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Self-Rated Health among Multiracial Young Adults in the United States: Findings from the Add Health study

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Abstract

Objective: The multiracial adult population is one of the fastest growing segments of the U.S. population, yet much remains to be learned about multiracial health. Considerable research finds racial/ethnic disparities in self-rated health, however subgroups within the multiracial population have not been consistently described.

Design: We use data from the National Longitudinal Survey of Adolescent Health (Add Health) and multivariate logistic regression analyses to compare self-rated health of multiracial and monoracial young adults (n=7880).

Results: Overall, there were no significant differences in poor self-rated health status of multiracial adults as a single group odds ratio 0.84 (95% CI: 0.52–1.36) compared to monoracial White adults. Analyses further revealed important variations in health-status by specific subgroups and show that some multiracial subgroups may not fit existing patterns of health disparities. For instance, Asian-White multiracial adults do not fit documented patterns of health disparities and report better health than monoracial Asian and monoracial White adults.

Conclusion: This study illustrates that the inclusion of specific multiracial categories provides evidence to enhance understanding of the pathways that are linked to health outcomes and the implications for health disparities.

Keywords

Self-rated health; young adult; Add Health; multiracial; mixed race; odds ratios

Racial and ethnic minority groups face a heightened burden of disease and more severe illnesses. In past years, a focus on the health of large minority groups, including African

American, Asian American, and Native American populations, has provided insight into not only the epidemiology of disease, but also preventive actions in these populations that have proven beneficial. More recently, researchers have sought to learn about the health and health disparities of smaller racial and ethnic minority groups such as Arab Americans (El-Sayed and Galea 2009). Although there are still many areas for improvement regarding the health of monoracial (one race only) groups, there is a growing need to better understand the health and health outcomes of the multiracial (two or more races) population. Multiracial young adults represent a growing segment of the American population, however little is known about their health status as compared to monoracial individuals across the life course. Within the sizable body of literature that explores the demographic transition of multiracial Americans (Saenz and Morales 2005, Harris and Sim 2002, Korgen 2010), empirical studies tend to implicitly and explicitly test hypotheses based on the assumption that multiracials will be the most disadvantaged and will be at the greatest risk for several psychosocial problems (Cheng and Lively 2009, Bratter and Gorman 2011). Most studies on multiracial health center on prisms of identity and psychosocial well-being. Past studies have found that this particular group experiences an increased likelihood of psychosocial, mental, and physical health problems, including depression (Shih and Sanchez 2005), health and sexual risk-taking behaviors (Choi 2007, Jayakody et al. 2011, Whaley and Francis 2006, Udry, Li, and Hendrickson-Smith 2003), asthma (Pleis and Barnes 2008), engaging in violence and substance use (Choi et al. 2006, Chavez and Sanchez 2010, Jackson and Lecroy 2009, Sakai, Wang, and Price 2010, Wu et al. 2011) compared with monoracial Americans. Medical problems are another concern for multiracial American adults. For example, when compared with White adults, multiracial adults who categorize as American Indian-White or Alaskan Native-White were more likely to have increased odds of asthma, hay fever, sinusitis, and chronic obstructive pulmonary disease (Pleis and Barnes 2008). Furthermore, multiracial Americans fare poorer on numerous social indicators which may affect their health status such as being less likely to complete college or marry compared to monoracial peers (PewResearchCenter 2015). Multiracial adults are a young group compared to the general population with the majority under the age of 40 (PewResearchCenter 2015); therefore, it is possible that major health problems are not documented in an aging multiracial population. Using a life course framework to understand the complexities of the lived experience, there are critical periods including birth, childhood, young adulthood, and middle adulthood that can provide insight into the temporal sequence of health disparities. Accordingly, there is an urgent need to understand the health of multiracial Americans at particular time points along the life course and learn how this group fits into existing health patterns. In this study, we will focus on the health of multiracial Americans during young adulthood, a critical time for predicting health trajectories into older adulthood (Ben-Shlomo and Kuh 2002).

Racial Categorization and Multiracial Health

Despite existing knowledge of the potential health issues experienced by multiracial Americans, little is known about disparities related to health outcomes among subgroups within the multiracial population since the majority of previous studies combined all multiracial individuals into single category (Liebler and Halpern-Manners 2008). Research contributions are needed to conceptualize social determinants of health research within a

