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Color-Evasive Cognition: The Unavoidable Impact of Scientific Racism in the Founding of a Field

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Abstract

Cognitive psychology has traditionally focused on investigating principles of cognition that are universal across the human species. The motivation to identify "cognitive universals" stems from the close relationship between biology and human cognition and from the theoretical architecture presupposed by the information-processing model. In this article, we argue that the underlying theoretical assumption of universality also stems from epistemological and methodological assumptions that laws of cognition can be effectively developed only by controlling for variables deemed to be outside the scope of internal cognition. These assumptions have resulted in the development of a science of human cognition based on the performance and behavior of a White, English-speaking, normatively invisible, racially color-evasive, socially dominant (WEIRD) class. In this article, we identify how scientific racism has influenced the study of cognition and offer perspective on how researchers may reconsider many of the premises that undergird our approach.

Keywords

cognitive psychology, scientific racism

Humans are born with the capacity for cognition. Our shared evolutionary trajectory has resulted in a shared capacity to perceive, attend, remember, communicate, and decide. In the broadest sense, cognitive capacity is universal. However, how humans perceive, think, make sense of, and represent the external world is intimately tied to experience, social interactions and social environment, and culture. In this article, we suggest that the implicit assumptions and search to establish universal principles of cognition across the human species has resulted in constraints on theory-building, methodology, and understanding of the functions and processes that underlie human cognition. The motivation to uncover and establish universals of cognition is the primary foundation of cognitive psychology, and in many ways, the search for universality was motivated by a conscious desire to remove racist and sexist assumptions found in previous approaches to the study of cognition. However, we suggest that how we have developed theories and methods in our pursuit of cognitive universals continues to uphold scientific racism. Importantly, although the field has generally abandoned inherently racist investigations—those entwined with the eugenics movement—we suggest that scientific racism continues to exert influence, resulting in barriers to predicting behavioral effects from well-formed theories (Guest & Martin, 2021).

In this article, we will establish that individual experience and cultural norms shape cognitive processes, with culture understood as a dynamic and emergent set of practices that reflect shared (yet not homogeneous) in-group values and the reaction to out-group pressures. We will discuss how cognition adapts as culture and environment change and how our theories and methods

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must also evolve to better capture the diversity of human cognition. We suggest that the field of study has avoided engaging in consideration of culture, context, and race (for a more in-depth consideration, see Prather, 2021). Although attention has recently been given to how culture shapes human cognition (e.g., Gentner & Goldin-Meadow, 2003; Lucy, 1992; Wang, 2021), this has had limited impact in guiding broad theory development. Further, this work has generally focused on cross-cultural differences, comparing groups on the basis of nationality, who may have different systems of language and different methods of communication but often share similar beliefs and values. More nuanced psychological investigations may use the "way of life"—behaviors, beliefs, values, and symbols that a group accepts and that are passed along by communication and imitation from one generation to the next (e.g., Ellis & Stam, 2015).

The influence of scientific racism in psychology and on the study of cognition specifically has a long history (for a review, see Winston, 2020). Scientific racism has pushed to quantify racial differences in "mental tests," motivated in part by societal pressures (e.g., school segregation, immigration restrictions, resistance to the Civil Rights Movement; see Fig. 1). Although this explicit form of scientific racism is no longer part of the mainstream of psychological science, a small but active community of researchers continues to pursue questions of race in relation to intelligence and other cognitive and neuroscientific constructs. As one notable example, *Mankind Quarterly*—a peer-reviewed journal described as a cornerstone of scientific racism—remains active. Further, although mainstream psychology has engaged in careful scholarly criticism of overtly racist research, psychologists have been resistant to completely abandoning problematic constructs, such as IQ.

The implicit assumption of universality in human cognition has often minimized the variation across groups, which is a direct rebuttal of the scientific racism that permeated psychology in the early 20th century. That said, the move to control individual differences in the search for cognitive universals has indirectly perpetuated a form of racist logic that centers a normative experience and marginalizes others (see American Psychological Association, 2021; Banaji & Crowder, 1989). By centering the White, English-speaking, normatively invisible, racially color-evasive, socially dominant (WEIRD) class (for a revised definition of WEIRD, see Syed, 2021; Tripp, 2021), the field's understanding of aspects of cognition such as attention and multitasking, executive functioning, bilingualism and the "word gap," memory and salience, symbolic manipulation, and cognitive development, to name a few, has become skewed.

