050	0.03	10.83
20	3,551,347	3,510,418	1,257,130	0.02	9.86
25	2,249,286	2,469,054	872,902	0.01	8.44
30	2,273,964	2,120,163	737,422	0.01	4.97
Panel B. Females					
Job tenure x	2004 J(x)	2006 J(x)	l_x	$p(x)$	e_x
0	10,314,095	11,388,457	44,371,467	1.00	1.19
1	5,662,821	5,619,671	8,513,108	0.19	4.92
2	11,880,791	11,268,429	5,407,354	0.12	6.65
5	9,255,615	9,968,986	3,189,443	0.07	7.63
10	4,068,981	4,071,093	1,493,211	0.03	9.47
15	2,529,654	2,822,446	831,265	0.02	11.31
20	1,499,479	1,502,527	587,808	0.01	9.91
25	880,857	1,049,491	415,029	0.01	8.49
30	751,342	723,640	352,315	0.01	4.76
Panel C. Whites					
Job tenure x	2004 J(x)	2006 J(x)	l_x	$p(x)$	e_x
0	17,273,967	19,006,985	71,974,611	1.00	1.29
1	9,440,401	9,475,526	14,244,169	0.20	5.22
2	20,316,298	19,335,441	9,120,200	0.13	7.07
5	16,202,125	17,605,074	5,552,394	0.08	8.00
10	7,834,066	7,714,971	2,744,062	0.04	9.52
15	4,771,882	5,171,173	1,550,670	0.02	10.94
20	3,059,454	3,001,775	1,052,896	0.01	10.09
25	2,013,516	2,238,164	744,542	0.01	8.65
30	2,019,363	1,897,148	644,160	0.01	4.93
Panel D: Hispanics					
Job tenure x	2004 J(x)	2006 J(x)	l_x	$p(x)$	e_x
0	3,123,863	3,902,417	15,513,580	1.00	1.16
1	1,968,080	2,001,489	2,959,448	0.19	4.83
2	4,381,617	4,274,218	2,069,721	0.13	5.83
5	2,533,995	3,004,082	1,275,442	0.08	5.71
10	1,030,594	982,491	528,158	0.03	6.77
15	523,197	589,165	252,491	0.02	7.93
20	258,687	265,292	148,618	0.01	7.09
25	105,064	128,737	85,333	0.01	6.06
30	94,553	70,745	51,677	0.00	3.87

Source: Author's calculations using the IPUMS CPS JTS 2004–2006 (Flood et al. 2022) and QWI Hires Series.
Note: The first two columns are the number of jobs in each tenure group for each subpopulation. The radix, l_0 for each panel is the number of between survey hires for each period divided by the length of the between survey period (two years).

Figure 1. Expected Job Tenure and Conditional Expected Job Tenure, U.S. Population, 1996–2020

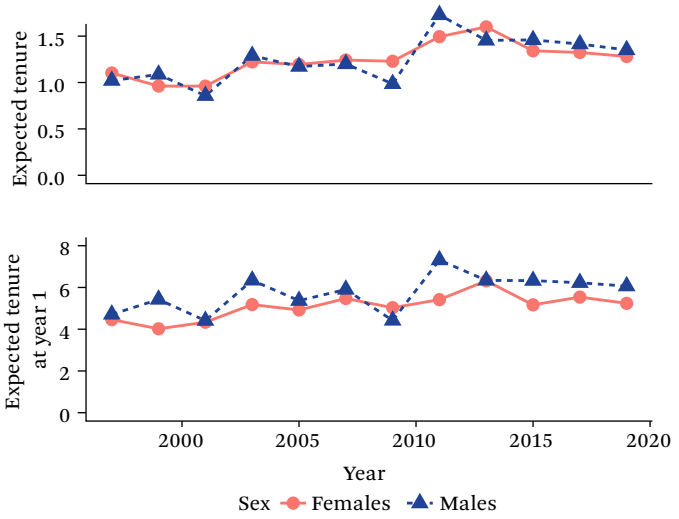


Source: Author's calculations based on Flood et al. 2022.
Note: Calculations relied on the IPUMS CPS JTS 1996–2020 for all nongovernment and non-self-employed workers and the Quarterly Workforce Indicators hiring series for workers working in privately owned firms age fourteen to ninety-nine from 1996 to 2019. The top panel graphs the computed expected job tenure for workers in each between survey period for the IPUMS CPS JTS: February 1996 through January 1998, February 1998 through January 2000, February 2000 through December 2001, January 2001 through December 2002, and so on until January 2019 through December 2020. I abbreviate this as "for each between survey period from 1996 to 2020" for all remaining figures. The top panel shows a slight trend in expected job tenure. Expected job tenures rose from 1.07 for the 1996–1998 between survey period to 1.32 for the 2018 to 2020 between survey period. The population minimum (maximum) expected job tenure was 0.91 (1.59) from 2000 to 2002 (2010 to 2012). The bottom panel shows that the rise in workers' expected job tenure advantage also exists at the one-year tenure mark. Conditional expected job tenures rose more than a year over the period, from 4.60 in the 1996 to 1998 between survey period to 5.65 in the 2018 to 2020 between survey period. The population minimum (maximum) conditional expected job tenure was 4.37 (6.29) during the 2000 to 2002 (2012 to 2014) between survey period.

cessions. Women have slightly longer expected tenures than men at the point of hiring. Averaging across each between-census expected job tenure gives men an average expected tenure of 1.57 and women an average expected tenure of 1.62. A male advantage emerges at the one-year mark. Men's average expected tenure conditional on spending one year with an employer is 5.74 years. The equivalent female estimate is 5.09 years.[15] These findings suggest that the private-sector expected job tenure gap by sex likely closed between the mid-1980s and the late-1990s (Neumark, Polsky, and Hansen 1999).

