Deconstructing Race and Ethnicity
Implications for Measurement of Health Outcomes

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Abstract: A crucial issue for health researchers is how to measure health and health-related behaviors across racial/ethnic groups. This commentary outlines an approach that involves the deconstruction of race/ethnicity, which clarifies the independent influences of acculturation, quality of education, socioeconomic class, and racial socialization on outcomes of interest. Research on the influence of these variables on health outcomes in general, and cognitive test performance specifically, is presented. This research indicates that when variables such as quality of education, wealth, and perceived racism are taken into account, the effect of race/ethnicity on health outcomes is greatly reduced. In other words, race/ethnicity serves as a proxy for these more meaningful variables, and explicit measurement of these constructs will improve research of health within majority and minority ethnic groups.

Key Words: race, ethnicity, quality of education, acculturation

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Despite recent and projected growth in racial and ethnic diversity within the United States, few measures of health or of health-related behaviors have been validated properly for use among ethnic minorities. Several different approaches to resolving this problem are emerging in the literature, including use of different measures for each group or the development of separate normative standards for each racial/ethnic group. This commentary describes another solution to the dilemma that investigators face when attempting to use established measures among ethnic minorities involving the deconstruction of race and ethnicity. This particular approach clarifies the independent influences of race, culture, educational experience, and socioeconomic status on outcomes of interest. Several authors have advocated the abandonment of racial or ethnic classifications in health research because they create a potential for stigmatization and reinforce race as a scientific concept.[1,2] The approach described in this commentary acknowledges that racial classifications are necessary in health research because of the disparities in health that occur within and between racial groups.[3] However, like many authors have previously noted,[4] potential misunderstanding and misuse of racial/ethnic classifications must be addressed by exploring factors that underlie the differences. Emphasizing the effects of cultural experience on behavior, attitudes, and other health outcomes reduces the importance of racial classifications and highlights the distinctiveness and depth of culture. This commentary summarizes several examples of how researchers have deconstructed race and ethnicity in studies of health. To further exemplify this approach, we describe in more detail how we have begun to take this approach in our studies of cognitive test performance among ethnically diverse elders. A full discussion of the processes involved with validating measures for use among ethnic minorities is beyond the scope of this commentary; however, we refer the reader to more comprehensive texts for a review of this issue.[5–10] Finally, Table 1 presents some definitions of several terms that are used in this commentary.

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WHY WE SHOULD DECONSTRUCT RACE

Separate Measures for Racial/Ethnic Groups Promote Misunderstanding

To address the poor validity and predictive value often associated with the use of standard measures of health when used among ethnic minorities, many investigators have chosen to develop separate measures for different racial or cultural groups or are establishing separate normative standards for each racial/ethnic group. Although this is a reasonable first step, such an approach does not automatically improve validity and predictive value. In addition, use of separate norms leaves ethnic differences in performance unexplained, unexamined, and thus not understood. Many authors[11,12] have described how genetic or biologic factors are often invoked to account for unexplained racial and ethnic differences in cognitive test performance.

Racial and Ethnic Classifications Are Not Biologically Meaningful

The most difficult challenge facing investigators who perform research in ethnically diverse groups is an assumption embedded in racial and ethnic classifications, ie, that race/ethnicity reflects an underlying genetic or cultural ho-

TABLE 1. Definition of Key Terms Used in This Commentary

Acculturation	The level at which an individual shares the values, language, and cognitive style of their own ethnic community versus those of the dominant culture
Ethnic identity	An aspect of self-concept, social value, and emotional significance derived from knowledge of membership in a an ethnic group
Predictive value	That measures are measuring the construct they are intended to measure
Racial segregation	Discrimination on the basis of race, formalized through legal and social structures, characterized by geographic and/or institutional separation of racial groups from each other
Racial socialization	The process by which people acquire beliefs about their own and others' racial identity, including messages regarding experience as minority or majority group members, and information related to cultural heritage
Racism	A system of oppression, whether explicit, tacit, or unconscious which though practices, organizations, and institutions combine to discriminate against and marginalize people who share a common racial designation based on that designation
Socioeconomic status	A person's position in society, traditionally expressed in terms of income, education, occupation, but could also be represented by net worth, ownership of assets such as a home, and so on
Validity	The probability that a person with a positive result on a measure truly does have the disease or that a person with a negative test result truly does not have the disease

