

Theory and Research on 'Race' as a Natural Kind Variable in Psychology

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ABSTRACT. This article examines a portion of the theory about and research on 'race' in the field of psychology. Specifically, we examine whether the construct of 'race' can be used efficaciously as a natural kind variable that explains data in psychological inquiry. The foregoing consideration involves an exploration of the so-called 'biological/genetic' bases of 'race' from the conceptual paradigms of (a) mutual exclusivity and inalterability and (b) gradations on a continuum of genetic data. Our critique of these positions suggests an abdication of 'race' *as a natural kind variable* because both of the above arguments for the concept are ultimately incoherent given the genetic data that they seek to explain. Consequently, 'race' as a natural kind variable cannot explain psychological data. However, because the idea of 'race' has become diffused into societies, 'race' should be studied as a purely cognitive concept that influences social perception.

KEY WORDS: cline, natural kind, race, social perception

Recent articles on the topic of 'race' in the field of psychology (e.g. Allen & Adams, 1992; Yee, Fairchild, Weizmann, & Wyatt, 1993; Zuckerman, 1990), and many of the reactions to these articles (e.g. Fish, 1995; Jensen, 1995; Rushton, 1991, 1995; Sun, 1995), have addressed some important issues regarding the definition and use of 'race' in scientific discourse. Yet many of the foregoing articles have failed to examine carefully the relationship between the various definitions of 'race' and their impact on the interpretation of and explanation of psychological data. This article examines only a portion of the debate—namely the genetic argument for the existence of valid natural kind 'human races'. This genetic position is explored from the conceptual paradigms of (1) mutual exclusivity and inalterability and (2) meaningful gradations on a continuum of characteristics. From this two-fold analysis, we conclude that 'race', understood as a natural kind variable, is a meaningless concept because either its assertions are contrary to the human genetic data which it seeks to explain or else it is

logically incoherent. Thus, 'race' as natural kind variable cannot adequately or usefully explain psychological data, and the study of 'race' needs to be re-evaluated in light of this assertion. The proposed re-valuation of 'race' argues that the construct is more appropriately examined from the social construction vantage (see Jones, 1997, chap. 12) as socially developed information that influences social perception. Insofar as the theoretical underpinnings of 'race' as a concept are under investigation, we do not concern ourselves at present with the issue of 'racism'.

We should also note that our proceeding analysis of 'race' as a natural kind variable will focus in good measure on the work of J.P. Rushton and Arthur Jensen. This focus should not be read as *ad hominem*; rather, Rushton and Jensen provide the most popular and well-articulated positions on 'race' as genetic/biological. Other theorists (see de Vries & Sameroff, 1984; Rothbart & Taylor, 1992) allow for the possibility that 'race' is genetic or biological, but these theorists never explicitly state why they allow for this possibility, or, more importantly, how it could be the case that 'race' is genetic.

Additionally, our paper represents a contribution to the literature on this controversial topic because other attempts to undermine the natural kind variable argument for 'race' (see, e.g., Betancourt & Lopez, 1993; Fairchild, 1991; Zuckerman, 1990) have not clearly delineated the assumptions and issues relevant to 'race' as a natural kind variable. Consequently, these analyses have fallen short of their intended goal (for reasons that we enumerate below). This article, by contrast, clearly outlines the assumptions and issues relevant to a natural kind theory of 'race' and shows why these assumptions are otiose.

Natural Kind Categories and Natural Kind Variables

Before we begin the body of our discussion, we would like to draw an important distinction between natural kind categories and natural kind variables. Natural kind categories are cognitive perceptions of objects, involving beliefs about 'underlying essences that make one category different from another' (Rothbart & Taylor, 1992, p. 12). Accordingly, natural kind categories are predicated on the *belief* that an object has some mutually exclusive and inalterable property (Rothbart & Taylor, 1992), or else on the belief that objects can be divided into sets based on graduated differences. Yet, as a belief, this natural kind category perception does not have to characterize the object accurately (Brown, 1998). Alternatively, natural kind variables actually possess the qualities of mutual exclusivity and inalterability or graduated differences *independent of human perception*. An elephant, for instance, is a natural kind variable because elephants possess some quality (namely gene sequences) that is unique to *all* elephants and not

shared by any other animal. The existence of this unique quality is the sufficient condition for asserting that elephants are a different species than humans or tigers or any other animal. Furthermore, even if human beings did not perceive and categorize elephants as a species, the fact would still remain that elephants can only produce viable offspring with each other, thus establishing elephants' mutual exclusivity from other animals. Additionally, any elephant cannot change its unique quality over its life span, establishing inalterability. The concept of 'race' in psychology can be understood as either a natural kind category (a perception) or as a natural kind variable (a perception-independent fact). Our discussion focuses on the latter position.

The distinction drawn between natural kind categories and natural kind variables is admittedly a difficult one. The thrust of this distinction, however, is aimed at parsing out perception-dependent conceptualizations of objects in the world (natural kind categories) and the assumed perception-independent realism of how objects exist in the world (natural kind variables). This distinction is implicitly made in the philosophical and psychological literature (e.g. Brown, 1998; Millikan, 1998; Putnam, 1975). Yet many existing analyses (e.g. Brown, 1998; Millikan, 1998) do not deal adequately with erroneous perceptions of natural kinds, even though they allow for this possibility. We believe that natural kind perception should be evaluated in terms of whether the premises that it assumes accurately characterize the empirical data appropriate to these premises. Such an evaluation ultimately reveals whether the perception itself is useful or otiose, and the terms 'natural kind category' and 'natural kind variable' help frame this issue in language.¹

Spurious Human Taxonomies and Science

The concept of 'race' has a history in empirical science that antedates the establishment of psychology as an academic discipline. Accordingly, we should examine 'race's' etiology in order to understand better the assumptions underpinning its current usage. In 1749, Georges Le Clerc Buffon created six groupings of human beings based on geographic origin and was the first to use the term 'race' in reference to his classification (Montagu, 1941/1964). Buffon's ideas were based on the prevalent socio-religious doctrine in Europe at that time, called the Great Chain of Being or Fixity of Species (see Montagu, 1941/1964). This doctrine stated that all existing forms of animate and inanimate objects were created by God, and were therefore perfect and unchanging. Hence, Buffon was suggesting that geographic location was somehow indicative of naturally occurring 'human race' inalterability and mutual exclusivity (i.e. each 'race' possesses some uniform geographic origin that other 'races' did not and could not possess).