Take, for example, the work by Hart and Risley (1995) focused on the linguistic environments of children across socioeconomic backgrounds. The work has led to the prevailing assumption that socioeconomically advantaged parents (typically White) direct a higher quantity and quality of language to their children than do their disadvantaged peers (see Figueroa, in press, for a review). According to this research, the experiential difference results in a word gap with downstream consequences for language and general cognitive development. However, research supporting this perspective was based on observational data across a narrow window of time and was conducted by researchers who did not share the cultural context or background of those classified as disadvantaged (e.g., Black families receiving government subsidies). Research on this word gap and on language development more generally has largely been studied through a White lens (Clancy & Davis, 2019), resulting in the normalization of White linguistic behaviors as good and non-White behaviors as deficient.

Understanding and addressing the direct and indirect contribution of scientific racism on the study of human cognition affords the opportunity to develop theories with more explanatory power than those that presently exist. In this article, we will argue that the reaction to overt scientific racism prevalent in the study of cognition resulted in adopting a color-evasive[1] approach, in which race and often culture were explicitly controlled. This has resulted in limitations in (a) theoretical understanding of human cognition, (b) methodological innovations to the study of cognitive process and cognitive architecture, and (c) and investigator diversity.

Epistemological Assumptions: Cognitive Universals as a Color-Evasive Ideology

Human cognition can be understood as a set of internal processes that allow for the transformation of sensory input into abstract mental representations that can be stored, recovered, and used. The predominant approach to the study of human cognition broadly is on understanding cognitive processes, and this approach is informed by the underlying assumption that cognitive processes are generally universal across the human species. The assumption of universality in human cognition has been explicitly discussed (e.g., Banaji & Crowder, 1989), but more commonly, this assumption of universality has implicitly guided the field of cognitive psychology since its formal beginnings, with the cognitive revolution.

Four central reasons have led to the pursuit of and assumptions regarding cognitive universals. First, the study of cognition directly implicates the brain and biology

