

Multiple Constructs of Racial Identity among Multiracial Adults and Associations with Body Mass Index: An Intersectional Approach

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ABSTRACT

Intersectionality is a framework that originates in Black feminist scholarship and posits that social stratification forms a system of oppression, limiting opportunities for those with marginalized social statuses. Body mass index (BMI) is a widely used measure of metabolic health, with differences patterned intersectionally by race, ethnicity, gender, and education in the United States. However, studies of BMI patterns almost exclusively focus on single race adults, grouping individuals who identify as multiracial into single-race categories or into the “other” race category. We first hypothesize that multiracial adults are not homogeneous and there is large variability in BMI within this population. We further hypothesize that the dimension of racial identity used (i.e., racial self-identification versus racial category) for multiracial adults will result in differences in BMI variability. We address these hypotheses using the Behavioral Risk Factor Surveillance System (BRFSS) in the US (full sample of multiracial adults: 42,182) using a MAIHDA (Multilevel Analysis of Individual Heterogeneity and Discriminatory Accuracy) model. Social strata will include racial identity first defined as racial self-identification (12 multiracial categories). The second definition of racial identity is defined as racial category (AIAN, Asian, Black, NHPI, Other, White, No Preferred Single Race). The other strata components are Hispanic ethnicity (yes, no), gender (male, female), and education (<HS, HS or GED, Some College, College or higher). This study will help highlight potential differences and similarities in BMI among multiracial adults when considering other social determinants of health within an intersectionality framework.

INTRODUCTION

The multiracial population is considered the fastest growing population in the United States (US).¹ In 2020, the percentage of people who reported multiple races changed more than all other race categories, increasing from 2.9% of the population (9 million people) in 2010 to 10.2% of the population (33.8 million) in 2020.² Multiracial groups have social and political histories that may lead to distinct social perceptions and economic situations, with possible implications for health.³ These changes may demonstrate distinctive health patterns for multiracial individuals by the specific racial categories they identify with.^{4,5}

Multiracial individuals are often not accounted for in the dominant discourse of race. However, starting in 1997, allowance was made for inclusion of multiracial individuals into the broader US health profile and in extension national surveys.⁶ The option to select multiple races is becoming more common on many major health surveys as well as the US census. Beyond being able to be identified, the dimension of racial identity may differ across surveys. These dimensions may include how an individual self-identifies their race, how they are perceived by others, how they believe they are perceived by others, what they check among the limited options on the census or other surveys, their skin color and other aspects of racial appearance and racial ancestry.⁷ These dimensions influence one another but are not always the same. No single dimension is a person's 'true' or 'correct' race.

An approach taken in many surveys has been to ask multiracial people to select the race with which they most identify. The extent to which multi-racial people are similar or different in terms of health from others in these "preferred single race" categories has implications not only for understanding their health patterns, but can also influence our estimates of the health of the specific race groups. Both Udry & colleagues and Campbell & Eggerling-Boeck (2006) found that white-American Indian adolescents stand out relative to single-race whites in multiple mental health outcomes, smoking and drinking.^{8,9} These comparisons provide insight into disparities that might otherwise be overlooked if these groups were folded into one category.

Another approach has been to allow multi-racial people to indicate a multi-race identity. With this racial identity dimension, researchers have typically grouped these multiracial people into one group, called Other or Multiracial, which might also include people from very small race groups and people who refuse to answer. Some studies have reported health patterns for this Other race or multiracial group, but what the findings entail for multiracial people remains unclear; other studies have dropped this group from analysis altogether. Bratter examined differences in self-rated health among multiracial adults by both racial self-identification and racial category separately and found that multiracial adults self-rated health did not fit the single race category group they most preferred if asked to choose one category.¹⁰

Another body of work in health disparities is intersectionality. Intersectionality is a framework for analysis that originates in black feminist scholarship.^{11,12} Intersections between axes of identity and social process, such as female and black, are not intersections in the sense that two roads cross each other and continue on unaffected in their original directions.^{13,14} Rather, the points of intersection describe social positions that may entail unique advantages or disadvantages with potential relevance to a range of outcomes, including health. According to

intersectionality theory and identity theory, these aspects of social constructs cannot be fully understood if they are analyzed independently or additively.^{15, 16} Researchers in intersectionality work have begun to explore applying techniques such as Multilevel Analysis of Individual Heterogeneity and Discriminatory Accuracy (MAIHDA).^{17, 18} In brief, in a MAIHDA model, social categories (e.g., race, class, gender) are combined into mutually exclusive strata and each individual is nested within a single stratum; both second-order strata-level residuals and additive main effects of each social category are estimated. Most relevant, the MAIHDA considers the dimensions of social identity and positions as contexts rather than individual characteristics.

The aim of this study is to evaluate the intersectionality of BMI within multiracial adults and whether the type of racial dimension measured varies the contribution of intersectional social strata. We use data from Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative study with both detailed racial self-identification information (which multiple races individuals chose) and preferred single race category when asked to self-select into one racial category. These data provide a unique opportunity to quantify multiple dimensions of race within a heterogeneous multiracial population. We utilized the MAIHDA model to measure health inequalities in BMI within and between strata defined by the intersection of race, ethnicity, gender and education.

