

**REIFYING HUMAN DIFFERENCE: THE DEBATE ON
GENETICS, RACE, AND HEALTH**

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The causes of racial and ethnic inequalities in health and the most appropriate categories to use to address health inequality have been the subject of heated debate in recent years. At the same time, genetic explanations for racial disparities have figured prominently in the scientific and popular press since the announcement of the sequencing of the human genome. To understand how such explanations assumed prominence, this essay analyzes the circulation of ideas about race and genetics and the rhetorical strategies used by authors of key texts to shape the debate. The authority of genetic accounts for racial and ethnic difference in disease, the author argues, is rooted in a broad cultural faith in the promise of genetics to solve problems of human disease and the inner truth of human beings that is intertwined with historical meanings attached to race. Such accounts are problematic for a variety of reasons. Importantly, they produce, reify, and naturalize notions of racial difference, provide a scientific rationale for racially targeted medical care, and distract attention from research that probes the complex ways in which political, economic, social, and biological factors, especially those of inequality and racism, cause health disparities.

Over the past decade, a consensus has emerged among public health practitioners, researchers, policymakers, and lay advocates that health inequality is a pressing social problem. There is, however, little consensus on the magnitude, causes of, and possible solutions to the problem. Since the notion of “inequality” or “disparity” implies group difference in the experience of health, much of the debate over health disparities has necessarily centered on the issue of human classification, thereby generating a series of important questions. How are groups or populations defined and by whom? How is group membership assigned and by whom? What groups should be studied and why? Is genetic variation a property of individuals or groups? In the United States, the groups of most intense interest for

genetic study are, not surprisingly, those comprising “races” or “ethnic” groups. That the problem of health disparities has become synonymous with racial and ethnic difference in the United States has profound political, epistemological, and public health consequences.

What has made these questions all the more pressing is the intersection of the health disparities movement with cultural faith in the promise of genetics to solve the problem of human disease, population genetic studies claiming that the time-honored, commonsensical ideas of “five” continental groups have a scientific basis, and a burgeoning multinational pharmaceutical industry poised to exploit race-based niche markets. In the past several years, genetic explanations have been taken up widely by the popular press, including the *New York Times*, which has played a major role in the uncritical promotion of the view that races can be defined genetically.

Within the space of one week in March 2005, the *New York Times* published two pieces linking biology to race. The first was an op-ed that argued forcefully that recent genetic studies support the division of humankind into “the major races of traditional anthropology” (1). The second article reported on economist Roland Fryer’s hypothesis that a genetic predisposition to salt retention among African Americans could account for racial differences in mortality (2). Surprisingly, no mention was made of the many critiques of this decades-old hypothesis (3, 4). More recently, there has been a flurry of scientific and press articles about race-based medicine, focused on marketing of a cancer drug to “Asians” (5) and the contentious submission to and subsequent approval by the U.S. Food and Drug Administration of BiDil, a drug marketed by NitroMed Inc. specifically to African Americans for treatment of heart failure (6, 7).

We can anticipate that for the foreseeable future, scientists will continue to amass a vast amount of data on the molecular genetics of disease, develop new genetic tests for disease susceptibility, and attempt to market new, if not improved, drug treatments. Most likely the public will continue to be enticed by this dazzling display of scientific prowess. The question remains, Will such scientific work actually improve health and reduce racial and ethnic disparities in disease?

As many scholars (8–13) have shown, the cultural appeal of genetics is enmeshed in and produced together with changing political, economic, and social contexts in which scientific research is conducted. Dissecting this context is critical in gaining clarity on what social values shape scientific investigations of disease causality. Of great importance is the possibility that the next period will be marked by reduced resources devoted to studying the sociopolitical dimensions of health and the complex ways in which the social world is materially embodied,¹ producing differential patterns of disease among socially and politically defined groups.

¹ In the context of this essay, “embodiment” can be defined as the biological or material expression of social and cultural life experiences. Such experiences include structured inequality, racism, discrimination, inability to afford a healthy diet, segregated housing, and so forth.