15. In appendix B, I conduct checks on these surprising results in three ways. First, I show that they hold when using an alternative age group consisting of workers aged nineteen to sixty-four. Second, I show that similar parity holds when considering each sex's expected tenure within education groups. Third, I visualize the fraction of each birth-year cohort that obtained lifetime employment at ages near retirement and find evidence consistent with these surprising results.

Figure 2. Expected Job Tenure and Conditional Expected Job Tenure by Sex, 1996–2020



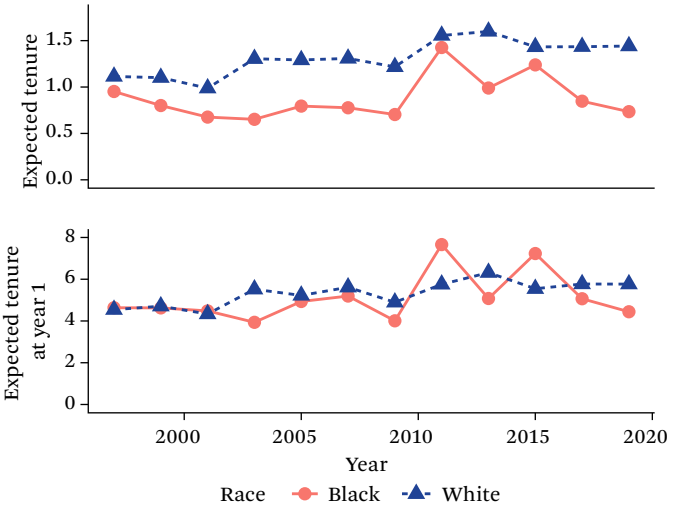
Source: Author's calculations based on Flood et al. 2022.

Note: Calculations relied on the IPUMS CPS JTS 1996–2020 for all nongovernment and non-self-employed workers and the Quarterly Workforce Indicators hiring series for workers in privately owned firms age fourteen to ninety-nine from 1996 to 2019. The top panel graphs the computed expected job tenure for male and female workers for each between survey period for the IPUMS CPS JTS. The top panel shows an inconsistent expected job tenure advantage for male workers at the time of hiring of about two days. The bottom panel graphs the expected job tenure conditional on spending one year with an employer for male and female workers for each between survey period from 1996 to 2020. The bottom panel shows that male advantage grows to about 0.65 years of expected tenure after one year with an employer.

Figure 3 presents group differences by race. The trend in expected job tenure at the time of hiring is shown in the top panel and conditional expected job tenure is shown in the bottom panel. Expected tenure statistics are shown separately for blacks and whites. Figure 3 shows an upward trend in expected employment tenure for white workers. Black workers' expected tenure increases until reaching a peak in the 2010 to 2012 between survey period, but then falls to below its starting point in the 1996 to 1998 between-survey period. White workers maintain a consistent advantage in expected job tenure at the point of hiring, but that advantage shrinks when both workers have spent one year on the job. White workers' advantage at the time of hiring is 0.43 years or a little over five months. After one year on the job, this expected advantage shrinks to 0.22 years or between eleven and twelve weeks. In the 1996 to 1998, 2000 to 2002, 2010 to 2012, and 2014 to 2016 between-survey periods, black workers who have spent one year with an employer have a (small) outright advantage over white workers. However, throughout most of this period, white workers still experience more job stability than black workers. The consistent white advantage in expected job tenure aligns with Baum's findings (2022, 554), that black workers' jobs survive for less time than white workers' do, all else equal.

Racialized group differences in job stability exhibit an inverse pattern to group differences by sex. Group differences in job stability by sex emerged when studying the population of workers who had already spent one year on the job but were small at the time of hiring. Ra-

Figure 3. Expected Job Tenure and Conditional Expected Job tenure by Race, 1996–2020



Source: Author's calculations based on Flood et al. 2022.

Note: Calculations relied on the IPUMS CPS JTS 1996–2020 for all nongovernment and non-self-employed workers and the Quarterly Workforce Indicators hiring series for black and white workers age fourteen to ninety-nine from 1996 to 2019. Shown are the computed expected job tenure for black and white workers for each between survey period from 1996 to 2020. The top panel shows a consistent expected job tenure advantage for white workers at the time of hiring. The mean period size of the expected duration advantage at hiring is 0.43 years or about five months. The bottom panel shows that white workers' expected job tenure advantage becomes less consistent at the one-year tenure mark. Black workers have substantial advantages in expected job tenure conditional on making it to one year in 2011 and 2015. White workers' mean period expected job tenure advantage at the one-year mark is about 0.22 years (smaller than the equivalent male advantage of 0.65 years).

cialized differences in employment stability exhibit nearly the opposite pattern. Substantial racialized differences in favor of whites at the point of hiring shrink in individual periods when analyzing the population of workers who have made it to the one-year mark. Indeed, in four of the periods studied, black workers have a small, expected job tenure advantage conditional on their jobs surviving for one year.

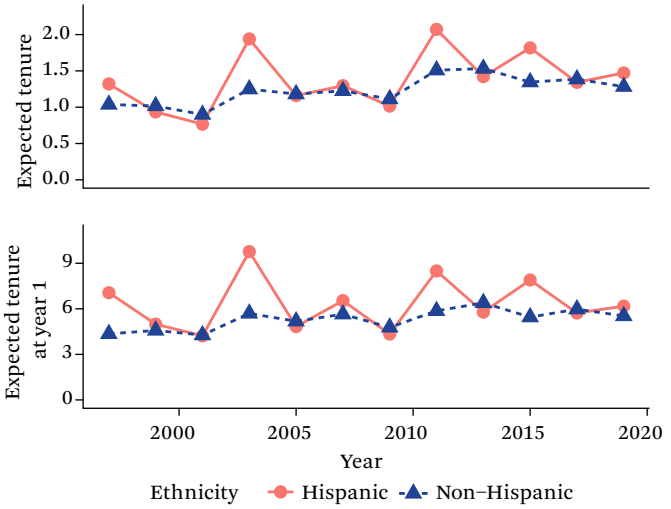
Figure 4 presents group differences by ethnicity broken down by Hispanic identification. Trends in expected job tenure are plotted in the top panel and conditional expected job tenure in the bottom panel for Hispanics and non-Hispanics. Both series trend upward over time. Hispanic workers, averaging across all periods, have an expected job tenure advantage of about 0.14 years. However, in half of the periods they have a slight disadvantage relative to non-Hispanics. After one year on the job, their expected job tenure advantage grows to one full year, but non-Hispanics retain an advantage in just under half of all periods.[16]