In 1785, Karl von Linné (Linnaeus) revised Buffon's groupings of human beings to include two traits: geographic location and temperament (Montagu, 1941/1964). Temperament was defined by levels of the four humors—blood, phlegm, cholera and black bile. Each fluid purported to have associated characteristics, such as blood's presumed association with passion. Using the Great Chain of Being, Linné suggested that each supposed 'race', along with having a unique and inalterable geographic origin, also had a unique set of humoral levels (a graduate difference) that could not change, and thereby differentiated each 'race' from the others (cf. Montagu, 1941/1964). From his premises, Linné developed the groupings *Homo afer*, *Homo americanus*, *Homo asiaticus* and *Homo europaeus*—representing the continents of Africa, the Americas, Asia and Europe, respectively. There was no implied order of rank in Linné's system (as argued by Montagu, 1941/1964); accordingly, the groupings here are presented alphabetically.

Ten years later, in 1795, Johann Blumenbach also adduced the Great Chain of Being or Fixity of Species to create new groupings of human beings based on his assumptions about aesthetics. Blumenbach altered Linné's system in order to account for the above factor, which he believed germane to human taxonomy (see Montagu, 1941/1964). From Blumenbach's premises came ranked groupings.² Caucasians topped this hierarchy because in Blumenbach's epoch the Caucasus Mountains (near present-day Russia) were believed to be the ancient Garden of Eden in biblical lore, making these so-called 'Caucasians' the most beautiful of the supposed 'races'. Americans (i.e. so-called 'Native Americans') and Malaysians were the next ranking, followed by Mongoloids and Ethiopians (the latter category included all African populations). These rankings were justified not only on religious and aesthetic grounds but also through conjecture about intelligence within and across these supposedly distinct groups (see Gould, 1980, chap. 15).

Eventually, both the humors explanation of Linné and Blumenbach's aesthetic assertions were found to lack any empirical support in addition to resting on questionable theoretical grounds (Gould, 1980, chap. 15). As a result, these explanations were dropped from scientific discourse (except for pedagogical purposes). Nevertheless, psychology and other sciences have inherited Blumenbach's terminology (e.g. 'Caucasians', 'Mongoloids') and still tacitly agree with Buffon's assertions about the meaningfulness of geographic location for 'human race' classifications (see, e.g., Zuckerman, 1990).

The above delineation of three previous human taxonomies is used here to illustrate the dubious premises that can influence scientific investigation, especially as it relates to the construct of 'race'. The classifications of Buffon, Linné and Blumenbach can be viewed as incipient 'racial classifications', when 'race' is understood as a natural kind variable (see Gould, 1980, chap. 15; see also Kelso, 1970, chap. 1; Montagu, 1941/1964). It is our contention that spurious premises, like those that shaped the taxonomies of

Blumenbach, Linné and Buffon, are still present in psychological theory on 'race' as a natural kind variable and continue to misdirect theory and research on the topic.

At this point, we would like to make the reader aware that the natural kind conception of 'race' is not the only manner by which to understand 'race'. There has been and continues to be a shift to a social construction theory of 'race' (see Jones, 1997, chap. 12, for a review), wherein 'race' is viewed as socially developed information used in social perception, and is not necessarily a biological or genetic reality. However, the present paper focuses upon the older conception of 'race' as a natural kind variable because some theorists, like J.P. Rushton (e.g. 1985, 1991, 1999) and Arthur Jensen (1995, 1998) continue to promulgate the notion that 'race' is a biological/genetic reality. As we have stated at the outset of this article, neither Jensen nor Rushton's position has been sufficiently counter-argued.

Current psychological research on 'race' as a natural kind variable may not include assumptions of inherent hierarchical divisions within the human species, as in some previous theory, but it does evince two distinct arguments for the existence of natural kind 'human races'. One argument is that 'human races' are mutually exclusive and inalterable divisions within the human species (a position called the Platonic view; see Jensen, 1998, chap. 12). The other argument is that 'human races' are gradations on a continuum of genetic characteristics (a position called the cline argument; see Jensen, 1998, chap. 12). These two positions are related to the extent that differences between and among supposed 'human races' on specific biological or genetic features are presumed to be independent of human perception, or *objective* (see Rushton, 1995). Put another way, 'race' is not a concept like a unicorn, which is dependent on human perception—or *subjective*—because no unicorns exist independent of human thought about them. 'Race' for the natural kind theorists (both Platonic and cline) is an objective, biological fact within the human species no matter what any person thinks or says on the issue.

Insofar as some psychological research (especially on individual differences) makes distinctions among supposedly naturally occurring 'human races' (e.g. Ellis, 1988; Jensen, 1998; Rushton, 1988, 1991, 1999), one might imagine that these supposed natural kind divisions are supported on either empirical or logical grounds. Yet an examination of both the Platonic and cline arguments for 'race' as a natural kind variable clearly shows that support for either position is lacking.

Our analysis begins with the Platonic argument because it is the oldest and the strongest (despite eschewals by Jensen, 1998). As we develop below, the strength of the Platonic argument is its conceptual coherence. Unlike the cline argument, the Platonic argument does not evince the difficulties associated with creating divisions on a continuum.

The Platonic Natural Kind 'Race' Theory: Mutual Exclusivity and Inalterability

The Platonic natural kind argument for 'race', similar to the arguments of Buffon, Linné, Blumenbach and other early anthropologists who endorsed 'race' (see Kelso, 1970, p. 9, for a list of these anthropologists), assumes that the phenotypic differences and disparate geographic locations within the human species reflect some kind of natural division within the human species. This view recapitulates the precepts of Plato's ontology (Jensen, 1998, chap. 12). This Platonic view argues that 'human races' are genetically meaningful classifications that point to underlying mutually exclusive and inalterable divisions between and among human beings. An assertion that 'human races' are mutually exclusive and inalterable natural kind variables involves three major tenets: (1) *all* 'members' of a particular 'race' have *at least* one genetic sequence (or other characteristic) in common that is, moreover, *unique to them* (i.e. not evinced in any other supposed 'race'), and is furthermore an inalterable characteristic; (2) there can be so-called 'inter-race' similarity on any number of genetic, biological and physiological characteristics *provided that* the conditions outlined in the first tenet exist; and (3) any two people, regardless of 'racial classification', can produce offspring with each other because the second tenet allows them to be members of the same species. The tenets of a Platonic natural kind argument outlined above elucidate why many counter-arguments (e.g. Yee et al., 1993; Zuckerman, 1990) to a theorist like Rushton may not be adequate to discredit his premises.³ Even if psychologists state that 'racial groups are more alike than they are different' (Zuckerman, 1990, p. 1300), the only data one needs to argue that 'race' is a valid Platonic natural kind variable is one inalterable gene unique to and uniform within some population currently designated as a 'human race'. Other arguments (e.g. Fairchild, 1991) that focus on the teleological nature of Darwinian evolution are not sufficient to counter-argue a Platonic natural kind conception of 'race' for two reasons. First, the assertion that Darwinian arguments are circular misunderstands the distinction between retrodictive and predictive explanations, thereby rendering this criticism invalid. Second (as will be developed in more detail below), the theory of Darwinian evolution (i.e. natural selection) offers a logical counterpoint to a Platonic theory of 'race' (despite the fact that Darwin himself still allowed for 'human races'; see Kelso, 1970, chap. 1).

