Why the Nonexistence of Biological Races Does Not Mean the Nonexistence of Racism

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Abstract
Color-blind racism is an ideology that allows persons of the dominant socially defined race (European Americans) to claim that racism is no longer the central factor determining the life chances of persons of non-European descent (particularly dark-skinned individuals of African descent). They argue that instead of the ongoing institutional and individual racism of American society, nonracial factors such as market dynamics, naturally occurring phenomena, and the cultural attitudes of minorities themselves are the main causal factors of their social subordination. Concurrent with the rise of this ideology has been the scientific determination that the human species does not really contain biological races. Thus, many color-blind racists have co-opted this fact to further argue that racism can no longer exist, since we have no biological races. This article will not only outline the nature of human biological variation, why that variation does not justify the classification of biological races within the species, but also why this fact has absolutely nothing to do with the ongoing racial discrimination faced by persons with dark skins in the United States. Furthermore, it will explain why membership in a socially defined race has real biological consequences including reducing the mental and physical well-being of the socially subordinated.

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Introduction: On the Origin of Species and Races

Claiming that biological races do not exist within the human species should rest on the analysis of the relevant biological facts. To accomplish this, one must employ a definition of what biological races are and with said definition weigh the data objectively. Whether or not biological races exist, it would/should not determine the social relationships between them. There would be no reason to assume that biological races would differ in any ways relevant to their character or intelligence. Even if they did, there would be no moral reason to suppose that a group of persons who have less intelligence than another group of people deserve to be socially subordinated; neither is it true that the absence of biological races in our species implies that racism cannot exist either. Racism is the practice of treating people differently in a society based on their membership in a racial group, however defined. The confusion between the absence of biological race and the nonexistence of racism occurs because Americans routinely conflate socially defined and biological conceptions of race. This is also true in scholarly discourse. Scholars from the humanities to the biological sciences disagree on the meaning of the term. Although many humanists adhere to the notion of social definition, they often refer to race in ways that include essentialist biologic notions. Biologists, who should understand population thinking, assume that socially defined races are indeed biological races without ever describing by what criteria they are making this claim. In 2015, social opportunity in the United States is still contingent on one's socially defined race. Trayvon Martin was not killed due to the presence of any particular genetic polymorphism within his genome; rather it was due to long-standing socially defined racial stereotypes deeply embedded in the cultural psyche of this nation. Thus, race is still the elephant sitting in the living room of all American social/cultural discourse.

Neoracism in part results from the conflation of biological and socially defined race concepts. Neoracists argue that because biological races do not exist in our species, racism cannot exist. They fail to recognize that racism never resulted from the biological features of human beings, but rather has always been the result of social processes. Socially defined races are not equivalent to biological races. The former are dependent on historical social and cultural forces, the latter when they exist within a species, result from evolutionary processes (e.g., natural selection, genetic drift) which can result in the formation of new biological species. An excellent example of how social forces define racial identities is given by contrasting the United States to Brazil. Less than one tenth of the slaves transported from Western/Central Africa came to North America, whereas over one-third went to Brazil (Thomas, 1997; Trans-Atlantic Slave Trade Database, 2014). In the United States, states differed in the amount of African ancestry which legally defined an individual as Negro or "Black." However, generally the rule of hypodescent was in play, such that any detectable African ancestry classified one as "Black" or whatever term was in fashion for the historical period in question (Montagu, 1997). Persons of African descent in the United States generally agreed with the notion of hypodescent as well. Conversely, in Brazil, there are at least 11 categories of socially defined race for persons containing some African ancestry

(Jones, 2000). For Brazilians, membership in these categories has real meaning in ways that would confound African Americans. Indeed, in a National Survey by Household Sample, Brazilians defined themselves in 136 categories related to skin color (Schwarcz, 2003). Yet even today, there is evidence that thinking about American socially defined categories is changing. Many Americans now perceive an African American underclass as distinct from the African American middle class (Massey & Denton, 1998; Rolison, 1991).

Western thinking about race in the human species began with creationist foundations (Gould, 1981; Graves, 2005a). Carolus Linneaus in *Systema Naturae* (1758, 10th edition) thought that there were four varieties within *Homo sapiens* (vs. *europaeus* [Europeans], *afer* [sub-Saharan Africans], *asiaticus* [East Asians], and *americanus* [Amerinidans]). One can immediately see the flaw in this scheme, as Linneaus arbitrarily chose four regions to represent the entire spectrum of human diversity. This is consistent, however, with 18th century essentialist thinking, since for Linnaeus varieties were deviations from the ideal species type. These deviations were both heritable and nonheritable. Linneaus also saw a clear hierarchy in these varieties with *Homo sapiens europaeus* representing the pinnacle of the species and *Homo sapiens afer* representing the abyss. The term geographic race or subspecies had no meaning to Linneaus and would not develop in biology until much later (Graves, 2005a). Yet during the 18th century, there was no consensus concerning hierarchy among human varieties (Graves, 2005a). However, by the 19th century, with the consolidation of chattel slavery as an economic force, the hierarchy of human varieties was well-established in Western thought (Brace, 2005; Graves, 2005a). Leading naturalists of the time such as Georges Cuvier (France) and Louis Agassiz (United States) were convinced that the human varieties were hierarchically arranged. Indeed, in this period, polygeny (the idea that the human varieties were separate species) dominated creationist biological thought (Graves, 2005a). Agassiz popularized the idea of "zones of creation." This meant that each climatic zone had been populated by the creator with a unique flora and fauna (including human species; Agassiz, 1854). It would not be until after 1859 that the confusion concerning varieties, races, and species could be settled. This is because before Darwin, all ideas concerning the meaning of these categories and the mechanisms by which they came into origin were simply wrong (Graves, 2005a). Darwin purposefully ignored the question of human speciation, varieties, and races in *The Origin* (Desmond & Moore, 2009). However, by 1871, with the publication of the *Descent of Man and Selection in Relation to Sex*, he was ready to lay the definitive groundwork required for all further scientific discussion of biological races within the human species. In Chapter 7 of *The Descent*, Darwin establishes a seminal principle on how to address variation within the human species (which unfortunately has been forgotten by the majority of modern biomedical researchers): "Now let us apply these generally-admitted principles to the races of man, *viewing him in the same spirit as a naturalist would any other animal*" (italics added).[1]