DISCUSSION

In this article, I investigate whether job stability exhibits change or continuity in the post- and pre-Great Recession periods for different groups using novel demographic methods and new administrative hiring records. From 1996 to 2020, expected job tenures for the U.S. popu-

16. This article appears to be the first investigation of expected job tenure by Hispanic ethnicity so earlier literature to set expectations is scant.

Figure 4. Expected Job Tenure and Conditional Expected Job Tenure by Ethnicity, 1996–2020



Source: Author's calculations based on Flood et al. 2022.
Note: Calculations relied on the IPUMS CPS JTS 1996–2020 for all nongovernment and non-self-employed workers and the Quarterly Workforce Indicators hiring series for black and white workers age fourteen to ninety-nine from 1996 to 2019. Shown are the computed expected job tenures for Hispanic and non-Hispanic workers for the between survey period from 1996 to 2020. Hispanics have an advantage in six of the between-survey periods investigated while non-Hispanics have an advantage in six of the between survey periods investigated. Nonetheless, averaging over all periods Hispanics have a slight expected tenure advantage of about 0.14 years or about twenty-one days at the time of hiring. The bottom panel shows that Hispanic workers' expected job tenure advantage grows at the one-year tenure mark to about one year. Hispanic workers lose their advantage during the 2001 and 2009 recessions, which is unsurprising given the large employment penalties documented for immigrant workers in 2009 and the high proportion of Hispanics in this period who are immigrants (Farber 2010; Tamborini and Villareal 2021).

lation in the private sector rose. If the stability of a typical employment relationship has decreased since the late 1990s, it has been offset by compositional factors at the population level.[17] That expected job tenures increased for both sexes at the time of hiring challenges the ability of the masked instability hypothesis to explain U.S. labor-market trends in the twenty-first century but is consistent with perspectives emphasizing the growing importance of screening and declining dynamism. Indeed, at the start of this century Autor (2001, 27–28) correctly predicted that technology-aided job matching boards would lead to longer-lasting jobs. That expected job tenures for workers with a year of tenure have also increased for the population and both sexes points to a critical role for declining business dynamism (Hyatt and Spletzer 2016). I discuss group differences in the next section.

Assessing Group Differences in Job Stability

The finding that throughout the postindustrial era men and women have had similar expected job tenures may surprise labor-market scholars

17. In appendix B, I show that the findings reported for the population age fifteen and older discussed here also hold for the age nineteen to sixty-four group. Therefore, changing age composition of the working population is unlikely to be driving these trends. Other unobserved compositional effects might be present.

for at least two reasons.[18] First, careful work on expected employment durations in the 1970s through the early 1990s reports a male advantage in employment survival and conditional probability of lifetime employment (Hall 1982; Ureta 1992; Diebold, Neumark, and Polsky 1997; Neumark, Polsky, and Hansen 1999; Hollister and Smith 2014; Molloy, Smith, and Wozniak 2024). Second, an academic and popular consensus holds that women tend to permanently leave their employers after childbirth, and this reduces females' expected tenure (Hollister and Smith 2014). Both points have been challenged in recent research. Baum (2022, 561) finds "greater job stability for young female high school graduates than their male counterparts" and concludes that "any gender differentials" in job stability "are slight" among cohorts born in the late 1950s and early 1960s. Hollister and Smith (2014) document increasing labor attachment by married women from the early 1980s to the early 2000s as prime-age male labor-force attachment underwent a secular decline (Eberstadt 2022). In previous eras, stable employment for males in heterosexual relationships was taken for granted as a precondition for marriage and childbearing (Schneider, Harknett, and Stimpson 2018). Sarah Halpern-Meekin and Adam Talkington (2022) present evidence that these norms can break down; unemployed males in a nonmetropolitan setting had unstable work histories, were not actively seeking work, and yet often had children and did not see themselves as inherently unmarriageable. These social forces might have reduced male employment stability and thus contributed to male-female parity in job stability over the past quarter century.

Scholarship documents either approximate racial parity or even a black advantage in job stability that was fading throughout the 1980s and 1990s (Hall 1982; Neumark, Polsky, and Hansen 1999). Both the black disadvantage at the time of hiring and an occasional (conditional) black advantage in job stability plausibly reflect an extrapolation of the falling black job stability advantage. Compositional differences likely explain a part of the divergence: Hall (1982), Kenneth Swinnerton and Howard Wial (1995), Diebold, Neumark, and Polsky (1997), and Neumark, Polsky, and Hansen (1999) all include the public sector, which has been an important source of employment for black jobholders, in their analyses. My analysis focuses exclusively on the private sector.

I document an unstable Hispanic expected job tenure pattern that sometimes exhibits large advantages and sometimes exhibits small disadvantages relative to non-Hispanics. The slight overall Hispanic advantage in job stability may perversely reflect a kind of "job lock" engendered by the risks of changing employers that immigrants face. Elevated job immobility has been documented in the unauthorized immigrant population by Matthew Hall, Emily Greenman, and Youngmin Yi (2019), and guest workers by Xuening Wang (2021), but little quantitative research has examined the effect of immigration policy on the Hispanic population's job mobility.