The period immediately following the announcement of the sequencing of a draft of the human genome witnessed a shift in discourse about genes and race in medicine and public health.² To understand the appeal of genetic explanations and how the authority of science was marshaled by scientists and journalists to promote the notion of five races, I analyze the circulation of ideas about race and genetics in scientific and popular press articles published between 2000 and 2004. Focusing specifically on arguments over the use of race and ethnicity as analytical categories in the study of health disparities, I sketch the contours of the debate, explore rhetorical strategies employed by writers to support their arguments, and finally consider the stakes of these arguments for our understanding of health inequalities. The scientific and the popular press, I show, are socially potent sites for societal deliberations about the meaning and use of racial categories and the relationship of “race” to disease. My central argument is that the process of clarifying the meanings of race or ethnicity is a social one in which values, commitments, and visions of what sort of human society we want are negotiated.

THE DEBATE ON RACE AND GENETICS IN MEDICAL RESEARCH

In the 1980s and 1990s, scientists published numerous articles and commentaries that attempted to clarify the concept of race and what understandings of race should inform health research, policy, and care (14–20). Many authors viewed racial and ethnic categories as sociopolitical, not genetic, categories and the causes of health disparities as simultaneously political, economic, social, and biological. For these authors, solutions to health disparities required an understanding of the biological expression of life experiences, especially those of discrimination and racism. However, throughout this period and seemingly untouched by more theoretical discussions, empirical research on patterns of disease consistently invoked genetic explanations for difference, either directly or by default (21). Thus, the announcement of the sequencing of a draft of the human genome in June 2000 capped a long period of sometimes explicit, but generally invisible, geneticization of health (22)—which was inextricably bound to social and scientific discourse over race (23–25).

Initial pronouncements from leaders of the Human Genome Project asserted with certainty the unity of the human species that shared 99.9 percent of its DNA. There were, according to these scientists, no major subdivisions of humankind that could be defined genetically (26). For a brief moment, it seemed that the debate was settled. However, the 0.1 percent difference and the definition of “major”

² Throughout this essay I make a key distinction between biology and genetics. Biology encompasses a broader range of phenomena than simply genes. This includes the expression of genes at the level of proteins, protein function, and epigenetic processes, all of which can influence the development of disease.

provided a discursive and material space for genetically based ideas and scientific practices centered on racial difference and disease susceptibility.

Editorial Comments

During 2000 and 2001, several prominent international scientific journals published a series of editorials on race that wove together controversies over the 2000 U.S. census, genomics, disease susceptibility, and questions related to the meaning of race, ethnicity, populations, genetic clusters, and ancestry. For example, in response to the controversy over racial categorization in the 2000 U.S. census, the editor of *Nature Genetics* (27) claimed that race was not a scientific category and that the preferred method to categorize groups should be based on genotyping. In the future, the journal would require investigators to justify their use of race and ethnicity as analytical categories. With no consensus on the meaning of race, however, this was a daunting charge to scientists with little or no knowledge of the history of the concept of race.

The next year, paired editorials in the *New England Journal of Medicine* addressed racial categorization and its relationship to disease and drug response. In the first editorial, Robert Schwartz made an explicit attempt to define race and to outline the dangers of medical profiling. “Race,” he stated, “is a social construct, not a scientific classification. . . . Instruction in medical genetics should emphasize the fallacy of race as a scientific concept and the dangers inherent in practicing race-based medicine” (28, p. 1393). In sharp contrast, Alistair Wood proposed in the second editorial that racial categories were in fact rooted in biology and genetics. Illustrating a common slippage between two separable phenotypes, disease and drug response, Wood claimed that environment and “fundamental differences in the pathogenesis of disease” accounted for racial and ethnic differences in the response to drugs (29, p. 1394).

Several months later, the hot topic of pharmacogenomics was again the subject of editorial comment in *Nature Genetics*. Noting the “confusion and potential harmful effects of using ‘race’ as a variable in medical research” (30), and calling for the substitution of the more “race-neutral” approach of genotyping populations, this editor nonetheless argued that genotypic clusters overlapped roughly with self-reported race and ethnicity. How one would define “rough” was a point future commentators would not overlook. Whether a fixed category or a more fluid concept defined statistically, “race” simply would not disappear.