In this chapter, Darwin problematized both the idea that separate human species exist and the classification schemes used by the naturalists of his day. These classification schemes were compromised by the fact that the various naturalists could not agree

on which traits served as the correct basis to perform classification. This meant that naturalists had named between 2 and 63 different human races (Graves, 2005a). It turns out that even if naturalists could have agreed on a suite of physical traits to utilize for classification of human groups into races, these would have failed as well. This is due to the principle of discordance (Goodman & Jones, 2013; Montagu, 1997). The principle of discordance means that physical traits which are controlled by different segments of the genome are influenced by selection pressures in specific environments. This means that physical traits such as skin color, hair type, skeletal proportions mix and match in different human populations. Attempting to form trees of relatedness via physical traits will not match human genetic relatedness. For example, Cavalli-Sfroza and Edwards (1964) utilized general anthropomorphic characters to generate a tree of relatedness of human groups. The tree had a number of apparent mistakes, including classifying North Americans on the same branch as Swedes and French and on a separate branch from South American Indians. Most notably was classifying sub-Saharan Africans and Australian aboriginals on the same branch, but separating sub-Saharan Africans from Europeans. Genetically, Europeans are closer to sub-Saharan Africans than Australian aboriginals are (Barbujani, Ghirotto, & Tassi, 2013; Lawson Handley, Manica, Goudet, & Balloux, 2007; Templeton, 2013).

With the ascendance of evolutionary thinking in the early portion of the 20th century, biological racism transformed from creation-based to evolution-based (Graves, 2005a). However, unlike creationist thinking, evolutionary thinking contains within it the means to test its own assumptions. Thus, by the 1950s, anthropologists and evolutionary biologists had begun to accumulate data which eroded the idea that biological races existed within the human species (at least according to Darwin's dictum, treating humans the same way we treat other animals). For example, the 1950 UNESCO statement on race made clear that our species did not have biological races:

> . . . *Homo sapiens* is made up of a number of populations, each one of which differs from the others in the frequency of one or more genes. Such genes . . . are always few when compared to the whole genetic constitution of man and to the vast number of genes common to all human beings . . . the likenesses among men are far greater than the differences.[2]

Evolutionary biology now operated on population-based as opposed to essentialist ideas of varieties, geographic races/subspecies, and species (Mayr, 1982). To evolutionary biologists, populations may begin to accumulate genetic variants which are useful for survival and reproduction of individuals within specific environments. Should this adaption go for a long enough time, in the absence of gene flow between the populations, allele frequencies will begin to diverge. Over a long enough period of time, reproductive isolation will develop between the groups and two new species will be formed. Reproduction isolation is not a necessary result of allele frequency divergence, indeed should there be sufficiently high levels of gene flow between populations, speciation will never occur. Thus, for evolutionary biologists, geographic races/subspecies are a level of genetic divergence that occurs somewhere between a single

unitary population living in one set of circumstances and the formation of multiple populations adapting to different circumstances. For example, the aboriginal skin color of our ape-like ancestors was nonmelanic, as they were covered with dark hair. However, as humans lost hair, natural selection favored darker skin (Jablonski & Chaplin, 2000). Thus, all modern humans are descended from dark-skinned individuals who originally inhabited a small region of Eastern Africa. As groups began to leave this region at the end of the last glaciation, populations began to accumulate alleles producing lighter skin hues in environments with less solar intensity, and where having darker skin was either disadvantageous or neutral (McEvoy, Beleza, & Shriver, 2006; Norton et al., 2007; Olalde et al., 2014). Adaptation to these new environments happened via the principle of discordance, for example, a recent report suggests that individuals might have retained dark skin in Europe as late as 6,000 years ago, even while displaying the blue-eye phenotype (Olalde et al., 2014). The question is how and when do we determine that enough genetic variation exists between populations such that it is appropriate to classify them as geographic races or eventually as separate species.

