



**university of
 groningen**

faculty of spatial sciences

**Regional Dynamics of Biracial Identity in the United States: Education,
Income, and Cultural Influences**

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Bachelor's Project

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1. Summary

Biraciality is a relatively new concept in the United States, and newer in the population Census and American Community Survey. As population censuses are subjective to the applicant, the way that some individuals identify themselves may be different from their actual objective identity. Rationale for this can include cultural pressures, political reasons, and regional differences. Simple linear regressions are used to complete moderation and mediation analyses to ascertain the impact of education, income, and region on the proportion of self-reported Black biracial people in the United States's American Community Survey. A case study comparing California and Georgia exposes regional differences in these variables.

The main research question is as follows: "How do region and education mediate the relationship between income and multiracial identity in the United States, as observed through 5-year estimates in the American Community Survey?"

I used quantitative statistical methods, in particular moderation and mediation analysis. Statistical data is from 5 year estimates in the American Community Survey, dating from 2017-2022. At the national level, higher levels of educational attainment in a county are associated with lower levels of Black biraciality. However, when controlled for interaction, Black biraciality decreases with an increase in Black Americans in a county. At the regional level, differences persist among states with higher proportions of Black Americans than others. In California, increases in Black biraciality are correlated with higher levels of Black Americans in a county when controlling for income, age, and educational attainment. In Georgia, interaction effects between proportion of Black Americans and income are significant, in addition to a negative significant relationship between Black Americans and Black biraciality. Inferring from this, in a state such as Georgia with a high Black American proportion, biraciality is less common in counties with higher proportions of Black Americans.

More qualitative research should be performed to analyze individual differences in self-reporting sensitive topics like racial identity. Quantitative macroanalyses such as this are limited in their explanatory power, and a sample-based analysis can help to find individual motives for reporting other than their objective identity.

2. Introduction

Despite the increasing multiracial population, there is a lack of understanding about how various factors such as region and education influence their income. This research aims to fill this gap by analyzing data from the ACS. Multiracial is the fastest growing racial group in the United States (Jones et. al, 2020). Coming to terms with which box to tick can be difficult for those with diverse ethnic and racial backgrounds. Likely, growth in numbers of multiracial

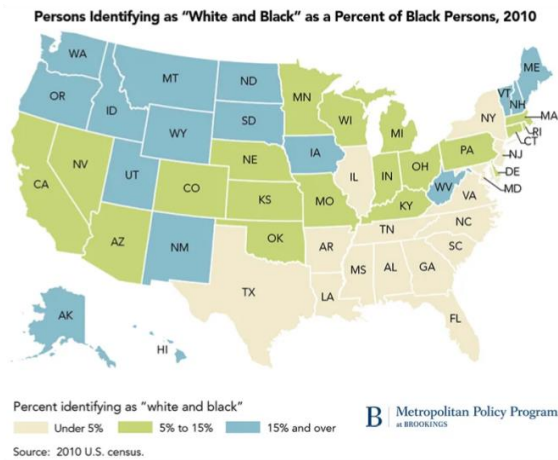


Figure 1 (Brookings, 2015)

people in the United States is not behind this, but increased cultural and racial awareness. The Census and ACS have important roles in determining congressional districts and government funding allocations, so the accuracy of these population measurements can have lasting effects on social programs (Berry-James et. al, 2020).

According to this map using 2010 Census Data, many of the states with a Jim Crow and segregationist past have a lower percentage of multiracial as a percentage of the black population. My research will attempt to discern what factors affect the accuracy of responses to census and other identity-related surveys.

The main research question is as follows: ‘How do region and education mediate the relationship between income and multiracial identity in the United States, as observed through 5-year estimates in the American Community Survey?’. Furthermore, subquestions will help to provide more detail and nuance to the main research question.

- How does educational attainment affect income?
- Are there larger income differences between ethnicities than those with a multiracial identity?
- Which other factors within the multiracial subset account for differences in income?

First, the theoretical framework will be laid out to outline possible social theory explanations for identity formation. In addition, a brief history of multiracial status in society will be given, in addition to academic theory carrying the impacts of these to the present day.

Then, methodology, stemming from the use of 2022 5-year estimates from the American Community Survey, and an explanation of the variables and why I selected them to answer the research question.

I will give the statistical results from my moderation and mediation analyses, and discuss them in the context of the theoretical framework. Also, I will discuss the limitations of conclusions taken from the data set, as the data is generalized to make an estimate for the United States population, rather than an individual level.

I will conclude with recommendations for further research, especially a recommendation to investigate this question using a smaller random sample.

3. Theoretical Framework

Critical race theory, neoconservative perspectives, and sociological theories on identity and socioeconomic status provide a foundation for this research. These theories help explain the complex interactions between race, identity, and socioeconomic outcomes. Due to the census and American Community Survey deciding congressional districts, people have seen their identity as a weapon to bolster Black demographics in certain districts (Atkin and Minniear, 2023). Privilege and concerns of their own connections to oppressive countries and races was mentioned in their decision-making. In a separate study of the 1990 US Census, the last before the multiracial category was introduced, Holloway et. al (2009) found that multiracial children were more likely to be marked as white if they lived in white neighborhoods. Therefore, the minority parent's identity was less likely to be an identifier of the child. In the late 1990s, House Republicans were supporting multiculturalism as a way to eliminate racial divisiveness and push toward the erasure of racial identity itself (Thompson, 2011). Introducing an option to choose more than one race in the census, would, in their eyes, work to create so many 'boxes' to fit people into that race would become obsolete.

