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The Disparities of the Marginalized: Focusing Race and Queerness in Science and Medicine

Kearby Stiles

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Murray State University Honors College

HONORS THESIS

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The Disparities of the Marginalized: Focusing Race and Queerness in Science and Medicine

Kearby Stiles
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Dr. Joshua Adair, Professor
Department of English and Philosophy

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Dr. Warren Edminster, Executive Director
Honors College

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Author: Kearby Stiles

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Approval by Examining Committee:

(Dr. Joshua Adair, Advisor)

(Date)

(Dr. Jeff Osborne, Committee Member)

(Date)

(Dr. Diane Nititham, Committee Member)

(Date)

(Dr. Andrew Black, Committee Member)

(Date)

The Disparities of the Marginalized: Focusing Race and Queerness in Science and Medicine

Submitted in partial fulfillment
of the requirements
for the Murray State University Honors Focus

Kearby Stiles

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I. Introduction

The United States is an immensely diverse country in which certain groups have been—and continue to be—marginalized in society because of their differences. Science and healthcare are areas in which marginalized peoples are negatively affected by a society that punishes difference and diversity. This is an immense problem because in biological and medical school education, in clinical research, and medical practices, little attention is given to marginalized populations. In this paper, I focus on the disadvantages faced by people of color, trans, and intersex people. I decided to focus on race because the history and current state of racism in society create an immense state of health disparity faced by people of color. I also focused on trans and intersex people because I am trans and have experienced discrimination and disadvantage in healthcare because of queerphobia. Ultimately, the lack of knowledge and focus on diverse marginalized groups in education, research, and medical practice is harmful both to diverse peoples and the progression of scientific and medical knowledge.

I will first explain the relevant history of scientific racism and queerphobia in science and medicine to help understand how the current state of marginalization came to be and continues to exist. I will then explain the current state of education, research, and medical practice in regard to people of color, trans, and intersex people. Then I will examine how the current lack of knowledge and focus of diversity harms marginalized peoples and science itself. Finally, I will outline some possible steps to help increase knowledge about diverse peoples to decrease the harm done and increase the progression of science. I hope that this paper will bring awareness to the problems involving science and diversity and that the harm done to all marginalized peoples will decrease and science will improve.

II. History

Acknowledging and understanding the history of how marginalized peoples have been ignored and mistreated in education, research, and medical practice in the United States is the first step to recognize the issue of the lack of diversity addressed today. This section will discuss the history and past effects of racism and queerphobia that have influenced today's science. First, I will discuss racism, covering scientific racism, social Darwinism, and the atrocities committed by medical practices to people of color. Then I will discuss queerphobia, covering the influence of European colonization on gender and sexuality norms, the emergence of sexology, and how trans and intersex people have been viewed and treated.

Race

The United States' history of racism can be tied to the emerging idea of scientific racism. After Charles Darwin's theory of evolution was published in 1859, others began to apply his theory to separate human races into constructed categories that were not actually supported by this science. Rather than recognizing and appreciating the diversity of people, white Europeans used the new scientific findings to justify, falsely, their racist beliefs. Scientific racism combined the novel and minimal understanding of biology and heredity with the growing sense of white supremacy among white western Europeans and those coming to the United States (Jackson and Weidman 66). Scientific racism argued that white people were inherently superior to non-white races because of their biology. Scientific racism is a pseudoscience built upon the idea that race is essential, being an inherent and immutable biological categorization. However, race is a constructed categorization of people that was made into an identity group to create a hierarchical

system of advantage and disadvantage, with white people having an advantage and everyone else experiencing varying degrees of disadvantage.

Though the color of peoples' skin and their geographical and ancestral origins have been used to differentiate people, the constructed racial categories are not actually significantly different in their biology or genetics. All human, regardless of supposed racial categories, are genetically "“more than 99.9 percent the same”" (Kendi 52). Additionally, when ethnic populations are compared, more genetic diversity is found “between populations within Africa than between Africa and the rest of the world” (53). This shows how race and scientific racism have no foundations in true science. This evidence against scientific racism was not discovered for many years and has since often been ignored (Ortiz 59). Though race is constructed by humans, the idea of it as an essentialist aspect of a person has caused, and continues to cause, great harm throughout history.