Population definitions of race within any species revolve around how much genetic variation exists within and between supposed racial groups. If there is more genetic variation within a group than between them, the notion that the groups have diverged sufficiently to describe biological races is not supported. For example, in 1974, Nei and Roychoudhury measured genetic variation utilizing protein electrophoresis within the five purported geographical races/subspecies of humans and showed that the amount of variation for protein loci were equivalent to that found in local populations of other species and considerably smaller than that associated with subspecies. They concluded that it was not appropriate to consider Caucasians, Negroids, Mongoloids, Capoids (Hottentot and Bushmen), and Australoids as subspecies.

Population Subdivision

Population subdivision is a means to test the amount of genetic variation among subpopulations within a species. This concept was developed by American evolutionary geneticist Sewall Wright (1978). Populations, which have undergone significant adaptation to local conditions, differ in population dynamic history, and limited gene flow between them should differ in allele frequencies at a number of loci. The population subdivision statistic (F_{ST}) compares the allelic diversity of each of the subpopulations against a pooled total population. Since Wright's invention of F coefficients, which examine the proportioning of genetic variation between different levels within a species, population geneticists have utilized a minimum value of differentiation between subpopulations and the total species as the threshold for identifying the existence of biological races ($F_{ST} > 0.250$). Wright chose this value to maximize the probability that the subgroups were actually fixed for alternative different alleles at various loci.

At the level of the DNA, the alleles are the four nucleotides: adenosine (A), Thymine (T), Guanine (G), and Cytosine (C). In coding regions of the genetic code, three nucleotides in succession determine which amino acid should be placed in the

resultant protein. The code is redundant, but a change in a position can result in a different amino acid being specified. When we examine the coding and noncoding regions of DNA in a population, most organisms will have the same nucleotide at the vast majority of the positions within the code. However, at some positions, a variant will be found in some individuals. Such a variant is called a single nucleotide polymorphism or SNP. Genetic variation in SNPs has been studied extensively in humans (Barbujani & Colona, 2010; Dunham et al., 2012; The 1000 Genomes Project Consortium, 2010). One study examined 4,833 SNPs in 538 clusters across the human genome in Europeans ($N = 30$), African Americans ($N = 30$), and Asians ($N = 40$; Clark et al., 2003). In the study, the mean frequency for F_{ST} at each locus was 0.083, with only 10% of the loci exceeding F_{ST} of 0.18 and about 6.5% exceeding F_{ST} of 0.250. This is consistent with the general finding that, averaged across the genome, F_{ST} in humans does not approach Wright's threshold (and is generally $F_{ST} = 0.110$).

The other criterion by which one might identify geographic races within a species is to determine whether unique evolutionary lineages exist. This means populations that have had limited gene flow with other populations for a sufficiently long period of time. Such lineages, should they exist, would necessarily have large values of F_{ST} compared with nonunique lineages. However, we observe no such highly differentiated lineages within our species, anatomically modern humans (Barbujani & Colona, 2010; Lawson Handley et al., 2007; Templeton, 2002, 2013). The best way to understand human genetic diversity is through isolation-by-distance. This means that gene flow between different populations of humans is proportional to the geographic distance between them. Geographic barriers to dispersal of humans exist, such as mountain ranges and deserts, but these barriers only account for 2% of the variation of F_{ST}, whereas isolation-by-distance accounts for 75% (Lawson Handley et al., 2007). Attempts to represent human genetic variation as "clustered" has been attempted (Rosenberg et al., 2002).

Furthermore, it has been claimed that these clusters roughly match the five continents, and thus correspond to the five-race scheme for modern humans (sub-Saharan African, European, East Asian, Australoid, Amerindian). This was accomplished by the use of a computer algorithm called STRUCTURE. The problem with this analysis is that underlying assumptions are essentialist and do not correspond to the evolutionary history of our species (Weiss & Long, 2009). A typical STRUCTURE-like analysis defined a number of parental populations (either by user input or statistical inference) and then assigns fractions of parental ancestry to individuals. Unrealistic assumptions are made about the nature of the parental populations, such as random mating, with Hardy–Weinberg equilibrium for allele frequencies, and minimal linkage disequilibrium between parental populations. Of course, the most unsupported assumption of STRUCTURE-like analysis is that the world once harbored distinct and independently evolving populations (Weiss & Long, 2009). To determine the genetic character of the "parental populations," one needs alleles that are "private" to the purported parental populations. However, these sorts of genetic markers, called ancestry informative markers were determined from small- to medium-size samples taken from geographically distant populations (Europe, West sub-Saharan Africa, and East Asia). Given this

sampling, it is a circular exercise to structure individuals into clusters. Of course, if the AIMS are not really informative of population ancestry, a STRUCTURE analysis may be simply meaningless.

On balance, the modern population genetic analysis suggests that our species, anatomically modern humans, does not display biological races (Barbujani et al., 2013; Graves, 2005a, 2005b; Montagu, 1997). We do have geographically based genetic and physical variation, and this fact has been consistently misinterpreted as evidence of the existence of biological races in our species. However, our species is young, has very little genetic variation, has maintained relatively high levels of gene flow throughout its history, and thus has never reached the levels of differentiation between its subpopulations consistent with the identification of geographical races (see discussions of this in Templeton, 2002; also see Graves, 2011; Lawson Handley et al., 2007; Serre & Pääbo, 2004). Unfortunately, most researchers involved in projects that are affected by genetic variation do not have training or understand the historical context of evolutionary thinking concerning speciation and the role that geographical races play in the process (Nesse et al., 2010; White et al., 2009). This is illustrated by the fact that they often assume that socially defined races are legitimate biological races (Bliss, 2012; Friedman & Lee, 2013; Graves, 2010, 2011).