This is ironic, as the essence of critical race theory is to destroy race-based power hierarchies. Critical race theory is the idea that racial oppression must be included in any conversation about racial dynamics, and that white supremacy and racism are deeply ingrained in society by means of this oppression (Taylor, 2000). Neo-conservatives of the 90s are also theoretically aligned with this idea, as they believe that race should be eliminated from the power hierarchy conversation. However, the difference is in racial awareness, as critical race theorists argue for such intense awareness of racial power dynamics as to raise awareness to them embedded in society, and neoconservatives argue that these racial power dynamics can be eliminated through the elimination of race itself.

Thomas Sowell identified three different types of Black Americans and the differences between them in his influential essay 'Ethnicity: Three Black Histories' (1979). He argues that the slavery background can explain regional differences, as conditions of Southern slavery

differed from West Indian (Caribbean) (Sowell, 1979). According to Sowell (1979), Southern slavery had lower levels of self-reliance for food and other living standards compared to West Indian plantations, something that Sowell argues was transmitted through culture after emancipation. At that point in time, people of West Indian descent had almost double the income of 'American Negroes', despite having similar education (Sowell, 1979). In a further study, African-Caribbeans described their transition to White-majority areas as racialized, as they were externally perceived as Black, instead of their own identity as their ethnicity (Jones and Erving, 2015). The consequences of this internal struggle over identity may lead to discrepancies when they identify themselves on government documents, as their internal and external identities clash.

In the United Kingdom, ethnicity data is collected in a similar fashion to racial data in the United States. Kesler and Schwartzman (2015) found that children of mixed-ethnicity parents in higher 'SES' or socioeconomic status in the UK were more likely to identify with their minority status. Their hypothesis was that in higher-SES contexts, the "relative symbolic or material rewards of minority identification are higher" (Kesler and Schwartzman, 2015). Diversity, equity, and inclusion initiatives are often top-down at a corporate level, meaning that higher-income corporate positions, like those occupied by those with a higher 'SES', would give career advantages to those with a minority status.

A traditional individualistic lens can be applied to suburban contexts with relative accuracy, as the majority of all Americans live in suburban dwellings (Frey, 2018). Rastogi (2021) found that as diversity increased in suburban areas, the median household income increased for all races except for Asians. For Black Americans, household income rises by about 50% if the area that they live in becomes more diverse, which challenges the critical race theory notion of oppression by those in power is a strong determinant of success for marginalized groups.

Critical race theory may be better equipped to explain disparities in funding in urban contexts. Chicago is historically a very ethnically diverse and ethnically divided city. Smith and Stovall (2008) examine how private gentrification of a poor Black neighborhood in Chicago changed how the city invested and renovated the area's high school. A neoliberal model would conclude that this educational and housing investment into a community benefits all, however critical race theory examines how the underprivileged are impacted. In this case, development raises rents overall, hurting long-time residents and preventing them from reaping the benefits of the added public investment into their community.

Historically, it is important to mention the 'one-drop rule', which was a term used to denote the 'tarnished blood' of bi and multiracial children if even 'one drop' of African blood was in their veins. The term for this is hypodescence, where mixed-origin people are classified based on their lower-status parental ancestry (Iverson et. al, 2022).

There is a plethora of qualitative research on multi-racial people in the United States. One study found significant regional differences in the way people identify themselves, with no respondent in the study in the 'East' (as defined in the study) identifying themselves as Black,

and no respondent in the ‘South’ identifying themselves as White (Brunsma, 2006). Middle-Eastern people also find it difficult to classify themselves into a racial or even Arabic classification in the United States, especially important in the perceptions of Americans post September 11th. Armenians and Syrian Christians found themselves similar in religion and culture to White Christian Americans, however efforts to assimilate were countered with intermarriage protest in the 20th century (Gualtieri, 2001). An ethnographic study found that less than half of Arabs under 40 do not agree with the ‘white’ classification, yet 79% of respondents have been assumed to be Muslim in their time living around the Washington D.C. area (Kayyali, 2017).

Conceptual Model

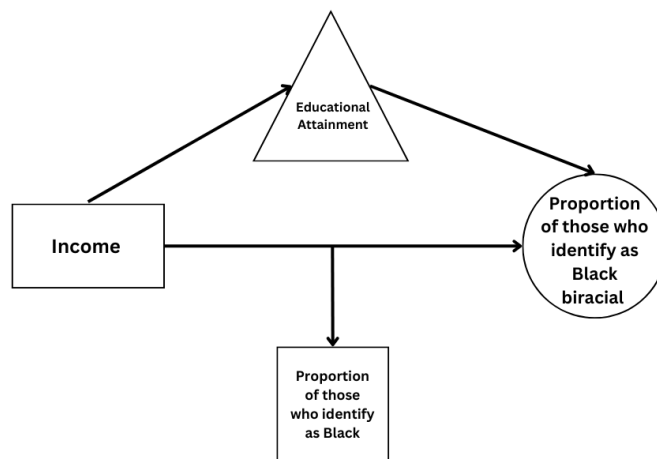


Figure 2

This conceptual model explains the relationship between income and proportion of those who identify as Black biracial, as mediated by education attainment, and moderated by proportion of those who identify as Black. This is based on Brunsma (2006)’s research, who

found significant regional differences in the proportion of biracial people who chose ‘White’ and ‘Black’ as a singular racial identity.