methodological framework that is inclusive of multiracial Americans. However, using the racial categories that individuals select themselves may provide insight into how race is related to health. At the population level, scholars implicitly use self-categorization as a theory to support the self-selection of one or more racial categories to examine multiracial individuals. Self-categorization theory, first established by Turner (1987), posits that categorization is a process which includes a number of assumptions that cannot be understood outright. Because race is a powerful social construct, it is important to recognize that some individuals might categorize themselves as belonging to two or more racial categories for a number of reasons such as having two biological parents of different races. Individuals categorize in certain ways given the context of time, place, and a lived experience. As noted in Poston's (1990) biracial identity model, when individuals select group categorization, there are a number of traits or characteristics associated with the categorization process such as social status and social support. Self-categorization theory posits that prospective group members perceive a normative fit of group norms or stereotypes (Turner et al. 1994); therefore, categorization is related to identity, but less complex to a certain degree. Good, Chavez, and Sanchez (2009) use the example of an Asian-White individual who identifies with the Asian group, the White group, and, at times, the multiracial group. This decision, coming at a given time point, captures only a momentary fluctuation in the self-categorization process of a multiracial person. The end result of their study is that self-categorization is a sociopsychological process that is shaped by one's own perception of group membership or connectedness and is reinforced by the way that observers perceive the individual. Another important caveat of self-categorization theory and race is that individuals might categorize themselves into categories they do not physically appear to belong to. According to Root and Kelley (2003), multiracial individuals are often racially ambiguous and/or do not exhibit physical traits similar to those of their minority counterparts, therefore self-selected categories are a proxy to their lived experiences. Accordingly, the situation self-categorization and how individuals classify themselves into macro categories is essential to acknowledge in population health research.

Health Assessments and Multiracial Young Adults

The current approaches to including multiracial respondents in the analysis of health data are very limited. It is common for researchers to exclude respondents who self-report as belonging to multiple racial groups. Even where multiracial respondents are presented, it is rare for researchers to analyze data according to specific categories of multiracial respondents. Allocating respondents who report two or more races to a single multiracial category may or may not mask the heterogeneity within the multiracial groups. In contrast, assigning multiracial individuals to subgroups might reveal specific health outcomes for multiracial subgroups. Additionally, the risk exposures and protective factors may differentially affect specific multiracial subgroups. For example, in the U.S. income levels are different by specific multiracial subgroups (Korgen 2010).

Examination of health assessments, such as self-rated health, is a proven approach to identify racial differences in health across groups. Self-rated health is a widely used health assessment measure that has been validated across age groups and is predictive of mortality (Idler and Benyamini 1997, Mossey and Shapiro 1982), and chronic health conditions

(Vandervoort, Divers, and Acojido 2000). Few studies have examined reports of self-rated health from multiracial (two or more races) Americans. Past studies have examined health assessments of multiracial children (Flores and Tomany-Korman 2008) and multiracial older adults (Bratter and Gorman 2011); however, few have examined health assessments during early adulthood for multiracial Americans. Young adulthood is a critical time to measure self-rated health assessments to examine pre-disease pathways to health in older adulthood (Bauldry et al. 2012). Vandervoort and colleagues (2000) found that multiracial individuals reported the poorest health compared with their monoracial White and monoracial Asian counterparts. Therefore, self-rated health may be an important health assessment and an appropriate measure to determine whether multiracials have better or worse health than monoracials.

This study aims to address gaps in the previous literature by investigating the differences in health status by race with the inclusion of multiracial subgroup categories. The research question guiding this investigation is “Do multiracial young adults have better or worse self-rated health than monoracial majority and monoracial minority groups?” We examine data on monoracial-multiracial differences based upon a nationally representative sample of young adults to test two hypotheses based upon Rockquemore, Brunsma, and Delgado’s (2009) multiracial identity formation theory: The first testable hypothesis is that self-categorized multiracial individuals as a single group are “variant” and will differ in an assessment of self-rated health compared with monoracial groups. The variant approach is based upon the premise that multiracial Americans as a group are distinct and therefore do not reflect patterns of any other group. Hence, multiracials should be conceptualized as a group distinct from monoracials (Rockquemore, Brunsma, and Delgado 2009). The second testable hypothesis is that specific multiracial subgroups are different from an all-inclusive multiracial category thus; inclusion of these specific subgroups will explain some of the effect of differences in fair/poor self-rated health. Accordingly, the paper will extend past work by including five specific multiracial categories and comparing these multiracial groups with monoracial majority and monoracial minority counterparts.

Data and Methods

Sample

The data used in this study are from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative, school-based probability sample of Americans. Add Health is a longitudinal study of youth, beginning in 1994 with data collection on social and behavioral factors. The details of the sample design have been described elsewhere (Harris, 2011). The sample was taken from a stratified probability sample of 132 schools in the United States. The original sample included more than 90,118 students, and some respondents were selected for in-home interviews with youth and at least one of their parent. The objective of this study was to measure health status of young adults at Wave IV of Add Health; however because race was only measured at Waves I and III, data for the present study were drawn from Waves I, III, and IV of Add Health. Wave I (n = 20,745) was collected in 1994, Wave III (n = 15,197) was collected in 2002, and Wave IV (n = 15,701) was collected in 2008. Data on parental level of education and respondent nativity are taken

from the Wave I in-home parent survey. In Wave I, 15,984 female caretakers completed the in-home parent survey. The response rate for the parent survey was 85.4%. For the present study, we draw from a subset of Wave IV non-Hispanic respondents who participated in the Waves I, III and IV. Respondents with missing data for any of the independent and dependent variables were also excluded from the present analyses. In addition, we excluded respondents whose Wave IV sampling weights were unavailable. The final sample consisted of 7,880 in the multivariate analyses when weights are applied. The study was approved by the Center for Studies on Demography and Ecology at the University of Washington under contractual agreement from the Carolina Population Center at the University of North Carolina–Chapel Hill.