Race and Racism

Despite over 70 years of analysis from evolutionary biology, population genetics, biological anthropology, and related disciplines, the majority of Americans still believe there are legitimate biological races within our species (Jayaratne et al., 2006). This occurs for a number of reasons. First, a significant minority of Americans are creationists. The most recent Gallup poll showed that 33% of American adults believe that humans were specially created in their present form (Patten, 2013). A logical inference of believing that humans were created in their present form is that the variation of modern humans was present from the beginning. This does not follow, however, as some Judeo-Christian thinkers have associated the formation of modern human biological variation with the aftermath of the Genesis flood (Genesis 6-10). Noah's sons represent the roots of the different racial lineages of humans. The Babylonian Talmud in the 6th century C.E. claimed that the result of the curse Noah placed on his son Ham resulted in the darkening of his descendant's skin (Aaron, 1995; Graves, 2005a). There was no scriptural support for this claim, however, as other medieval authors associated different sons with fathering different races (Braude, 1997). However, with the consolidation of the African slave trade, dark skin and African ancestry became associated with Noah's curse, and this in turn became a justification for American chattel slavery (Haynes, 2002).

Of the 60% who accept that humans evolved, a significant portion of those people harbor the notion of progressive evolution. In their minds, they see this as a progression from lesser forms to the most evolved human, the European (ape—apelike—African—European; Eberhardt, Davies, Purdie-Vaughns, & Johnson, 2006). Another factor involved in the persistence of racialist ideas is psychological essentialism

(Gelman & Rhodes, 2012). Psychological essentialism is the default belief of the human psyche and it holds that certain categories are real rather than human constructions. For example, the majority of Americans agree with the statement: "Two people from the same race will always be more genetically similar to each other than two people from different races" (Jayaratne, 2001). Furthermore, in a recent study, Jayaratne et al. (2006) showed that 50% of the European Americans they surveyed believed that the racial differences in drive to succeed, math ability, tendency to act violently, and intelligence were accounted for by some degree by genetics (24% little influence, 20% some influence, 6% a lot of influence, and 1% just about all influence).

On the other hand, there are Americans who do not accept that biological races exist within our species. There are not good national surveys to know exactly what proportion of Americans fall into this category. Based on surveys I have conducted with college students, this group is still a minority (Graves, 2002). However, there is a growing confusion among some quarters concerning the relationship between the existence/nonexistence of race and the existence of racism. For example, in his 2011 opinion written on the University of Texas affirmative action plan, 5th Circuit Justice Emilio Garza relied on the nonexistence of biological race to criticize the means by which the University of Texas admitted students in racial categories:

> The idea of dividing people along racial lines is artificial and antiquated. Human beings are not divisible biologically into any set number of races. A world war was fought over such principles. Each individual is unique. And yet, in 2010, governmental decision makers are still fixated on dividing people into white, black, Hispanic, and other arbitrary subdivisions. The University of Texas, for instance, segregates student admissions data along five racial classes. *See, e.g., 2008 Top Ten Percent Report at 6* (reporting admissions data for White, Native–American, African–American, Asian–American, and Hispanic students). That is not how society looks any more, if it ever did.

The problem with Garza's reasoning is precisely that it confuses biological and socially defined racial categories (and their impacts). Garza is correct in pointing out the nonexistence of biological races. Indeed, he cited important scholarly literature supporting that fact (including my own work). However, the past-discrimination that the University of Texas (and other affirmative action) plans attempts to redress are based on how socially defined races suffered past and are suffering ongoing discrimination in American society. It is also not just the government that divides Americans into socially defined racial groups, it is virtually all lay Americans who continue this practice. Indeed, the American judiciary has a sad history of conflating social and biological definitions of race to suit its own political agendas. For example, in *United States v. Bhagat Singh Thind*, 261 U.S. 204 (1923), the 9th Circuit Court held that scientific definitions of race were irrelevant to determining whether Mr. Thind could become an American citizen. It relied on the understanding of "free White person" as the common man understood the term, and upheld the earlier decision in *Ozawa v. United States*, 260 U.S. 178. In Ozawa, despite Takeo Ozawa's attempt to assimilate

into Anglo-Saxon culture, his petition for citizenship on the basis of his character was denied (Tehranian, 2000). In Thind, the court recognized that scientific pronouncement concerning race was not how race was lived in the United States. It relied on the social definition to adjudicate this case against Mr. Thind's claim for citizenship based on his scientifically determined membership in the Aryan or Caucasian race.[3]

