

ANTI-BLACK STRUCTURAL RACISM GOES ONLINE: A CONCEPTUAL MODEL FOR RACIAL HEALTH DISPARITIES RESEARCH

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Anti-Black racism is an established social determinant of racial health disparities in the United States. Although the majority of research on racism examines in-person individual-level experiences, a majority of Americans engage online and may therefore be exposed to racism directly or indirectly in online contexts. Research suggests that the structural technological features of online contexts may be especially powerful in perpetuating and enacting racism, often in inconspicuous or automated ways. However, there is a paucity of literature that articulates how structural online racism may be an important catalyst for racial health disparities, despite emerging evidence of racism embedded in our technological infrastructures. Therefore, the purpose of this article is to articulate the basis for investigating online racism as a form of structural racism with growing implications for racial health disparities in the digital age. We first define the structural features of online settings that generate and reinforce inequities among racial groups in the United States. Next, we propose a conceptual model detailing potential mechanisms through which structural online racism may translate into racial health disparities. Finally, we discuss ways in which exposures to online racism could be measured in order to capture their structural nature. Implications and future directions for research on online racism as a form of structural racism and corresponding policy for the reduction of racial health disparities are highlighted. *Ethn Dis.* 2021;31(Suppl 1):311-318; doi:10.18865/ed.31.S1.311

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INTRODUCTION

Despite attention devoted to the social determinants of health inequities in the United States, racial disparities in health persist. On average, Black individuals have significantly worse health and a shorter life expectancy than White individuals.¹ One established social determinant of these disparities is anti-Black racism (hereafter “racism”),^{1,2} a sociopolitical White supremacist system entailing hierarchical categorization of social groups into races, for the purpose of inequitable allocation of status, resources, and power to non-White individuals.³ Although approximately 80% of Americans report daily online activity⁴ and Black people use media via online platforms more often per week than the total population,⁵ little is known about how structurally enacted online racism can impact health outcomes for this group.

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model describes interlocking levels of racism, including individual (ie, differential and unfavorable race-related treatment in social interactions), cultural (ie, proliferation of race-related stereotypes and ethnocentric messaging), and institutional/structural (ie, differential and unfavorable race-related treatment embedded in the systems that maintain societal power hierarchies).⁷ The model’s conceptualization of structural racism, in

which racism is embedded in larger systems of society (eg, judicial, education, housing, health care) via laws, policies, and practices within these systems, can be applied to structural OR. Therefore, we define structural OR as the embedding of racist technology laws (eg, Electronic Communications Privacy Act, Cyber Intelligence Sharing and Protection Act), policies (eg, platform and website use of cookies, terms of service, privacy policies), and practices (eg, search and advertising, cloaked websites) in online systems. As the tripartite model describes for offline racism,⁷ structural OR may shape cultural racist ideologies (ie, cultural racism) and manifest in individual experiences of racism online (ie, individual racism). In this way, structural OR comprises a system of purposeful online structures and their concomitant technological processes that maintain White power at the expense of Black health.⁸ Digital studies scholars have increasingly demonstrated that structural racism online creates advantages and disadvantages across racial lines, in some cases through racially segregated navigation.⁹ The current sociopolitical climate calls for the development of solid conceptual grounding to address looming and extant online manifestations of health threats ranging from COVID-19 to police brutality.

STRUCTURAL FEATURES OF ONLINE SETTINGS

The public often assumes that the technological processes that structure online worlds are inherently neutral and superior to traditional human-

based solutions.^{10,11} Yet, technology is shaped by those who have power, for the purpose of wielding such power through digital systems to accrue profit.^{10,11} Modern technology conglomerates (eg, Facebook, Amazon) have benefitted from a history of both public and venture capital funding combined with little governmental regulation.^{10,11} This combination has enabled them to influence legislators and corner the technology market, employing business practices (eg, ad-based platform revenue, large-scale data breaches and privacy violations) that perpetuate racism by prioritizing profit over privacy and surveillance rights.¹² Importantly, this perpetuation of racism is not a matter of how people use the systems, but of how these systems are designed to function.^{10,11} For example, search engines are not designed to retrieve information in objective ways. Instead, search engines are advertising algorithms, creating and maintaining profitable narratives of Black people by increasing advertising revenue via linking users to popular racist top search hits.¹¹ In these ways, technological systems and their concomitant processes are disproportionately weaponized to oppress Black people.^{10,13}