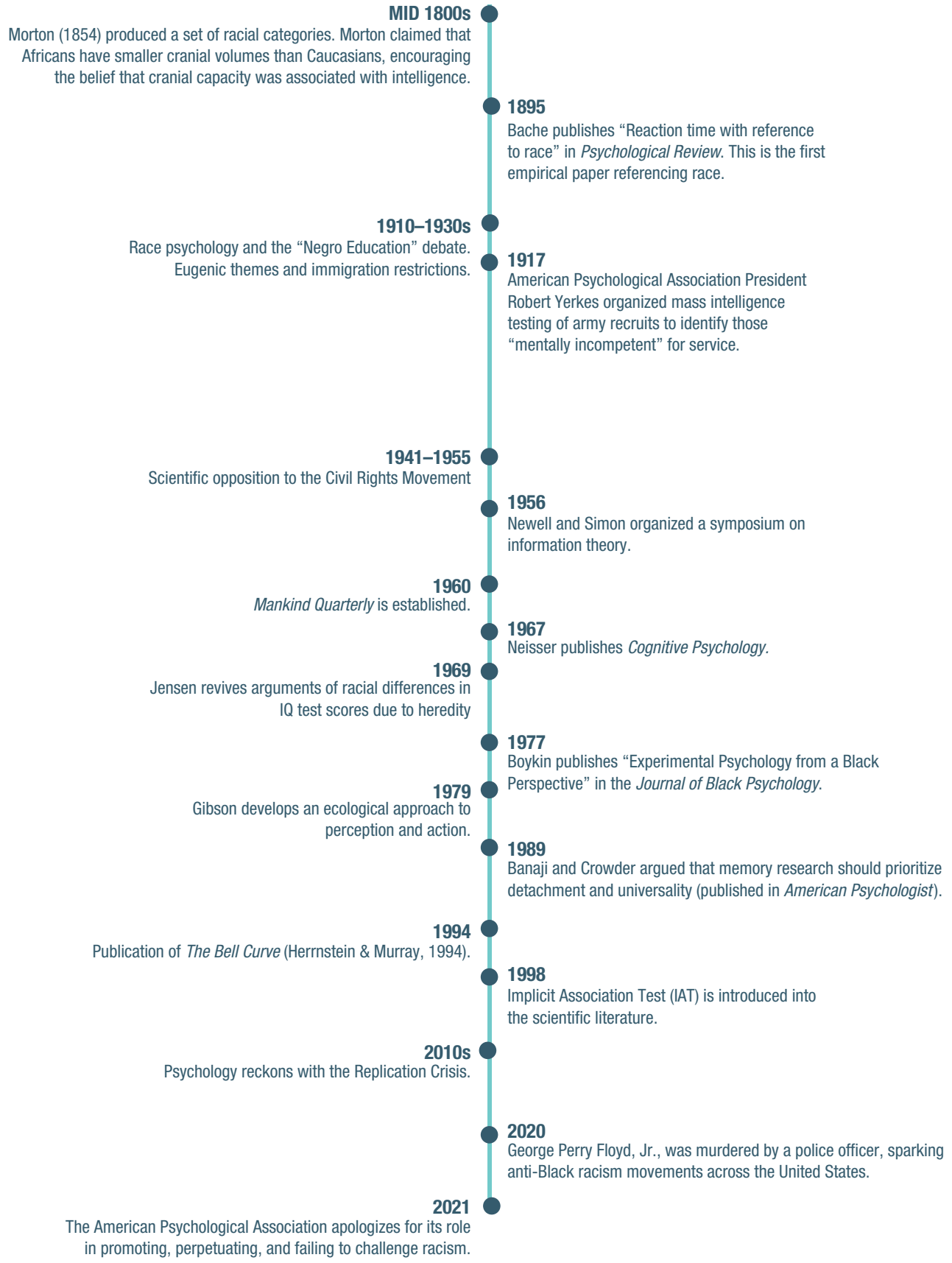

Fig. 1. *(continued on next page)*

Fig. 1. The relationship between scientific racism and the study of human cognition. The study of human cognition cannot be understood without considering scientific racism. As Winston (2020) argues, American psychologists have played important roles in the fight against racial injustice and in promoting scientific racism. The figure highlights a subset of the important historical events that we argue have impacted the field of cognitive psychology. From early publications highlighting racial differences in psychological behavior and intelligence, the emerging field of cognitive psychology was unable to escape the prevailing social and societal pressures to marginalize specific groups. We see the cognitive revolution (Newell and Simon symposium in 1956; Neisser's publication of *Cognitive Psychology* in 1967) as partly a reaction to the scientific racism that preceded it and that has continued to exist. Although the cognitive revolution sparked an era of objective empirical investigation, it remained a central factor in the prevailing scientific racism. By not considering important arguments made by Gibson, Boykin, and other scholars considered outside of the mainstream, a field of study emerged that failed to develop a generalizable understanding of dynamic cognitive processes. Psychological science currently reckons with the methodological and conceptual missteps, and we seek to broaden participation in empirical investigations and reconsider what counts as good science. Our approach to our science continues in the context of major societal events that continue to highlight systemic and structural racism. As we reckon with our role in perpetuating scientific racism, we see a way to move beyond it by embracing perspectives and ideas that were previously dismissed.

(Benjamin, 1988). Second, information processing and the computer metaphor provide the foundational theoretical architecture for understanding human cognition and presuppose that beneath superficial differences that may emerge across cultures, or deficits in performance that may emerge across racial groups, lies a shared cognitive architecture (Block, 1995). Third, the cognitive revolution in part was a reaction to and informed by neobehaviorism, also motivated to establish universal principles (Segal & Lachman, 1972). Finally, the pursuit of cognitive universals is a direct rebuttal of explicit scientific racism that permeated psychological science in the late 19th and early 20th century.

By providing a language that enabled interaction and unification across a broad range of psychological, behavioral, and neurophysiological concerns (Proctor & Vu, 2006), and by demonstrating that human cognition may be modeled on a computer, researchers were able to abstract the operations of the mind. The cognitive revolution resulted in not just an underlying assumption of universality but also the assumption that cognition rests internally. Although the information-processing model distinguishes three processing stages—perception, action, and cognition—it has traditionally fostered research focused on processes that involve input to the human from the environment, mental manipulations and operations on that input, and control of action that affects the environment. This focus centers the internal processes of the animal (in this case, human) with little consideration of cultural and social pressures on transduction of input, the interpretation of output, and integration of action with the external world. The information-processing model suggests a general approach of cognition as algorithmic, with that algorithmic process modeled by and for the WEIRD population. However, the information-processing model, algorithms, and the WEIRD population exist and operate within social contexts that advantage and privilege White people.