Measures

The dependent measure is self-rated health in early adulthood (assessed when respondents were between ages 24–34 years) collected at Wave IV. Self-rated health was assessed by the following question “In general, how is your health?” Respondents were asked to rate their health on a 5-point scale (excellent, very good, fair, and poor). We coded this variable as dichotomous: poor health (1 = poor or fair) to good health (0 = good, very good, or excellent). This dichotomous measure is an important distinction because past studies have found that use of a single dichotomous measure of fair/poor self-rated health is a predictor of morbidity (Vingilis, Wade, and Seeley 2002) and mortality (DeSalvo et al. 2006). Furthermore, this single-item assessment has been used in an array of populations including elderly (Idler and Angel 1990, Mossey and Shapiro 1982), adults and young adults (Lantz et al. 2001, Manderbacka, Lundberg, and Martikainen 1999, Shi et al. 2002), and adolescents (Heard, Gorman, and Kapinus 2008, Wade, Pevalin, and Vingilis 2000)

The main independent measure is self-reported race. Since the Wave I interview, respondents have had the option of selecting one or more racial groups to categorize themselves (“What is your race? You may give more than one answer”). Respondents were coded as multiracial if they reported two or more racial categories in the Wave I and Wave III interviews. Self-reported race was assessed across two waves of data when respondents were aged 12–22 and 18–28 years, respectively. Past studies have shown that multiracial adolescents and young adults might change self-reported race over time from changing from one to many races (diversifiers) and changing from many to one race (consolidators) (Hitlin, Brown, and Elder 2006, Tabb 2015). Therefore, in this study, we used self-categorization of respondents’ race from the in-home interviews conducted in Waves I and III, at which point the respondents were aged 12–22 and 18–28 years, respectively. The use of self-categorized race in two waves of data (previous to the health outcome measure) provides a measure of race over the early life course and possible changes in racial categorization. The Add Health data includes six race categories: White (reference), Black, American Indian (Native American), Asian, Other (other-only) race, and multiracial. Examining the full sample, we found 36 multiracial groups in these data. For the present study we used the full multiracial sample along with five multiracial subgroups: White-American Indian, White-Asian, White-Black, White-Other, and Black-Native. These specific categories were designated due to larger sample sizes (>30) and in accordance with past studies that used these data to examine multiracial outcomes (Campbell and Eggerling-Boeck 2006, Harris and Sim 2002, Harris and Thomas

2002). Based on previous studies, the following covariates measured at Wave IV were included in the present study: demographic characteristics, socioeconomic status, health behaviors, chronic health conditions, and adverse health behaviors (Bratter and Gorman 2011).

Demographic variables.

Demographic factors known to influence individual self-reported health status such as age (Wade, Pevalin, and Vingilis 2000), sex or gender (Mossey and Shapiro 1982), partner status and employment outside of the home (Bratter and Gorman 2011) are controlled for. In this analysis the sociodemographic characteristics include Wave IV self-reported sex (1 = male versus 0 = female), Wave IV self-reported age at Wave III, adjusted to reflect age in Wave IV (range, 24–34 years; mean age, 27 years), Wave IV self-reported partner status (1 = currently married or cohabitating versus 0 = not married); and Wave I self-reported nativity (0 = not U.S. born versus 1 = U.S. born).

Socioeconomic status.

Socioeconomic status (SES) includes three measures shown to be good proxies for socioeconomic position. Education is a widely used indicator of socioeconomic status and has been used in several studies on self-rated health (Phillips, Hammock, and Blanton 2005). Self-reported educational attainment, or the highest grade of school completed, was assessed at Wave IV (1 = less than high school, 2 = high school, 3 = vocational training, 4 = some college, 5 = college degree, 6 = graduate or professional degree). Self-reported employment status (1 = currently working 10 hours versus 0 = not working) was also assessed at Wave IV. Past studies find a relationship between early life SES including parent's educational attainment and self-rated health (Heard, Gorman, and Kapinus 2008). Parental educational attainment was obtained in the Wave I parent survey. Parent survey respondents were asked about the highest level of education they had achieved to date (1 = less than high school education versus 0 = high school and beyond).

Chronic health conditions.