The recent use of online technology by corporations to predict and control human behavior for profit, termed “the age of surveillance capitalism,”¹⁴ is one example of the weaponization of technology. Evidence that this surveillance capitalism disproportionately oppresses Black communities abounds. For instance, law enforcement uses social media surveillance and impersonation to police and incarcerate Black

individuals¹⁵ and racist algorithms to predict recidivism and sentencing (eg, COMPAS, PredPol).¹⁶ Amazon’s security company, Ring, produces surveillance products (eg, cameras, “smart” doorbells) and encourages the use of racial profiling neighborhood watch apps.¹⁷ Such surveillance technologies pose carceral and bodily threat for Black protestors exercising their rights to free speech and assembly in the Movement for Black Lives, as well as threats for Black individuals and communities more broadly.¹⁸ Furthermore, cloud-based artificial intelligence health tracking and tracing tools may disproportionately affect Black individuals, as they face greater challenges to their health due to racism. These tools, developed by private industries with limited privacy protections, require Black people to disclose medical information and geolocations that could be punitively used against them by employers, law enforcement, health insurers, and medical providers.¹⁸ This is an especially timely concern in the context of the COVID-19 outbreak.

Beyond new technologies themselves, White supremacist ideologies also gain perceived legitimacy by capitalizing on established structural mechanisms of online information transmission.¹⁹ These mechanisms are technological processes that structure the tangible reality of users’ online experience, but often remain hidden. They are the “code” of algorithms and computational statistics working below the user interface; this code includes search engines,¹¹ cloaked website content and processes,¹³ facial recognition software employed in online contexts,²⁰ and security practices

of information transmission in social media networks.²¹ Furthermore, online information is presented to users based on expected public interest (ie, clicks, site visits, likes), and media is easily shareable via online platforms, quickly infiltrating social networks and achieving large-scale exposure. Such exposure could be prolonged, as online anonymity combined with relative lack of oversight of online content often means that racist content is permanently accessible.⁸ Moreover, racist online content may be packaged to appear legitimate¹⁹ and search filters may be programmed for various sociopolitical purposes, including influencing elections and generating profit for technology companies.²² Thus, online technologies have been described as a “New Jim Code,” reinforcing racial hierarchies and inequities by structuring online processes of information transmission.²³

Online search algorithms and artificial intelligence applications may especially facilitate racism via the code that creates them or via the data on which they are trained to carry out their functions, thereby introducing systemic racism into technological structures.^{11,23} In investigations of Google searches, Noble found that the algorithms that power search results reinforce racism and sexism by generating results that “structure knowledge...and create their own particular material reality.”¹¹ For example, top Google results populate pornography when users search for “Black girls.”¹¹ This result was replicated using Google’s Keywords Planner, an online tool that helps advertisers select search terms to associate with their ads to maximize profit. In

contrast, searches for “White girls” and “White boys” returned no suggested search terms.²⁴ This is one example of the ways that programmed cultural racism creates tangible profits for advertising companies that control search engine results: by generating revenue via directing the public to these top search hits. Patented technology from Google also suggests that users are differentially marketed targeted advertisements based on their race (eg, Patent #US8326689B2).

Specific to health care, racism was detected in one health care algorithm programmed to use future health cost as an index of health need.²⁵ The algorithm inaccurately identified Black patients as healthier than White patients, resulting in fewer Black patients being correctly identified for extra care. Such proprietary algorithms are used frequently in medicine and therefore may have large-scale implications for the quality of care that Black patients in health care facilities receive. Research indicates that use of algorithms in medical systems (eg, automated medical charts that allow hospitals to predict presenting problems and treatment before examination) is a new area in which technology conglomerates can generate profit,²⁶ with implications for such technologies to automate racism.¹⁸

CONCEPTUAL MODEL OF STRUCTURAL ONLINE ANTI-BLACK RACISM AND HEALTH DISPARITIES

We propose a working conceptual model of structural anti-Black OR and health disparities (Figure 1).