4. Methodology

I will be employing two different, but similar methods of statistical analysis, moderation and mediation analysis.

Mediation analysis is the test of an indirect effect of a third variable on an independent variable to dependent variable relationship. Full mediation involves the independent variable having a direct effect on the mediator, which then has a direct effect on the dependent variable (Jae Jung, 2021). This analysis will use the partial mediation model to test the indirect effect of M (mediator): percentage of people with a bachelor’s degree or higher in a state/ZIP code on X: median income and Y: percentage of multiracial people in a county/state.

Moderation analysis is similar, yet different in the causal effect of the third variable on the primary relationship. Moderators influence the direction or strength of the effect of an independent variable on a dependent variable. In this analysis, I will be testing how W (moderator): percentage of Black people in a state/ZIP code changes the direction or strength of the relationship between X: median income and Y: percentage of multiracial people in a state/ZIP code.

Three models will be employed to assess the relationship between income and multiracial identity. The first will be a simple linear regression with income as the independent and proportion of multiracial people in a state. The second will add the proportion of those over 25 years old with a Bachelor’s degree as an independent variable to the first model to ascertain the impact of education on self-identification. Unstandardized coefficients will be used in both to compare the mediation effect of education compared to the first model. The third model will add a new variable, the percentage of those identifying as Black American, income, and the interaction effect between income and the former with the proportion of multiracial people in a state as a dependent variable.

I will be assessing as Independent Variable:

- Median Income by State/County
- Median Age (control)

I will be assessing as the Dependent Variable:

- Proportion that identifies as Black Biracial (including Black and White, Black and American Indian, and Black and Some Other Race)

I will be assessing as Mediator

- Proportion of those within a county that have a Bachelor’s Degree or higher

I will be assessing as Moderator

- Proportion of Black Americans within a county

Data Sources

The American Community Survey is a yearly survey collected to influence government spending. Cases are separated by either individual address or by group quarters interview. The data is collected through internet, mail survey, or Computer Assisted Personal Interview (CAPI). Two sampling areas are designated: weighting areas and subcounty areas. The Survey collects select social, economic, housing, and demographic data, and has more information about a smaller sample. This is in contrast to the U.S. Census, which attempts to collect data from each member of the United States population, and only collects basic demographic information. Total addresses reached was 1,980,550, and total group quarters interviews were 124,846. Total number of households in the United States is about 123,600,000. Inherently this leaves the data open to response bias and concerns of validity and representativeness of the U.S. population. I will be using these variables to first discern if there is a significant difference between multiracial people and the general population in household income. Then, I will run tests to find significant differences in household income between the racial combinations within the two or more races group. I also intend to test the connection between multiracial income and educational attainment, to put the theories of Thomas Sowell to test and attempt to discern the most important factor in income: culture, discrimination, or selection.

The dataset at the end of my research will be quite large, and I intend to store data on my X-Drive of the UG Network and the UG Google Drive. I also intend to store the results of the analysis on these drives as well, including SPSS and GIS data. I will only be sharing my data with the University of Groningen. I will not be collecting personal data. The American Community Survey is a random sample, and no responses can be attributed back to a single person as the final data is an estimate of the American population gathered from the sample taken.

To analyze the data, I will be using SPSS to run various statistical tests on the data. Because the standard error is known, z-tests may be used for simple difference testing. I intend to use one-way ANOVA tests to compare the various subgroups within the two or more races category.

If differences are deemed to be significant, then further literature and statistical testing will be done to attempt to determine the reasoning behind it.

Data Collection and Privacy Commitments

The U.S. Census Bureau has outlined specific promises to ensure ethical data collection and usage:

Necessity: Only necessary information is collected and used to produce relevant statistics about the population (U.S. Census Bureau, 2021).

Openness: The purpose and uses of every survey or census are communicated before data collection (U.S. Census Bureau, 2021).

Respectful Treatment: Data collection is designed to minimize respondent effort and time, using legal, ethical, and professional practices. Sensitive information is collected only when it benefits the public good and adheres to federal protections. (U.S. Census Bureau, 2021).

Confidentiality: All personnel with access to data are sworn to lifelong confidentiality, and robust measures are employed to protect information. (U.S. Census Bureau, 2021).

Data Protection in the U.S.

Unlike the European Union, the U.S. lacks uniform data protection laws, necessitating individual due diligence by data collectors. For this research, 5-year aggregate data estimates will be used, minimizing the risk of identifiable personal data exposure. While the American Community Survey includes individual-level microdata, access to this data requires an application process and is not publicly available.

5. Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,010	2	,005	77,980	<,001 ^b
	Residual	,202	3140	,000		
	Total	,212	3142			

a. Dependent Variable: biracialblackprop

b. Predictors: (Constant), shrtincome, medianage

Figure 3

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,021	,001		16,262	<,001
	medianage	,000	,000	-,206	-11,799	<,001
	shrtincome	2,309E-5	,000	,054	3,115	,002

a. Dependent Variable: biracialblackprop

Figure 4

The first model is evaluating the effects of income on the proportion of people who identify as Black and some other race at the county level in the United States (excluding Puerto Rico and including the District of Columbia). Median age of each county is included in the analysis, as there is a hypothesized age effect on those who use a more complicated classification than was used in the past. As income is reduced by 1000, the interpretation of this result of 2,309E-5 is for every increase of a thousand dollar median household income in a county, the proportion of those in a county identifying as Black and Some Other Race increases by 0.000002309 (0.0002309%). It may seem miniscule, however the result was highly significant at a p-value of 0.05. This suggests that socioeconomic factors, such as income and education, play a crucial role in the demographic composition of biracial populations.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,012	3	,004	65,611	<,001 ^b
	Residual	,199	3139	,000		
	Total	,212	3142			

a. Dependent Variable: biracialblackprop

b. Predictors: (Constant), propbachorhigher, medianage, shrtincome

Figure 5**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,024	,001		17,451	<,001
	medianage	,000	,000	-,224	-12,715	<,001
	shrtincome	-3,394E-5	,000	-,080	-2,892	,004
	propbachorhigher	,020	,003	,172	6,244	<,001

a. Dependent Variable: biracialblackprop

Figure 6

The second model must be viewed in relation to the first model, as the only difference is including the proportion of those with a Bachelor's degree or higher over the age of 25 in each county. As with the first, no distinction is made at the state level. This mediation analysis was also extremely significant at a p-value of 0.05. The effect of income on the proportion of Black biracial people has been reversed but still extremely significant ($p = 0.004$). With each increase of 1000 dollars in median household income, the proportion of Black biracial people decreases by 0.00003394 or 0.003394%.

Distinctions between the first and second are needed to conduct the mediation analysis. The significant relationship between income and Black biracial persists, but the sign changed to negative. This means that in counties with similar educational attainment, higher income is associated with a lower percentage of Black biracial people. Furthermore, the inclusion of educational attainment caused an increase in the sum of squares of the model, indicating that education explains additional variance in the proportion of Black biracial people. In order to fully interpret mediation analyses, direct and indirect effects of independent variables on the dependent variable must be ascertained. Both the direct effect of income and the indirect effect of educational attainment are significant. This indicates that educational attainment partially mediates the relationship between household income and the biracial Black population, highlighting the importance of educational opportunities in shaping demographic patterns.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,036	4	,009	159,010	<,001 ^b
	Residual	,176	3138	,000		
	Total	,212	3142			

a. Dependent Variable: biracialblackprop

b. Predictors: (Constant), medianage, shrtincome, interactionblackxincome, blackprop

Figure 7

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,018	,001		13,438	<,001
	shrtincome	-1,071E-5	,000	-,025	-1,244	,214
	interactionblackxincome	,001	,000	,838	13,537	<,001
	blackprop	-,031	,004	-,546	-8,590	<,001
	medianage	,000	,000	-,140	-8,414	<,001

a. Dependent Variable: biracialblackprop

Figure 8

The final model is a moderation analysis, assessing whether the relationship between income and the proportion of Black biracial people in a county is dependent on the presence of a high proportion of Black Americans.

The interaction term is significant, which indicates that the effect of income on the proportion of Black biracial people in a county is dependent on the proportion of Black Americans. However, the effect of income is now insignificant at the $p = 0.05$ level, indicating that when accounting for the interaction effect, income is not a strong predictor of the proportion of Black biracial people in a county.