The effects of scientific racism, which some call biological racism, are immense because both individuals and groups of people have been impacted by actions, policies, and beliefs according to their assigned race's inferiority. It is held that “[b]iological racism rests on two ideas: that the races are meaningfully different in their biology and that these differences create a hierarchy of value” (Kendi 49). This idea of race has been both an implied order of hierarchy and an explicit one. Carl Linnaeus is taught in biology classes in high school and college for his contributions to taxonomy to name species. However, his racist applications to this concept were never mentioned. He ranked from top to bottom and named Europeans as *Homo sapiens europaeus*, Asians as *Homo sapiens asiaticus*, Indigenous peoples as *Homo sapiens americanus*, and Africans as *Homo sapiens afer* (Kendi 41). Not only does ranking constructed races reduce

the diversity of peoples into four groups that are by no means monoliths, but it also reinforced the already existing ideas of white superiority and people of color's inferiority. By creating an explicit hierarchy and naming different races as human subspecies, thus creating a further separation of the humanity of different races, scientific racism was seemingly supported and validated.

When categorizing people to place them in the racial hierarchy, various methods have been used to determine and rank individuals' race. It is also essential to recognize just how subjective the determination of one's race was. While black Americans would be considered black if they had "one drop of [black] blood," Indigenous peoples had to prove they had enough of a "blood quantum" in order to qualify for Indigenesness" (Dunbar Ortiz 170). One of the most known methods is the idea that human races could be ranked according to their skull size (Ortiz 59). The practice of the pseudoscience phrenology is based on relating skull shape to mental intelligence. Phrenology, "the cephalic index," and even different facial structures became considered racial rather than the natural diversity of individuals (Jackson and Weidman 71). Racist white Europeans used this method to argue that those with non-European skull shapes, especially African peoples, were less intelligent. By finding supposed scientific and measurable physical differences between peoples of different skin colors, pseudoscience falsely justified racist beliefs and actions. This general practice of biometrics focused on measuring physical traits and determining them to be biologically essential and the only factor contributing to a person's intelligence and then attributing this to their race (68). Additionally, characteristics other than skull shape that we determined to be "socially desirable," such as being "blond, blue-eyed, creative, strong, and natural leaders" (71). Ideas such as these only enforced racist ideas

that unfortunately already existed in the country.

Another method used involved an intelligence test. Tests meant to determine people's inherent intelligence were applied to support the false notion that people of various races could be ranked by their decided intelligence. Used during World War I to determine troops' duties according to their intelligence, the US Army found "that black soldiers were far less intelligent than white soldiers" (76). Ignoring the differences in educational opportunities, these findings of less intelligence were interpreted as further support of scientific racism. Ultimately, the intelligence test was used to propose that only people from white Nordic countries were sufficient and that other Europeans should not be encouraged to come to the United States. This same test and its "data" were influential in the decision "to pass the Immigration Restriction Act in 1924," which based immigration quotas on population composition prior to when most Eastern Europeans came to the country (76). While phrenology and intelligence tests were not the only methods used by scientific racism, they were both immensely influential in supposedly justifying scientific racism's claims and beliefs.

Scientific racism greatly influenced the belief and practice of dehumanization. The basis of the false reasoning provided by these ideas' proponents is that certain people, such as those that are not white Europeans, are inherently biologically inferior and that they cannot be or become equal or better through education or assimilation. Dehumanization as a practice involves not treating people equally, revoking basic human rights, and characterizing people as animalistic. Dehumanization has been as an element of power in "colonialism, slavery, and war" in which "religious, moral, and scientific rationales and stereotypes [were used] to disparage and treat minorities as subhuman" (Stern 64). Dehumanization is a common tactic used by many

groups in power to justify their treatment of others, but especially used by white people towards people of color. A particular situation of dehumanization and mistreatment was how “women experienced slavery” as beings of childbirth (Nielsen 62). Not only were they treated as chattel to make children that would then be dehumanized as slaves, but they were also essentially tortured women that would have no post-natal care after complications to give their bodies time to heal (62). Furthermore, as if painful and dangerous pregnancies and births were not dehumanizing enough, many were unwillingly experimented upon by malicious doctors. Due to the belief or knowingly false claim that slaves “did not feel physical pain or anxiety due to their racially defective bodies,” women were tortured (62). The horror of the effect of this dehumanization and scientific racism can clearly be seen in this excerpt discussing medical experimentation on slaves by a doctor:

Either convinced of this or simply not caring, slave owner and medical doctor James Marion Sims, today often considered a founder of modern gynecology, performed years of “nightmarishly painful and degrading experiments, without anesthesia or consent, on a group of slave women.” He eventually perfected the surgery that could alleviate a vesicovaginal fistula, but only after years of physically restraining enslaved women during forced vaginal surgeries. He performed over thirty such surgeries on an enslaved woman named Anarcha and scores more on numerous other individuals. (Nielsen 62-63)

This not only provides an example of how white people thought and acted in regard to enslaved humans’ bodily autonomy and humanity, but it shows how a man that committed such atrocities could be commended for his contributions to science that were not worth the unnecessary harm

done to these exploited women. It is also important to note that even today, the idea that African Americans feel less pain continues to affect their medical treatment.

In recent history, prominent politicians have taken to “dehumanizing Mexican immigrants as rapists and criminals” and name-calling of people of color to further them from their humanity in the eyes of racist white people (Bailey 162). Dehumanization has been involved particularly in medicine, with some people not being treated the same as others in medical settings. Dehumanization is an effort to justify the wrong actions of how some groups treat others, including and beyond racial groupings. While not the first use of dehumanization, the Nazis used dehumanization to portray Jewish people “as parasites and vermin that required extirpation from the body politic” (Stern 65). A focus of studying and experimenting on those determined to be lesser, usually based on race, highlighted the horrors of using dehumanization to justify science and medicine for the sake of others’ lives. After World War II, the Nuremberg Code was meant to end unethical research practices on humans, yet further racially charged experiments would later still occur in the United States (66). Dehumanization targets many marginalized groups, including people of color, disabled people, queer people, and anyone deemed undeserving of their rights. With the Nazi’s practice of dehumanization being so extreme by “depriv[ing] its victims initially of their juridical and civil rights and next of their existential rights, ultimately denying perceived enemies of ‘the right to have rights,’” it is disturbing to recognize the continuing of this denial of rights up to present-day times (64). By referring to Jewish people as “parasites” in propaganda, the Nazis dehumanized and distanced the Jewish people from others (Jackson and Weidman 78). Ultimately, the practice of dehumanization in scientific racism is used as a method to enact and take action on ideas of social Darwinism

through eugenics.

In regards to scientific racism, social Darwinism and eugenics are major aspects of the history of how racist ideas become tangible actions. Social Darwinism is a misreading of Charles Darwin's theory of evolution and how organisms with the most advantageous traits continue to persist, while those without advantage or with disadvantage eventually become extinct. Social Darwinists, so called, misapplied the theory in a scientifically racist way to justify ideas that races were in competition for survival falsely. Any differences were evidence of white Europeans' superiority. Using social Darwinism as the basis for the argument, white Europeans used evolutionary biology to justify their supposed inherent advantage of being white. Thus, they then used social Darwinism to explain racist intentions and actions upon people of color because they saw them as competition to eliminate for their advantage. Additionally, it is important to note that social Darwinism is founded in evolutionary biological reasoning being falsely and unethically applied to devalue other humans' lives because racist white people did not see people of color as biological equals. The supposed inherent biological difference of races was meant to justify any differences and the claim of superiority while ignoring any social and environmental factors created by white people, which have reinforced the situations of advantage and disadvantage. While Social Darwinism was not yet a concept, the effects of its precursory ideology were first felt in the United States by the Indigenous peoples living on the land before European colonization. What we refer to today as "manifest destiny" was a form of social Darwinism in which the colonists believed they were "preordained" to have a claim to land that was not theirs because of their self-proclaimed biological superiority (Dunbar-Ortiz 118). In this way, social Darwinism was used to justify genocide and the theft of Indigenous peoples' land

because the Europeans saw themselves as inherently better. Ultimately, the idea of social Darwinism becomes more extreme when the same concepts are then applied to the practice of eugenics.