Racial and ethnic minorities are disproportionately affected by a variety of chronic health conditions (Smedley and Smedley 2012). In addition, chronic health conditions during adolescence have been shown to predict health behaviors in early adulthood (Vingilis, Wade, and Seeley 2002). In accordance with past research on self-rated health and related chronic health conditions for adults we included common chronic health problems (Bratter and Gorman 2011) drawn from Wave III. Self-reported health conditions was classified as follows: asthma diagnosis (0 = no, 1 = yes), diabetes diagnosis (0 = no, 1 = yes), cancer or leukemia diagnosis (0 = no, 1 = yes), hypertension or high blood pressure diagnosis (0 = no, 1 = yes), and depression diagnosis (0 = no, 1 = yes).

Adverse health behaviors.

Prior research shows that adolescent substance use disorders are more likely to self-report fair/poor health (Wu et al. 2011), and heavy alcohol use by adolescents predicts poor young adult health outcomes (Oesterle et al. 2004). Self-reported health behaviors are drawn from

Wave IV. Health behaviors included 30-day tobacco use, including either smoking or chewing of tobacco (>1 = yes, 0 = no); 30-day heavy alcohol use equal to five drinks per day for men and four drinks per day for women (1 = yes, 0 = no); or any 30-day illicit substance use (1 = yes, 0 = no).

Analysis

Racial differences in self-rated health were tested using univariate and multivariate analyses. Given the sampling framework, Wave IV grand sampling weights (accessed via the STATA software's "svy" command) was used to account for the general population in 2008. This weighting technique adjusts for oversampling and inconsistencies in response across four waves of data. First, we provided sample characteristics and performed the chi-square test of bivariate association between self-rated health and race. Second, we provided sample characteristics including demographic characteristics, SES, health behaviors, and chronic health conditions by fair/poor self-rated health. Third, we examined the association between fair/poor self-rated health and race (using multiracial as a single category), adjusting for all covariates by using weighted multivariate logistic regression analysis. Fourth, we examined the association between race and self-rated health to see whether there are differences when examining specific multiracial subgroup categories. Last, we conducted a multivariate logistic regression to compare specific multiracial groups with both monoracial majority and monoracial minority groups. $P .05$ is considered significant in this study. We used a design-based Wald test to account for significance in all multivariate analyses. All analyses were conducted using STATA (Stata Corp., College Station, TX).

Results

Table 1 presents the descriptive characteristics of the analytic sample along with cross-tabulations with fair/poor self-rated health. The percentage of respondents with fair/poor self-rated health is slightly lower than for studies with older populations, yet slightly higher than for studies with adolescents, a pattern consistent with previous findings (Boardman 2006). In this analysis, the average age of respondents is 27 years (range: 24–34 years), and the majority of respondents (92%) have completed at least high school. The sample is evenly split by gender, half men (50%) and half women (50%), and the proportion of fair/poor self-rated health (9%) is the same by gender. The majority of respondents' parents (84%) completed high school. There is a gradient of self-rated health by mother's education: 13% of respondents whose mother completed less than high school reported fair/poor self-rated health, whereas only 7% of respondents whose mothers had more than high school education reported fair/poor self-rated health. Furthermore, there is a graded association between education and self-rated health, with the proportion of respondents with fair/poor self-rated health decreasing with educational attainment in Wave IV. Nearly one-fifth or 19% of respondents with less than a high school education reported fair/poor self-rated health. Among respondents who completed graduate or professional degrees, only 3% reported fair/poor self-rated health. In this sample there are high rates of reported problem health behaviors including tobacco use (40%), heavy alcohol use (23%), and illicit substance use (15%). Nearly one in five respondents reported a chronic health condition.

In order to test our first hypothesis, we performed a multivariate analysis with six racial groups. Using the multivariate analyses, we examined whether there was an association between self-reported race and self-rated health, adjusting for demographic variables (Model 1); adjusting for SES (Model 2); adjusting for chronic health conditions (Model 3); and adjusting for adverse health behaviors (Model 4).

Table 2 shows the odds of reporting fair-to-poor self-rated health for each racial group, compared with monoracial majority (White) adults, adjusting for demographic variables, SES, chronic health conditions, and adverse health behaviors. In all four models we found that multiracial Americans as a single group were not more likely to report fair/poor self-rated health when compared with monoracial Whites. We found Black and Native Americans were more likely to self-report fair/poor health compared with their White counterparts, after adjusting for covariates. Monoracial Native American were four times more likely (Odds Ratio [*OR*] = 4.23; 95% confidence interval [CI] [1.67–10.69]) and Monoracial Black adults were nearly twice more likely (*OR* = 1.66; 95% CI [1.28–2.15]) to report fair/poor self-rated health compared with White adults in the fully adjusted model (Model 4). In the fully adjusted model there was not a statistically significant difference between multiracial and monoracial majority adults (*OR* = 0.84; 95% CI [0.52–1.36]). An additional surprise finding was that heavy alcohol use was not a significant predictor of self-reported health status among young adults. This contrasts with previous research findings that heavy alcohol users were more likely to be obese, high blood pressure, and reporting being ill in the past year in young adulthood (Oesterle et al. 2004).