In order for 'human races' to exist independent of human perception as Platonic natural kind variables, the first tenet of a Platonic natural kind argument discussed above must exist. However, as we argue below, no empirical or logical evidence exists to support any claim of mutually exclusive and inalterable genetic differences among populations currently perceived as 'human races'.

Genes and Platonic 'Race'

The Human Genome Project has found that 'although the genes in each person's genome are made up of unique DNA sequences, the average variation in the genomes of two different people is estimated to be less than 1 percent. Thus the differences between DNA samples from various sources are small in comparison to their similarities' ('The Human Genome Project'). The above estimate was derived from the first 10,000 sequences of the complete genome (Vines, 1995), but this statement recently received even stronger support from the virtually complete human genome (see Cullington, 2001; Venter et al., 2001). These findings, therefore, seriously antagonize the assertion of valid Platonic natural kind 'human races' because the estimated 1 percent differences in DNA sequencing are not confined to the populations currently designated as 'races'. This less than 1 percent dissimilarity is found both within and across populations called 'races' and therefore provides no support for genetic mutual exclusivity. In fact, studies of mitochondrial and nuclear DNA samples (e.g. Cann, Stoneking, & Wilson, 1987; Cavalli-Sforza & Cavalli-Sforza, 1995; Marks, 1995; Wainscoat et al., 1986) from various human populations reveal that so-called 'racial groups' evince profound genetic *dissimilarities* within the sample and genetic similarities across 'races', with no mutually exclusive genetic similarities within or mutually exclusive genetic differences across so-called 'human races'. Additionally, examinations of melanin production (the process that gives degrees of coloration to human skin) have demonstrated that the variation within and across human populations cannot support mutually exclusive divisions of these populations (cf. Barnicot, 1964; Cavalli-Sforza, 1981; Wills, 1994). Moreover, current genetic theory in the Darwinian vein (e.g. Eldridge & Gould, 1972) posits genetic variation and random mutations within any population, which logically disallows complete uniformity on characteristics within a given population over time, and further intimates that gene frequency and gene distribution are mutable as a result of natural selective pressures.

The above arguments illustrate why averaged differences are incompatible with a Platonic natural kind argument. Averaged differences conflate information that could otherwise be evaluated in terms of whether it supports assertions of mutual exclusivity. Nevertheless, Rushton (1995) cites skeletal morphologies, hair texture and hair color as a few of the traits that distinguish 'human races', with the intimation that these traits fit into the Platonic understanding (see note 3). However, any anthropologist will acknowledge that such criteria for human taxonomy are heuristic guidelines by which to classify populations, especially population remains. As heuristics, these above-discussed criteria are also by no means applicable in every instance because they are an *average*. This method is, moreover,

imprecise because in practice the taxonomy is restricted to discrete geographic locations, ostensibly supporting the 'race' argument. For example, adult skeletons on the Asian continent may be smaller *on average* than adult skeletons found in regions of Europe, yet this statement does not preclude the existence of adult skeletons in Europe that are smaller than in adult skeletons in Asia. Further, skeletal morphologies may not reveal genotypic differences as much as phenotypic differences—that is, differences based on human interaction with the environment (e.g. nutrition)—and could, in principle, happen to any human being who lived in that environment (cf. Adair, 1987; Weiss & Mann, 1990). As a result, disparate skeletal morphologies (and other averaged differences) cannot support any assertion about mutually exclusive or inalterable differences.

Ancestry and Platonic 'Race'

A sub-argument to the larger genetic argument for the Platonic natural kind validity of 'race' that deserves attention is the assertion that ancestry can provide a valid argument for a natural kind conception of 'race'. A common argument from this position is: 'If your ancestors were European, then you're White.' The underlying precepts in this argument are (1) that a person cannot change his or her ancestors' origin—thus making ancestry an inalterable conception—and (2) that any geographic location is mutually exclusive from other locations. This kind of argument recapitulates the thinking of Buffon, Linné and Blumenbach discussed at the outset of this paper, wherein geographic location was cited in support of mutually exclusive and inalterable distinctions because it was assumed to be *geographic origin*, suggesting that humans in certain regions developed completely independent of other humans based upon the precepts of Fixity of Species (cf. Montagu, 1941/1964). Nevertheless, the evolutionary perspective has rendered meaningless the notion of multiple, *completely independent geographic origins*, even though there is one evolutionary theory that has historically been cited in support of 'race'.

The evolutionary theory alluded to above is the multi-regional hypothesis (MRH). MRH was developed as a counterpoint to the Out-of-Africa hypothesis, the more popular theory that argues that all anatomically modern humans (AMHs) originated in one place and migrated all over the world, logically negating the notion of independent origins. MRH was developed by Coon (1962) and originally argued for the existence of 'human races' by suggesting that, contrary to the Out-of-Africa hypothesis, the groups of *Homo erectus* in different regions of the world developed into AMHs independent of each other. The implication for 'human races' in Coon's MRH is that gene flow was sufficiently minimal across groups of *Homo erectus* to justify the argument that 'race' is based on mutually exclusive differences (or else averaged differences) resulting from isolation between

human sub-groups. The revival of MRH has proponents who are sympathetic toward Coon (e.g. Shipman, 1994), but other proponents (e.g. Wolpoff & Caspari, 1997) argue that gene flow between regional groups was sufficient to keep genetic differentiation at a very low rate. As stated above, the Human Genome Project (e.g. Cann et al., 1987; Vines, 1995; Wainscoat et al., 1986; Venter et al., 2001) has found less than 1 percent genetic difference between any two human DNA samples *irrespective of geographic location* or supposed 'race'. Accordingly, the MRH stance that argues for the least amount of genetic differentiation fits better with the empirical data, thereby making Coon's original argument otiose.