Scientific racism and social Darwinism contributed to the development of eugenics as an ideology and practice. Eugenics uses beliefs of racial superiority to decrease or alter the population of those racial groups deemed lesser. Eugenics is not solely based on race and has been used as a weapon against queer, disabled, specifically autistic people recently, and other marginalized peoples. By using scientific racism to argue that white Europeans were superior to all other races and using social Darwinism to argue that their advantage is innate and they need to use their advantage in competition with other races, eugenics became a method for people to act on these beliefs. Though presented as a science, eugenics is a pseudoscience that has historically and continues to spread “the ideology of white supremacy” (170). Eugenics largely revolves around the idea that “good people should be encouraged to reproduce and bad people should be discouraged from it,” with discouragement the least invasive method, while coerced or forced sterilization and genocide are the most extreme (Jackson and Weidman 72). It is also important to note how eugenics became a practice that many came to be aware of as problematic. Before World War II, eugenics was an emerging field of study being researched worldwide, including in the United States and Germany. Many scientists in the United States saw the possibilities of eugenics as a solution where policy lacked, and if other resources were controlled by the government, then reproduction could as well (72). Eugenicists sought supposedly to “preserve the [white] race” in the United States and believed that “man ‘can breed from the best, or he can eliminate the worst by segregation or sterilization’” (73). Immigration restrictions

served as the ultimate form of segregation by not allowing many non-white racial groups into the country. Additionally, even after the country relied upon Chinese labor for building the intranational railroad infrastructure, the Chinese Exclusion Act of 1882 ended all immigration from China (75). Ultimately, immigration restrictions limited the number of non-white people into the country to decrease the non-white population. The ideology of eugenics influenced national policy, including immigration and especially concerning sterilization programs.

Sterilization is one of the most recognizable weapons of eugenics. When sterilization is coerced, forced, or performed unknowingly, it is an absolute violation of that person's rights and bodily autonomy. Throughout the United States' history, the sterilization of marginalized groups of people has disproportionately targeted non-white racial groups by sterilizing higher percentages of people of color than white people (Novak et al. 611). Additionally, it is important to note that part of the Nazi's "Final Solution" focused on sterilization laws inspired by pre-existing US policy (Stern 66; Jackson and Weidman 78). From various state laws and the proposed "Model Sterilization Law" to "*Buck v. Bell*, which held that involuntary sterilization was constitutional," the US has proclaimed that some people should not be allowed the possibility or right to have children (Jackson and Weidman 77). Sterilization policies in the US largely focused on targeting disabled peoples. It is important to note how the conceptualization and understanding of disability are malleable and everchanging. More often than not, it consists of people deemed lesser because of reasons, including their biology and race. One of the first sterilization policies to clearly disproportionately affect people of color was California's sterilization program. California's sterilization law was passed in 1909, with the law being revised in the 1950s, resulting in a lower number of sterilizations (Novak et al. 611). This law

resulted in nearly 20,000 people in California being recommended to be sterilized between 1920 and 1945 (612). The laws focused on those determined to be feeble-minded, often meaning disabled peoples and those in mental hospitals. Specifically, scientific racism contributed to the disproportionate number of Latinx people being sterilized because they were deemed “inferior and unfit to reproduce” (613). Additionally, the racist stereotypes of Mexican American women being “‘hyper-fertile,’ inadequate mothers, criminally inclined, and more prone to feeblemindedness” contributed to their disproportionate sterilizations (613). Latinx people “were at the highest risk of sterilization for the entire period,” with Latino men having a 23% larger risk compared to non-Latino men and Latina women having a 59% larger risk compared to non-Latina women (612). Sterilizations have been forced upon black women more recently, with “two hundred thousand cases in 1970, rising to seven hundred thousand in 1980” (Kendi 189). Additionally, sterilizations that were not only involuntary but also unauthorized were performed on “more than 140 women—the majority of them women of color—in 2 California women’s prisons from 2006 to 2010” (Stern 67). Sterilization as a weapon of eugenics is immensely powerful. By disproportionately sterilizing those considered to be inferior, unfit for reproducing, and non-white, the United States’ sterilization programs have used scientific racism to justify the constant violation of people of colors’ right to bodily autonomy.

There are ways aside from sterilization in which racism was a part of science and medicine. Racism has been a part of scientific beliefs, research, experiments, and practices throughout history. The ideas of scientific racism greatly influenced the United States’ actions towards Mexican laborers that traveled daily between the two countries to work. Before 1917, there was no physical border to cross between Ciudad Juarez, Mexico, and El Paso, Texas.

