

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Studies in History and Philosophy of Biological and Biomedical Sciences

journal homepage: www.elsevier.com/locate/shpsc

Putting humanity back into the teaching of human biology



Brian M. Donovan

Stanford Graduate School of Education, Stanford University, 485 Lasuen Mall, Stanford, CA 94305, USA

ARTICLE INFO

Article history:
Available online 18 February 2015

Keywords:
Race
Genetics
Biology education
Essentialism

ABSTRACT

In this paper, I draw upon debates about race in biology and philosophy as well as the concepts of ineliminable pluralism and psychological essentialism to outline the necessary subject matter knowledge that teachers should possess if they desire to: (i) increase student understanding of scientific research on genetic and behavioral variation in humans; and (ii) attenuate inegalitarian beliefs about race amongst students.

© 2015 Elsevier Ltd. All rights reserved.

When citing this paper, please use the full journal title *Studies in History and Philosophy of Biological and Biomedical Sciences*

Scholars claim that racism should be challenged through biology education. Within the field of science education, [Zeidler, Sadler, Berson, and Fogelman \(2002\)](#) advocate teaching about the history of cultural prejudice in scientific research. [Castéra, Sarapuu, and Clément \(2013\)](#) and [Puig and Jiménez-Aleixandre \(2011\)](#) argue that school science should challenge genetic determinism in order to undermine racism or ethnocentrism. [Donovan \(2015\)](#) argues that race should be directly discussed as a topic of biology textbooks in order to increase understanding of human evolution and decrease racial prejudice. Finally, [Willinsky \(1998\)](#) claims that it is irresponsible for the biology curriculum to ignore race in light of science's contribution to racial prejudice. Instead, he argues school biology should teach how racial ideas were socially constructed in the history of science. Despite such arguments no one has outlined the body of subject matter knowledge that science teachers ought to know to accomplish these goals.

In the post-genomic era this oversight appears problematic. The frequency of articles discussing genetic differences between races has increased in the news media over the last twenty years ([Phelan, Link, & Feldman, 2013](#)). Research also demonstrates that such articles can strengthen racist attitudes amongst Americans ([Condit, Parrott, Bates, Bevan, & Achter, 2004](#); [Phelan et al., 2013](#)). Furthermore, popular science books written for lay audiences, such as [Wade's \(2014\) Our Troublesome Inheritance: Genes, Race, and Human History](#)

have advanced the scientifically specious thesis (see [Coop, Eisen, Nielsen, Przeworski, & Rosenberg, 2014](#)) that complex human traits and political systems differ between races because of recent human evolution. If exposed to such media, then science teachers probably possess biased beliefs about race, which makes them ill-equipped to teach about scientific debates surrounding the nature of race.

Even the curriculum that science teachers inherit appears to discuss race in an inappropriate manner by failing to address scientific controversies surrounding race ([Donovan, 2015](#); [Morning, 2008](#)). Early in the 20th century biology textbooks directly taught students that races were biological subdivisions of the human species and some texts also taught students about a racial hierarchy ([Morning, 2008](#)). Today, textbooks address race indirectly by referring to 'race' or racial categories in passing but not as an explicit focus of learning ([Morning, 2008](#)). Usually these subtle references occur in chapters discussing forensics, genetic diseases, and human evolution ([Morning, 2008](#)). Furthermore, evidence from a field experiment carried out in eighth grade science classrooms demonstrated that when students encounter these subtle references to race in the modern biology curriculum it can lead students to agree more strongly that races differ in complex human traits (e.g. academic ability & artistic ability) because of genetics ([Donovan, 2014](#)). Put differently, there appears to be a hidden racial curriculum in biology textbooks that is learned by students but never purposefully taught by teachers. And arguably, this curriculum reinforces potentially prejudiced beliefs about race that are not supported by biological theory or research ([Donovan, 2015](#)).

E-mail address: bdonovan79@gmail.com.

The purpose of this paper is to argue for the necessary subject matter knowledge (SMK) about ‘human races’ that science educators should possess if they want to teach about genetic and behavioral variation in human populations without strengthening inegalitarian beliefs about race. Importantly, this argument does not outline what science teachers should teach about race or what students ought to know about race and biology. Nor, does this paper explain the way in which teachers should represent and formulate their SMK about race so that it is comprehensible to students. In other words, it does not outline the pedagogical content knowledge (PCK) (Shulman, 1986) that teachers need to possess to teach about race effectively. By outlining a body of requisite SMK about race, however, this paper provides a foundation for determining the PCK required for teaching about race through school science. The paper establishes what might be called the “necessary but not sufficient subject matter knowledge” for teaching about race. What follows is not the final word on this subject, but it is the first argument in what could be a long debate. In brief, the paper makes an argument that the following four components be included in the necessary SMK for teaching about race:

1. Psychological essentialism is associated with a misunderstanding of human genetic diversity and the belief that racial inequality is immutable.
2. Biologists can apply different methods to the same human genetic data and infer different things about the reality of race.
3. Philosophers who disagree about the reality of race can each be concerned with eliminating racial inequality.
4. Scientific research on human behavior cannot be used to conclusively support the essentialist claim that racial inequality is immutable for biological reasons.