This model builds upon previous theory on structural racism.^{7,27} It is also informed by Tynes and colleagues’ model of online racism.⁸ In our model, sites of structural OR are upstream factors that catalyze exposure to individual racism online that erode health (both mental and physical) and contribute to racial disparities in medical morbidity and mortality. In line with research on offline structural racism, we assert that enmeshed government, corporate, and private sector structural level “actors” create operations, laws, and policies infused with cultural ideologies of anti-Black racism.²⁸ These actors, in the interest of profit from anti-Black racism, dictate the online technology policies and practices (ie, infrastructure, interfaces, and processes) that are programmed by technology professionals. These structural technology policies and practices are, in turn, re-supported by these actors, who create and maintain the technology infrastructure. Structural policies and practices of the online environment appear in forms of structural OR – ways in which the technological infrastructure orchestrates, enables, and/or perpetuates racism. Implicit assumptions of the model are that each of these sites of OR interact with offline components, and that anti-Black cultural ideologies permeate all levels of the model.²⁸ We articulate five overarching forms of structural OR: Racist Miseducation, Racist Mis/Disinformation, Online Racial Discrimination and Race-Based Trauma, Racist Privacy Violations and Surveillance, and Racist Health and Health Care Algorithms and Tech Processes.

Racist miseducation entails the

misrepresentation of Black individuals and their health in various online educational contexts and formats, including eBooks, online course discussion forums, educational apps, games, wikis, blogs, online courses, virtual labs, and web-based physician training.⁸ These online educational resources underrepresent or entirely erase Black individuals in curricula, minimize the contributions of Black people in health care leadership and practice, and fail to attend to Black cultural experiences, norms, and resources. Racist miseducation may engender health care leadership and/or health provider biases (eg, Black pain tolerance), lack of competent health care training, and development of racist medical school curricula. Each of these pathways may lead to psychosocial stress and/or trauma experienced by Black individuals within and beyond health care settings, which in turn may lead to engagement in less healthy behaviors (eg, use of substances, emotional eating) in an effort to cope, distrust of healthcare systems, and/or medical morbidity and mortality.

Broadly, Racist Misinformation is misleading, erroneous, or incorrect information often spread unintentionally.⁸ For example, misinformation about COVID-19 on Black health can be spread easily in social network sites, impacting health behavior and engendering racist ideologies that contribute to health disparities. Misinformation differs from disinformation, which is intentionally false information that is created specifically to cause harm.²⁹ Disinformation is often disseminated as part of foreign and domestic government campaigns,

and by those seeking financial or political influence.²⁹ For example, during the 2016 campaign and election, the Russian government engaged in information warfare targeting Black Americans in an effort to sway the election in their favor and impact voting behaviors.²² Such disinformation continues to be weaponized in the contexts of Black Lives Matter, the 2020 election,³⁰ COVID-19, and school openings. Both Mis- and Disinformation may take the form of targeted advertising based on Black individuals' social media or browsing history data. Such targeted advertising may expose Black individuals to "health" products that are unsafe and/or ineffective, generating corporate profit and advertising revenue. At a larger scale, exposure to racist mis/disinformation online may be linked to Black individuals' experiences of online and/or offline racist housing, mortgage lending, and employment practices that undermine health.¹

Online Racial Discrimination and Race-Based Trauma is inclusive of online direct and vicarious individual racism, hate crimes, harassment, and traumatic events experienced within online contexts. Vicarious exposure to online events may catalyze online collective trauma for Black individuals. Such vicarious exposure may entail viral images and/or videos of police killings of unarmed citizens, detainment of undocumented immigrants, and violence against people of color.⁸ More exposure to traumatic events online has been associated with worse mental health for youth of color.³¹ Such trauma may be transmitted rapidly and widely, resulting in repeated or prolonged exposure. Expo-

sure to online individual racism and/or race-based trauma subsequently shapes psychosocial stress and/or traumatic symptoms that may impact health behaviors or directly result in medical morbidity and/or mortality.