Rather, laborers could travel freely to and from work (“The Dark History”). Due to racist stereotypes “of Mexicans as disease carriers” and being generally unclean, the eugenicist ideal of racial and physical purity, and the severely blown out of proportion fear of typhus spreading though lice supposedly carried by the Mexican laborers, the US used them “as unwilling subjects in experiments with different delousing treatments” (Ortiz 122; “The Dark History”). The supposed treatments included having to strip and have their clothes fumigated by poisonous and toxic gasses, vinegar and kerosene baths, having their heads shaved, and being sprayed with different chemicals (“The Dark History”; Ortiz 122). The toxic insecticide DDT was one of the chemicals used to coat the laborers in the white powder, even though commercials at the time stated that “repeated contact [with DDT] must be avoided” (“The Dark History”). The methods of fumigating the clothes with poisonous gas served as a disgusting inspiration for the Nazi’s gas chambers during World War II, with some modifications to fulfill the purpose of genocide (“The Dark History”). Thousands of people were subjected to these treatments without knowing what all the substances were and their harmful effects, yet it is not a situation commonly known.

When one thinks of scientific racism and experimentation in the United States, most people will recall the Tuskegee syphilis experiment. Infamous for what happened during the study and the long-lasting effects, it is important to understand just how racially motivated and erroneous this experiment was. Despite arguments made by scientists and politicians that were involved in the study, the study was not a well-designed scientific study, did not result in any helpful scientific findings, and purposefully targeted a poor black population.

In the 1920s and 1930s, syphilis was an infection that caused a lot of complications and deleterious health effects. With the high incidences of cases across the country, public health

officials and scientists needed to find ways to help those at risk. The idea of scientific racism was already a prominent belief among scientists and others living at the time. Specifically, many believed that if people of different races were biologically different, then syphilis would present itself differently (Howell 1). This false belief would lead to the horrors done to hundreds of people at Tuskegee.

Initially, government health initiatives arrived in Macon County, Alabama in 1929 to help and treat those with syphilis in the community (Howell 1; “Tuskegee Syphilis Experiment”). Macon County “was one of the poorest towns in the United States” and had a predominately black population (Howell 1). Government doctors began diagnosing and treating people, finding that thirty-five percent of black men and women in the area had syphilis (“Tuskegee Syphilis Experiment”). However, the government had underestimated the costs of providing care to the community. It ran out of funds for the program, resulting in most doctors and treatments leaving, only treating a little more than one thousand people (“Tuskegee Syphilis Experiment”; Howell 1). After abandoning the people of Macon County, the government then realized that there was a way they could still conduct a study and research syphilis in the area.

Scientific racism pushed the idea that since they did not have enough money to treat those with syphilis, they could research untreated syphilis on the black population and see the infection’s differences between different races (“Tuskegee Syphilis Experiment”). One specific line of thinking founded in false and racist scientific thought was that since syphilis can cause problems in the central nervous system, the “relatively ‘primitive’ and ‘underdeveloped’ black brains would be spared” (Howell 1). This reflects the dehumanization tactics used against marginalized populations, especially non-white people, that tend to infantilize the cognitive

abilities of different races while simultaneously reinforcing the belief that black bodies were stronger and able to withstand more because of their supposed animalistic characteristics. The government and scientists decided that due to the high percentage of syphilis infection in the area and the lack of treatment available, that the new research study would delve into the “natural history” of the infection by not treating those infected (Howell 2; “Tuskegee Syphilis Experiment”). One doctor said that “Macon County is a natural laboratory; a ready-made situation. The rather low intelligence of the Negro population, depressed economic conditions, and the common promiscuous sex relations not only contribute to the spread of syphilis but the prevailing indifference with regards to treatment” (Howell 1). Not only is this statement racist, but it ignores the societal influences of the economy, education, and health in the area that is a direct result of systemic racism. The only reasoning behind this decision was based in the scientific racism that black people would be affected differently by syphilis. They could risk black men’s lives to study the infection without treatment because the government did not have enough money to treat them.

