

RACE ≠ DNA

*IF RACE IS A SOCIAL CONSTRUCT,
WHAT'S UP WITH DNA ANCESTRY TESTING?*

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ILLUSTRATION BY KEN ORVIDAS

THE CONCEPT OF RACE is the elephant in the collective American living room. It affects how we think about virtually every aspect of our society and culture—and yet we struggle to talk about or even define it.

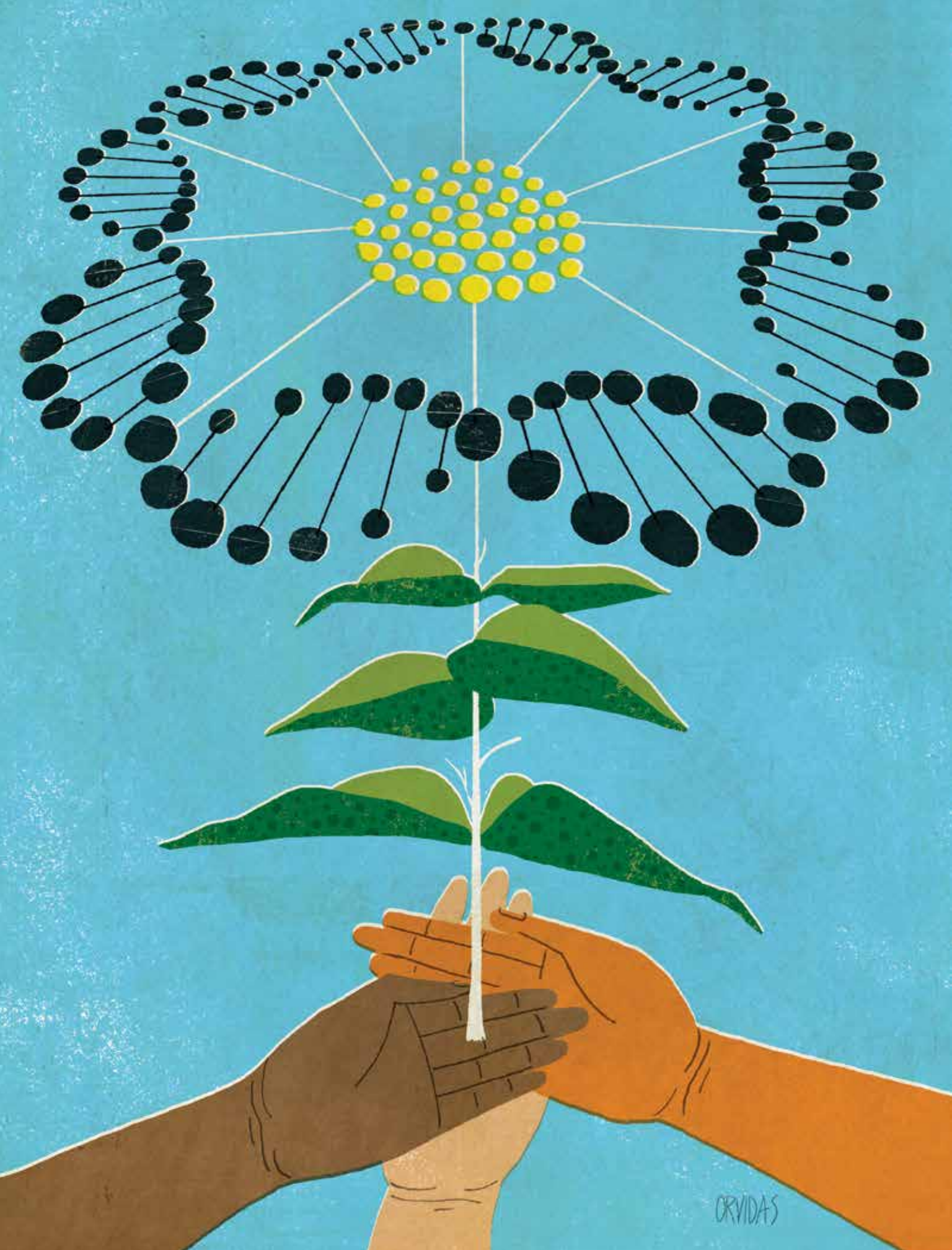
Numerous studies demonstrate that members of socially defined racial groups in the United States experience the realities of life differently. For example, a recent public opinion survey showed that while 80 percent of European-American (white) individuals

hold positive views of the police, only 52 percent of African-American individuals and 51 percent of Mexican-American individuals share that view. In addition, when asked the question of whether the police use lethal force only when necessary, 59 percent, 16 percent and 23 percent of European-American, African-American and Mexican-American individuals respectively responded in the affirmative.

Often, when we try to describe the elephant in the room, our attempts

make it sound like we're examining the elephant while blindfolded. Some of us describe the trunk, while others the tail and still others the feet. Our descriptions and definitions are different, and without understanding how they fit together, we cannot ascertain a complete picture of the elephant.