Another manifestation of OR is user vulnerability to Racist Privacy Violations and Surveillance. For example, hacks of social media and government websites and applications (eg, tax preparation tools) and online payment technologies may be leveraged to financially disenfranchise Black communities for the profit of White supremacy. Biomedical specimens and family records provided to companies for "ancestry services" may not be kept private, potentially resulting in data breaches or hacks that threaten consumer safety. Facial recognition software used in a variety of data systems (eg, criminal, health care, financial, employment) do not recognize and/or frequently miscategorize Black faces, which suggests that such misidentification can be used by companies to discriminate against Black people.³² Regarding surveillance, global position system coordinates are employed in a wide variety of cellular online applications, providing the potential for large-scale monitoring of targeted individuals, groups, and communities to fit sociopolitical and commercial needs, including profiting from the technology that helps law enforcement incarcerate Black people. When we consider these technologies in the context of racism and a lack of governmental regulation of data security and privacy standards, these technologies pose far-reaching consequences for racial health disparities, whether through

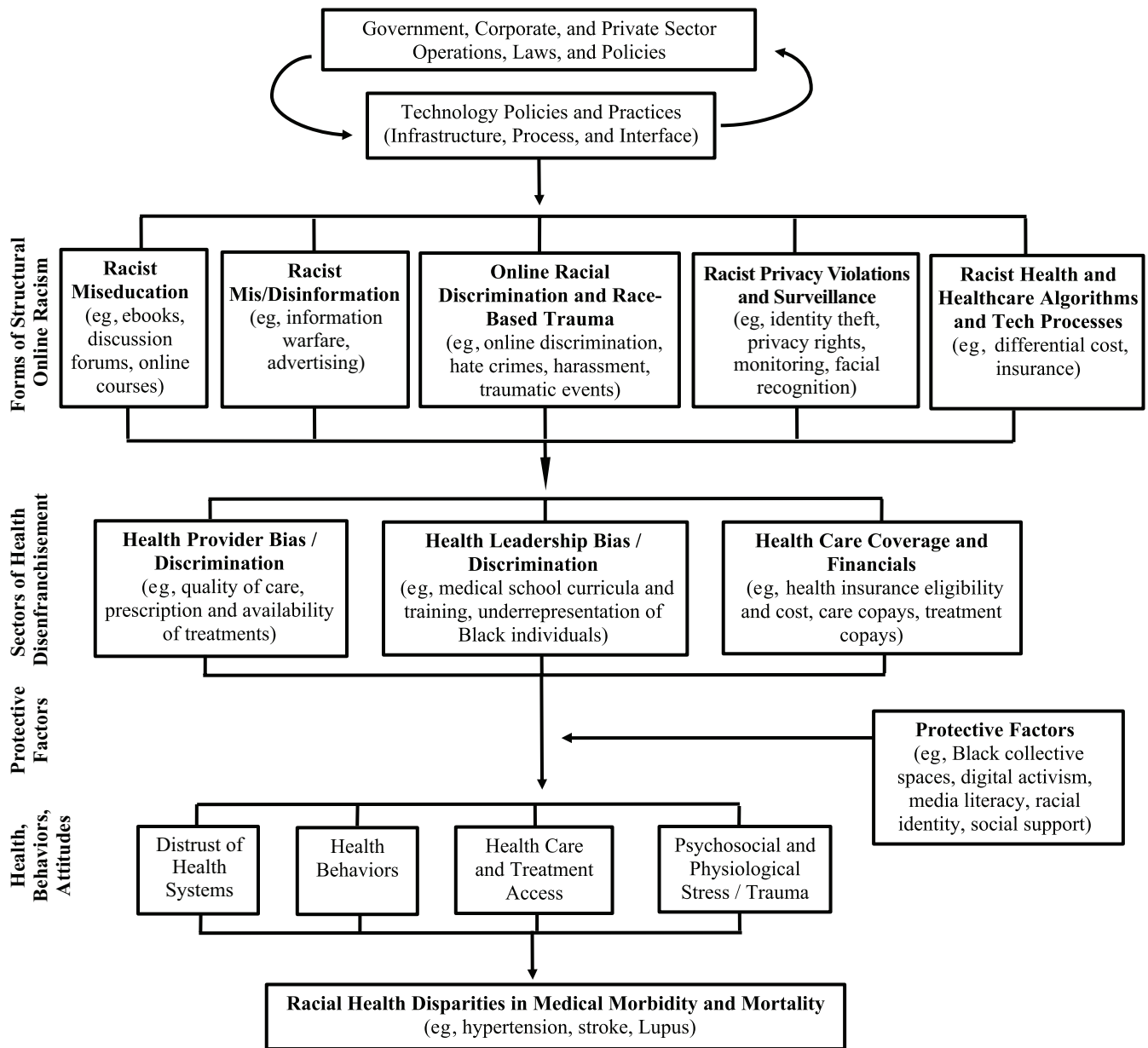


Figure 1. Model of structural online racism and health disparities

overt discrimination that leads to psychosocial stress, trauma, and differential access to care, or directly to differential access to care itself as a result of using such monitoring as a basis upon which to deny care or coverage.

Finally, Racist Health and Health Care Algorithms and Tech Processes may contribute to medical morbidity and mortality among Black individuals. These technologies may influence insurance industry deci-

sions, raising premiums and making it more difficult for Black individuals to become insured. Results of these algorithms may also lead to differential funding of health care providers and places of health care de-

livery based on characteristics of the populations with which they work. Similarly, results may lead to health leadership not investing resources into areas with greater proportions of Black individuals. This directly impacts Black individuals' access to health care, which in turn is associated with health provider bias and the resources that are available at any given health care facility. Such bias and resources impact the quality of care Black patients receive, the medications and treatments they are prescribed, and the availability of and their ability to access these medications and treatments. Such aspects of care may lead directly to racial health disparities, or indirectly to these disparities through health behaviors, psychosocial and physiological stress and/or trauma, and/or distrust of health care systems.