Evolutionary explanations notwithstanding, one could argue that even the concept of ancestors' geographic location (instead of geographic origin) allows for disparate natural selective pressures acting upon random mutations, thus allowing variation and/or speciation to occur (cf. Eldridge & Gould, 1972). As a result, ancestral disparate geographic locations, even when understood by evolutionary theory, may still allow for so-called 'racial differences' in the Platonic sense.

Such an argument, although seemingly valid, fails to consider carefully pertinent issues regarding evolutionary theory. Both Cavalli-Sforza and Cavalli-Sforza (1995) and Marks (1995) argue that ancestral geographic location is a matter of degree (not kind), and, more specifically, that geographic location can be used to estimate how long ago *arbitrarily designated* (implying subdivisions within an otherwise singular whole) human populations settled areas that their origin population did not through an examination of gene frequencies within each arbitrarily designated population. The measure of gene frequency in no way supports notions of genetic mutual exclusivity (because of the above-discussed genetic variation and random mutations within any population; see, e.g., Eldridge & Gould, 1972; in addition to the logical precept that differences of degree are not differences of kind). Gene frequency is more indicative of specific selective pressures that a single population may have faced in the past. The notion of selective pressures implies that gene frequency is mutable to the extent that natural selection occurs and selects against those traits that antagonize reproduction and survival (see also Eldridge & Gould, 1972). Therefore, even if ancestry arguments adduce disparate gene frequencies and evolutionary theory to argue that 'race' is Platonic natural kind variable, these data are not mutually exclusive (because of existing variation and random mutation) and are not inalterable (to the extent that natural selection occurs).

Furthermore, assertions about ancestry often intimate cultural distinctions, which are considered by many anthropologists to be independent of genes (e.g. Kelso, 1970; Kormondy & Brown, 1998). Yet, even if cultural activities are considered to be a function of genes (e.g. Janicki & Krebs, 1998), cultures are not monolithic. As a result, any assertion that ancestry

implicating culture is somehow indicative of mutually exclusive and inalterable differences elides the fact that cultures are not uniform at all levels, nor are they immutable.

The New Natural Kind ‘Race’ Theory: Clines

In an attempt to rectify the problems with the foregoing Platonic natural kind understanding of ‘race’ in psychology, some theorists and researchers have borrowed literature from anthropology in an attempt to clarify the topic of study. This anthropological literature argues that human differences can be graduated (rather than typological or Platonic) differences, and these differences still support an argument for natural kinds. This position is called the cline argument. Unfortunately, psychologists who endorse the cline understanding of ‘race’ have borrowed the older anthropological understanding of ‘race’ rather than the current one and tried to harmonize this older conception of ‘race’ with the cline argument. Introducing the older anthropological definition of ‘race’ damages the cline argument because this definition is based on typological thinking rather than minute genetic processes and discrete population dynamics (see Mayr, 1959, 1963)—the mechanisms of natural selection and human evolution. Consequently, any theory resulting from this older anthropological understanding together with the cline argument is misconstrued and misleading. The current wisdom in anthropology is that ‘race’ is a genetically meaningless construct (e.g. Gould, 1980), and, consequently, its usage in anthropology has declined (see Lieberman, 1997; Lieberman & Fatimah-Jackson, 1995; Littlefield, Lieberman, & Reynolds, 1982).

Zuckerman’s Cline Argument for ‘Race’

Despite Mayr, Gould and Lieberman’s arguments, according to Zuckerman (1990), the concept of ‘race’ in anthropology and biology is currently defined as ‘an inbreeding, geographically isolated population that differs in distinguishable traits from other members of the species’ (p. 1297). The definition further states that ‘members of such a population are capable of breeding with members of other populations in their species’ (p. 1297). The above definition tries to avoid the difficulties associated with arguing for Platonic, genetically mutually exclusive and inalterable ‘races’, and suggests that ‘race’ can be understood as accurately and precisely identifying gradations on a continuum of genetic (and non-genetic) characteristics by emphasizing similarities within groups that do not necessarily intimate mutually exclusive differences across groups. Nevertheless, Zuckerman’s cline definition of ‘race’ is more problematic than the Platonic definition because of the ambiguity and logical implications of his argument.

In Zuckerman’s definition two points need to be made clear. First, exactly

what is 'geographic isolation'? For example, the continents of Africa and North America are geographically isolated by the Atlantic Ocean. Many people who currently live in North America 'inbreed', so to speak, with other North Americans, while many contemporary Africans 'inbreed' with other Africans. Of course, any one person living on either continent could breed with a person from the other continent (if contact were made, and fertility problems did not exist). Additionally, averaging the physical characteristics of all the people currently in North America and all the people currently in Africa would undoubtedly reveal some phenotypic differences between the populations. For instance, skin shade (which is indicative of melanin production), *on average*, may be darker in the African population than in the North American population. Do we now, based upon the foregoing data, have the North American and African 'races'?

Second, what exactly are 'distinguishable physical traits'? Do height and weight fall under the purview of such differences? Does melanin production? Even using current 'racial divisions' (i.e. 'Black', 'White', etc.), it is clear that the same diversity of physical traits exists in the so-called 'White race' as in the so-called 'Black race' (Barnicot, 1964; cf. Marks, 1995). Furthermore, physical features can differ markedly from sibling to sibling (unless both are identical twins). Can siblings from the same parents now be considered members of different 'races' based on their disparate physical traits and the provision that each lives in a different, geographically isolated 'inbreeding' population?

Similarly, if a person leaves a population and joins another, has he or she effectively changed 'races'? If 'race' is viewed as an inalterable natural kind variable (the predication of the concept since Buffon), then the answer is necessarily 'no'. Following from Zuckerman's definition of 'race', however, in which origin is not a criterion for 'racial classification', if one is no longer geographically isolated from the population that one has joined, and one's physical features meet the vague similarity criterion discussed above, then it would appear logical that one could change one's 'racial membership'. Additionally, Zuckerman's definition does not make any assertions about inalterability, thereby allowing mutability. In this instance, the logical conclusions of his cline definition of 'race' are incongruous with the current use of 'race' as inalterable (e.g. a 'Black person' cannot become a 'White person', and vice versa)—a basic assumption of the natural kind theory of 'race' (both Platonic and cline) since its inception in anthropology (cf. Montagu, 1941/1964).