To speak meaningfully about race, we need to truly understand how different people perceive and define it and how these definitions fit together. This includes understanding socially defined



race, biological race, human variation and ancestry. Unfortunately, most Americans do not, with the result that many racist beliefs are passed along as scientific fact. Have you ever heard the stereotype “African Americans are lazy”? Someone who understood how human behavioral variation relates to socially defined race would know this statement is not logically possible—and yet it has been used for centuries as one of a number of scientifically impossible justifications for the subjugation of African-American individuals.

Taking Off the Blindfolds

The majority of Americans still operate on the assumption that there are legitimate biological races within the human species, and that these racial categories align with physical features—in other words, the way that race is socially defined in the United States. To debunk this misconception, it is important to understand two often-conflated definitions of race.

➔ **BIOLOGICAL RACE** has been defined by combinations of physical features, geographic ancestry, frequencies of genes (alleles) and evolutionary lineages. Biological races exist within some species. This is why we know they do *not* exist within our species, modern humans.

➔ **SOcially DEFINED RACE** has been defined by an arbitrarily organized combination of physical traits, geographic ancestry, language, religion and a variety of other cultural features. Social definitions of race differ depending on context and *always operate in the service of social-dominance hierarchies*.

The modern consensus of evolutionary biologists is that our species does not have enough genetic variability among its populations to justify either the identification of geographically based races or of evolutionarily distinct lineages. This is because we are a relatively young species (150,000–200,000 years old) that has always maintained significant amounts of

gene flow among its major population centers (or regional clusters of inhabitants). Indeed, all modern humans living today are descended from people who once lived in East Africa. (The oldest modern human fossils come from Omo Kibish in Ethiopia.) Humans did not begin to populate the rest of the world until about 60,000 years ago. Some of the first recorded civilizations were located in Ethiopia (prior to 3,000 B.C.E.) and then moved up the Blue Nile to modern-day Egypt. Thus many of the biological traits *not* found in sub-Saharan Africans are relatively new; fair skin and the blue-eye allele are—at most—6,000 years old. Finally this also means that when most people think of biological ancestry, they are really envisioning recent ancestry relative to our species’ existence (within the last 50,000 years or so).

This is where our understanding often gets fouled up. How is it possible that geographically based genetic and physical variation can tell you something about an individual’s recent biological ancestry, and yet that variation is not useful in identifying an individual’s biological race? Isn’t it true that Norwegians have fair complexions and Nigerians are dark?

It is true that all modern human populations have genetic differences that reflect adaptation to the environments their “recent” ancestors inhabited. There are also genetic changes that resulted from simple chance events. Have you ever heard the term “genetic drift”? This refers to chance events that alter gene frequencies in populations. This happened when human groups migrated out of Africa at different times and in different directions. Members of a given group carried a unique subset of all human genetic variation with them. For all these reasons, there is no single physical trait or gene that can be used to unambiguously assign people to racial groups. Here’s an example: The sickle cell allele is found in high frequency

wherever malaria is found, including West Africa, the Arabian Peninsula, the Mediterranean Basin and in India. It is not found among Kenyans whose ancestry is from high-altitude regions of that country. Therefore the sickle cell gene can’t be used to define races.

Another relevant example is skin color. Skin color variation is associated with solar intensity, and thus all populations with tropical ancestry have darker skin than those whose recent ancestry is from the temperate and arctic zones. Solomon Islanders, for example, have physical traits very similar to sub-Saharan Africans, yet these Pacific Islanders are much further apart on overall gene frequency (the percentage of genes of a given type) from sub-Saharan Africans than from Europeans. A less visible evolutionary trait is the ability to tolerate milk beyond the age of weaning, which evolved both in Europeans and in some Africans (Masai tribe) due to the domestication of cattle. It stands to follow that if we attempt to infer relatedness between human groups based only on physical traits like dark skin and milk tolerance, we consistently incorrectly assign groups of people together.

Physical factors fail to correctly cluster humans and thus cannot be used to assign people to racial groups—a fact scientists have known since the 1940s!

Yet today, most Americans still utilize physical features to judge the racial alignment of individuals. This mistake is understandable in the context of American history, since physical features were a reliable indicator of ancestry for much of the nation’s history. Western Europeans (mainly from England) founded this country. They invaded the territory of the American Indians (whose recent biological descent was from Central and Northeast Asia), and then captured, transported and enslaved people from West and Central Africa. This meant that the original inhabitants of our country were drawn from

geographically disparate portions of the human genetic spectrum. However, soon after these populations were brought together they began to amalgamate (sometimes willingly, sometimes by force). Soon physical appearance was no longer a reliable determinate of ancestry.