Measuring Group Differences in Job Stability

A spike in theoretical and empirical research on ethnicity, race, and sex-structured socioeconomic inequalities in the last decade has yielded surprisingly little attention to gaps in job stability despite a voluminous literature identifying stable employment as a key contributor to the well-being of the truly disadvantaged (Wilson 1987, 1996). As a result, I believe that several challenges for the measurement of job tenures remain underexplored.

First, regression analyses attempt to implicitly capture the job separation but neglect that tenure-specific separation rates and the history of hires can differ between groups. Males were hired more in each period of our data, but also tended to have greater separation rates at low tenures. This suggests that men's mean tenure advantage documented in previous work arises from workers whose jobs survive for more than, say, a year. The bottom panel of figure 2 shows that this is in fact the case: men's tenure advantage becomes persistent conditional on a job

18. On the other hand, it is well known that women are likely to work in occupations that offer more stable jobs, such as administrative and clerical domains.

surviving for one year, with the notable exception of the Great Recession.[19]

Second, the measurement strategy throughout this article is based on a formal demographic analysis for nonstable populations applied to the population of jobs. The methods can appropriately handle dual job holding, but the CPS JTS dataset includes only a worker's tenure at their main job (Hyatt and Spletzer 2016, 367). Baum (2022, 556) points out that although holding three jobs at once is rare, substantial fractions of the working population hold two jobs simultaneously at some point in their careers (Paxson and Sicherman 1996). If workers only report tenures at their longest-held job on the CPS JTS, which seems likely, then our expected tenure estimates are likely biased (Hyatt and Spletzer 2016, 367). Although Hyatt and Spletzer (2016, 368) find that the CPS JTS dataset captures main job tenures about as accurately as administrative data, the effect of differential trends in dual job holding on group differences is unclear.

Third, I have adopted the demographer's norm of focusing on point estimation and visual inspection of trends rather than fixating on statistical significance (Preston, Heuveline, and Guillot 2001; Hendi 2023). As table 2 shows, the case counts in my sample are large, but I have not attempted to rule out the possibility that the group differences and time trends I document arise from sample error. Bayesian methods in organizational demography remain in their infancy and have not yet been applied to the problem of tenure table inference despite the continued growth of Bayesian inference in population research generally (Stewman 1988; Lynch and Zang 2022; Lachanski 2023). An alternative approach would be to attempt to replicate the findings I present from a cohort perspective using panel data from, for example, the Survey of Income and Program Participation, Panel Study of Income Dynamics, or National Longitudinal Survey of Youth.

Fourth, I have assumed that Hispanics, non-Hispanics, blacks, and whites constitute separate populations with individual statuses that are consistent and stable through time. This was never strictly true in U.S. history, but the quantitative significance of individual changes in racial identification was likely limited. It is now well known that substantial changes to Hispanic identification occur over time (Emeka and Vallejo 2011). Similarly, as populations with both white and black self-identification grows in the United States, standard demographic methods relying on a dichotomous characterization of these two groups may become increasingly untenable. The extension of demographic methods to situations in which individuals may have multiple racial classifications that change over time has posed problems for demographers and remains an active area of research (Alba 2020).

CONCLUSIONS

The upward trend in population-level expected job tenure over the 2000s and 2010s constitutes a break with the slight declines documented in the 1980s and 1990s (Neumark, Polsky, and Hansen 1999; Farber 2000; 2010). The break likely arises from a combination of increased screening and declining labor-market dynamism. In the model by Pries and Rogerson (2022), the impact of screening should rapidly diminish with the length of job tenure. However, I find that expected job tenure after one year on the job has also increased, consistent with an important role for declining labor-market dynamism. On the other hand, job stability differences by race remained moderate and exhibit continuity with trends previously documented in the 1990s (Neumark, Polsky, and Hansen 1999). A more optimistic story emerges when examining job stability inequality by sex, which has remained small throughout the period examined. Ethnic differences in job stability did not exhibit any clear trend over the period. I found no clear trend in lifetime employment for any group in the period under examination. Ascriptive gaps in job stability exhibit substantial continuities over the last quarter century.

This article focuses primarily on inequalities by ascriptive characteristics, but compari-

19. This is also consistent with males' advantage in lifetime employment conditional on spending five years with an employer discussed in appendix B. This pattern is also present in the supplementary results computed for the male and female population age nineteen to sixty-four in table B.2.2. and figure B.2.2.

sons based on achieved characteristics are also possible using these methods. For instance, in appendix B, while attempting to rule out confounding of parity in expected job tenure by sex with education, a substantial divergence in expected tenure by educational attainment was uncovered that will be explored in future work. It is plausible that similar job stability inequalities exist between the public and private sectors as well as between industries. Period (conditional) expected employment duration and the conditional probability of reaching a certain tenure are only a few of many interesting estimands that can be computed using period tenure tables. With decrement data, the probability of a job ending in a quit, displacement, or firing are other interesting quantities that can be computed with these methods (Lachanski 2023). Future work should consider the demography of job separation, or whether jobs tend to end in different ways for different race-sex combinations.[20] Similar work could be done on the 2020–2023 Great Resignation. Some speculate that white, highly educated workers were more likely to quit their jobs during the so-called Great Resignation that occurred during the COVID-19 pandemic (Kaplan and Hoff 2022). The framework I use in this article enables a principled answer to these questions.