mogeneity. It is common practice, however, to assign race on socially defined classification of phenotypic traits such as skin color and hair features.[13] Because of this incongruity between theory and research practice, race is a construct that lacks biologic basis.[14,15] There is more genotypic variation within races than between them;[13,16] it is difficult, therefore, to classify humans into discrete biologic categories with rigid boundaries. Part of the confusion stems from the tremendous heterogeneity within the traditional, "federally" defined ethnic group classifications in the United States.[15] These classifications, based on the protocol used by the U.S. Census,[17,18] are actually a combination of racial self-categorization (white, black, Asian, Pacific Islander, American Indian, other) and ethnicity (Hispanic/non-Hispanic). Hispanics can be of any race using this classification method. This protocol confuses issues of heritage and immigration status; for example, in some studies, "African Americans" include only non-Hispanic black individuals who were born in the United States (black), whereas other studies may also include black immigrants from the West Indies or Africa. Race, nationality, place of birth, and immigration status are not the only sources of heterogeneity within these traditional ethnic group classifications; the level at which the culture of origin is maintained also varies among individuals within one ethnic group. Because racial classifications are socially determined, they can change over time and vary among geographic locations and cultural groups. For example, in the United States in the early 20th century, certain national and ethnic groups were classified as different racial groups in a way that is not maintained today. Driven by their role in inspecting new immigrants to the states, the U.S. Public Health Service classified Slavs, Hebrews, Nordics, Asiatics, Negroes, and Anglo-Saxons as biologically distinct racial groups.[19] Census categories for race in the United States and Brazil have been shown to shift in relation to changing political and social conditions.[20] Racial classifications shift with time and locations because they are markers for social policy, cultural beliefs, and political practices.[20,21] Researchers must contend with the fact that their results may rapidly become outdated or will be geographically specific. It is this imprecision that may explain incomparable findings between studies of "Hispanics" or "Asians," because significantly different populations may be gathered under each label. Finally, the concepts and labels of ethnicity, race, and culture often are blurred, which can result in inconsistent classification of people into groups.[13,14]

Racial/Ethnic Classifications Are a Proxy for the Variables of Interest

A person's racial classification reveals nothing about his or her cultural, socioeconomic, educational, or racial experiences. Race and ethnicity may be surrogates for, or be confounded by, other relevant variables such as socioeconomic status; therefore, information on these other variables must be considered. However, if we explicitly measure behavioral, attitudinal, experiential, and psychologic variables of interest that may underlie racial/ethnic classifications, we can take advantage of this variability and improve our understanding of the role of race and culture on health.

Several researchers[3,12] suggest that specification of experiential, attitudinal, or behavioral variables, which can help distinguish those belonging to different ethnic groups, and which also vary among individuals within an ethnic group, may allow investigators to understand better the underlying reasons for the relationship between racial/ethnic background and health outcomes. As discussed previously, there is tremendous diversity in geographic, economic, and educational experiences as well as level of exposure to European American culture among ethnic minorities.