Genetics of Race and Ancestry

We've determined that "biological races" in the human species do not exist. They cannot be determined by either physical or genetic measures; what we think of as "races" are socially assigned sets of characteristics that change depending on context. This does not mean that there is not geographically based genetic variation found in our species. It simply means that this variation is not sufficient to describe biological races within the species. How then is the concept of ancestry different from that of race? Understanding the difference requires understanding these two definitions:

➔ BIOLOGICAL/GENETIC ANCESTRY

is the proportion of recent ancestry displayed in an individual via genetic material inherited from one's ancestral geographic origins.

➔ SOCIAL/CULTURAL ANCES-

TRY refers to the origin of attitudes, beliefs and behaviors displayed by an individual.

To understand biological/genetic ancestry you must recognize that the number of biological ancestors you have doubles each generation into the past and rapidly becomes a very large number. Every living person has two parents, four grandparents, eight great-grandparents and so on. A standard calculation of a human generation is 30 years. If your family arrived in North America at the time of the Jamestown landing of Africans or the arrival of the Mayflower, that means your

ancestors have been on this continent for 13 generations. This also means you contain—from that time to now—the genetic material from as many as 8,192 individuals! And that estimate doesn't even begin to touch the number of ancestors who came before your genes arrived in North America.

Although it is not possible to determine someone's socially defined race by examining their DNA, it is possible to estimate the continental origin of different segments of an individual's DNA. Remember that all of us have deep ancestry in East Africa; the proportion of our variable DNA that falls into that category is about 85 percent. This means that about 15 percent of our "recent" DNA could potentially be differentiated by continent or region within a continent. No single genetic marker is going to be a reliable estimate of ancestry, so statistical methods, such as maximum likelihood, are used to make estimates of a person's ancestry.

Ironically, ancestry studies have revealed a great deal about the history

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of American racial subordination. We know from ancestry genetic studies, for example, that the flow of European genes into African Americans occurred mainly during slavery, primarily through European men forcibly impregnating enslaved African women. This is because the genetic code on the Y chromosome is inherited intact from father to son. Numerous ancestry studies have found large numbers of “European Ys” circulating in the African-American and other formerly enslaved communities, but not vice versa.

Finally, there has been much interest in using ancestry testing to try to reconstruct lost identities. This was part of the motivation behind the very successful PBS series *African American Lives* and *Finding Your Roots*, conceived

of and hosted by Professor Henry Louis Gates Jr. of Harvard University. DNA ancestry testing has some ability to achieve that goal, so long as one is cognizant of the limitations of the methods, specifically the population assumptions underlying them.

However, it is also important to realize that our genetic composition is not ultimately the determinant of variations in our complex behavior! The behavioral repertoire of anatomically modern humans was already in place before anyone left Africa. Thus, the variations we see in the manifestation of these behaviors are mainly driven by cultural evolution. Cultural evolution is the transmission of ideas across groups of varying degrees of genetic relatedness. Thus, each person’s social and cultural identity is contributed to

by ancestors from all over the world. So, why should we teach about human genetic variation and the difference among socially constructed race, biological race and ancestry? Everything we know about our genetics has proven that we are far more alike than we are different. If more people understood that, it would be easier to debunk the myth that people of a certain race are “naturally” one way or another. And it would be easier to teach and live tolerance. ♦

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How Did We Get Here?

How is it that our collective understanding of race is so flawed and incomplete?

Our ignorance surrounding the meaning of socially defined race, biological race and ancestry is not accidental. Like many misconceptions, it results from a perfect storm of incompetence, indifference, denial and design. This perfect storm affects our K-12 and university education systems and—to some extent—originates from them as well. This is not surprising considering that our education system evolved alongside other social, legal and economic systems designed to privilege European Americans.

One factor that contributes to our confusion is that the preconditions necessary to design and teach a curriculum that would help our students understand the biological basis of physical human variation (and its lack of concordance with biological races) would be based in evolutionary science. In many areas of the country, administrators and teachers fear the topic of evolution and are often inadequately prepared to teach it.

Another factor that interferes with our understanding is the manner in which unnamed and unaddressed racial bias disrupts serious and factual discourse concerning the history of racial injustice in the United States. Implicit bias—as opposed to overtly aggressive, hateful racism—is a form of prejudice that characterizes a person’s thoughts,

feelings and behaviors toward a racial group. It manifests itself in several ways, including bias and prejudices in many European Americans toward African Americans, viewing them as aggressive, impulsive and lazy.

These prejudices have real consequences for socially subordinated racial minorities. For example, African-American children are far more likely to be seen as adults in criminal justice proceedings. As a result, African-American children are 18 times more likely than European-American children to be sentenced as adults, and represent 58 percent of children sentenced to adult facilities. European-American police officers are also far more likely to misjudge the age of African-American adolescents. This type of prejudice was largely speculated to be a factor in the shootings of Tamir Rice, Michael Brown and Trayvon Martin.

Implicit bias is supported by faulty science manufactured and reproduced to maintain a racially defined social order. Without a robust national dialogue about the realities of aversive racism, we will not move past it. And a robust dialogue cannot happen as long as we labor under false beliefs about fundamental biological divisions defined by skin tone.