Jensen's Cline Argument for 'Race'

Jensen (1998) provides a similar cline position on 'race' that explicitly argues against the Platonic conception. He favors *average differences* among groups as providing coherent 'racial' divisions (Jensen, 1998, chap. 12), but

his argument does not focus on 'inbreeding populations', as Zuckerman's does.

There are two salient and damaging problems with Jensen's argument. First, like Zuckerman's (1990) position, the selection of differences on which to focus is problematic. What differences does one choose to define 'race'? Jensen (1998) explicitly tries to ground 'race' in genetic differences, even though geneticists like Marks (1995) have cogently argued that 'race' cannot be organized around any genetic differences.

Empirical and logical counter-arguments notwithstanding, because Jensen (1998) believes that averaged genetic differences can provide a coherent argument for 'race', he averages differences to this end. Herein is the second problem with Jensen's cline argument. Although humans can perceive, meaningfully divide and categorize gradations on a continuum, there are two logical bases for developing clines: (1) inductive organization and (2) deductive organization. For inductive organization, a person meaningfully divides and categorizes gradations on a continuum (clines, in this broad sense) by setting limits on the range of a continuous measure and *only categorizing individuals within that determined limit* as being a part of the group. For instance, a person can divide and categorize ranges of height using this inductive (or bottom-up) organization. If a person wants to create a group X, and limits the height range of humans in group X from the lower limit of 1 foot tall to the upper limit of 5 feet 7 inches tall, then this division and categorization of an otherwise continuous measure are acceptable because only persons who fall in this range of height will be categorized as group X. Another group (group Y) cannot have any members who fall within the range determined for group X because it would be illogical to classify a person into group Y when he or she meets the criterion for classification in group X. In short, overlap is illogical for inductive organization because in this case category boundaries cease to make sense and are therefore not compelling.

For deductive (or theory-driven) organization, a person needs to have existing premises or conditions (which are, further, internally consistent) that provide the basis for categorization. For example, using geographic location to discern how long ago human populations migrated from one region to another (e.g. Marks, 1995) is a valid deductive organization. Geographic location, here, is an internally consistent condition (i.e. humans are, in fact, in different geographic locations). Geographic location can further be construed as a logical consequent of the theory of migration (i.e. movement from one point to another explains how humans are in different locations). Therefore, one can meaningfully organize humans around geographic locations and look for averaged differences as an indication of when populations migrated away from each other because there is a logically consistent theory that underpins categorization. Jensen's (1998) cline position, however, meets neither the deductive nor the inductive organization requirements.

Jensen and others who endorse the 'race' as cline (see Rushton, 1999, as a compatriot) use socially and culturally defined 'human races' as starting points for categorization, even though these socially and culturally defined 'races' are based on spurious scientific theories (see the above section on 'Spurious Human Taxonomies'). Consequently, Jensen is not categorizing people by minute, continuous differences (e.g. height) and then aggregating *only those with the appropriate range of difference* into a group (as in the inductive organization example above). Instead, he starts with groups (whose very organization is not internally consistent, thereby negating a deductive organization), then tries to find differences between (or among) them. Thus, one damaging question is: how were the groups formed in the first place? And a second damaging question is: why are the outliers in 'race X' (who are presumably overlapping with the members of another so-called 'race', 'race Y') still categorized as being a part of 'race X' when they have little similarity with those closer to the 'race X' central tendency? Relatedly, why are the 'race X' outliers, who may be more demonstrably similar to the members of 'race Y', not considered part of 'race Y'?

As a result of the above difficulties, Jensen's 'racial taxonomy' is, in principle, no different than grouping random persons into two (or more) sets and then looking for differences between the sets. Using all available human genetic data provides a high likelihood that some difference (however trivial) will be found between any two sets. Once any difference is found, this difference is assumed to be diagnostic for each set even though the sets were determined by random grouping, or, in the case of 'race', the sets' composition was determined on erroneous premises that provide pre-categorized (albeit meaningless) groupings. Therefore, one cannot start with 'race' as a given (because the concept itself has irreconcilable logical and empirical problems), then look hard for differences to support it; instead, one must investigate whether human differences can support the concept of 'race', then re-evaluate or abandon the concept accordingly.

In sum, when dealing with *arbitrary* divisions along a continuum of physical and genetic characteristics, as in the new cline definitions of 'race', any attempt to make distinctions among or between so-called 'human races' is either superfluous (because these differences are a matter of degree, and are more appropriately referred to as such on the *specific* physical or genetic grounds) or illogical if the appropriate organizational methods outlined above are not employed.

Methodological Issues and Natural Kind 'Races' in the Light of the Foregoing Arguments

The preceding refutations of the natural kind arguments have important consequences for methodology, specifically the assessment of so-called

'racial differences'. One of these consequences is what we term the *sampling frame fallacy*. Stated simply, this fallacy occurs when a researcher *assumes* that a sampling frame with specific parameters or features exists even though the data relevant to each parameter or feature are contrary to the original assertions. For example, if a researcher *assumes* that Platonic natural kind 'human races' (the supposed sampling frame) exist and are based upon some kind of mutually exclusive and inalterable genetic data, then his or her assumption is fallacious. Cline understandings of 'race' are similarly fallacious for the reasons enumerated above. Consequently, a researcher's findings that 'race' influences or explains psychological data cannot be interpreted as supporting his or her hypotheses because the major premise on which the assertion is based (i.e. 'race' is a natural kind) is fallacious. As a result of the major premise being fallacious, the entire argument is invalid.⁴

Moreover, using the meaningless genetic concept of 'race' as if it were a useful explanation obscures the valid constructs that can more efficaciously explain the data. Socio-economic status, for instance, is a better predictor of crime than is the construct of 'race' (see Baruah, 1989; Robins, 1978) even though socio-economic status is subsumed under the construct of 'race' in some analyses (e.g. Ellis, 1988).