WAYS IN WHICH TO DECONSTRUCT RACE

Cultural Experience

Level of acculturation is one way in which social scientists have operationalized within-group cultural variability. Previous studies have identified ideologies, beliefs, expectations, and attitudes as important components of acculturation as well as cognitive and behavioral characteristics such as language and customs.[22–25] Although acculturation is clearly related to socioeconomic class (most studies find that among Latino immigrants and blacks, less acculturated individuals are more likely to be of lower socioeconomic class), the 2 constructs are not overlapping and generally account for independent variance in health outcomes.[26] Although less well studied, acculturation and ethnic identity are related but separate constructs that have a complicated relationship with nationality, immigrant status, and generational level.[27] Acculturation has traditionally been measured among immigrant

groups such as Latino[28,29] and Asian Americans.[30,31] These measures operationalize acculturation primarily by focusing on language use across different arenas, and it has been shown that time in the country and native language use are the best reflections of acculturation level.[24] More recently, measures of acculturation have been developed for blacks[32–35] and Native Americans.[36] Despite the recent appearance of some "multigroup" scales of acculturation that focus on "use of native language and native cultural practices,"[37,38] to our knowledge, there is no measure of acculturation that can be used among people from immigrant and nonimmigrant cultures.

A number of studies have found that acculturation has a significant and independent relationship to health outcomes[39] and health risk behaviors[38,40–43] such as smoking, alcohol use, and breast cancer screening. Relationships between Latino acculturation and performance on cognitive tests have also been reported.[44,45] Four studies have explored the relationship of black cultural experience (as measured by the African American Acculturation Scale[33,34]) to cognitive test performance. Each of these studies showed that black participants who were less acculturated obtained lower scores on neuropsychologic measures[46–49] even after accounting for age and years of education; however, only one included reading level in the analysis and found that when that was accounted for, the unique effect of acculturation was greatly reduced.

Taken together, investigations of acculturation level suggest that there are cultural differences within those of the same ethnicity that relate to health behaviors and cognitive measures, and that accounting for the level of cultural experience may help to improve understanding of race/ethnicity and health. For measures of cognition, acculturation level probably reflects other cognitive and noncognitive factors as well that have a direct influence on test performance. For example, acculturation level may reflect the salience that a particular task has in everyday life. Acculturation may also reflect the emphasis that was placed on a particular task during development. Traditional ethnic minorities may not be as "test-wise" or as proficient in the implicit and explicit requirements of cognitive measures. Acculturation may also reflect motivation or attitude toward testing. If individuals are suspicious as to the value of a task, they may not deliver their maximum performance. We assume that internalized competition will cause most persons to try their hardest, but competition on formal cognitive tests may be more valued in white American culture and thus vary with level of acculturation.

Operationalization of Cultural Experience

In summary, research on health and cultural experience shows that among immigrant groups, acculturation is best operationalized by determining years in the country, English proficiency, and language use at work, home, and social situations. Among nonimmigrant groups, acculturation is best operationalized by assessing racial segregation level of schooling as well as current and childhood residential segregation level.

Years of Education/Quality of Education/Literacy

Extreme differences in educational level often are found among racial/ethnic groups in the United States. Cross-cultural researchers are therefore challenged to find measures that are sensitive to cognitive impairment across broad educational backgrounds.[50] In addition, it is common for investigators to use covariance or matching procedures to equate ethnic groups on years of education before comparing neuropsychologic test performance. However, matching racial/ethnic groups on quantity of formal education does not necessarily mean that the quality of education is comparable.[51]

In the United States, there is a great deal of discordance between years of education and quality of education; this is true particularly among ethnic minorities and immigrants.[52] Studies have suggested that elderly blacks have reading skills significantly below their self-reported education level.[53–55] Blacks educated in the South before the Supreme Court's 1954 *Brown v. Board of Education* decision attended segregated schools, which received less funding as contrasted with white southern schools and most integrated northern schools.[56] The unequal distribution of funds to segregated black schools in the South during the first half of this century, and the subsequent lower quality of education, was related to lower earnings among blacks in a number of studies.[57–62] Margo[57] also found that the opportunity gaps resulting from black children being employed rather than attending school played a role in reducing attendance during the year and therefore quality of schooling and literacy levels. Therefore, disparate school experiences, with accompanying different bases of problem-solving strategies, knowledge, familiarity, and practice, could explain why some ethnic minorities obtain lower scores on cognitive measures even after controlling for "years of education." Statistical control of years of education may be inadequate or inappropriate because different measures may be used among (and within) each ethnic group.[51,63]

