

multiple levels of analysis has direct and indirect effects on health" (33). If we argue that "race is not biology," however, and equate biology with genetics, we blind ourselves "to the biological consequences of race and racism," leaving ourselves "without a constructive framework for explaining biological differences between racially defined groups" (Gravlee 2013, 34).

Gravlee's (2013) approach brings together what anthropologists have learned about "race": first, race does not line up with patterns of genetic variation in human populations; second, race is a sociocultural and historical construct that shapes the circumstances of people's lives; and third, awareness of the consequences for health of living under racist conditions constitutes "a mandate for ethnographic research on the social reality of race and racism . . . to identify . . . the experiences and exposures that shape the emergence and persistence of racial inequalities in health" (41).

Gravlee and his colleagues used this approach to carry out research in Puerto Rico, attempting to explain why darker skin pigmentation was associated with higher blood pressure. They discovered that skin color had two dimensions that needed to be distinguished: "the phenotype of skin pigmentation and the cultural significance of skin color as a criterion of social status" (Gravlee 2013, 38). Measurement of skin pigmentation was carried out using the method of reflectance spectrometry, which reliably estimates the concentration of melanin in the skin. Measurement of the cultural relationship between skin color and social status required ethnographic methods. This "biocultural" (or "biocultural") approach revealed that Puerto Ricans with darker skins and higher socioeconomic status actually experienced higher blood pressure than other Puerto Ricans. This was interpreted as resulting from the fact that such individuals were likely to experience more intense racism as their social status increased, thereby producing increasingly frustrating social interactions that contributed to higher blood pressure (Gravlee 2013, 38). When Gravlee (2013) and his colleagues later included genetic-based estimates of African ancestry, they found that adding sociocultural data to the model revealed a statistically significant association between blood pressure and a particular candidate gene for hypertension—an association that was not evident in the analysis including only African ancestry and standard risk factors. This finding suggests that taking culture seriously may both clarify the biological consequences of social inequalities and empower future genetic association studies. (39)

Biocultural or biosocial approaches like that of Gravlee and his colleagues demonstrate, in the words of Greg Downey and Daniel Lende, how "social differences

however, that although biomedical research of this kind "seems to affirm that 'biological differences' are a more powerful explanation for health disparities than are social factors," the situation is better understood as "the outcome of various ways in which people struggle to contend with the significance of race in multiple social and biological registers simultaneously, often in contradictory manners." (10)

One way to disentangle these matters may be to follow the suggestion of anthropologist Clarence Gravlee and examine more closely a widespread tendency, found among medical researchers and ordinary citizens alike, to equate genetics with biology in discussions of race and disease. Gravlee rightly points out that everyone agrees that race cannot be defined in terms of genetics, as we saw previously. And anthropologists and other social scientists are also well aware of the sociocultural and historical factors in the United States and elsewhere that have created the conditions of racism with which African Americans and other nonwhite groups must contend. However, "the claim that race is not biology unwittingly perpetuates genetic determinism because it tacitly reduces biology to genetics. The more we appreciate the complexity of human biology beyond the genome, the sooner we can explain how race *becomes* biology through the embodiment of social inequality" (Gravlee 2013, 22).

Gravlee (2013) reminds us that many discussions of possible links between race and genetics use "the concept of biology and genetics interchangeably, often pitting these concepts against socioeconomic factors. . . . The implication is that the mere observation of biological differences is sufficient evidence of a genetic one" (30). Instead, he argues, we need to stop using biology as a synonym for genetics and "to pay as much attention to the meaning of biology as we have paid to the meaning of race" (32). Since the deciphering of the human genome, scientists are increasingly learning that many factors other than genes contribute to disease. At the same time, biological theorists have begun to pay closer attention to the factors that affect the health of developing organisms throughout their life course. As we saw earlier, renewed attention is being paid to phenotypic plasticity, a phenomenon, Gravlee reminds us, that Boas was insightfully investigating a century ago.

These considerations have led Gravlee to develop a model of the phenotype that pays attention to a hierarchy of causal influences that shape it over time. As developing organisms encounters these influences (which may have individual, cultural, or historical sources), the organism's responses become *embodied* in the organism's physiology in ways that shape the biological functioning of individual human bodies. "Most relevant," Gravlee (2013) writes, "is the evidence that racism at