APPENDIX A: DETAILS OF THE TENURE TABLE PARAMETER ESTIMATION ALGORITHM

Recent variable-*r* applications have included the estimation of the Net Reproduction Rate in China (Cai 2008), and the decomposition of age-specific growth rates into those arising from changes in birth, mortality rates, and migration (Horiuchi and Preston 1988; Murphy 2017). My proposed application of the variable-r relations borrows primarily from Michael Lachanski (2023). Lachanski (2023), in turn, utilizes work by Samuel H. Preston and Neil G. Bennett (1983), Preston and Ansley J. Coale (1986), and Preston (1987), which shows how two censuses and a measure of births can be used to construct intercensal period life tables using abridged data. Specifically, Preston, Patrick Heuveline, and Michel Guillot (2001, chap. 8) shows that the population aged x to $x + dx$ at time t to $t + dt$ is, at any point in time, related to the population aged y to $y + dy$ via the growth rate of the population in the age interval a to $a + da$ over t to $t + dt$ and the probability of surviving from age y to age x as shown by fundamental nonstable population equation A1 below:

$$J(x,t) = J(y,t)\frac{l_x}{l_y}\exp\left\{-\int_y^x r(a,t)da\right\} \qquad \text{(A1)}$$

where $J(x,t)$ is the number of jobs reaching exact age x and time t, l_x/l_y is the ratio of jobs surviving to y from time x in the stationary population (a conditional survival function), and r(a,t) is the age-a-specific growth rate at time t. This identity applies to any population over a short period of time.

If $y = 0$, then $J(0,t)$ is the number of hires at time t, $H(t)$. This substitution immediately transforms the equation above to:

$$J(x,t) = H(t)p(x,t)\exp\left\{-\int_0^x r(a,t)da\right\} \qquad \text{(A2)}$$

relating the population aged x at time t to the number of births at time t multiplied by a function of age-specific growth rates from 0 to x and the probability of surviving to age x for the cohort born at time t. Because $J(t)$ and $p(x, t)$ are period t measures, the population history relating them to $J(x, t)$ is captured by the *age-specific* growth rates $r(a,t)$ at time t. The key idea is that $J(x, t)$, $H(t)$, and $r(a,t)$ are all quantities that can be estimated with data. This allows us to solve for a survival curve at time t as a function of age x, $p(x, t)$, and thus, the period tenure table for the population of employment relationships. The typical approach, which I summarize here, then constructs a midpoint population for which a version of this identity also holds. Substituting instantaneous growth rates, average annual births, and the midpoint populations generates the $p(x, t)$ estimate. I construct ten-

20. Some research has already begun along these lines. In a working paper, Elizabeth Wrigley-Field and Nathan Seltzer (2020) show that displacements explain a substantial amount of black-white employment inequalities, which would suggest that blacks are at elevated risk of being laid off on a per-employment relationship basis relative to whites.

ure tables for the United States as a whole and selected groups using the $p(x, t)$ terms from equation (A2).[21]

Suppose the population's job tenure distribution is $J(x, t_1)$ at time t_1 and $J(x, t_2)$ at time t_2. Using equation (A2), with the population of jobs reaching tenure x at time t be $J(x, t)$ one can write:

$$J(x, t_1) = J(y, t_1)_{x\text{-}y}\, p_y\,(t_1)\, \exp\left\{-\int_y^x r(j, t_1)dj\right\}$$

$$J(x, t_2) = J(y, t_2)_{x\text{-}y}\, p_y\,(t_2)\, \exp\left\{-\int_y^x r(j, t_2)dj\right\}$$

Multiplying these equations by one another and taking the square root of each side yields:

$$J^*(x) = J^*(y)_{x\text{-}y} p_y^* \exp\left\{-\int_y^x \frac{r(j, t_1) + r(j, t_2)}{2}\right\}$$

where the * superscript denotes the midpoint estimate. Note that here, I am using the notation age-specific survival probability, $\{x\text{-}y\}_{px}$, notation from Preston, Heuveline, and Guillot (2001). The goal is to isolate and estimate ${}_{x\text{-}y}p_y^*$, which will yield the period job tenure table. To do this, three discretization assumptions will be required.

Our first assumption is that the tenure-specific employment growth rate changes linearly during the time interval. This implies:

$$\frac{r(j, t_1) + r(j, t_2)}{2} = \frac{\ln\left[\frac{J(j, t_2)}{J(j, t_1)}\right]}{t_2 - t_1} = \bar{r}(j) \Rightarrow J^*(x)$$
$$= J^*(y)_{x\text{-}y} p_y^* \exp\left\{-\int_y^x \bar{r}(j)\, dj\right\}$$

with the estimate of the constant tenure-specific employment growth rate $\bar{r}(j)$ being computable from data as shown by the second equality. The first equality will be exact if $r(j, t)$ changes linearly in the interval or is constant. The more irregular $r(j, t)$ is in the interval $[t_1, t_2]$, the worse an approximation this will be.

As in equation (A2), one can make the substitution of $J(0) = H$ to obtain:

$$J^*(x) = J^*(0)_{x\text{-}y} p_0^* \exp\left\{-\int_0^x \bar{r}(j)\, dj\right\}$$
$$= H^*{}_x p_0^* \exp\left\{-\int_0^x \bar{r}(j)\, dj\right\} \qquad \text{(A3)}$$

where H^* can be estimated by summing hires over the interval we are interested in and dividing by the length of the interval $t_2 - t_1$.[22]

The second discretization assumption arises from the problem that variable-r formulas require exact tenures. Utilizing exact tenures can result in upward sloping job survival curves in the presence of high levels of heaping and rounding, a common problem arising from the use of demographic methods (Jaeger and Stevens 1999; Coale 1984; Stupp 1995, 234). As discussed in the main text, I address this problem by first abridging the data and working with grouped tenure intervals of [0, 1), [1, 2), [2, 5), [5, 10), [10, 15), [15, 20), [20, 25), [25, 30), and [30, 40]. How can one approximate the quantities on the right-hand side of equation (A3), which represent the values at the midpoint of the interval $[t_2, t_1]$? Preston, Heuveline, and Guillot (2001, 185) write, "When the data come in 5-year intervals, a convenient solution to this problem is to assume that the values" in an equation analogous to A1 "at the midpoint of an age interval can be approximated by the sum of values in the 5-year interval divided by 5."