Component one argues that a cognitive bias called psychological essentialism leads people to believe that races are biological subdivisions of the human species that possess different genetic predispositions for behavior. Consequently, psychological essentialism leads people to believe that social inequalities between races are natural and immutable. Given this problem, educators might be tempted to claim that race is not biological in order to challenge essentialist beliefs about race. Yet, in component two it is argued that biologists can look at the same genetic data and infer different things about the reality of race. Therefore, educators should be cautious about appealing to biological data to claim that race is not real. The reality of race is a question best answered through philosophy. Component three explains that philosophers who argue that race is biologically real and those who argue that it is socially real can disagree about the nature of race but still agree that racial inequality should be eliminated. Thus, there are alternatives to essentialist thinking that exist in the philosophy of race, but it is not the case that all of the alternatives concerned with eliminating racial inequality are also anti-biological. Finally, in component four it is argued that science teachers need to know that there are ontological inconsistencies and epistemological limitations in human behavioral research that make it extremely difficult, if not impossible, to definitively claim that racial inequality is immutable on the basis of human behavioral research. In summary, knowledge of these four components makes it difficult for the science educator concerned with the elimination of racial inequality and the scientific racist concerned with the justification of inequality to appeal to the authority of science to support a racial ideology. To know how the issue of racial equality can be divorced from the scientific study of human difference is the necessary SMK knowledge required to teach about race.

Before beginning, however, a definitional point should be made. The term racial inequality refers to a state of social affairs in which

members of different races do not enjoy similar social standing (e.g. economically, educationally, etc.). The goal of teaching about race through science education is to improve students’ understanding of genetic and behavioral variation in humans without increasing racial inequality. And, if this is the goal to which teachers aspire then they ought to know about psychological essentialism, because it is associated with misunderstanding of intraspecific genetic variation and it leads individuals to believe that racial inequality is immutable, and therefore, not worthy of redress.

1. Component one

The etiology of American racial thinking is not perfectly understood. Descriptive studies demonstrate that American children demarcate humans on the basis of their spoken language rather than race in early childhood (Kinzler & Dautel, 2012). But during late childhood this propensity appears to transform into the tendency to distinguish human groups using racial phenotypes (Kinzler & Dautel, 2012). Experimental studies demonstrate that beliefs about social groups are perpetuated culturally through the use of language (Rhodes, Leslie, & Tworek, 2012). Thus, ideas about race communicated through writing and speaking appear to be important factors in the formation of racial beliefs—more important than the observation that human skin color varies. In other words, children do not learn about race by passively observing variation in human skin color rather they construct theories about race as they encounter representations of race in culture (Hirschfeld, 2012). A theory of race common in American culture that is implicated in inegalitarian racial thinking is essentialist thinking about race (Morning, 2011).

Studies document that children and adults in cultures around the world tend to think about social and biological categories as if they are committed to metaphysical essentialism (Gelman, 2004; Henrich, Heine, & Norenzayan, 2010; Hirschfeld, 1998; Prentice & Miller, 2007). In other words, people act as if biological and social categories possess an underlying essence that causally determines the properties of the organisms in that category (Medin & Ortony, 1989). Racially speaking, this essence can be biological, cultural, or merely the belief that scientists will one day find the underlying essences that determine the physical traits, psychological temperaments, and abilities of different races (Morning, 2011). Thus, psychological essentialism of race can be, and often is, equated with socially or biologically deterministic beliefs about human difference (Keller, 2005; Rangel & Keller, 2011).

Unsurprisingly, then, it is not uncommon for researchers to operationalize racial essentialism as the belief that race is biological, or the belief that racial difference is genetic, or the belief that races are natural kinds, or the belief that races possess different cultural essences. Indeed, racial essentialism can mean so many different things in the literature on racial beliefs that it is important to carefully define the beliefs that constitute this construct if one intends to discuss it (Glasgow, Shulman, & Covarrubias, 2009). Social-psychologists (e.g. Bastian & Haslam, 2006; Haslam, Rothschild, & Ernst, 2002; Williams & Eberhardt, 2008) that study the social consequences of essentialist thinking on variables such as stereotyping, prejudice, and interethnic socialization, operationalize essentialism with two sets of beliefs: *natural kind thinking* and *entitative thinking*. Studies employing factor analysis also provide empirical support for the conceptual distinctness of these two components of essentialist thinking (Haslam, Rothschild, & Ernst, 2000).

The *natural kind* dimension of essentialism involves the belief that races are biological categories. To be precise, the natural kind component includes beliefs about the discreteness, immutability, naturalness, and stability of racial categories as well as beliefs about

Download English Version:

<https://daneshyari.com/en/article/1161651>

Download Persian Version:

<https://daneshyari.com/article/1161651>

[Daneshyari.com](https://daneshyari.com)