Socially Defined Races Are Real

Ironically, in many ways, membership in a socially defined race may have more important impacts on one's health and well-being, and ultimately evolutionary fitness (as measured by survival probability and reproductive output) than any genomic characteristic (Broyles et al., 2012; Goff, Jackson, Di Leone, Culotta, & DiTomasso, 2014; Kant, Graubard, & Kumanyika, 2007; Kuzawa & Sweet, 2009; Williams & Sternthal, 2010). The case of German Jews in the mid-20th century is an extreme example of that fact. Montagu (1997) explained that persons of the Jewish faith do not comprise a biological race. Indeed, the genetic and physical characteristics between non-Jewish and Jewish Germans could not have been determined by the technology of the mid-20th century (nor today). Yet by the end of the Nazi social program, 83% of German Jews would be killed (Noakes & Pridham, 1988). Another illustrative case of this was that Rwandan genocide, in which the Hutu ethnic group slaughtered members of the Tutsi ethnic group. Genetically these groups would be virtually indistinguishable. The physical differences (e.g., greater average height) resulted from the Tutsi ethnic group's better nutrition, which in turn resulted from their former superior position within the British colonial administration of the country. While these examples establish the principle that socially defined groups have significant impacts on one's life chances, it is harder for Americans to envision that this is currently the situation in the United States. However, Graves (2013) reported age-specific mortality rate ratios for biological sources of disease comparing African American with European American mortality. Data from 1963 to 2004 show that ratio of African American to European American mortality rates from birth to age 80 consistently run between 2.50 and 1.25. Thus, African Americans as a socially defined group are for the majority of their lives >1.5 times more likely to die compared with European Americans from a biological source of death. Worse are sources of death that are not considered biological, such as homicide or police intervention. The mortality rate for African American males due to homicide at ages 20 to 24 years is 9.3 times greater than that of European Americans; for African American females at ages 1 to 4 years the rates are 3.35 times higher (Centers for Disease Control and Prevention, 2013). The recent killings of Michael Brown, Eric Garner, and Tamir Rice underscore the risk of death from police action in the United States associated with socially defined race. Goff et al. (2014) have demonstrated that the risk of police violence toward African American youth is associated with their dehumanization. Their studies demonstrated that the tendency of police to associate African Americans with apes predicted actual racial disparities in police violence toward children.

Differentials in virtually every measurable aspect of social life have existed throughout American history by socially defined race. For example in 1995, educational attainment (as measured by 4-year college degree) for European Americans was still more than twice that of African Americans and more than three times that of Hispanics. Computer use of European American children at home in their first 6 years of schools was also approximately three times higher than that of African American or Hispanic children (Council of Economic Advisors, 1998). Educational attainment affects other aspects of life, including employment. Throughout the latter half of the 20th century, unemployment rates for African Americans were twice that of European Americans.

This trend has continued in the 21st century. There is considerable evidence that some of the employment differential results from European American employer attitudes toward African Americans and other undesirable minorities (Hitt, Zikmund, & Pickens, 1982; Roscigno, Garcia, & Bobbitt-Zeher, 2007; Skaggs & Bridges, 2013). Pager (2003) showed that discrimination existed in potential employment opportunities for African American and European American men matched by equal appearance, equal resumes, and absence of a criminal record. The study showed that European American males (with and without criminal records) were called back for a second interview at a higher rate than African American men without criminal records! Obviously, African American men with prison records were least likely to be called back. The Pager result is made even more startling when one considers the ratio of African American males who are currently incarcerated in the United States. In 2008, approximately 1 in 100 men were imprisoned in the United States. This figure is one of the largest in the world. Of men aged 18 years or older, the ratio of Hispanic American to European American was 2.94 and African American to European American was 7.07! This result is made even more startling by the systematic increase of the African American/European American ratio. In 1933, during Jim Crow, African Americans were incarcerated at a rate of 3:1 compared with European Americans, in 1950 the ratio was 4:1; 1960, 5:1; 1970, 6:1; 1989, 7:1; 2008, 7.07:1 (The Pew Center on the States, 2008).

Incarceration has severe impacts on the health of individuals and communities. For example, in 2010, the death rate from HIV for European American males ages 35 to 44 years was 3.8/100,000; and for European American females, HIV never is recorded as one of the top-10 causes of mortality. Conversely, in that same year for African American males, HIV first appears as one of the top-ten causes of death at ages 15 to 19 years, at approximately 5.6/100,000. By ages 35 to 44 years, HIV is the fifth largest cause of death at a rate of 24.8/100,000! The African American male rate is approximately 6 times the rate of European American males. The rate continues to climb until at ages 45 to 64 years, it exceeds 39/100,000. For African American females, HIV becomes the 10th leading cause of death by 15 to 19 years, at around 1.9/100,000. By 35 to 44 years, it is the fourth leading cause of death at 14.3/100,000 (remember HIV as a cause of death in European American females never cracks the top 10). It continues at this rate until 55 to 64 years. The data are important because the relationship between incarceration in the United States and HIV risk is well-established (Adimora,

Schoenbach, & Doherty, 2006; Blankenship, Smoyer, Bray, & Mattocks, 2005; Wohl et al., 2000). Even worse is the fact that these sky-rocketing rates of HIV infection associated with incarceration rates is an unintended consequence of an ill-considered social stratagem ("the war on drugs"; Alexander, 2012; Blankenship et al., 2005). The "war on drugs" has led to greater HIV rates via differential and record incarceration rates of African Americans, resulting in social network disruption, inadvertent connection of individuals to high-risk subpopulations, and riskier sexual behavior among incarcerated males (Adimora et al., 2006; Blankenship et al., 2005; Wohl et al., 2000). Graves (2002) demonstrates that these elevated HIV rates are not the result of genetically determined racial differences in sexual behavior (as has been claimed by many).