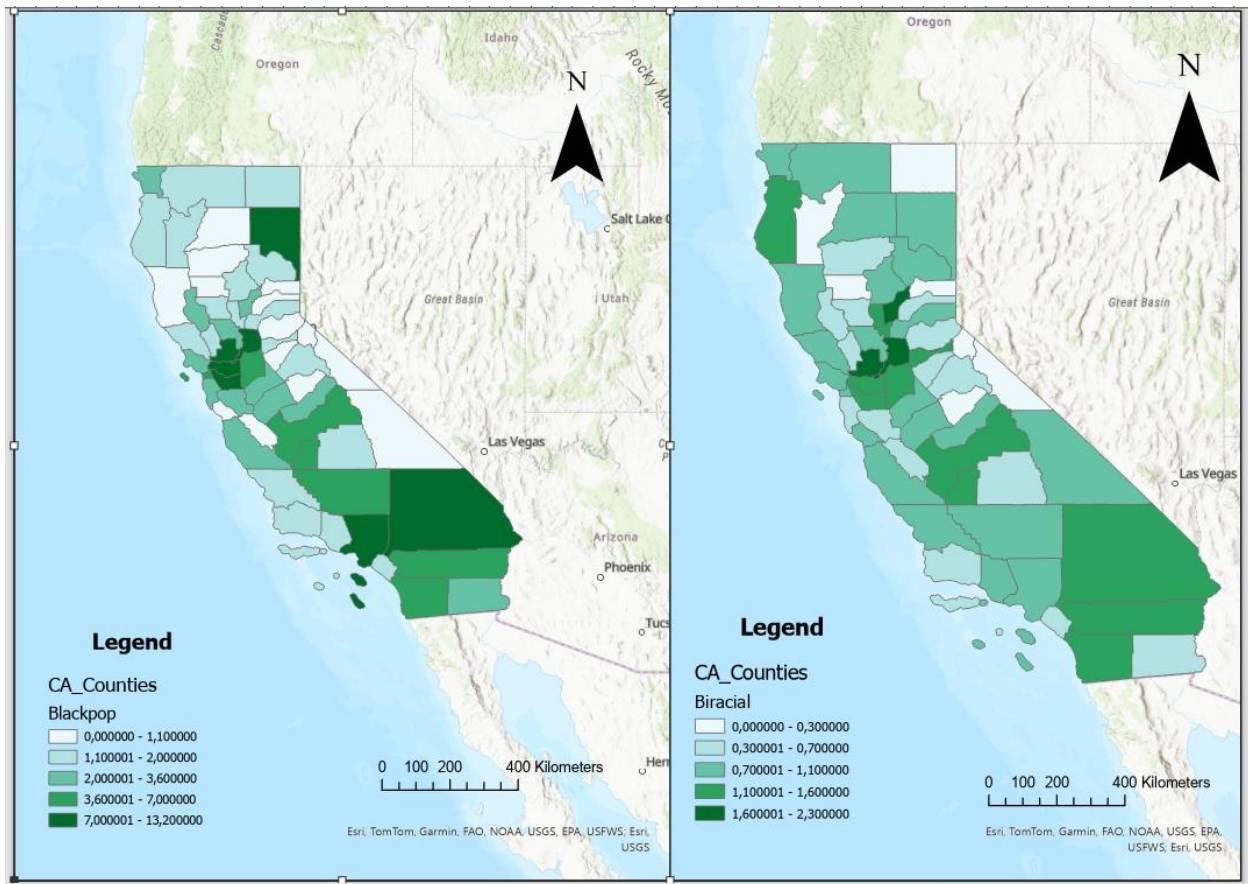
The relationship between the proportion of Black Americans and Black biracial people is significant and negative, which indicates that, when controlling for age and income, the proportion of Black biracial people decreases when there is a higher proportion of Black Americans present.

Overall, this model indicates that the relationship between income and the proportion of Black biracial people is moderated by the proportion of Black Americans on the county level. As the proportion of Black Americans increases, the effect changes, with higher income levels increasing the effect of income on the proportion of Black biracial people present. This suggests that in counties with higher proportions of Black Americans, increases in median household income are more strongly associated with increases in the proportion of Black biracial individuals.

The findings from these three models provide a nuanced understanding of the factors influencing the proportion of Black biracial individuals in counties. Socioeconomic factors such as median household income and educational attainment are critical, both independently and through their interplay. Additionally, the demographic context, particularly the proportion of Black Americans, significantly moderates these relationships. These insights underscore the complexity of demographic dynamics and the importance of considering multiple interacting factors in demographic research.

Case Study: California

California is the most populous and second most diverse state in the United States, which leads to extreme differences between ethnic, socioeconomic, and racial groups in the state (Hubbard, 2021). Running similar analyses as above, the case for the impact of educational attainment and Black Americans can be nuanced among the vast differences between inland and rural counties in California.



Map 1: Percentage of Black vs. Black Biracial per California County

This map shows less of a correlation between the two at high proportions of Black Americans, however less diverse counties tend to also have lower proportions of Black biracial people. This is something that will be confirmed in the tests below.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,000	2	,000	,813	,449 ^b
	Residual	,001	54	,000		
	Total	,001	56			

a. Dependent Variable: blackbiracial

b. Predictors: (Constant), shrtincome, medianage

Figure 9

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,009	,004		1,971	,054
	medianage	-5,931E-5	,000	-,083	-,615	,541
	shrtincome	2,278E-5	,000	,150	1,122	,267

a. Dependent Variable: blackbiracial

Figure 10

In contrast to the findings in the United States county analysis, the California result is insignificant. Neither age nor income are good predictors of the proportion of Black biracial people in California, pointing to other variables that may have a relationship.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,000	3	,000	1,504	,224 ^b
	Residual	,001	53	,000		
	Total	,001	56			

a. Dependent Variable: blackbiracial

b. Predictors: (Constant), eduattainment, medianage, shrtincome

Figure 11**Coefficients^a**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,007	,004		1,697	,096
	medianage	-7,055E-5	,000	-,098	-,742	,461
	shrtincome	9,072E-5	,000	,599	2,013	,049
	eduattainment	-,024	,015	-,501	-1,682	,098