Table 3 shows self-rated health status among specific multiracial groups adjusting for demographic, SES, chronic health, and adverse health behaviors characteristics. In Model 4, we found no statistically significant differences between White adults and Black-White, Native-White, Other-White, and Black-Native adults. However, the Asian-White multiracial subgroup was less likely (*OR* = 0.07; 95% CI [0.01–0.45]) to report fair/poor self-rated health compared with monoracial White adults. In the fully adjusted model (Model 4) Asian-White multiracial adults were less likely to report fair/poor self-rated health compared with White adults (*OR* = 0.08; 95% CI [0.014–0.51]).

In Table 4, we examined specific multiracial groups with both the monoracial majority and monoracial minority groups. When compared with both Black and White monoracial groups, there are no statistically significant differences in Black-White multiracial self-reported health. When compared with White monoracials, there are no statistically significant differences for Native-White respondents across all four models after adjusting for the covariates. However, when we compared Native-White multiracial to Native monoracial respondents we found significant differences. In the fully adjusted model (Model 4), Native-White respondents were less likely to report fair/poor self-rated health (*OR* = 0.16; 95% CI [0.05–0.51]) than Native monoracial adults. Compared with White adults, Asian-White adults were less likely to report fair/poor self-rated health in the fully adjusted model (*OR* = 0.08; 95% CI [0.014–0.51]). Compared with Asian adults, Asian-White adults were less likely to report fair/poor self-rated health (*OR* = 0.04; 95% CI [0.004–0.38]). Furthermore, Native American-Black multiracial adults were no more or less likely to report

fair/poor self-rated health compared with their Native American and Black counterparts after adjusting for other factors.

Discussion

In this study, we examined whether there were racial differences in self-rated health in a nationally representative longitudinal sample of multiracial and monoracial young adults. The study consisted of two objectives: (1) describe the self-rated health status of multiracial young adults; and (2) test two hypotheses related to multiracial-monoracial differences in self-rated health based upon Rockquemore, Brunsma, and Delgado's (2009) multiracial identity formation theory. This study contributes to the existing literature on self-rated health and race in the following ways: First, the inclusion of multiracial respondents as a distinct group and by drawing comparisons between specific multiracial categories and monoracial categories to examine the health status of young adults. In our first hypothesis, we posited that multiracial adults are a variant group, and, therefore, we would find differences in reported health status. When multiracials are examined as a single category, there are no statistical differences in their assessment of self-rated fair/poor health compared with their monoracial counterparts. Second, we examined differences between specific multiracial groups and White young adults on a group-by-group basis. Our second hypothesis posited that the level of detail in categorization might reveal differences between specific multiracial groups and the monoracial majority group. We find that there are indeed differences in health status when comparing specific multiracial groups with the monoracial majority group. Third, in a further test of the second hypothesis, we did find differences in self-rated health for some specific multiracial categories (for example, Asian-White versus Native-White multiracial adults) compared with monoracial majority and minority groups, after adjusting for several factors. For example, Native American-White respondents were significantly less likely to report fair/poor self-rated health compared with Native American monoracial respondents, but their reports were not significantly different from those of White monoracial respondents. This finding confirms that some multiracial adults do not fit documented patterns of health disparities (Bratter and Gorman 2011). Moreover, we found differences when comparing specific multiracial groups with monoracial majority and monoracial minority groups (Udry, Li, and Hendrickson-Smith 2003) that do explain the effect of the differences in self-rated health.

The results of this study highlight that there are differences in fair/poor self-rated health when examining differences by self-categorized race. When the level of detail is examined further, the use specific self-categorized race categories uncovers differences for some subgroups. In the analyses of specific multiracial subgroups, we found that reports of self-rated health varied from monoracial majority and monoracial minority counterparts. This study illustrates that the incorporation of specific multiracial categories provides evidence to enhance understanding of the pathways that are linked to health outcomes and the implications for health disparities.

Methodological Considerations

In our analysis, using a single multiracial group to cover all multiracial combinations has the potential to conceal some of the heterogeneity of specific multiracial groups. In line with past studies we examined specific multiracial subgroups to examine if differences in health status exist for young adults in the U.S. For example, Sakai and colleagues (2010) reported the differences in substance use for multiracial Asians compared with single-race Asians and single-race Whites. One particular finding suggests that multiracial Filipinos may be at a higher risk for drug use and alcohol dependence compared to monoracial Whites. However, when multiracial Asians were examined as a group, their prevalence of lifetime alcohol use was less than monoracial Whites, but higher than monoracial Asians. Despite these findings, it is not apparent whether the prevalence of substance use differs for specific multiracial subgroups. In contrast, a different investigation reported striking differences in increased odds for delivering low birth weight or a preterm birth when examining multiracial mothers by specific multiethnic subgroups (Schempf et al. 2010). The findings in our study along with the two aforementioned examples provide illustrations for how the use of specific multiracial categories could provide insight into existing health patterns and unmask health disparities among multiracial Americans. Future studies are needed to understand the health outcomes of specific multiracial subgroups to provide additional support to establish if the multiracial identity formation perspective of a variant group exists in terms of health.