Although Black individuals face multiple threats to their health in online contexts, it is unlikely that the online context only uniformly exposes Black individuals to negative experiences and trauma. Indeed, the online context may increase access to health information and connect individuals to communities and resources that may be protective.³³⁻³⁵ As depicted in Figure 1, we posit that the online context provides opportunities for online identity exploration (eg, Black youth) and digital activism, provides access to Black collective spaces (spaces of resistance; eg, Black Twitter), and connects Black individuals to online/virtual social support networks. These online cultural resources may protect against the impacts of both OR and offline racism on health outcomes.

MEASUREMENT OF STRUCTURAL ONLINE RACISM

Measurement of structural OR in health research will require the convergence of multiple sources of data from private and public institutes and agencies. Quasi-experimental investigations of pre- and post-exposures to OR, including content, timing, and proliferation of exposures via social networks, will be necessary to estimate the psychosocial and cultural effects of OR on individual, community, and population health. Online social network analysis and big data approaches for combing social media and/or other online activity are viable methods to assess the impact of structural OR on health status. Access to the code that governs algorithms and machine learning programs that are employed, directly or indirectly, in health care systems, is necessary to both understand the effects of and intervene upon structural OR. More specifically, this code contains the "blueprint" for how racism may be enacted within a given technological process via computational functions. Examination of this code will reveal the often-invisible ways in which these technologies function, such that racism within the code (ie, structure) can be linked to potential inequities in health and health care outcomes for Black individuals. Examination of racism in medical infrastructures (eg, automated medical charts and/or medical scheduling services), digital marketing, and health care and layperson exposures to racist medical ideologies online should be

triangulated with health informatics and disparities data across time. Given heterogeneity in how individuals engage with online contexts, future explorations of structural OR should account for individual differences.