These same themes dominated discussions of race in reviews, commentaries, and opinion pieces written between 2000 and 2004. Investigators articulated an array of perspectives on the definitions of race, ethnicity, populations, and ancestry; the most informative DNA markers to use to map populations and disease susceptibility; technical and methodological problems of epidemiological and population genetics research; the relevance of genetics to our understanding of complex diseases, response to drugs, and public health; and whether, or to what extent, the use of

self-reported racial categories should guide clinical practice, medical research, and public health policy. The notion that isolated populations, be they “Yorubans,” “Corsicans,” “Gambians,” or “Pima Indians,” exist in nature waiting to be studied was a persistent and largely uncontested theme in most commentaries.

Despite differing conceptions of “race” and of solutions to the problem of health disparities, editors and commentators expressed an almost uniform consensus over the promise—and power—of genomics for the production of knowledge about and solutions to the problem of disease. This faith shaped their explanations of disease causality. For example, after questioning whether allelic difference could ever explain a complex physiological phenomenon, such as the response to drugs, one editor opined that “once all the genes that contribute to drug response are identified, doctors will be able to prescribe drugs based on patients’ genotypes. For patients, this is the real promise of the Human Genome Project” (30, p. 240). Although acknowledging a complex relationship between genes and human physiology, the imperative of genetic research as a privileged site of knowledge production won out in this editor’s mind.

Summary of Positions

In this richly textured terrain of constantly shifting uses and meanings of the conceptions of race and ethnicity, it is possible to discern the outlines of five positions circulating in the biomedical literature,³ each of which differs in its conceptualization of race and/or ethnicity, assumptions about disease causality, and solutions to disparities in health.

1. One position, represented in the Institute of Medicine report *The Unequal Burden of Cancer: An Assessment of NIH Research and Programs for Ethnic Minorities and the Medically Underserved* (31), but not described in detail in the literature reviewed for this analysis, interprets race as a social category and calls for the substitution of ethnicity for race. However, in this report the relationship between race, ethnicity, and disease susceptibility is never clearly delineated and thus does not provide any operational guide for research.
2. Another position, articulated by public health researchers, such as epidemiologist Nancy Krieger (32, 33) and sociologist David Williams (34), holds that while race and ethnicity are socially produced categories, the health consequences of racial discrimination are mediated biologically and cannot be reduced to group-specific genetic differences. They advocate for the use of racial and ethnic categorization in social epidemiological investigations that integrate biological and social research.

³ It is important to note that, since this is an active debate, positions are not fixed and are quite reasonably subject to change over time. Some scientists involved cannot be located in one of the five positions.

3. A related but distinct perspective, epitomized by Jay Kaufman and Richard Cooper (35), argues that race is a social entity and that categorization at the level of continental ancestry is too crude to be meaningful for genetic studies of racial and ethnic disparities in disease. These researchers question the public health and clinical significance of self-reported race and ethnicity, arguing that the focus of investigation of racial disparities in disease should be racism, not “race.”
4. Another perspective, represented by the editor at *Nature Genetics* (30), proposes to sidestep the issue of race and ethnicity, calling for the “race-neutral” approach of genotyping populations instead of classifying people based on self-identified race and/or ethnicity. Individual-level genotyping, then, would ultimately replace population-level genotyping. The extent to which self-identification corresponds to genetic clusters, however, would remain a point of contention.
5. The final position, exemplified by Neil Risch and his colleagues (36, 37), puts forth a seemingly simple and straightforward interpretation of decades of population genetics research and its meaning for biomedicine. Drawing on the results of population genetics research, these authors argue that genetic polymorphisms cluster “roughly” into five major continental groups worldwide. Since these clusters, in turn, correspond “roughly” to self-reported race and ethnicity in the United States and to the U.S. census categories, race and ethnicity, as codified in the U.S. census, should—and indeed must—be used to study group-specific disease susceptibility. This position has become the centerpiece of the contemporary debate and consequently is the focus of the following discussion.