Valid Natural Kind Variables and Psychological Data: Extending the Basic 'Race' Argument

As argued above, 'race' was a taxonomical system developed in order to understand human differences in terms of specific philosophical assumptions, but is ultimately invalid. In pursuit of valid human taxonomies, some anthropologists and biologists have focused on genotypic, rather than phenotypic or geographic, differences among human beings in order to develop classifications.⁵ These genotypic differences may result in part from geographic isolation, but may also reflect political, religious and cultural isolation within the same geographic area. These taxonomies are largely based on the Platonic natural kind understanding because, as stated above, the Platonic stance is not susceptible to the difficulties of arbitrary divisions evinced by the cline argument. The results of these genotypic taxonomies are groupings of human beings based on blood type and risk of genetically transmitted pathogens, to name two characteristics. These criteria appear satisfactory for strict biological taxonomies of human beings. Blood types are valid distinctions with reliable methods of assessment (Kelso, 1970, chap. 8; Mourant, 1983), and risk of genetically transmitted pathogens can also be assessed through genetic analyses (Kelso, 1970, chap. 8). These classifications are mutually exclusive to the extent that these physiological/genetic traits are unique to the people who possess them (because not all

people possess each blood type or each genetic pathogen) and are inalterable (i.e. a person cannot change the blood type in his or her body or the existence of genetic pathogens in his or her ancestors; cf. Marks, 1995). The reader should be aware, however, that neither of the above natural kind variables is exclusive to any of the currently designated 'human races'. No so-called 'race' has a unique, uniform blood type (Cavalli-Sforza & Cavalli-Sforza, 1995; Mourant, 1983), nor is any genotypic pathogen unique to and uniform within any so-called 'race'. Sickle-cell anemia, for instance, is not exclusive to all, or even most, so-called 'Black people'; sickle-cell anemia exists in specific regions of east Africa, southern Europe and southwestern Asia (Cavalli-Sforza & Cavalli-Sforza, 1995). As a result, persons who have ancestors from these specific regions are at risk.

Yet even the valid natural kind variables presented above appear to have no efficacious theoretical bearing on or any differential relationship to psychological data.⁶ Consequently, even a neo-natural kind 'race' argument using genetic data that are actually mutually exclusive and inalterable appears to be useless for psychology. Put more simply, the kind of genetic data used for a valid human taxonomy, such as blood type, have little (if any) connection to psychological data such as intelligence, psychoticism, aggression or schizophrenia. In fact, to suggest such a relationship would be tantamount to entertaining the otiose premises of Linné's humoral theory (see above), and in the process one tends to overlook the more demonstrably associated and explanatorily useful factors (e.g. the relationship between socio-economic status and crime).

Speculation on the Continued Use of 'Race' as a Natural Kind Variable in Psychology

Despite the above-discussed shift toward the social construction view of 'race', many theorists still allow for (e.g. de Vries & Sameroff, 1984, p. 83; Rothbart & Taylor, 1992, p. 21; Zuckerman, 1990), if not defend (e.g. Ellis, 1988; Jensen, 1995, 1998; Rushton, 1991, 1995, 1999), the notion of natural kind 'human races'. The reluctance to abandon 'race' completely as a natural kind variable in psychology may be a direct result of the assumptions upon which 'race' theory is founded, as well as the currently popular theoretical biases in psychology. Although 'racism' is often adduced to explain the continued use of 'race' in social sciences (e.g. Jones, 1997; Lieberman & Reynolds, 1991; Omi & Winant, 1994; Tucker, 1994; Winston, 1998), we focus on reasons other than prejudice in order to supplement previous discussions.

Psychology's current emphasis on the biological, genetic and physiological components of the human being, and their presumed causal impact on human behavior (see Crawford & Krebs, 1998; Marazatti et al., 1993;

Propping & Nothren, 1995; Rosenthal, 1970), provides one explanation as to why some psychologists may be reluctant to completely abdicate their belief in 'race' as a natural kind variable. If genetic, biological and physiological factors *causally* impact behavior, and these causal influences can be *reduced* to discrete genes or collections of genes, and provided that 'human races' differ in some uniform or averaged genetic manner—even on a minute level—then differences in human behavior can be explained as 'racial differences' in human populations.

Nonetheless, the previous argument has two assumptions that must be demonstrated before the conclusion reached can be considered valid. First, the argument assumes that much of human behavior is *reducible* to genetics (or its manifestations in human physiology), even though no convincing evidence has been advanced in support of this position. One famous illustration of the non-reductive quality of human behaviors to genes or physiology is Penfield's manipulations of the cerebral cortex (see Penfield 1975; Penfield & Jasper, 1954). Penfield found while he could produce reflex actions and even access some behaviors, he could not manipulate belief—a very human activity. Rychlak (1994) provides an insightful discussion of the non-reductive quality of human activity to biology, and we agree that the more plausible explanation of the link between human biology and human activity is one that states that human activity is *grounded* in human biology—that is, activities cannot exist without biology (and thus genetics)—but activities are not reducible to biology or genetics. Using an analogy, the word *and* is not reducible to its constituent letters *a*, *n* or *d*, but could not exist without them. The word *and* is also not reducible to any two-letter combination (e.g. *an*, *nd* or *ad*) or to any single-letter reduction. In fact, some single-letter reductions of the word *and* convey totally different concepts. *A*, for example, can be used as an article in reference to a singular object (e.g. *a* book). The letter *a* by itself can refer to single entities, but this meaning of the letter has no relationship to the conjunctive meaning of the word *and*. Thus, reducing the word *and* to its constituent letters can result in the mis-direction of thought, which can further lead to unwarranted conclusions. *And* is a gestalt phenomenon, wherein the whole of the letters (i.e. the word) is different from the sum of its individual parts. Likewise, human activity may be more of a gestalt phenomenon, wherein the whole of human activity is different from the sum of its biological, genetic and physiological parts. This gestalt position allows for similarities in activities (i.e. behaviors, thoughts, etc.) despite varying levels of physiological and/or genetic similarities—a phenomenon that a strict reduction argument can only explain as aberrant.

Despite conceptual difficulties, the genetic reductionism argument for human behavior has received additional support from evolutionary psychology positions that posit the genetic inheritance of psychological predispositions, which then interact with the environment. These predispositions are

often construed as narrow, mechanical, deterministic and tantamount to culture (see Crawford & Krebs, 1998, for examples). Nevertheless, other evolutionary psychology positions (e.g. Barkow, Cosmides, & Tooby, 1992) argue that humans inherit more general parameters for psychological functioning that interact with culture, rather than narrow dispositions, which are equivalent to culture. Lewontin (1990), however, argues that both biology (inherited dispositions) and the environment only explain part of the total variance in human behavior. Thus, *even if* a 'race' argument could be coherently organized on genetic grounds, the conclusion that genetics would differentially predispose certain so-called 'races' to certain psychological activities would be a controversial claim at best.

Second, the above argument assumes that natural kind (i.e. biological/genetic) 'racial classifications' actually exist and furthermore demarcate valid differences between groups designated as such. But a careful examination of both the Platonic and cline arguments for a 'race' natural kind variable reveals that their presumptions and assertions are inconsistent with human genetic data, evolutionary theory and precepts of logical organization.