Our first attempts to assess the effect of quality of education have focused on reading level.[55] We hypothesized that reading achievement would reflect educational experience. We sought to determine whether or not reading level had a significant relationship to cognitive test performance, even after accounting for the effects of years of education. Among community-dwelling elders, we found that (1) blacks were overrepresented within the group for which self-reported years of education was an overestimate of actual reading level (47% among blacks vs. 18% among whites; (2) although demographics (age, gender, and years of education) explained a significant amount of variance on most cognitive measures, reading level had a significant, independent effect on measures of verbal and nonverbal learning and memory, orientation, verbal and nonverbal abstraction, language, and construction; and (3) significant discrepancies in neuropsychologic test performance between education-matched black and white elders become nonsignificant when reading score was used as a covariate. These results suggest that reading level is sensitive to aspects of educational experience important for successful performance on measures across several

cognitive domains but that are not captured by years of education.

Although reading level is a major component of literacy, we recognized that literacy also involves the knowledge of how and in what context to apply literacy skills for specific purposes. Literacy should be viewed as an advancing set of skills, knowledge, and information-processing strategies that individuals apply within specific contexts that are influenced by culture.[64] This concept directly pertains to the growing literature addressing literacy level as it pertains to ability to read, understand, and act on medical instructions.[65–67] For example, these studies find that low health literacy is associated with poor diabetes outcomes,[68,69] poor asthma self-care,[70] cancer severity,[71] and poor health status among people with AIDS.[72] Measuring and relating literacy to health outcomes of interest is one way to deconstruct race/ethnicity and to discover the factors that underlie racial differences.

Operationalization of Quality of Education

We recommend evaluating educational experience by inquiring not only about highest grade achieved but also obtain details about the location primary, secondary, and postsecondary schooling took place, whether it was a one-room school or had a low student/teacher ratio, and whether schools were in a rural or urban settings. Finally, reading level should be assessed using very brief, the Wide Range Achievement Test–Version 3 reading subtest[73] for English speakers and the Word Accentuation Test[74] among Spanish speakers. In addition, measures such as the Rapid Estimate of Adult Literacy in Medicine[75] or the Test of Functional Health Literacy in Adults[76] can be used to assess health literacy.

Socioeconomic Status

Several studies have exquisitely demonstrated that traditional assessment of social class such as earnings and years of school are inappropriate measures among ethnic minorities.[51] Instead, several researchers have begun to use measures such as assets, debt, use of public assistance, and neighborhood-level indicators of income.[77–82]

Operationalization of Socioeconomic Status

In addition to querying about yearly income, studies such as the National Survey of Black Americans[78] and the Health and Retirement Survey[83] have included items that assess whether the individual feels their current financial situation compares with that of 10 years ago, whether they are having difficulty meeting the monthly rent/mortgage and bill payments, whether there has been any difficulty attaining enough food or clothing for the family, debt burden, home, and vehicle ownership.

Racial Socialization

Although race is not a biologically meaningful concept, it is undeniably meaningful to individuals within society. People acquire beliefs about their own and others' racial identity through the process of racial socialization. Because of the highly charged history of racism in the United States, the effect of racial socialization on behavior and attitudes means that racial socialization must be considered in measurement of health outcomes. Over the past several years, a number of studies have shown a link between perceived discrimination and physical and mental health.[84–92] There are now a number of recent studies that show that racial disparities in quality of health care have remained largely unchanged over the past decade such as use of major surgical procedures,[93] treatment after myocardial infarction,[94] glucose control among patients with diabetes, and cholesterol-lowering treatment among people with cardiovascular disorders.[95]