Of course, this logic can be extended to age intervals less than 5. I use the notation developed in Preston, Heuveline, and Guillot (2001) for discrete intervals: ${}_1L_0^*$ for the estimated years of tenure a job survives for between 0 and 1 and ${}_3L_2^*$ for the estimated years of tenure a job survives for between tenures 2 and 5:

$${}_1J_0^* = H^* e^{-S_0}\, {}_1L_0^* \Rightarrow {}_1L_0^* = \left({}_1J_0^*/H^*\right) \boldsymbol{e^{S_0}}$$
$${}_1J_1^* = H^* e^{-S_1}\, {}_1L_1^* \Rightarrow {}_1L_1^* = \left({}_1J_1^*/H^*\right) \boldsymbol{e^{S_1}}$$
$${}_3J_2^* = H^* e^{-S_2}\, {}_3L_2^* \Rightarrow {}_3L_2^* = \left({}_3J_2^*/H^*\right) \boldsymbol{e^{S_2}}$$
$${}_5J_x^* = H^* e^{-S_x}\, {}_5L_x^* \Rightarrow {}_5L_x^* = \left({}_5J_x^*/H^*\right) \boldsymbol{e^{S_x}} \qquad \text{(A4)}$$

21. Space considerations prevent us from giving a full exposition of these relations and their historical context, which can be found in a companion article (Lachanski 2023).

22. Specifically, equation A2 suggests that the estimation of a job survival curve for a specific group requires regularly spaced counts of jobs indexed by tenure for that group as well as the number of hires of that group between surveys.

and corresponding S_j cumulation functions:

$$S_0 = 0.5\ {}_1r_0$$

$$S_1 = {}_1r_0 + 0.5\ {}_1r_1$$

$$S_2 = {}_1r_0 + {}_1r_1 + 1.5\ {}_3r_2$$

$$S_{x,x\geq 5} = {}_1r_0 + {}_1r_1 + 3_3r_2 + 2.5_5r_x + \mathbf{1}[x \geq 10] \cdot 5\sum_{j=5}^{x-5} {}_5r_j$$

which adapts the solution in Preston, Heuveline, and Guillot (2001, 185) to the abridging scheme I used in the main text and naturally fills in the final interval.

The third and final discretization is to convert the ${}_n\mathrm{L}_j^*$ terms to l_j terms in a principled fashion. Lachanski (2023) generalizes Preston's (1987) estimator when tenure interval lengths are unequal to yield:

$$\hat{l}_x = \frac{n_2}{n_1+n_2}\left(\frac{\widehat{{}_{n_1}L^*_{x-n_1}}}{n_1}\right) + \frac{n_1}{n_1+n_2}\left(\frac{\widehat{{}_{n_2}L^*_{x-n_2}}}{n_2}\right). \quad \text{(A5)}$$

Equation A5 yields the l_x column from the ${}_n\mathrm{L}_x$ estimates. All other tenure table variables, for example, e_x and $p(x)$ can be computed from the estimated l_x and ${}_n\mathrm{L}_x$ values.

REFERENCES

Alba, Richard. 2020. *The Great Demographic Illusion*. Princeton, N.J.: Princeton University Press.

Alderotti, Giammarco, Daniele Vignoli, Michaela Baccini, and Anna Matysiak. 2021. "Employment Instability and Fertility in Europe: A Meta-Analysis." *Demography* 58(3): 871–900.

Autor, David H. 2001. "Wiring the Labor Market." *Journal of Economic Perspectives* 15(1): 25–40.

Autor, David H., and David Scarborough. 2008. "Does Job Testing Harm Minority Workers? Evidence from Retail Establishments." *Quarterly Journal of Economics* 123(1): 219–77.

Baum, Charles L. 2022. "Seven Jobs in a Lifetime? An Analysis of Employee Tenure." *Economic Inquiry* 60(2): 543–67.

Bidwell, Matthew J. 2013. "What Happened to Long-Term Employment? the Role of Worker Power and Environmental Turbulence in Explaining Declines in Worker Tenure." *Organization Science* 24(4): 1061–82.

Cai, Yong. 2008. "An Assessment of China's Fertility Level Using the Variable-*r* Method." *Demography* 45(2): 271–81.

Cappelli, Peter. 1999. "Career Jobs Are Dead." *California Management Review* 42(1): 146–67.

Clark, Andrew E., and Anthony Lepinteur. 2022. "A Natural Experiment on Job Insecurity and Fertility in France." *The Review of Economics and Statistics* 10 4(2): 386–98.

Coale, Ansley J. 1984. "Life Table Construction on the Basis of Two Enumerations of a Closed Population." *Population Index* 50(2): 193–213.

Diebold, Francis X., David Neumark, and Daniel Polsky. 1996. "Comment on Kenneth A. Swinnerton and Howard Wial. 'Is Job Stability Declining in the US Economy?'" *ILR Review* 49(2): 348–52.

———. 1997. "Job Stability in the United States." *Journal of Labor Economics* 15(2): 206–33.

Eberstadt, Nicholas. 2022. *Men Without Work: Post-Pandemic Edition*. West Conshohocken, Penn.: Templeton Foundation Press.

Emeka, Amon, and Jody A. Vallejo. 2011. "Non-Hispanics with Latin American Ancestry: Assimilation, Race, and Identity Among Latin American Descendants in the US." *Social Science Research* 40(6): 1547–63.

Farber, Henry S. 1998. "Are Lifetime Jobs Disappearing?" In *Labor Statistics Measurement Issues*, edited by John Haltiwanger, Marilyn E. Manser, and Robert Topel, 157–206. Chicago: University of Chicago Press.