Conclusion

The above-described problems with what 'race' means as a natural kind variable and how the concept is inconsistent with relevant genetic data and germane theoretical assumptions lead us to advocate the complete abdication of 'race' *as a natural kind variable* in psychological inquiry on the grounds that the construct is meaningless. This abdication will not hinder scientific investigation into psychological phenomena, but will instead facilitate such investigation to the extent that the illogical and otiose construct called 'race' as a natural kind variable would not obstruct careful and thorough analyses of psychological phenomena.

General Discussion

Reactions to Criticisms

One of the most salient criticisms that we have encountered while promulgating our position is the belief that we are somehow denying social realities by advocating the discontinuance of 'race' as a natural kind variable in the psychological lexicon. We would like to remind the reader that we are questioning the *usefulness* of the construct called 'race' as a *natural kind variable in psychological discourse*, and not whether the *idea of 'race'* exists

in contemporary societies. Based on our evaluation, we propose an abandonment of 'race' as a natural kind variable because it is an invalid, illogical division of the human species with no scientific value at all. The more appropriate scientific pursuit is to study the perception of 'race' from a social cognitive vantage, employing positions such as *racial formation theory* (Omi & Winant, 1994; Winant, 1994), *social identity theory* (e.g. Tajfel, 1978) and Hirschfeld's (1995, 1996) theory-driven model of perceiving 'race' to interpret data involving 'race' because the two foregoing positions are more consonant with the current anthropological and biological literature, which states that 'race' as a natural kind variable is 'irreconcilable with evolutionary theory' (Kelso, 1970, p. 9), and, further, that 'race' is inconsistent with human genetic data (see also Cavalli-Sforza & Cavalli-Sforza, 1995; Cullington, 2001; Gould, 1980, chap. 15; Marks, 1995; Montagu, 1941/1964; Venter et al., 2001).

A second criticism is that our position reaches premature conclusions. This criticism is grounded in the belief that 'human races' exist independent of human perception (see Rushton, 1995), and that we cannot accurately assess 'race' and 'racial differences' with current scientific methods. Of course, we cannot prove that differences do not exist between and among human beings because differences do exist. Those who believe in (or at least allow for) the natural kind validity of 'race' often cite the mere existence of differences between and among human beings as evidence of 'racial differences' (cf. de Vries & Sameroff, 1984, p. 83; Jensen, 1998; Rothbart & Taylor, 1992, p. 21; Rushton, 1991, 1995). To the extent that human differences exist, it is important to explore what these differences are and how they relate to the notion of 'race' as a natural kind variable. Again, the kinds of differences between and among human beings offered as support for current 'racial taxonomies' are by no means mutually exclusive, are in some cases alterable (e.g. gene frequency), or else are organized in illogical ways, and thus cannot offer categorizations of human populations into any natural kind 'racial' groupings. Similarly, if natural kind 'races' are defined as clines for physical, genetic or cultural features, then the construct is superfluous because the differences under investigation can be more accurately and more precisely discussed as gradations on *specific* physical, genetic or cultural measures. In the event that the criteria for natural kind 'racial taxonomies' are questionable, then it is likely that any data purporting to show such differences as a function of natural kind 'races' may actually be indicating other valid factors not carefully assessed by those investigations. The question then is not whether differences exist between and among humans; instead, the real questions are (1) do such differences support the natural kind 'racial' divisions presently employed by some psychologists (e.g. Ellis, 1988; Jensen, 1998; Rushton, 1988, 1999; Zuckerman, 1990)? (2) Do even valid mutually exclusive and inalterable differences among human beings (e.g. blood type) have any bearing on psychological data?⁷ And (3) is

'race' as a natural kind variable a precise representation of graduated differences on particular physical, genetic or cultural measures? In all three cases, the answer suggested by a critical evaluation of the topic is 'no'.

We are not, however, also advocating a complete abdication of research of the general topic of 'race' in psychology. We agree with Rothbart and Taylor (1992) that a *belief* in essential differences in reference to social categories (e.g. 'human races') 'has important psychological consequences' (p. 19). As stated above, we believe that theory and research in the social construction vein can assess these consequences. Yet, before psychologists can accurately assess these consequences, they must first correctly identify the precipitating factors. A step toward such a correct identification is through the discontinuance of 'race' as a natural kind variable.

The aims of this article will not be achieved, however, if tacit belief persists in a natural kind understanding of 'race'. Although Zuckerman's (1990) article tries to argue against Jensen and Rushton's conceptions of 'race', it endorses a belief in the existence of natural kind 'human races'. As long as anyone accepts the premise that natural kind 'human races' exist, then it is difficult to argue that no 'racial differences' exist or that such supposed differences are unimportant. The difficulty with the former argument (that 'racial differences' do not exist) is that such a position is contrary to the predication of 'race' as mutually exclusive (or as a cline)—indicating some uniform (or averaged) similarity between in-group members and some uniform (or averaged) difference between the in-group and the out-group. If the out-group members were similar to the in-group members on relevant criteria for the division of the two groups, then there appears to be no basis for the division. The difficulty with the second argument (that 'racial differences' are unimportant) is inextricable from the previous argument. If 'races' are thought to be mutually exclusive (or, at least, clines), then some evidence of this division must exist. Differences attributed to natural kind 'races' serve to reinforce and justify the notion that the two (or more) groups are distinct one from the other(s). To deny the importance of 'racial differences' while presuming the existence of natural kind 'races' is an incoherent argument.

In order to avoid the foregoing logical and conceptual difficulties, one must begin from the premise that 'human races' do not exist anywhere but in people's minds. This premise does not say that human differences do not exist; rather, human differences that support the current natural kind 'racial classifications' (e.g. Jensen, 1998; Rushton, 1988, 1999) do not exist. Once the natural kind usage of 'race' is abandoned, then genetic, biological and physiological data can be interpreted more precisely without the confounding factors that a belief in the natural kind validity of 'race' introduces. Furthermore, the existing theory and research on 'race' in the social construction vein (see Jones, 1997, for a review) can be performed more

efficaciously and interpreted more easily because psychologists will have a uniform, more accurate understanding of 'race'.