THE FIVE RACES

Set in the context of the bitter debate over the Racial Privacy Initiative in California in October 2003, a referendum pushed by politically conservative opponents of affirmative action that called for elimination of the use of racial categories in public databases, the publication of the 12-page opinion piece in *Genome Biology* by Risch and colleagues (36), along with its subsequent affirmation and elaboration eight months later in the *New England Journal of Medicine* (37), was a turning point in the debate. What was particularly striking was the almost immediate credibility accorded to Risch and colleagues’ views in the popular press and the rapid marginalization of the views of other researchers, many of whom had been deeply engaged for decades in theorizing and studying empirically the causes of racial and ethnic disparities in disease. Not for decades had anyone dared to propose so explicitly that there are five major racial groups that differed genetically.

Why, then, was this particular argument so persuasive and consequently so powerful as a knowledge-making activity? The answer to this question requires a

detailed analysis of the history of science and the construction of race. What I want to highlight here is that the credibility of Risch and colleagues' views cannot be explained by the substance of their argument or the truth-value of the scientific evidence. Rather, attaining scientific credibility occurred through the mobilization of social and technical resources and deployment of rhetorical strategies that are historically situated (38–42). In other words, the authority ascribed to Risch's arguments is profoundly social, embedded in language, history, and science.

As sociologist Joel Best has stated so clearly, "Claimsmakers inevitably characterize problems in particular ways. They emphasize some aspects and not others, they promote certain orientations and they focus on particular causes and advocate particular solutions" (40, p. 9). What I want to argue here is that the authority of Risch and colleagues' accounts derives *in part* from the rhetorically skillful connections they make among certain dimensions of the problem of health disparities, their selection of evidence, and the enticingly simple solutions to complex questions of disease that they offer. Importantly, because of the broader context of the history of race in U.S. society, their focused, carefully structured, and controlled argument articulated what many were already thinking about racial difference. The notion of the "reality" of five racial groups resonated with popular understandings of difference shared by scientists and the public alike.

Much of the rhetorical work in the *Genome Biology* paper takes place in the first two paragraphs of the article. Here the authors orient the reader to how the article should be read *and* who is entitled to speak about the meaning of race. Positioning themselves in a tradition of objective and value-free science, they characterize the debate as a recent and technical one over "optimal strategies for categorizing humans" for biomedical research. They then link the technical problem of categorization to population-specific disease susceptibility. They question the objectivity of those who assert that race is biologically meaningless, casting these actors as well-intentioned and attuned to "sensitivities" brought on by "historic and current inequities based on perceived racial and ethnic identities" but lacking an objective scientific perspective. Dismissing the social construction of race as politically motivated and ignoring the violent history of race relations worldwide, Risch and colleagues maintain that from an "objective and scientific (genetic and epidemiologic) perspective, there is great validity in racial/ethnic self-categorizations, both from the research and public policy points of view" (36, p. 2007.1).

With this framing, their task in the paper became a relatively straightforward one of characterizing population-specific risks of disease (some populations are more at risk for certain diseases than others); providing a compelling rationale for *five* major groupings of humankind (population genetics has shown that they exist and it makes sense); and articulating a very simple solution to classifying racial groups (the U.S. census categories and self-identification work pretty well.) In turn, the legitimacy of their position is supported by a number of rhetorical devices: selective referencing of research on population genetics; constant restatements of their objectivity; a simply drawn figure of a crude evolutionary

tree of human racial divergence; highlighting of a few well-known monogenic diseases, such as Tay-Sachs, sickle cell anemia, and hemochromatosis; several tables synthesizing data on allelic frequencies; and a special box, studded with mathematical formulas, that purports to explain the key question—the number of loci needed to cluster people into races. By casting themselves as firm opponents of the Racial Privacy Initiative with a moral commitment to reducing racial and ethnic disparities in health, they attempt to distance themselves from both an earlier period in U.S. history when scientific theories of race were explicitly used to justify racist policies and the contemporary politically conservative movement that denies the reality of racial discrimination.

Moreover, these authors never allow themselves to get embroiled in the complexities of the science or the specifics of the debates over health disparities. For example, there is no substantive discussion in either of their two influential papers (*a*) that the data used to cluster genetic variation derived from noncoding regions of DNA are for the most part irrelevant to disease predisposition; (*b*) that the databases are widely acknowledged to be distorted geographic and numerical samplings of people worldwide; and (*c*) that clustering relies on complex models with serious limitations (43–46). Instead, the story they tell is a simple and seemingly straightforward one, which, as I will show, has had great appeal to print media.