a. Dependent Variable: blackbiracial

Figure 12

This model is also insignificant, however, the income variable is now significant ($p = 0.049$) at the $p = 0.05$ and educational attainment is significant ($p = 0.098$) at a $p = 0.10$ as predictors of the proportion of Black biracial people in the county. California has a high educational attainment rate, yet also has a wide range of educational attainment ranging from 9% to 45%. This model points to a negative, significant relationship between educational attainment and Black biraciality, indicating that lower levels of diversity in California are correlated with

higher educational attainment. Income is more complicated, as the limited, yet significant effect shows a disconnect between education and relative county income. This points to higher incomes not necessarily being correlated to higher education in counties in California, when age is controlled.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,001	4	,000	16,734	<,001 ^b
	Residual	,000	52	,000		
	Total	,001	56			

a. Dependent Variable: blackbiracial

b. Predictors: (Constant), shrtincome, medianage, blackprop, interactionblackincome

Figure 13

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,001	,004		,365	,716
	medianage	3,728E-6	,000	,005	,056	,956
	interactionblackincome	-,001	,001	-,623	-1,445	,154
	blackprop	,199	,062	1,293	3,214	,002
	shrtincome	3,581E-5	,000	,236	1,574	,122

a. Dependent Variable: blackbiracial

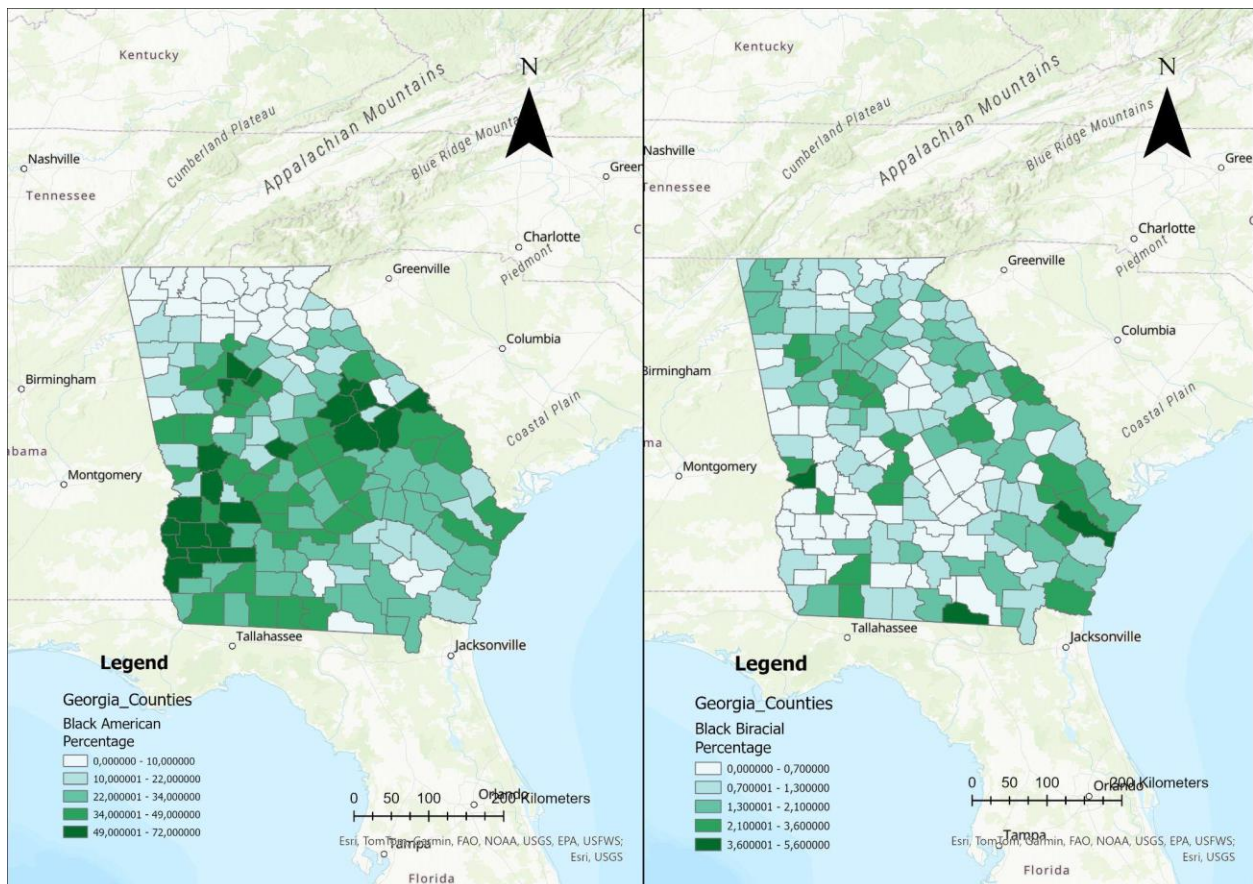
Figure 14

The final moderation analysis is significant, but only the proportion of Black Americans in a county is significant. This means that the best predictor out of the variables above is Black Americans in a county. Considering the national model, this likely means that diversity between counties in California is high, as Black and Black biracial classifications are not entirely independent of each other.