The centering of the internal experience, and the assumption of universality, has limited the scope of theories of human cognition. Take, for example, research on the psychology of categorization and, specifically, the typicality effect. The idea is that some examples of a category are better—more typical—examples than others. For example, robins have been suggested to be more typical examples of the category of bird compared with penguins (Rosch & Mervis, 1975). These classic cognitive-psychology findings suggest that typicality judgments may be based on central tendency. However, what factors into judgments of typicality vary across cultures. For example, typicality judgments among Itza' show that idealness may be more relevant than central tendency as demonstrated by Western undergraduate students (Atran, 1999). The three most representative birds are all large, morphologically striking, and highly edible wild fowl: ocellated turkey, crested guan, and great curassow. On further examination, results from a standard undergraduate population proved to be atypical (see Medin & Atran, 2004, for a full discussion).

The typicality effect as understood through central tendency remains the dominant perspective in cognitive psychology, at least at the introductory level. However, the type of task and diversity of sample demonstrates a more complex pattern of conceptual representation. It is this important nuance that is often overlooked when one is introduced to the topic. Rather, this topic, like many that fall under the umbrella of human cognition, is often covered in ways that remove the nuance, complexity, and contradictions in favor of an understanding based on a nonrepresentative sample of participants and, therefore, a nonrepresentative set of observations.

The underlying assumption of universal cognition has led to misunderstanding about and mischaracterizations of perceptual illusions (Rivers, 1901/1905; Segall et al., 1963) and how these illusions inform our understanding of information processing, the relationship between thinking and speaking (Kim, 2002), spatial reasoning (Levinson, 1996), how spatial strategies are deployed (Butterworth & Reeve, 2008), executive

functioning (Miller-Cotto et al., 2022), and memory encoding and retrieval dynamics (Wang, 2021), to name just a few. Although there is a long history of consideration of culture factors as they impact cognition, we suggest that an overreliance on the computer metaphor and the implicit assumption of universals resulted in minimizing cross-cultural differences or characterizing them as interesting aberrations as opposed to critical indicators of cognition as an internal–external dynamic system that is adaptable and diverse. Even in cross-cultural cognitive research, there remains a perspective of a fixed, universal, and interior mind that operates according to its own interior logic. Contrast this perspective with that taken by cultural psychology, in which the mind and culture cannot be studied separately (e.g., Ellis & Stam, 2015).

The information-processing model remains a vital cornerstone of multiple fields, including cognitive psychology; however, we suggest that what is needed is a deeper consideration of complementary perspectives that incorporate Black psychology, cultural psychology, embodied cognition, and environmental ecology and an explicit interrogation of how scientific racism continues to shape our field. Take, for example, the perspective of embodied cognition, which suggests that internal algorithms are integrated with distributed perceptually coupled systems from which behavior emerges in a context (Wilson & Golonka, 2013). From this perspective, task resources (the body, the environment, the brain) give rise to complex behaviors, eliminating the need to involve additional cognitive constructs to explain behavior. As another example, we may consider cognition as a complex system composed of many individual elements embedded within and open to a complex environment (e.g., Smith & Thelen, 2003). From this perspective, every neural event, every encounter, and every new word sets the stage for change. We offer these examples to encourage cognitive psychologists to consider alternative traditions and how those traditions may help to inform the development of a new approach. We many consider human cognition as enduring patterns of reactions, attitudes, or overt behavioral manifestations that are a function of demographic, cultural, social, and other environmental factors (see Boykin, 1977).

Methodological Assumptions: Cognitive Universals and Methodological Stagnation

The assumption of universality and the desire to align psychology with a natural scientific model such as physics or chemistry has also resulted in experimental methodology that minimizes the contribution of social and cultural context in favor of contrived, artificial methods, with the perspective that these methods will foster generality of conclusions (see also Prather, 2021). An argument as to how to understand and study human memory demonstrates this tension. Banaji and Crowder (1989) suggested that diverse samples and ecologically relevant stimuli were often unnecessary to understand primary principles of mechanisms of memory. Unfortunately, this perspective has resulted in lines of research that have failed to effectively capture how experience shapes expectation or how salience may operate in identifying important information for learning and consolidation. Further, by constraining who has had the opportunity to engage in research (e.g., limited nondiverse sample), psychologists have likely not developed tasks and measures to effectively understand cognitive processes in noncentered populations. Miller-Cotto et al. (2022) present a strong argument for how this limitation has constrained research on executive function, which aligns with Boykin's (1977) discussion of cognitive considerations. Rather than directing research energies toward understanding executive functioning in disadvantaged individuals, we should turn our attention to understanding functioning in natural contexts, thereby developing a multicontextualization of cognition.