The combined expertise of genetic epidemiologic, statistical, and medical training represented by the authors of the *Genome Biology* paper was formidable and difficult for non-experts or even many scientists to counter. How could one argue with the expertise of population genetics, given that most scientists, physicians, and certainly non-scientists lack any training in this field? Moreover, geneticists had now teamed up with epidemiologists “who have a broad view of the complex nature of most human traits” (36, p. 2007.3). According to Risch and colleagues, it was population geneticists and genetic epidemiologists who were best situated to determine the “reality” of race and the causes of health disparities.⁴

To counter the argument that genetic clustering would be more informative than racial self-identification, Risch and colleagues make another interesting and crucially important claim. While laying the groundwork for studying the genetic roots of racial and ethnic difference in disease susceptibility, they are careful to provide a space for studying the social dimensions of disease. They rightly note that genotyping would actually make it more difficult to understand the causes of diseases, for it would obscure the “variety of social, cultural, behavioral and environmental variables as well as gene frequencies” that distinguish racial and ethnic groups” (36, p. 2007.7). By making this claim, they thus resist any characterization of their position as genetically reductionist.

But, perhaps the most significant feature of Risch and colleagues’ argument is their reliance on the explanatory power of the notion of five major races that

⁴ This statement is not meant to imply that all genetic epidemiologists share Risch’s perspective.

corresponds to continental ancestry. This notion is a compelling, if ahistorical, trope, conforming to “commonsense” ideas about race as natural groupings, which has been deeply embedded in Western thought for centuries (see, e.g., 47–49). This is the case, even though the precise number of groups and which groups are the primary objects of analysis change over time and in different contexts—as political scientist Melissa Nobles (50) has so elegantly demonstrated in her study of the sociopolitical production of the U.S. and Brazilian census categories.

THE POPULAR PRESS AND THE MAKING OF RACE

News articles do not simply report on a controversy but play an active role in constituting the terms of a controversy and what becomes accepted as knowledge (51, 52). In providing a vehicle to reach a broad audience and, importantly, to elaborate on the assumptions underlying its research, the popular press is a particularly important site for public debate, even for scientists who publish in specialized journals read by few outside their narrow field of study. Moreover, by popularizing a single position in the debate on race and biology, rather than presenting it in its complexity, the popular press, notably the *New York Times*, has actively shaped current understandings of the debate and sharply delimited who was entitled to speak on race.

To be sure, the popular press was a crucial resource for Risch and his colleagues. In the July 30, 2002, issue of the *New York Times*, veteran science reporter Nicholas Wade wrote an article provocatively entitled “Race Is Seen as Real Guide to Track Roots of Disease” (53). In turn, the article caught the attention of syndicated columnist William Pfaff, who brought Wade’s framing of the genetics of race to an international audience through his pointed commentary published in the *International Herald Tribune* (54) and *Boston Globe* (55). In all likelihood, many scientists read Wade’s article or Pfaff’s column long before they read Risch’s opinion piece in *Genome Biology*—if they ever read it at all. Non-scientists probably never consulted the original article.

In his article (53), Wade outlines Risch and colleagues’ central claims that races should be redefined as statistical clusters corresponding to continent of origin and that racial categorization is essential to understanding the etiology of disease. Risch’s assertions are represented with an aura of scientific certainty. By quoting the geneticist Stephen O’Brien’s comments that those who differ with Risch are “honest and brilliant people who are not population geneticists,” Wade portrays Risch as eminently qualified to speak on the “reality” of race, thereby silencing alternative views. Moreover, by featuring O’Brien’s statement on political correctness—a term invented by the *New York Times* (56) and deployed repeatedly by political conservatives and their allies to dismiss critics of biological concepts of race (1, 57)—Wade casts Risch as a courageous figure for “plunging into an arena where many fear to tread,” an arena untainted by political ideology, and therefore scientifically more credible. According to O’Brien, “what is happening

here is that Neil Risch and his colleagues have decided the pendulum of political correctness has taken the field in a direction that will hurt epidemiological assessment of disease in the very minorities the defenders of political correctness wish to protect” (all O’Brien quotations in 53).