There is also the practice of reassigning race, which tends to classify multiple-race respondents into the racial group with the least status (Poston and Micklin 2006). This may add error to estimates of disparities in self-reported health, as our study found Native-White multiracial young adults reported better health than monoracial Native Americans. In past studies, there is complexity when examining race over time and some of this could be attributed to changing definitions of race (Tabb 2015). Moreover, the changes in race could be associated with exposures to specific events over the life course (Saperstein 2006, 2009, Saperstein and Penner 2010) or related to the aging process, and the development of individual phenotypes over time. Regardless of why individuals switch categories, researchers can use a “were you ever” status to capture individuals who considered themselves multiracial at a given time point. This study examined differences in health status by self-reported race. Classifications of race can be fluid and can change according to place and time (Hitlin, Brown, and Elder 2006). By using a measure of race captured at two time points we were able to examine individuals that self-categorized as multiracial at least once during the life course. Future studies are needed to examine differences in health among self-identified multiracial persons that report fluid categorization over the life course.

Limitations and Conclusion

Although this study has a number of strengths, there are also limitations. The first limitation is the school-based sampling framework of the study. Although the nationally stratified probability sampling technique captured a diverse sample, we were able to examine only outcomes of those individuals who were attending middle and high schools. Thus we did not include adults who were not enrolled in public school during adolescence. A second limitation to this study is that we used responses from the in-home interview sample only.

Therefore, our analytic sample was not as large as that of past studies which included the in-school interview (Udry, Li, and Hendrickson-Smith 2003). In addition, past studies have found that respondents were more likely to self-identify as being one or more races in the in-school sample, as opposed to the in-home sample, resulting in a larger and more accurately defined self-identified multiracial sample (Harris and Sim 2002). Given the focus on health outcomes in early adulthood and given our sufficient weighted sample size, we decided to use measures from the in-home interview and do not see this as a major limitation.

In conclusion, the multiracial population represents one of the swiftest demographic changes in the United States and health information has not kept pace for this group. The findings in this study assist in conceptualizing social determinants of health research within a methodological framework that is inclusive of multiracial Americans. Specifically, the findings presented in this study provide support for self-categorization theory for a variant group of multiracial American young adults. We identified differences in health status for specific multiracial subgroups, namely Asian-White adults and Native-White adults were more likely to report better health than their minority counterparts. These findings suggest that the health of multiracial American young adults could be varying by multiracial subgroups and thus more research is needed in this area. Future studies are warranted to examine specific multiracial subgroups and differences in health outcomes as the wave of multiracial young adults age into later adulthood.

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Table 1

Sample Characteristics of Demographic, Socioeconomic, Chronic Health, and Health Behaviors, Add Health 2008 ($n = 7,880$)

Variable	Sample Proportions (standard error)	Unweighted Sample Size	Fair/Poor Self-Rated Health
Race (Non-Hispanic)			
White	73% (2.55)	4,969	8% (0.01)
Black	16% (2.21)	1,750	13% (0.01)
Native American	0.4% (0.25)	32	30% (0.08)
Asian	3% (0.8)	499	10% (0.03)
Other	0.7% (0.14)	55	7% (0.03)
Multiracial (all)	6% (0.47)	575	8% (0.02)
Demographic Controls			
<i>Gender (Wave 4)</i>			
Male	50% (0.73)	3,584	9% (0.63)
Female	50% (0.73)	4,363	9% (0.65)
<i>Partner Status (Wave 3)</i>			
Not married or cohabitating	51% (0.64)	3,980	9% (0.71)
Married or cohabitating	49% (0.64)	3,967	9% (0.64)
<i>Nativity (Wave 1)</i>			
U.S. born	97% (0.53)	7,599	8% (2.42)
Not U.S. born	3% (0.53)	348	9% (0.53)
Socioeconomic Status Controls			
<i>Mother Education (Wave 1)</i>			
Less than high school	16% (1.0)	1,107	13% (1.3)
High school	57% (1.4)	4,051	8% (0.5)
College	27% (1.7)	2,384	7% (0.6)
<i>Education (Wave 4)</i>			
Less than high school diploma	8% (0.7)	549	19% (2.1)
High school	16% (0.9)	1,185	13% (1.2)
Vocational training	9% (0.5)	746	10% (1.6)
Some college	33% (0.9)	2,611	9% (0.7)
College graduate	26% (1.3)	2,242	3% (0.4)
Graduate or professional degree	6% (0.6)	612	3% (0.9)
<i>Employment (Wave 4)</i>			
Employed	35% (0.83)	2,752	8% (0.57)
Not employed	65% (0.83)	5,190	11% (0.83)
Chronic Health Conditions (Wave 4)			
Asthma	18% (0.5)	1,356	10% (1.2)
Diabetes	1% (0.15)	74	32% (6.5)