Racial socialization has also been shown to have an impact on level of comfort and confidence during cognitive testing.[96] The concept of stereotype threat has been described as a factor that may attenuate the performance of blacks on cognitive tests.[97] Stereotype threat describes the effect of attention diverting from the task at hand to the concern that one's performance will confirm a negative stereotype about one's group. Steele and his colleagues[97,98] demonstrated that when a test consisting of difficult verbal GRE examination items was described as measuring intellectual ability, black undergraduates at Stanford University performed significantly worse than did SAT score-matched whites. However, when the same test was described as a "laboratory problem-solving task" or a "challenging test," which was unrelated to intellectual ability, scores of blacks matched those of white students. Using similar methods, another study showed an effect of stereotype threat on Ravens Progressive Matrices performance.[99] Researchers have also shown that when gender differences in math ability were invoked, stereotype threat undermined performance of women on math tests[100] and among white males (when comparisons to Asians were invoked).[98]

Operationalization of Racial Socialization

Many of the studies reviewed in the previous section used the Everyday Discrimination Scale[101] to measure routine and relatively minor experiences of unfair treatment. The questions are formed as follows: "Over the last year, in your day-to-day life, how often have any of the following things happened to you?" Response items include being treated with less courtesy than others, receiving poorer service than others in restaurants or stores, others being afraid of you, being called names or insulted, and so on. If the respondent answers "yes" to any of the responses, they are then asked "What do you think is the main reason for this treatment?" and are given the options of: (1) your ancestry or national origins, (2) your gender, (3) your race, (4) your age, (5) your height or weight, (6) your shade of skin color, or (7) other. The Major Experiences of Discrimination Scale[101] is an 8-item scale that asks whether unfair treatment has ever occurred at school, getting a job, at work, getting housing, in one's neighborhood, getting services from a plumber or mechanic, from police, or getting a loan. Again, if the respondent answers "yes," the perceived main reason for this treatment is determined and the frequency and last occurrence of this treatment is assessed.

CONCLUSIONS

Researchers must be aware that racial and ethnic classifications are historically defined categories that are not direct reflections of genetic populations. There is also tremendous heterogeneity in cultural, linguistic, educational, and environmental exposures within traditionally defined racial and ethnic groups. Without explicit measurement of these factors, possible interpretations of differences between ethnic or racial groups are too varied and complex. Although most of the work in this area has focused on differences between European Americans and ethnic minorities or within ethnic minority groups, refining measures of cultural experience, quality of education, socioeconomic class, and racial socialization and using them within research on health will also help to better predict outcomes among all ethnic groups, including European Americans.[55,102,103]

As should be clear from the literature reviewed previously, the constructs of acculturation, quality of education, socioeconomic class, and racial socialization are correlated. It is not clear whether these represent distinct constructs across different cultural groups, age cohorts, or participant groups. Even when they are assessed using reliable and valid measures, future research may reveal that the role of these variables is specific to certain cultural groups, geographic regions, or health outcomes. We have found that asking participants about their cultural and educational experience can be weaved into a standard interview assessing demographic variables; however, the comfort level of the participant is largely determinant on the comfort level of the interviewers in discussing these issues. Like with any other set of questions that are potentially sensitive, the interviewer must have had established good rapport with the interviewee, should spend time to provide sufficient explanation of why questions about educational history, literacy level, and cultural background are being asked, ensure the participant that their responses will remain confidential, and welcome any feedback the interviewee may have about the questions. Using this methodology, we have gathered these data on thousands of diverse elders[49,55,103–106] and have found that introduction of these questions does not attenuate follow-up rate in longitudinal research studies.

Despite the methodological difficulties all researchers must face, these investigations challenge our definitions of race and ethnicity, impairment, functional deficit, and definitions of health outcomes. The ultimate validity check for constructs involving these concepts may be their ability to supersede cultural boundaries. The challenges are substantial, but we expect that the struggle to deconstruct race, ethnicity, culture, and biology will inevitably enrich our understanding of cause-and-effect interactions between the environment and health.

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