Wade and the *New York Times* remained fascinated by the topic of race and genetics. After the publication of a new study in *Science* on the genetics of population structure (58), Wade featured Risch in yet another article in December 2002, again with a provocative title: “Gene Study Identifies 5 Main Human Populations, Linking Them to Geography” (59). Citing the *Science* article’s lead author Marcus Feldman’s view that “Neil’s article [in *Genome Biology*] was theoretical and this is the data that backs up what he said,” Wade portrays the new scientific findings as definitive, with scientific experts poised to bring closure to the most contentious aspects of the debate and embrace the fundamentals of Risch’s position. Indeed, Wade represents sociologists and anthropologists as of potential use in sorting out ethical issues but as lacking the requisite expertise to determine the meaning of race. In another article in the *New York Times*, in March 2003 (60), followed by one in *Science* in December 2003 (61), this rich and textured debate in which the meanings of race were being worked out was reduced to two opposing views.

What is particularly disturbing is the press’s failure to engage other public health scientists, such as Richard Cooper, Camara Jones, Jay Kaufman, Nancy Krieger, Thomas LaViest, or David Williams, to name but a few, or even to mention any of their contributions to research on health disparities and theorizing about race. Nor has the press questioned the methodological assumptions or sampling techniques underlying the production of certain types of clusterings. As a consequence, the continuity of genetic variation throughout the world has been ignored.

WHAT IS AT STAKE?

In this analysis, I have attempted to demonstrate that genetic accounts of racial and ethnic difference in disease, as exemplified by the position of Risch and his colleagues, have acquired authority for rhetorical, political, and social reasons, not for the truth-value of the scientific evidence. What are the consequences of this debate and the ways in which it is being conducted for the health care of patients and for public health policy? Is this simply a rerun of historical debates about race? Or is this debate being reconfigured in new political and social contexts, making new meanings of the relationship between race and disease? Genomics has immense cultural authority at this historical moment, stemming in part from claims to a special kind of expert knowledge, to which only a few have access. For researchers studying the role of genetics in health, however, an important conceptual problem remains. How will the staggering amount of genetic information that is being generated, and will be generated for the foreseeable future, be organized and classified?

As Geoffrey Bowker and Susan Leigh Star have shown in *Sorting Things Out: Classification and Its Consequences* (62), categories are not empty vessels that exist in nature devoid of meaning. Instead, categories carry and produce political and social meaning. Their selection and use by scientists in turn creates new meaning, in part through historically variable explicit or implicit descriptors layered onto categories. That there is no single conception of race that produces the same categories of people in all contexts has been almost completely ignored by many actors in the recent debate. In the United States, much of the debate over classification of genetic data has centered on the use of racial and ethnic groups in medical research. But, the U.S. census categories, which have been formed and reformed over time, are devoid of meaning in South Africa, Brazil, or most other countries worldwide. In South Africa, for example, depending on one's political stance, "black" can refer specifically to "Africans" or it can encompass a broader politically defined group of people formally classified as "African," "coloured," and "Asian." Consequently, the use of the apartheid era "population group" categories—European, African, coloured, and Asian—for health research remains an area of intense contestation. Thus the argument that there is a close correspondence between the social act of self-identification, U.S. census categories, and genetic clustering according to continent of origin needs to be interrogated carefully.

Informing these unresolved issues about classification systems are the exigencies of establishing databases suitable for genetic research in an era of globalization, when the interpretations of science and the categories put forth by scientists in politically and economically powerful and resource-rich countries carry immense authority worldwide and the imperative to harmonize differing classification systems is strong. Many argue, for example, that expansion of research on population structure requires a more extensive collection of data on African peoples. Some of these databases, such as that established as a joint venture by the National Geographic Society and IBM are privately owned (63). Regardless of whether such databases are privately or publicly owned, or the fact that Africans will play a central role in establishing the databases, several questions remain. How will these data be organized? What and whose values will guide the development of these infrastructures? The prospect of U.S. notions of racial categorization being used to harmonize international databases has an inescapable imperialist dimension.