Variable	Sample Proportions (standard error)	Unweighted Sample Size	Fair/Poor Self-Rated Health
Cancer	1% (0.12)	73	14% (5.4)
Hypertension	6% (0.3)	419	18% (2.0)
Depression	13% (0.5)	908	15% (1.6)
Health Behavior Controls (Wave 4)			
Tobacco use	40% (1.1)	2,904	12% (0.8)
Heavy alcohol use	23% (0.9)	1,022	9% (0.9)
Illicit drug use	15% (0.7)	1,681	10% (1.1)

Table 2

Multivariate Logistic Regression Models to Predict Fair/Poor Self-Rated Health in a Sample of Young Adults, Add Health 2008

	Model 1^a	Model 2^b	Model 3^c	Model 4^d
	<i>OR</i> (95% CI)	<i>OR</i> (95% CI)	<i>OR</i> (95% CI)	<i>OR</i> (95% CI)
Variable				
Race				
White	Reference	Reference	Reference	Reference
Black	1.77 *** (1.35–2.32)	1.48 ** (1.16–1.88)	1.55 *** (1.21–2.00)	1.66 *** (1.28–2.15)
Native American	5.20 *** (2.45–11.01)	3.31 ** (1.37–7.98)	3.78 ** (1.62–8.85)	4.23 ** (1.67–10.69)
Asian	1.46 (0.67–3.16)	1.79 (0.82–3.89)	2.02 (0.92–4.39)	2.08 (0.96–4.50)
Other	0.92 (0.33–2.54)	1.02 (0.36–2.84)	1.07 (0.37–3.04)	1.08 (0.37–3.09)
Multiracial	1.03 (0.64–1.65)	0.88 (0.54–1.42)	0.85 (0.52–1.37)	0.84 (0.52–1.36)
Demographic Controls				
<i>Gender (Wave 4)</i>				
Female	1.04 (0.87–1.26)	1.14 (0.94–1.38)	1.02 (0.84–1.25)	1.07 (0.88–1.30)
<i>Marital status (Wave 3)</i>				
Not married or cohabitating	1.00 (0.81–1.24)	1.00 (0.80–1.24)	0.99 (0.79–1.24)	0.99 (0.79–1.25)
<i>Nativity (Wave 1)</i>				
Not U.S. born	0.88 (0.44–1.73)	0.95 (0.46–1.93)	0.93 (0.48–1.82)	0.99 (0.79–1.25)
Socioeconomic Controls				
<i>Education (Wave 4)</i>				
Less than high school diploma		Reference	Reference	Reference
High school		0.65 ** (0.46–0.91)	0.72 (0.50–1.04)	0.77 (0.52–1.13)
Some college		0.51 ** (0.32–0.82)	0.57 * (0.34–0.93)	0.60 (0.36–1.0)
Vocational Training		0.43 *** (0.31–0.60)	0.47 *** (0.33–0.68)	0.52 ** (0.36–0.76)
College graduate		0.14 *** (0.09–0.21)	0.16 *** (0.10–0.25)	0.19 *** (0.12–0.31)
Graduate or professional degree		0.13 *** (0.06–0.27)	0.15 *** (0.07–0.31)	0.18 *** (0.08–0.39)
<i>Employment (Wave 4)</i>				
Currently employed		0.79 * (0.63–0.99)	0.81 (0.64–1.02)	0.81 (0.64–1.03)
Chronic Health Conditions				
Asthma			0.90 (0.67–1.19)	0.90 (0.68–1.20)
Diabetes			0.29 *** (0.14–0.59)	0.28 *** (0.13–0.57)
Cancer			0.69 (0.25–1.9)	0.72 (0.26–1.97)
Hypertension			0.54 *** (0.38–0.76)	0.54 ** (0.39–0.77)
Depression			0.49 *** (0.36–0.65)	0.51 *** (0.38–0.68)
Health Behaviors				

	Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d
Tobacco use				0.68 ^{**} (0.52–.88)
Heavy alcohol use				1.01 (0.75–1.35)
Illicit drug use				0.93 (0.73–1.18)

Note. N = 7,880;

*
p < .05

**
p < .01

p < .001.

^aControlling for demographic characteristics.

^bControlling for demographic characteristics and socioeconomic characteristics.