A Brief Theoretical Outline of Recommended Theory on 'Race'

An adequate and precise outline of recommended theory for how to study 'race', given that the construct is not genetic or biological, would require another article. Nevertheless, we will briefly outline the theoretical issues that theorists should consider when developing a position on how to study 'race' in light of the arguments in this article. As we have stated above, 'race' can only be meaningfully studied as a purely cognitive representation of the social world, given certain assumptions about that world. This assertion necessitates a study of the perception of 'race', employing a position similar to (if not the same as) Rothbart and Taylor's (1992) notion of natural kind categories. That is, 'race' should be studied as involving perceptions of underlying mutual exclusivity and inalterability (see Rothbart & Taylor, 1992), or else perceptions of underlying valid clines, even though these assumptions do not accurately characterize data in the social world. The spuriousness of this perception is profoundly important because it requires theorists to examine all the possible constructions of 'race' without relying on their own or even popular understandings of the concept, because there is no accurate or objective perception of it. Thus, every theory of 'race', however rare in occurrence, matters for social perception because those who view 'race' in these respective manners no doubt use their own understanding to lend meaning to information in their respective experiences.

Theorists should also move into areas besides the social construction of 'race' in terms of prejudice (for the latter position, see, e.g., Devine, 1989a, 1989b; Jones, 1997). As argued above, a perception of 'race' tries to make sense of social information given the assumption that humans are divided into mutually exclusive and inalterable sub-groups, or, at least, clines on a continuum. Therefore, 'race' perception has broader theoretical implications for social inference and perceived social knowledge, which have hitherto gone unexplored. Other theorists (e.g. Lee & Ottati, 1995; Park & Rothbart, 1982) have offered interesting information about self- and other-perception using a conception of 'race', but these investigations have explored this question largely in terms of prejudice. Research in the spirit of Arroyo and Zigler's (1995) work, which concerned self-perceptions of strong and weak 'race'-identity and its relationship to academic achievement and subjective well-being, is a step in the direction that we propose, but even more basic research on the construction of 'race' can be done. Specifically, theorists can examine how different individual constructions of 'race' relate to social inference and perceived social knowledge in order to get a better picture of

how the pervasive idea of 'race' functions at different levels within human social perception.

The Urgency of the Issue

Malt (1989) found that people tend to rely on expert assertions rather than their own ideas when dealing with what they think are natural kinds. Some psychologists and other social scientists—those considered experts in their respective fields—continue to use 'race' as if it were a valid natural kind variable, or do not vehemently argue against a natural kind interpretation of 'race', thereby validating the notion of natural kind 'human races' for non-social scientists. This validation of 'race' as a natural kind variable is deleterious to the credibility of psychology as a science to the extent that grossly inaccurate assertions about human beings are unabatedly proliferated. We therefore believe that all psychologists have a responsibility on this issue, both ethically and socially, because other scientists and non-scientists view the field of psychology as accurately informative on the issues that it investigates.

Notes

1. The reader may wonder why the term 'natural kind variable' was chosen to represent a naturally occurring entity whose fundamental properties are presumably fixed by nature such that it is different from other natural entities in some demonstrable way—namely genes. After all, the notion of 'variable' implies fluidity rather than fixity. Nevertheless, our term tries simultaneously to capture the above notion of a naturally occurring entity having fundamental properties that distinguish it from other naturally occurring entities without representing the implied homogeneity within the group as completely uniform and static. Although many natural kind variables that we discuss (e.g. humans and elephants) have a profound amount of genetic homogeneity, the fact still remains that all members of the naturally occurring groups are not identical. Stated differently, there is some *variability* within each group (e.g. a species), and this range of variability is implicated by the grouping itself. The preceding insight is based upon post-Darwinian theory and genetics, which argues (and demonstrates) that not all members of some grouping (e.g. a species) are completely identical; rather, they have some fundamental similarity (e.g. number of chromosomal pairs) along with other minute differences.
2. We do not want to imply that Blumenbach himself ranked these groups. Some anthropologists, such as Philip J. Arnold III (personal communication, 25 April 1998), have argued that Blumenbach propounded ranked groups, while other anthropologists, such as Ashley Montagu (e.g. 1941/1964), argue that Blumenbach used the groups for convenience with no implied hierarchy. We will not speculate as to which account is more accurate because the issue is not central to our argument. We are merely reporting the fact that Blumenbach's system was used in order to develop hierarchical classifications of human beings.

3. We should note that Rushton's position on 'race' equivocates the issues of Platonic and cline natural kind arguments. That is, while he treats 'race' as if it were a Platonic natural kind variable (e.g. Rushton, 1995), he also argues that 'human races' are based on averaged differences (see Rushton, 1999). Accordingly, we present Rushton's arguments in both the Platonic and cline sections (even though he is probably closer to the cline argument) in order to account for his equivocation.
4. The argument that 'racial samples' are obtained through self-report measures does not invalidate the *sampling frame fallacy* criticism because the fact still remains that a sample that is assumed to be genetically mutually exclusive or a cline is not. Thus, it is fallacious to argue for either mutual exclusive genetic influences or averaged-difference genetic influences on the data based upon the sampling frame.

Also, when 'race' is self-reported (as is often the case in current psychological research; see Jensen, 1995; Zuckerman, 1990), the researcher is really suggesting a *cognitive* rather than a natural kind variable understanding of 'race'. Because 'race' is not a valid biological/genetic concept, people cannot self-report 'race' as if it were a valid biological or genetic distinction. Instead, we argue that people are actually reporting their self-perception. This self-perception position is (1) completely consonant with existing literature on self-perception (e.g. social identity theory; Tajfel, 1978), and (2) points to the *idea of 'race'* and how this idea exists and functions intra- and inter-psychically. As a result, self-reported 'racial membership' should be treated as a cognitive (namely self-perception) category, rather than a natural kind variable.

5. These genotypic taxonomies, much like attempts at 'racial taxonomies', are groupings that transcend chromosomal sex, even though the latter is a mutually exclusive and inalterable genotypic classification (e.g. an XX gene pair is uniformly different from and cannot become an XY gene pair, and vice versa). Sex and 'race' have always been separate conceptions since Buffon's taxonomy (cf. Montagu, 1941/1964), and the latter, since its inception, has subsumed the former. Therefore, in the current discussion of valid genotypic classifications, we focus on valid classifications *other than* chromosomal sex to provide a taxonomy similar in logic to supposed natural kind 'racial distinctions'.
6. Again, this assertion excludes chromosomal sex.
7. This assertion exempts chromosomal sex because of its physiological correlates and arguments that these physiological correlates influence brain activity and behavior (see, e.g., Gur et al., 1999).

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