In addition to higher rates of acute infectious disease (HIV, round worms, etc.), malnutrition (Rossen, 2014), differential exposure to toxic substances (e.g., Bullard, Mohai, Saha, & Wright, 2007; Olden, Lin, Gruber, & Sonawane, 2014), and neighborhood violence (Broyles et al., 2012; Harris, Fisher, & Thomas, 2012), there are other means by which socially defined racial subordination can affect human health and well-being. This is true of social subordination in general, and this has been demonstrated in a number of social species (not just humans; Abbott et al., 2003; Avitsur et al., 2007; Goosens & Sapolsky, 2007; Reiche, Morimoto, & Nunes, 2005; Sapolsky, Krey, & McEwen, 1985, 1986). A recent report showed that a biological marker of aging (telomere length) was negatively altered by perceived racial stress (Chae et al., 2014). This study found that after controlling for chronological age, socioeconomic, and health-related characteristics that the interaction between racial discrimination and implicit racial bias was significantly related to leukocyte telomere length. In their study, those demonstrating a stronger implicit anti-Black bias and reporting higher levels of racial discrimination had the shortest telomere lengths. This means that the more a person perceived that they have been discriminated against, the greater their rate of cellular aging. Worse, the more the person believes that the discrimination was justified (implicit bias), the greater their rate of cellular aging. Similar results have been found relating telomere length to cellular aging in general stress, such as Eppel et al. (2004) in the case of women giving care to chronically ill children. The Chae et al. (2014) study may go a long way to help us understand that racial discrimination affects individual health.

New evidence is accumulating concerning how epigenetic changes factor into this problem (Graves, in press). We have already established that socially defined race affects exposure to toxic environments. We now know that exposure to toxic materials and stress can alter gene expression epigenetically. Epigenetic change refers to changes in gene expression that do not involve any change in nucleotide sequence (Strachan & Read, 2011). These effects can be transient within the life span of an individual or they can be passed on to future generations. Epigenetic changes have been shown to be associated with a variety of complex diseases (diabetes, stroke, cancer, depression; Ptak & Petronis, 2008).

Worse, again here is the fact that the majority of African Americans feel (and objective evidence supports the reality of the discrimination) that they are consistently being discriminated against by European American-dominated society. A Pew poll

(Patten, 2013) found that 70%, 68%, 54%, 44%, 51%, 47%, and 48% of African Americans felt that they were treated less fairly than European Americans when: dealing with the police, in the courts, on the job or at work, in stores and restaurants, in local public schools, in getting health care, and when voting in elections. Also 58% of African Americans (compared with 14% of European Americans) felt that four to seven of the institutions listed above were unfair to African Americans. From these perceptions, we can predict that to the degree that perception of discrimination accelerates cellular aging, this phenomenon is occurring at a much greater rate in African Americans compared with European Americans. This is certainly contributing to the differential age-specific mortality that is being observed for these groups (described in Graves, 2013). All of the effects which have been described above are due to membership in a socially defined group, not due to genetic polymorphisms existing between biologically defined racial groups. So the absence of biological race in the human species does not mean that socially defined racial groups are not real and do not have drastic consequences.

Conclusion: Historical Dynamics of Socially Defined Subordination

Socially defined races rely on an arbitrary assemblage of traits that are deemed by their authors to be socially relevant. What has always been socially relevant to the authors of these schemes has been how these traits can be used to contribute to the existing social hierarchy. Socially defined races serve no other purpose. The traits included to define such groups can include physical features (such as skin color, facial features, hair type) or cultural features (such as language or religion). Socially defined race is a relatively new cultural phenomenon linked to the European colonial expansion of the 15th to 19th centuries (Graves, 2005a; Montagu, 1997). This does not mean that social subordination is new; indeed, it is ancient in human societies (Pratto, Sidanius, & Levin, 2006; Sidanius & Pratto, 1999). Prior to the development of technology which made long journeys more accessible to larger groups of people, few people ever viewed or came into contact with individuals who had physical traits differing from themselves. Prior to the European expansion, human societies had at least gender, religious, and class oppression, but not a great deal of what resembles modern socially defined racial subordination. For example, the Roman Emperor Julian, the Apostate, viewed the Gauls, Germans, and Celts as barbarians but thought that Africans were highly civilized (Graves, 2005a). Of course the former were often in rebellion against the Roman Empire. Gossett and others argue that the treatment of Jews in Europe from the medieval period onward had much of the features of modern socially defined racism (Gossett, 1997; Graves, 2005a; Montagu, 1997). Again, persons who practice the Jewish faith do not constitute a biological race (Montagu, 1997) despite the fact that European Jews had significant ancestry from the Jewish community of the Middle East. Recent genomic analysis of seven Jewish populations (Iranian, Iraqi, Syrian, Italian, Turkish, Greek, and Ashkenazi) suggests that they share Middle Eastern ancestry, are genetically close to modern Middle Eastern populations, and have varying

amounts of ancestry contributed from Europeans and North Africans (Atzmon et al., 2010). Thus, discrimination against this group in Europe could not have been based on biological features of the population but instead relied on cultural features.