^cControlling for demographic characteristics, socioeconomic characteristics, and chronic health conditions.

^dControlling for demographic characteristics, socioeconomic characteristics, chronic health conditions, and health behaviors.

Table 3

Logistic Regression Models to Predict Fair/Poor Self-Rated Health, by Specific Multiracial Categories in a sample of young adults, Add Health 2008

	Model 1^a	Model 2^b	Model 3^c	Model 4^d
	<i>OR</i> (95% CI)	<i>OR</i> (95% CI)	<i>OR</i> (95% CI)	<i>OR</i> (95% CI)
Variable				
Single-Race Adults				
White	Reference	Reference	Reference	Reference
Black	1.77 *** (1.35–2.32)	1.48 ** (1.16–1.88)	1.56 ** (1.21–2.00)	1.66 *** (1.28–2.16)
Native American	5.19 *** (2.45–11)	3.32 ** (1.38–7.9)	3.79 ** (1.62–8.86)	4.23 ** (1.67–10.7)
Asian	1.43 (0.65–3.13)	1.76 (0.80–3.86)	2.00 (0.91–4.37)	2.07 (0.95–4.48)
Other	0.92 (0.33–2.52)	1.01 (0.55–6.2)	1.06 (0.37–3.03)	1.07 (0.37–3.07)
Multiracial Adults				
Black-White	1.90 (0.59–6.1)	1.86 (0.55–6.2)	1.75 (0.53–5.80)	1.88 (0.58–6.10)
Native American-White	0.92 (0.46–1.82)	0.73 (0.36–1.47)	0.70 (0.35–1.43)	0.68 (0.34–1.37)
Asian-White	0.07 ** (0.01–0.45)	0.07 ** (0.01–0.42)	0.08 ** (0.01–0.48)	0.08 ** (0.014–0.51)
Other-White	2.48 (0.41–14.9)	2.74 (0.56–10.86)	2.21 (0.61–7.32)	2.20 (0.61–7.85)
Black-Native	2.06 (0.73–5.8)	1.69 (0.61–4.68)	1.71 (0.62–4.73)	1.77 (0.63–4.98)

Note. *N* = 7,880;

*
p < .05

**
p < .01

p < .001.

^a Controlling for demographic characteristics.

^b Controlling for demographic characteristics and socioeconomic characteristics.

^c Controlling for demographic characteristics, socioeconomic characteristics, and chronic health conditions.

^d Controlling for demographic characteristics, socioeconomic characteristics, chronic health conditions, and health behaviors.

Table 4

Multivariate Logistic Regression Models to Predict Fair/Poor Self-Rated Health, Multiracial Compared With Single-Race Categories: Add Health Sample 1994–2008

	Model 1 ^a	Model 2 ^b	Model 3 ^c	Model 4 ^d
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Category				
White	Reference	Reference	Reference	Reference
Black-White	1.90 (0.59–6.1)	1.86 (0.55–6.22)	1.75 (0.53–5.80)	1.88 (0.58–6.10)
Black	Reference	Reference	Reference	Reference
Black-White	1.07 (0.32–3.47)	1.25 (0.37–4.22)	1.12 (0.34–3.72)	1.13 (0.34–3.67)
White	Reference	Reference	Reference	Reference
Native-White	0.92 (0.46–1.82)	0.73 (0.36–1.47)	0.70 (0.35–1.43)	0.68 (0.34–1.37)
Native	Reference	Reference	Reference	Reference
Native-White	0.013 *** (0.001–1.01)	0.22 ** (0.07–0.69)	0.18 *** (0.06–0.56)	0.16 ** (0.05–0.51)
White	Reference	Reference	Reference	Reference
Asian-White	0.07 ** (0.01–0.45)	0.07 ** (0.13–0.42)	0.08 ** (0.01–0.48)	0.08 ** (0.014–0.51)
Asian	Reference	Reference	Reference	Reference
Asian-White	0.04 ** (0.005–0.45)	0.04 ** (0.004–0.37)	0.04 ** (0.004–0.32)	0.04 ** (0.004–0.38)
Black	Reference	Reference	Reference	Reference
Native/Black	1.15 (0.41–3.24)	1.13 (0.94–1.37)	1.09 (0.39–3.05)	1.06 (0.37–3.01)
Native	Reference	Reference	Reference	Reference
Native/Black	0.39 (0.11–1.42)	0.50 (0.13–1.94)	0.45 (0.11–1.70)	0.41 (0.10–1.66)

Note. N = 7,880;

* $p < .05$,

** $p < .01$,

*** $p < .001$.

^aControlling for demographic characteristics.

^bControlling for demographic characteristics and socioeconomic characteristics.

^cControlling for demographic characteristics, socioeconomic characteristics, and chronic health conditions.

^dControlling for demographic characteristics, socioeconomic characteristics, chronic health conditions, and health behaviors.