Based on our proposed conceptual model, future health and health disparities research should approach measurement of structural OR in at least three distinct ways. First, the degree to which Black individuals are differentially exposed to racist miseducation and/or mis/disinformation online, compared with White individuals, can be used to measure the degree of structural OR within online environments. Such differential exposure has direct implications for the health of Black individuals who may receive faulty health information, or indirect implications for the health of Black individuals treated by medical professionals who may discriminate against them. Second, researchers should systematically access and test features of algorithms to illuminate their direct and indirect impacts on health care access and quality. Third, measurement of individual, community, and national exposures to OR should consider multiple approaches, including daily diary survey research, retrospective reporting via established measurement scales, and employment of mixed methods, to garner information about the magnitude, duration, and meaning of exposure to structural OR. This measurement of exposure to structural OR across racial groups will inform research on the social determinants of racial health disparities and how they may be eliminated.

IMPLICATIONS AND FUTURE DIRECTIONS

Capitalizing on the structural features of technological infrastructure, processes, and interfaces, racism continues to flourish online in the digital age. Whether honing racist sociopolitical ideologies in the next generation of physicians, blocking virtual access to health information and care, or leveraging social media to expose Black individuals to collective trauma, structural online racism poses wide-reaching risks for Black health. Our conceptual model elaborates upon the potential impacts of structural OR. Empirical research is required to test this model, as well as the ways in which model paths may be similar or different for various marginalized racial/ethnic groups. Implicit in the current conceptual model is the assumption that other societal positions of relative advantage or disadvantage (eg, related to gender, sexual orientation, immigration status, disability) may change the ways in which model components and/or paths are experienced. Our future research aims to elaborate upon intersectionality and racial health disparities.

Technology infrastructure policies and interventions that can reduce racism also merit investigation. If technology can be co-opted in the service of racism, it may also be reclaimed for the collective health and empowerment of Black individuals and communities. For instance, scholars have argued that publicly funded public interest technology created to value human rights over profit may be one way to intervene upon racist technology.¹¹ Bottom-up efforts to design

such programs and interventions might include increasing representation of Black individuals in the technology industry (eg, coding camps, hackathons) who can actively combat the prevalence of anti-Black cultural ideologies. Additional interventions can bolster critical media literacy and/or data ethics skills of Black individuals as a means of recognizing and resisting anti-Blackness online, design additional technology, and applications that combat racist technol-

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ogy (eg, Copwatch and Afro Emoji applications, hashtag activism within and beyond Twitter³⁴), and center Black communities in the development of new health technologies (eg, Safe Space and Liberate Meditation applications, Hued platform). Simultaneously, top-down technology policies enacted by both governmental and private sector companies should be examined by triangulating national data on health with local or state-level data on access to online environments to determine whether enacted policies are effective in protecting the

health of Black communities or if they exacerbate existing racial health disparities. The Algorithmic Accountability Act of 2019 introduced in the House of Representatives is one example of legislation well-positioned to combat racism. Conversely, scholars have argued that more resources should not be expended to improve existing technological systems. Rather, technology that has any potential to be weaponized in the service of racism should be abolished.^{10,14} In this way, the question of when technology should be used to address societal ills remains an ongoing debate.

CONCLUSION

Working within the structures of internet information transmission, OR as a form of structural racism can have downstream and multi-pronged impacts on Black health and racial health disparities. Joining with technology firms and institutes to track emerging trends in technology and chart them respective to the health of racial groups is a first step in assessing the overarching impact of structural OR. However, to tackle structural OR, the structural elements that support racism must also be examined. Targets of interventions must include not only Black individuals and communities, but also the government, corporate, and technology sector operations, laws, and policies that allow racism to flourish online.

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CONFLICT OF INTEREST

No conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Research concept and design: Volpe, Hoggard, Willis, Tynes; Data analysis and interpretation: Willis, Tynes; Manuscript draft: Volpe, Hoggard, Willis, Tynes; Administrative: Volpe, Hoggard, Willis; Supervision: Volpe, Hoggard, Tynes

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