The interaction effect between the proportion of Black Americans and income is insignificant, indicating that the amount of Black Americans does not moderate the relationship between income and Black biraciality in a county. Whilst this does not align with nationwide calculations, it does with Figure 1 in the introduction, as a higher percentage of Black persons identified as ‘White and Black’ in California than in the Southeast. In California, higher proportions of Black people are correlated with higher levels of biraciality within the Black community.

Case Study: Georgia

Georgia is tied for 8th on the most racially diverse states, but has a Black American population of 30.7%, compared with 7.0% of California. Its history of segregation and Atlanta's status as a capital of African-American culture changes the way Black Americans interact with other racial and ethnic groups.



Map 2: Percentage of Black American vs Black Biracial in Georgia

In contrast to California, this map shows a stark contrast in counties with a relatively high proportion of Black Americans to counties with a relatively high proportion of Black biracial people. There are several counties in the map that have a majority of Black Americans, however, they have under 0,7% Black biracial. The below statistical tests explain the relationship between this interaction. Georgia also has a greater percentage of Black Americans than California by a significant margin, with the highest being 72% in Hancock County, compared to just 13.2% in Solano County, California.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,002	2	,001	17,020	<,001 ^b
	Residual	,011	156	,000		
	Total	,013	158			

a. Dependent Variable: blackbiracial

b. Predictors: (Constant), medianage, income

Figure 15

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,043	,006		6,921	<,001
	income	1,805E-5	,000	,035	,476	,635
	medianage	-,001	,000	-,420	-5,792	<,001

a. Dependent Variable: blackbiracial

Figure 16

This model is significant, however age is the main predictor of Black biraciality in Georgia. Since some counties in Georgia have a high proportion of middle-class Black Americans, and many have a high proportion of lower-class White people, income is not a good predictor of the proportion of Black biraciality in the state.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,002	3	,001	11,314	<,001 ^b
	Residual	,011	155	,000		
	Total	,013	158			

a. Dependent Variable: blackbiracial

b. Predictors: (Constant), Educationalattainment, medianage, income

Figure 17

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,043	,006		6,788	<,001
	income	-1,317E-7	,000	,000	-,002	,998
	medianage	-,001	,000	-,420	-5,774	<,001
	Educationalattainment	,006	,019	,042	,314	,754

a. Dependent Variable: blackbiracial

Figure 18

As in the last model, the model is significant, indicating that the variables present do explain the variance of Black biraciality between counties. However, age seems to be the largest predictor, as as age increases, the proportion of Black biracial people in a county decreases. Because both the direct effect of income on Black biraciality and the indirect effect of educational attainment on Black biraciality are both insignificant, educational attainment does not mediate the relationship. This is not consistent with the national analysis, where higher levels of education and lower levels of income correlate with higher levels of Black biraciality. Future research might explore other potential mediators or moderators that could influence this relationship to better understand the dynamics at play.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,003	4	,001	9,795	<,001 ^b
	Residual	,011	154	,000		
	Total	,013	158			

a. Dependent Variable: blackbiracial

b. Predictors: (Constant), interactionblackandincome, income, medianage, Blackprop

Figure 19

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,046	,007		6,296	<,001
	income	-7,182E-5	,000	-,138	-1,096	,275
	medianage	-,001	,000	-,393	-5,371	<,001
	Blackprop	-,027	,016	-,521	-1,726	,086
	interactionblackandincome	,000	,000	,558	1,995	,048

a. Dependent Variable: blackbiracial

Figure 20

This model is significant, and all variables except for income are also significant, meaning age, the proportion of Black Americans in a county, and the interaction effect of Black Americans and income are good predictors of Black biraciality. As from the previous models, income alone does not significantly predict the proportion of Black biracial individuals in Georgia. However, the proportion of Black Americans does have a negative effect on the proportion of Black biracial people. The interaction effect is also significant, indicating that when the proportion of Black individuals is low, the effect of income on Black biraciality might be weaker or even negative. When the proportion of Black individuals is high, the effect of income on Black biraciality becomes stronger and positive.

In the state of Georgia, the relationship between income and Black biraciality is moderated by the proportion of Black individuals in a county. The interaction term is significant, indicating that as the proportion of Black individuals increases, the influence of income on the proportion of Black biracial individuals changes. This highlights the importance of considering demographic context when examining the socioeconomic factors influencing racial and ethnic identities. Future research should further explore how these dynamics vary across different regions and populations to better understand the complex interactions between socioeconomic factors and racial identity.

The first model evaluated the relationship between income and the proportion of individuals identifying as Black and some other race, with median age as a control variable. The results revealed that for every \$1,000 increase in median household income, the proportion of Black biracial individuals increased by 0.0002309% ($p < 0.05$). This suggests that income is a significant socioeconomic factor influencing the demographic composition of biracial populations, consistent with the findings of Kesler and Schwartzman (2015) that higher socioeconomic status can encourage minority identification due to the relative rewards associated with it.