There is no denying that much of the behavioral research that underlies well-understood findings in cognitive psychology rests on those established by testing an extremely narrow population with limited materials to simplify the task to its most basic universals. When an atypical group is studied, their performance is compared with the unrepresentative "normal" sample, and conclusions of cognitive deficits are often the result. Although there has been recent attention to sampling across the field of psychology as a whole (e.g., Clancy & Davis, 2019), cognitive psychology has been slow to consider the ramifications of decades of empirical research that centered atypical samples. Recently, researchers (including the first author of this article) have attempted to increase the diversity of samples by capitalizing on online testing platforms, such as Amazon Mechanical Turk and Prolific. More and more published empirical work includes larger samples from numerous countries. However, this approach may not effectively account for important nuances in emergent cognition in subcultures within a country. Love (2019) discusses how multitasking and attention processes may operate in Black Americans in qualitatively different ways—adapting to a hostile environment with underexplored threats—than presently understood because tasks and stimuli have not been traditionally designed with these participants in mind. When research efforts are directed to studying subcultures, this has often been done with the underlying assumptions inherent to a deficit-based approach.

As with sampling, statistical techniques, analysis plans, measurement tools, and methodologies have traditionally focused on extracting universal principles by identifying central tendencies, given that they were developed for and by a small sample of the population. Take, for example, eye tracking. Eye tracking is a valuable tool used for understanding reasoning, spatial processing, problem solving, and reading. However, accuracy and precision have been found to be lower in participants of East Asian descent compared with White participants (Blignaut & Wium, 2014). Gaze angle has also been shown to interact with ethnicity. Similarly, noninvasive sensing and imaging technologies applied to investigate psychophysiological responses and brain functioning have been shown to be affected by skin color (Kredlow et al., 2017), hair color, and hair root densities (Etienne et al., 2020). These differences suggest that the techniques used to understand cognition and cognitive-adjacent constructs may not be effective across culture and ethnicity. These regularly used methodologies were developed under the constraints of color-evasive ideology and therefore not only have erased the lived experience of racial and ethnic minorities but also have failed to account for physical characteristics that impact measurement.

Reshaping the Field: Restructuring Assumptions About Human Cognition

Traditional approaches to studying human cognition have focused on using empirical research methods to identify and understand cognitive universals. These approaches are those that count as "good science" (Lewis, 2021). Mainstream cognitive psychology assumes that cognitive universals can be understood without consideration of context and culture. We argue that human cognition is a pervasive and fundamental activity that arises out of humans' biological need to be connected to social others, to adapt to the environment, and to engage in context-specific goal-oriented activities—that human cognition is adaptable, developing and restructuring through experience, through observation, and from a place of embodied and emotional connection (Wilson & Golonka, 2013).

Although the search for cognitive universals has the potential for establishing an objective science absent racism, the prioritization of detachment and universality and the assumption that quantification makes the research value neutral and legitimate has hindered progress in the field and resulted in a continued trajectory of scientific racism (see also Lewis, 2021). Although invisible, the evidence selected and ignored to support theories, the methods developed without question, and the theoretical frameworks that have shaped our understanding of human cognition remain entangled with a tradition of science that has evaded consideration of the ecology of cognition in the pursuit of generalizable laws. The consequences are limited theory development and limited participation of diverse voices in the study of human cognition. Not only does research in cognitive psychology fail to study race, but the study of cognition is also overwhelmingly conducted and edited by White authors perpetuating the influence of a White lens (Roberts et al., 2020).

To be clear, we do not discount the species-shared aspects of human cognition. Rather, we suggest that tests of universality across the species have been limited. Further, we argue that participation in culture practices directly impacts a range of domains (e.g., social, and emotional) that foster cognitive adaptability (Rogoff & Rogoff, 2003). By striving toward the singular goal of universal laws, we have failed to capture the ecology of human cognition. However, by embracing research traditions that consider context and culture, we have an opportunity to reshape the field of cognitive psychology and move toward well-developed theories of cognition in context.

Recommended Reading

Boykin, A. W. (1977). (See References). Considers how a White lens perpetuates a deficit-based understanding of cultural differences.

Smith, L., & Thelen, E. (2003). (See References). Argues for development as a dynamic system that is relevant to understanding human cognition in context.

Winston, A. S. (2020). (See References). Provides an excellent review of the relationship between scientific racism and the development of psychological science.

Transparency

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Note

1. We have chosen to move away from the term "color-blind" in favor of "color-evasive" because "color-blind" does not accurately depict the problem of refusing to acknowledge race while maintaining a deficit notion of people with disabilities (see Annamma et al., 2016).

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