The voyages of European of discovery, and the subsequent colonization of the Americas and the development of the transatlantic slave trade had profound effects on both the biological and socially defined race concepts (Brace, 2005; Graves, 2005a; Eiseley, 1961; Montagu, 1997). European naturalists of this time period where not sure whether or not fantastic types of people such as cyclops and giants existed somewhere in the world. Many were convinced that they might find dinosaurs living in the jungles of Africa and South America, as the concept of species extinction was not widely accepted. Furthermore, the notion of universal African inferiority to Europeans did not exist at the beginning of the Age of Discovery. There seems to be more awe and wonder concerning the wealth of the cities he encountered in Vasco da Gama's 1497 travel log along the coast of Africa than declarations of European supremacy (Mancall, 2006; Wolff, 1998). The historical record demonstrates that the European attempt to enter the African and Indian commercial trade of this period could not be taken as evidence of European technical or cultural superiority (Wolff, 1998).

It is estimated that at the time Columbus landed in Hispaniola (1492 C.E.), there were at least 20,000,000 residents of the Americas, and some estimates go as high as 100,000,000 (Marder, 2005; Snow, 1995; Verano & Ubelaker, 1992). Shortly after European first contact with the native population of North America (who Columbus mistakenly called "Indians"), the Europeans entered into a program of colonization and enslavement of these people. In addition to colonization and enslavement, the European contact also introduced new pathogens for which the Amerindians had no immunity (Waquespack, 2002). In combination, these caused such disruption of the populations of the Caribbean (tribes such as the Carribe and Arawacks) that by 1650 almost none of these original inhabitants survived.

The depopulation of the Caribbean prompted the mass importation of Africans to the Western Hemisphere. Most of the individuals sold into the transatlantic slave trade originated from the west and central portions of Africa. Of the 10.7 million individuals calculated to have survived the trade, about 338,000 were landed directly in North America; with another 70,000 arriving in North America via the Caribbean (Trans-Atlantic Slave Trade Database, 2014). The first of these Africans arrived in the English colonies in 1619, 3 years before the Mayflower landed the Pilgrims in New England (Bennett, 1993). At first, these Africans were indentured servants, but their indenture was different from that of European indentured from the very start. Soon after, African servitude took on the form of chattel slavery and by 1850, the slave population of the United States was 3,179,588, or 13.7% of the entire population! In that same year, the census recorded 419,173 free colored people. In some states, such as South Carolina, slaves were more numerous than free people (free Whites, 274,775; free colored, 8,769; and slaves, 384,925). The institution of chattel slavery was chiefly responsible for creating the system of socially defined race that developed in the United States (remember that members of the American Indian tribal nations were not considered citizens). It goes without saying that the vast majority of slaves were persons of varying percentages of

African ancestry. The European ancestry of these slaves resulted primarily from the forcible rape of African women by their European masters and overseers. This is evidenced by the fact that African Americans contain mitochondrial DNA lineages that are predominantly sub-Saharan African, yet have many European Y chromosome lineages (Battaggia et al., 2012; Gonçalves, Prosdocimi, Santos, Ortega, & Pena, 2007). Despite the fact that many slaves had >50% European ancestry, they were still considered non-White by the various racial codes enacted by the American states. The legal codes of the slave-holding states were specifically designed to allow the offspring of slave mothers to remain the property of their slave owner fathers (Montagu, 1997; Wiecek, 1977).

One of the most fundamental statutory characteristics of American slavery was racial identification. This is illustrated in the first comprehensive slave code of the British colonies in North America (South Carolina, 1696). The South Carolina code was modeled on the 1688 Barbados Code. The South Carolina law defined as slaves "all Negroes, Mullatoes, and Indians" who had been or were to be "bought and sold" (Wiecek, 1977). The South Carolina code and the Georgia code of 1755 required that in freedom suits the burden was always on the Black (Negro, Indian, mulatto or mestizo) to prove that they were born of a free woman. A Black was always assumed a slave unless they could prove their free status. In addition, the colonial codes also specified that baptism or conversion to Christianity did not liberate slaves. This was a reversal from Virginia's original code which accepted Christianity as conferring free status (Wiecek, 1977). These examples provide clear demonstration that socially defined racial classification in America evolved precisely to support the institution of chattel slavery.

In 1865, slavery in the United States was abolished by the 13th Amendment following one of the most brutal civil wars of the modern period. Despite that, African Americans and other non-Europeans would still be systematically denied their civil and human rights in the United States. At the same time, the United States was engaged in an aggressive Western expansion which brought under its control portions of Mexico and various American Indian nation tribal lands. To make this expansion possible, immigrants from Europe and the Far East would enter the United States at increasing numbers. All of these people would become part of the American nation, albeit at different levels of its evolving system of social hierarchy. This system was such that while African-descended, American Indian–descended, East Asian–descended, Mexican-descended people occupied its lowest rungs, European races could be arranged within themselves as well. The Irish, Italians, Poles, and Ashkenazim would not achieve similar standing with the Teutonic races (English, Germans, Scandinavians, etc.) until well after World War II. Indeed, during his 1881 to 1882 American lecture tour, Oxford University professor Edward Freeman opined that every Irishman should kill a Negro and be hanged for it. For Freeman, this would eliminate two threats to the purity of America's Teutonic master race at in one stroke (Chase, 1977).