METHODS

Study population

The Behavioral Risk Factor Surveillance System (BRFSS) is designed to assess behavioral risk factors and preventive health practices relevant to chronic diseases, injuries and preventable infectious diseases in the adult population. BRFSS uses a multistage cluster design based on random-digit dialing to select a representative sample from each state's non-institutionalized civilian residents aged 18 years and older. We utilize information from the core component of the questionnaire. From 2001 to 2012, respondents had the option to select more than one race: "Which one or more of the following would you say is your race? Mark all that apply." We append the 3 most recent waves with this question (2010-12) together to ensure a large enough sample of multiracial adults. We exclude women who are currently pregnant and respondents living outside the 50 U.S. states. We further exclude respondents who selected a multiracial group with less than 250 cases in the sample (multiracial remaining sample $n=42,182$).

Body Mass Index

Using self-reported height and weight, we calculated a continuous measure of BMI (kg/m^2). Heights of seven feet or taller, weights of 700 pounds and heavier, and BMI values less than 10 kg/m^2 or greater than 75 kg/m^2 were considered biologically implausible and coded as missing. Obesity was defined as $\geq 30 \text{ kg/m}^2$ and used for descriptive purposes.

Racial Identity

Racial Self-Identification: We frame racial self-identification as the races you identify with when you are able to choose multiple options on a close-ended form. This is not totally overlapping

with racial identity because it still entails choosing from a restricted listed of options. The category options follow the OMB's "major race groups," and are not all encompassing. Racial self-identification includes twelve multiracial categories: (1) Asian-Native Hawaiian Pacific Islander(NHPI), (2) Asian-Other, (3) Black-American Indian/Alaska Native (AIAN), (4) Black-Asian, (5) Black-Other, (6) White-AIAN, (7) White-Asian, (8) White-Asian-NHPI, (9) White-Black, (10) White-Black-AIAN, (11) White-NHPI, (12) White-Other.

Racial Category: Racial category refers to the race that is checked on an official form or survey, such as a census or federal financial aid forms. It is typically measured with a close-ended single choice question. For those who selected two races or more, they were asked a follow-up question about which race they prefer if they had to choose and has the following response options: (1) AIAN, (2) Asian, (3) Black, (4) NHPI, (5) Other, (6) White, (7) No Preferred Single Race.

Social Strata Dimensions

We used four dimensions to construct the intersectional social strata – racial identity (either racial category or racial self-identification), Hispanic ethnicity, gender, age and education. These measures are explicitly conceptualized as proxies for social experiences within intersecting systems disadvantage. Hispanic ethnicity is based on the following question: "Are you Hispanic, Latino/a, or of Spanish origin?" and is a (1)yes, (0)no. Gender was self-reported (1) Men, (2) Women. Education was self-reported as the highest level of education attained and coded as (1) Less than High School (HS) diploma, (2) HS Diploma or GED, (3) Some college, (4) College Degree or higher.

We thus had two combinations for social strata dimensions. The first combination included racial self-identification, Hispanic ethnicity, gender and education resulting in 180 unique strata. ID values are five-digit codes, with each digit corresponding to one of the four axes of social construct. The first and second digit represents racial self-identification, the third Hispanic ethnicity, the fourth gender, the fifth education. For example, stratum 3012 represents Black-AIAN (racial self-identification = 3), non-Hispanic (Hispanic ethnicity = 0), males (gender=1), with a HS degree (education=2). We dropped 9 strata (n=17) due to a sample size smaller than 4. The second combination included the same components but replacing racial self-identification with racial category resulting in 112 unique strata and no strata were dropped due to sample size.

Statistical analyses

Intersectional MAIHDA null model is a two-level hierarchical model where individuals (level 1) are nested in intersectional social strata (level 2) and no fixed effects parameters are specified beyond the intercept. The number of strata included at level 2 is determined by the number of intersections considered in the model. To test our aims, we fit 2 models: Model 1- the null model is a model that has only the intercept and the random effects. In this model, the total degree of variability in predicted BMIs between strata is captured without adjusting for compositional effects. Another measure of between-stratum variance is given by the Variance Partition Coefficient (VPC), calculated as the between-stratum variance divided by the total variance. Model 2- adds the additive main effects for racial identity (either racial self-identification and racial category), Hispanic ethnicity, education, and gender. The stratum-level residual is now

interpreted as a unique “interaction effect” for each stratum. We run these two models twice, once with racial self-identification as the race dimension in the intersectional social strata and then with racial category. A commonly used statistics in MAIHDA analysis is the Proportional Change in Variance (PCV), which evaluates the amount of between-stratum variance that is “explained” by adding fixed parameters to the model. In Model 2, the PCV is a measure of variance between-strata that is explained by additive (as opposed to interaction) effects. We evaluated the MAIHDA models by both social strata combinations for linear BMI and odds of obesity. Fitting logistic regression versions of MAIHDA models is similar to the linear case with a few differences. Rather than modeling the mean value of BMI in each stratum, we estimate the probability of being in the obese range in each stratum. For simplicity, we will say the probability of being obese. Further modeling details can be found in Evans et al., tutorial.¹⁸ We also utilize the area under the receiver operating characteristic curve (AUC) statistic. The AUC measures the accuracy of knowing the intersectional stratum of an individual for discriminating individuals with obesity from individuals without obesity. Data management and analyses were conducted using STATA 19.

EXPECTED FINDINGS

Our expected findings include acknowledgement and utilization of multiple dimensions of race to evaluate health disparities within multiracial populations in the US. Furthermore, findings will highlight specific groups at high and low risk in terms of weight status.

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