The second model introduced educational attainment (the proportion of individuals with a Bachelor's degree or higher) to assess its mediating effect on the relationship between income and Black biraciality. This model showed a reversal in the effect of income: higher income was

now associated with a 0.003394% decrease in the proportion of Black biracial individuals per \$1,000 increase in income ($p = 0.004$). The inclusion of educational attainment increased the explanatory power of the model, suggesting that education partially mediates this relationship. Both the direct effect of income and the indirect effect of education were significant, emphasizing the role of educational opportunities in shaping demographic patterns, as per critical race theory's emphasis on structural factors influencing racial dynamics (Taylor, 2000).

The third model examined whether the relationship between income and the proportion of Black biracial individuals was moderated by the proportion of Black Americans in a county. The interaction term was significant ($p = 0.048$), indicating that the impact of income on Black biraciality depends on the demographic context. In counties with a higher proportion of Black individuals, the positive effect of income on Black biraciality was more pronounced. In contrast, in counties with a lower proportion of Black individuals, the effect of income was weaker or even negative. This finding aligns with Rastogi (2021) who found that diversity in suburban areas impacts median household income differently for various racial groups, challenging critical race theory's assertion about oppression being a strong determinant of success for marginalized groups.

The analysis of these three models provides a comprehensive understanding of the factors influencing the proportion of Black biracial individuals in U.S. counties. Income emerged as a crucial factor, with its effects being modulated by educational attainment and regional demographic contexts. Educational attainment partially mediates the relationship between income and Black biraciality, highlighting the importance of education in demographic composition. However, in the case studies, regional differences are shown in the impact of education on Black biraciality, underscoring Sowell's (1979) observations of similar educational attainment yet differences in income among Black Americans. Additionally, the regional demographic context, particularly the proportion of Black Americans in a county, significantly moderates the relationship between income and Black biraciality. These findings underscore the complexity of demographic dynamics and the necessity of considering multiple interacting factors in demographic research. They also reflect the tensions between critical race theory and neoconservative perspectives regarding the roles of race and socioeconomic status in shaping identity and outcomes.

California

In California, a separate analysis indicated that neither age nor income were significant predictors of Black biraciality. However, educational attainment was a significant predictor, with higher education levels associated with lower proportions of Black biracial individuals ($p = 0.098$). The moderation analysis revealed that the proportion of Black Americans in a county was the best predictor of Black biraciality. This aligns with national trends, indicating that higher proportions of Black individuals correlate with higher levels of biraciality within the Black community. The findings in California resonate with the hypothesis by Kesler and Schwartzman

(2015) that higher socioeconomic status contexts encourage minority identification due to the relative symbolic or material rewards.

Georgia

In Georgia, the analysis highlighted age as the most significant predictor of Black biraciality. Higher age was associated with lower proportions of Black biracial individuals. Unlike the national model, educational attainment did not mediate the relationship between income and Black biraciality in Georgia. The final moderation analysis confirmed that the proportion of Black Americans significantly moderated the relationship between income and Black biraciality. In counties with higher proportions of Black individuals, higher income levels were more strongly associated with increases in the proportion of Black biracial individuals. This underscores the importance of considering regional demographic contexts when examining the socioeconomic factors influencing racial and ethnic identities. These findings reflect the historical and social complexities outlined by critical race theory, such as the persistent impact of racial power dynamics and the socio-historical context of racial identity formation (Taylor, 2000; Iverson et al., 2022).

6. Conclusion

The case studies of California and Georgia reveal important regional variations in the factors influencing Black biraciality. In California, educational attainment emerged as a significant predictor, while in Georgia, age was the dominant factor. The proportion of Black Americans played a crucial role in both states, aligning with national trends. These regional differences highlight the necessity of tailoring demographic analyses to specific contexts to capture the complex interactions between socioeconomic factors and racial identity. The findings from these case studies emphasize the importance of considering regional diversity and demographic contexts in demographic research to gain a more nuanced understanding of racial and ethnic identities, reflecting the theoretical frameworks of critical race theory and sociological theories on identity and socioeconomic status.

The main strength of this study is its ability to compare regional differences between states and assess national trends. The main effects that can be observed at the county level can be generally attributed to environmental differences, as the size of counties in the United States are small enough to observe the possible municipal discrimination and ecological fallacies present. The main weakness is the lack of individualized data, as 5-year estimates are used in place of an individualized sample. The American Community Survey is also assessed at the household level, so there are possible generalized data entries for diverse individuals in the same household based upon who is responding to the survey. Furthermore, while 5-year estimates may increase accuracy over sampling errors at a yearly scale, micro trends over the period 2018-2022 can be ignored, such as pandemic-related demographic changes. Finally, the risk of ecological fallacy of the American Community Survey is quite high, as it is estimating the characteristics of over 330

million people (Hsieh, 2017). Microtrends within counties can be missed, especially large urban counties like L.A. County in California and Fulton County, Georgia.

Further research is needed to find out how characteristics of multiracial people differ from their parents' single race backgrounds. In an era of critical race theory and deepening inequalities in the United States, the nuances in success rates of multiracial people compared to single race people may illuminate true impacts of racism, education, and environment. Qualitative research in the field of multiracial experiences would accomplish this, in addition to research on how those multiracial people self-identify when asked. An intersectional approach may best explain these discrepancies and help bridge achievement gaps.

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