It would not be until the mid-1960s that discrimination on the basis of race in broad sectors of social life was finally struck down by actions of the congress and the Supreme Court. The court ruled on a number of issues, including school desegregation

and interracial marriage, while Congress passed the landmark Civil Rights and Voting Rights bills. Thus in total, de jure socially defined racial discrimination in American social life lasted from 1619 to 1965 (or 346 years). This means that our society has only existed without formal racial segregation for ~50 years. Yet the absence of formal racial segregation does not mean the absence of racism. American social life and opportunity is still heavily segregated by race (Arrow, 1998; Bonilla-Silva, 2003; Pierce, 2013; Souhami, 2014). For example, from 1950 on, African Americans and European Americans became more segregated across municipal boundaries. This meant that not only were these groups living in different neighborhoods, they were increasingly living in different cities. This process has led to a situation in which by 1990, segregation and isolation of African Americans showed no sign of reduction. The average dissimilarity and isolation indexes for African Americans in northern cities were 77.8 and 68.9, respectively in 1990; these same values for southern cities were 66.5 and 64.9 in that same year (Massey, Rothwell, & Domina 2009). There is also evidence that most/many European Americans do not desire this situation to change (e.g., end segregation). For example, in 1982, a NORC poll asked the question: "White people have the right to keep blacks out of their neighborhoods if they want to, and blacks should respect that right." Over 30% of the European Americans polled agreed to this statement (Schuman, Steeth, & Bobo, 1985). Nor was the election of Barack Obama (the first president who we can definitively claim was not of entirely European ancestry) a symbol of the abatement of American racism. Pearson, Dovidio, and Gaertner (2009) describe the contradictory phenomenon of both the reduction of overtly racist attitudes among European Americans and yet the persistence of behaviors among them that contribute to racist outcomes. They titled this "aversive racism." Some examples of this behavior include a decrease in support for social justice among European Americans due to the election of President Obama (Kaiser, Drury, Spalding, Cheryan, & O'Brien, 2009). Indeed, the election of Barack Obama as president has spurred an increase in populist racism, as evidence by the spread of the Tea Party (Enck-Wanzer, 2011). Socially defined race is at the heart of Tea Party racism. The Tea Party objection to President Obama and his polices can be tied to the notion that he is not a European American ("White") and therefore cannot be truly American (Barreto, Cooper, Gonzalez, Parker, & Towler, 2011; Enck-Wanzer, 2011).

It is precisely in this environment where aversive racism is the common mode of racist practice that people could conflate scientific facts about human genetic variation and how that is classified (biological races) with the nonexistence of racism (which is based on social definitions). Since these biological and socially defined races are not equivalent, there is no logical relationship between them. The former has to do with the evolutionary history of our species (migration, natural selection, genetic drift) and the latter has to do with our social/cultural history (colonialism, slavery, genocide). The best available scientific evidence suggests that modern humans do not have biological races (consistent with definitions used for other species; Graves, 2005a; Montagu, 1997), while the best sociological evidence suggests that American racism is still a serious problem affecting the lives of Americans (Bonilla-Silva, 2013; Pearson et al., 2009). It is imperative that we disentangle these concepts, because without doing

so, it will be far more difficult to make strides toward producing a truly equitable society.

Notes

1. Darwin, C., Chapter 7: "On the Races of Man," in *The Descent of Man and Selection in Relation to Sex*, 1871.
2. See, UNESCO (1950).
3. *Fisher v. University of Texas at Austin*, 631 F.3d 213, C.A.5 (Tex.), 2011. "My disagreement with Grutter is more fundamental, however. Grutter's failing, in my view, is not only that it approved an affirmative action plan incapable of strict scrutiny, but more importantly, that it approved the use of race in university admissions as a compelling state interest at all. The idea of dividing people along racial lines is artificial and antiquated. Human beings are not divisible biologically into any set number of races. [FN22] A world war was fought over such principles. Each individual is unique. And yet, in 2010, governmental decision makers are still fixated on dividing people into white, black, Hispanic, and other arbitrary subdivisions. The University of Texas, for instance, segregates student admissions data along five racial classes. See, e.g., 2008 Top Ten Percent Report at 6 (reporting admissions data for White, Native–American, African–American, Asian–American, and Hispanic students). That is not how society looks any more, if it ever did. [FN22: See Alexander & Schwarzschild, 21 CONST. COMMENT. at 6 & n.10 ('There is broad scholarly support for this proposition. See, e.g., NAOMI ZACK, PHILOSOPHY OF SCIENCE AND RACE 58–62 (2002); JOSEPH L. GRAVES, JR., THE EMPEROR'S NEW CLOTHES: BIOLOGICAL THEORIES OF RACE AT THE MILLENNIUM (2001); Joshua M. Glasgow, On the New Biology of Race, 100 J. PHIL. 456 (2003).').)" Judge Emilio Garza].

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