———. 2000. "Trends in Long-Term Employment in the United States: 1979–1996." In *Global Competition and the American Employment Landscape as We Enter the 21st Century: Proceedings of New York University 52nd Conference on Labor*, edited by Samuel Estreicher, 63–98. Leiden: Kluwer Law International.

———. 2010. "Job Loss and the Decline in Job Security in the United States." In *Labor in the New Economy*, edited by Katherine G. Abraham, James R. Spletzer, and Michael Harper, 223–66. Chicago: University of Chicago Press.

Flood, Sarah, Miriam King, Renae Rodgers, Steven Ruggles, John R. Warren, and Michael Westberry. 2022. "Integrated Public Use Microdata Series, Current Population Survey: Version 10 [dataset]." Minneapolis, Minn.: IPUMS. https://doi.org/10.18128/D030.V10.0.

Goldin, Claudia, and Lawrence F. Katz. 2002. "The Power of the Pill: Oral Contraceptives and Wom-

en's Career and Marriage Decisions." *Journal of Political Economy* 110(4): 730–70.

Hall, Matthew, Emily Greenman, and Youngmin Yi. 2019. "Job Mobility Among Unauthorized Immigrant Workers." *Social Forces* 97(3): 999–1028.

Hall, Peter A., and David Soskice. 2001. "An Introduction to Varieties of Capitalism." In *Varieties of Capitalism. The Institutional Foundations of Comparative Advantage*, edited by Peter A. Hall and David Soskice, 1–70. Oxford: Oxford University Press.

Hall, Robert E. 1982. "The Importance of Lifetime Jobs in the U.S. Economy." *American Economic Review* 72(4): 716–24.

Halpern-Meekin, Sarah, and Adam Talkington. 2022. "'Disconnected' Men: Understanding Men's Joint Roles as Workers and Romantic Partners." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 8(5): 98–119. https://doi.org/10.7758/RSF.2022.8.5.05.

Haveman, Heather A., and Lisa E. Cohen. 1994. "The Ecological Dynamics of Careers: The Impact of Organizational Founding, Dissolution, and Merger on Job Mobility." *American Journal of Sociology* 100(1): 104–52.

Heisz, Andrew. 2005. "The Evolution of Job Stability in Canada: Trends and Comparisons with US Results." *Canadian Journal of Economics/Revue Canadienne D'économique* 38(1): 105–27.

Hendi, Arun. 2023. "Estimation of Confidence Intervals for Decompositions and Other Complex Demographic Estimators." *Demographic Research* 49: 83–108.

Hobbs, Frank. 2004. "Age and Sex Composition." In *The Methods and Materials of Demography*, edited by David Swanson and Jacob S. Siegel, 125–73. New York: Elsevier Academic Press.

Hollister, Matissa N. 2011. "Employment Stability in the US Labor Market: Rhetoric Versus Reality." *Annual Review of Sociology* 37(1): 305–24.

Hollister, Matissa N., and Kristin E. Smith. 2014. "Unmasking the Conflicting Trends in Job Tenure by Gender in the United States, 1983–2008." *American Sociological Review* 79(1): 159–81.

Horiuchi, Shiro, and Samuel H. Preston. 1988. "Age-Specific Growth Rates: The Legacy of Past Population Dynamics." *Demography* 25(3): 429–41.

Hyatt, Henry R., and James R. Spletzer. 2016. "The Shifting Job Tenure Distribution." *Labour Economics* (41): 363–77.

———. 2017. "The Recent Decline of Single Quarter Jobs." *Labour Economics* 46 (June): 166–76.

Jaeger, David A., and Ann H. Stevens. 1999. "Is Job Stability in the United States Falling? Reconciling Trends in the Current Population Survey and Panel Study of Income Dynamics." *Journal of Labor Economics* 17(S4): S1–S28.

Jargowsky, Paul A. 1997. *Poverty and Place: Ghettos, Barrios, and the American City*. New York: Russell Sage Foundation.

Kalleberg, Arne L. 2009. "Precarious Work, Insecure Workers: Employment Relations in Transition." *American Sociological Review* 74(1): 1–22.

Kambayashi, Ryo, and Takao Kato. 2017. "Long-Term Employment and Job Security over the Past 25 years: A Comparative Study of Japan and the United States." *ILR Review* 70(2): 359–94.

Kaplan, Juliana, and Madison Hoff. 2022. "We Were Wrong about the Great Resignation. Workers Are Still Powerless and the Looming Recession Will Make It Worse." *Business Insider*, July 17. Accessed April 20, 2024. https://www.businessinsider.com/wrong-great-resignation-recession-means-workers-powerless-despite-labor-shortage-2022-7.

Karabchuk, Tatiana. 2020. "Job Instability and Fertility Intentions of Young Adults in Europe: Does Labor Market Legislation Matter?" *The Annals of the American Academy of Political and Social Science* 688(1): 225–45.

Keyfitz, Nathan, and Hal Caswell. 2005. *Applied Mathematical Demography*. Vol. 47. New York: Springer.

Kroft, Kory, and Devin G. Pope. 2014. "Does Online Search Crowd Out Traditional Search and Improve Matching Efficiency? Evidence from Craigslist." *Journal of Labor Economics* 32(2): 259–303.

Lachanski, Michael. 2023. "Point Estimation of Certain Measures in Organizational Demography Using Variable-R Methods." *Demographic Research* 49: 865–904.

———. 2024. "U.S. Trends in Job Stability by Sex, Race, and Ethnicity from 1996 to 2020 [dataset]." Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research [distributor]. https://doi.org/10.3886/E207601V6.

Lane, K. F. and Andrew, J. E., 1955. "A Method of Labour Turnover Analysis." *Journal of the Royal Statistical Society.* Series A (General): 296–323.