The focus on genetic definitions of racial groups or "population clusters" and on proposals for their use in characterizing the disease experience of populations has almost completely obscured the relevance of other social categories—such as class, occupation, and, to a lesser extent, gender—to the prevalence and natural history of disease. Shula Marks addressed this question in the context of colonial medicine. "Can it be," she queries, "that because the discourses of medicine privilege bodily markers like gender and race, they serve, especially in a colonial context, whether consciously or unconsciously, to occlude considerations of class" (64, p. 216). Marks's concerns can certainly be generalized beyond colonial

medicine. Contemporary biomedical research promotes and participates in the process of de-linking race from class. As demonstrated by the recent sanitization of the National Healthcare Disparities Report by the Bush administration (65–67) and the cynical and opportunistic emphasis on poverty as opposed to race in the health care bill sponsored by Rep. Bill Frist (68), this failure to integrate race and social class into research design, causal explanations of health disparities, and public health policy has left an opening for conservatives to speak for the role of social class, if ever so cynically, and to deny the role of racism in health inequities.

CONCLUSION

In summary, I am not making the claim that individual human beings do not vary genetically. Nor am I arguing that there is no role for genetics in public health research. Rather, I am arguing that when we are planning and implementing programs of genetic research, we need to think carefully about why certain ideas are so readily accepted and from whence their authority derives. As Evelyn Hammonds has argued, “*the appeal of a story that links race to medical and scientific progress lies in the way in which it naturalizes the social order in a racially stratified society such as ours*” (25).

The attempt to order human variability into genetically defined continental groups or populations, to concretize genetic clusterings as fixed categories, to assign people to these categories, and to use the categories analytically in genetic studies of disease etiology has numerous consequences. First, such practices racialize the problem of health disparities, reifying human difference and encouraging uncritical acceptance of certain disparities (69). In addition, Shields and colleagues (70) have pointed out that the use of sociopolitical categories of race and ethnicity in genetic studies obscures the valid use of these categories in the U.S. context for monitoring health disparities. Finally, these practices distract attention from research that probes the ways in which political, economic, and social factors, especially those of inequality and racism, influence life experience and are expressed biologically, producing poor health.

Some aspects of life experience that produce differential patterns of disease, such as exposure to asbestos (71) or racial segregation (72, 73), are well-known to biomedical researchers. Others, such as the association of pesticides with low birth weight in minority communities in New York City, are under investigation (74). Still others, such as the connections between environment and epigenetic processes, have not been fully exploited in the context of understanding the mechanisms of disparities (75). The point is that we will never get answers to questions we fail to even ask.

That genetic research on racial groups produces, albeit unintentionally, a hierarchy of humanity based on innate biological difference—in this case, genetic predisposition to disease—is inescapable. As Richard Cooper and his coauthors Jay Kaufman and Ryk Ward note, “minority groups, particularly blacks in the

United States, are assumed to be genetically predisposed to virtually all common chronic diseases” (76, p. 1168). There is no race without its history. The correspondence of black race with disease, or what Melbourne Tapper (77) has termed the “‘anthropathology’ of the American Negro,” has a long and sordid history, which has been examined exhaustively by scholars (e.g., 78, 79). It matters just as much today as in the past whether disease and its variability among groups is conceptualized as fixed in one’s DNA or as produced by the totality of political, economic, social, and biological life. While genetics is certainly an important part of biology, biology cannot be reduced to DNA sequences (19). Genes are part of what Anne Fausto-Sterling (80) refers to as a fluid, changing, and inseparable gene environment *system*.

We are then left with a dilemma that is simultaneously political, social, and biological. Will we continue to interpret the experience of disease through what Troy Duster (81) referred to many years ago as the “prism of heritability”? Or will we choose to explore the complex ways in which the social world is embodied, producing differential patterns of health and disease? At stake is what kinds of research can be imagined to explain the origins of poor health. The promotion of technological fixes, such as gene therapy or race-specific designer drugs, is seductive, especially when compared with conceptually and scientifically more difficult investigations of gene environment *systems*. However, it is unlikely that technological solutions will have any significant impact on health disparities. If we are serious about addressing health inequality, we need to embrace the complexity of biology in its social context, rather than adopt simplistic understandings of racial classification or simplistic explanations for racial disparities. This is a plea to scholars and the public to keep the debate open so that we can engage in the necessary dialogue to enable such investigations.

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