Lundberg, Ian, Rebecca Johnson, and Brandon M. Stewart. 2021. "What Is Your Estimand? Defining the Target Quantity Connects Statistical Evidence to Theory." *American Sociological Review* 86(3): 532–65.

Lynch, Scott M., and Emma Zang. 2022. "Bayesian Multistate Life Table Methods for Large and Complex State Spaces: Development and Illustration of a New Method." *Sociological Methodology* 52(2): 254–86.

Molloy, Raven, Christopher Smith, and Abigail K. Wozniak. 2024. "Changing Stability in U.S. Employment Relationships: A Tale of Two Tails." *Journal of Human Resources* 59(1): 35–69.

Murphy, Michael. 2017. "Demographic Determinants of Population Aging in Europe Since 1850." *Population and Development Review* 43(2): 257–83.

Neumark, David, ed. 2000. *On the Job: Is Long-Term Employment a Thing of the Past?* New York: Russell Sage Foundation.

Neumark, David, Daniel Polsky, and David Hansen. 1999. "Has Job Stability Declined Yet? New Evidence for the 1990s." *Journal of Labor Economics* 17(S4): S29–S64.

Oppenheimer, Victoria K. 1988. "A Theory of Marriage Timing." *American Journal of Sociology* 94(3): 563–91.

O'Reilly III, C.A., Caldwell, D. F. and Barnett, W. P. 1989. "Work Group Demography, Social Integration, and Turnover." *Administrative Science Quarterly* 34(1): 21-37.

Paxson, Christina H., and Nachum Sicherman. 1996. "The Dynamics of Dual Job Holding and Job Mobility." *Journal of Labor Economics* 14(3): 357–93.

Preston, Samuel H. 1987. "Estimation of Certain Measures in Family Demography Based Upon Generalized Stable Population Relations." In *Family Demography: Methods and Their Application*, edited by John Bongaarts. Cambridge: Cambridge University Press.

Preston, Samuel H., and Neil G. Bennett. 1983. "A Census-Based Method for Estimating Adult Mortality." *Population Studies* 37(1): 91–104.

Preston, Samuel H., and Ansley J. Coale. 1986. "Age Intervals and Time Intervals: Reply to Kim." *Demography* 23(3): 463–65.

Preston, Samuel H., Patrick Heuveline, and Michel Guillot. 2001. *Demography: Measuring and Modeling Population Processes*. Oxford: Blackwell Publishers.

Pries, Michael J., and Richard Rogerson. 2022. "Declining Worker Turnover: The Role of Short-duration Employment Spells." *American Economic Journal: Macroeconomics* 14(1): 260–300.

Roberts, Anthony, and Roy Kwon. 2017. "Finance, Inequality and the Varieties of Capitalism in Post-Industrial Democracies." *Socio-Economic Review* 15(3): 511–38.

Schneider, David, Kristen Harknett, and Matthew Stimpson. 2018. "What Explains the Decline in First Marriage in the United States? Evidence from the Panel Study of Income Dynamics, 1969 to 2013." *Journal of Marriage and Family* 80(4): 791–811.

Silcock, Herbert. 1954. "The Phenomenon of Labour Turnover." *Journal of the Royal Statistical Society. Series A (General)* 117(4): 429–40.

St-Denis, Xavier. 2021. "The Changing Importance of Lifetime Jobs in the United Kingdom." *International Labour Review* 160(2): 243–69.

St-Denis, Xavier, and Matissa Hollister. 2023. "Are All the Stable Jobs Gone? The Transformation of the Worker–Firm Relationship and Trends in Job Tenure Duration and Separations in Canada, 1976–2015." *Work, Employment and Society*. First published online February 1, 2023. https://doi.org/10.1177/09500170221146916.

Stewman, Shelby. 1988. "Organizational Demography." *Annual Review of Sociology* 14(1): 173–202.

Stone, Katherine V. W. 2013. "The Decline in the Standard Employment Contract: A Review of the Evidence." In *Rethinking Workplace Regulation: Beyond the Standard Contract of Employment*, edited by Katherine V. W. Stone and Harry Arthurs, 366–404. New York: Russell Sage Foundation.

Stupp, P. W. 1995. "Estimates of Net Migration by Age at Migration from Pairs of Enumerations of the Foreign Born: United States, 1880–1930." *Genus* 51(3–4): 229–51.

Swinnerton, Kenneth A., and Howard Wial. 1995. "Is Job Stability Declining in the US Economy?" *ILR Review* 48(2): 293–304.

———. 1996. "Is Job Stability Declining in the US Economy? Reply to Diebold, Neumark, and Polsky." *ILR Review* 49(2): 352–55.

Tamborini, Christopher R., and Andrés Villarreal. 2021. "Immigrants' Employment Stability Over the Great Recession and Its Aftermath." *Demography* 58(5): 1867–95.

Ureta, Manuelita. 1992. "The Importance of Lifetime Jobs in the US Economy, Revisited." *The American Economic Review* 82(1): 322–35.

Wang, Xuening. 2021. "US Permanent Residency, Job Mobility, and Earnings." *Journal of Labor Economics* 39(3): 639–71.

Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.

———. 1996. *When Work Disappears: The World of the New Urban Poor*. New York: Vintage.

Witt, Michael A. and Gregory Jackson. 2016. "Varieties of Capitalism and Institutional Comparative Advantage: A Test and Reinterpretation." *Journal of International Business Studies* 47(7): 778–806.

Wrigley-Field, Elizabeth, and Nathan Seltzer. 2020. "Unequally Insecure: Rising Black/White Disparities in Job Displacement, 1981–2017, Version 2." Unpublished manuscript, University of Minnesota. Accessed April 20, 2024. https://assets.ipums.org/_files/mpc/wp2019-06.v2.pdf.