Once it was officially decided that those in Macon County did not deserve to be treated for their syphilis, the research study of untreated syphilis in black men, originally meant to last six months but instead lasted forty years, began in 1932 (Rothman 5; Howell 2). The government’s Public Health Service went to Tuskegee Institute to partner with them for the study to gain the trust of the locals, and since the Tuskegee Institute received federal funding, they could not say no (“Tuskegee Syphilis Experiment”; Howell 2). From the beginning of the study, around 400 men went from patients to experimental subjects without being told pertinent or accurate information (“Tuskegee Syphilis Experiment”; Howell 2; Rothman 5). They were

recruited by being offered free healthcare and medication, not told they had syphilis, but rather “bad blood,” and were told that various invasive and painful procedures were treatments when they were not (Howell 2; “Tuskegee Syphilis Experiment”). By not treating the men with syphilis infections, they suffered the symptoms with no reprieve. Even once effective treatments, such as penicillin, were discovered, the men were denied treatment. Efforts were made to prevent them from seeking treatment from other physicians in the state as well, and if someone did get treatment, the researchers would be angry about it (“Tuskegee Syphilis Experiment”). The researchers did not want the men to be treated or get better because they were only interested in studying how syphilis progresses. By 1936, some of the study’s findings were being published in medical journals, yet the ethics were still not challenged (“Tuskegee Syphilis Experiment”). By this point in the study, most men were in the late stages of syphilis infection, with many displaying neurological symptoms and cardiovascular damage (“Tuskegee Syphilis Experiment”). During the draft for World War II, they even made sure that the research participants would not get drafted because they would receive treatment for their syphilis (“Tuskegee Syphilis Experiment”; Howell 2). Once World War II was over, and the Nuremberg Trials resulted in the Nuremberg Code, the ethics of human experimentation were established (Howell 2; “Tuskegee Syphilis Experiment”). However, the scientists at Tuskegee entirely ignored the newly established regulations and rights regarding human experiment participants.

The Tuskegee syphilis study continued well after it had been determined that research participants deserved to be able to give informed consent, which was never a part of this study as they lied, misled, and did not tell them information regarding their syphilis infection. They were refused treatment that had been shown to be effective, and they were not able to leave the study

to receive treatment. The study continued on despite the world deciding that there were ethics to consider in human studies because the study itself was established because of scientific racism and not seeing the black men with syphilis as men deserving of the same rights and care as others. In 1955, the scientists reported that the “life expectancy [of] ages 25-50 years [was] reduced by about 17%” in those infected with syphilis and left untreated (Howell 2). Yet the study continued because they would “never have another opportunity like this” to study syphilis untreated (2). The study, perceived as a public health initiative, used the men as guinea pigs in their experiment, and ultimately were waiting for men to die so that they could perform autopsies to study the long-term effects of syphilis on the body, with a physician saying, “[w]e have no further interest in these men until they die” (2). The study continued through the civil rights movement, with an all-white panel of doctors voting to continue the study and the withholding of treatment in 1969, arguing that they may as well continue the study since it had been going on so long and that penicillin may not even work since they had been infected so long (“Tuskegee Syphilis Experiment”). Finally, in 1972 a newspaper broke the news of the horrid and racist study and shared the information with the country, leading to public backlash and the canceling of the study (“Tuskegee Syphilis Experiment”; Howell 2). Though the study ended, the effects continued to be impactful.

After the truth of the Tuskegee study was uncovered, it was apparent that what happened was a terrible violation of human rights. By withholding treatment from men infected with syphilis, many suffered life-long symptoms, many died, and the emotional trauma was carried in those that experienced it as well as future generations of black people in the United States. Now the Tuskegee syphilis study is infamous for its poor scientific processes, lack of medical ethics,

and human rights violations. The scientists that took part in the experiment, both then and more recently, have tried to justify their experimentation on the men. The general argument made was that the 400 men were refused treatment, lied to about their infection and symptoms, and some died, to further knowledge about long-term effects of syphilis (“Tuskegee Syphilis Experiment”). However, with penicillin already being shown to have beneficial effects on syphilis infections, they remained untreated to uphold the supposed integrity of the experiment. Once they realized that there was no difference between races, they continued to study it because they could not fathom that it was true because of scientific racism (“Tuskegee Syphilis Experiment”). No new knowledge was discovered, there was nothing justifying the continued study with non-treatment, yet they continued refusing treatment. Ultimately, the Tuskegee syphilis study brings to light the scientific and structural racism that enabled and encouraged this experiment to take place because the lives of the poor black men in Macon County, Alabama were not valued as they were seen as experiment subjects, not patients.

It is essential to understand the history and effects of scientific racism. I have explained some of the relevant history that has a lasting impact today. This discussion is by no means a complete summary of scientific racism but a mere glimpse into its vast horrors. Before I continue, I wanted to include a couple of more poignant examples that are critical to recognize. After the Tuskegee study was ended, and after one would think the idea of scientific racism would be lessened, another false scientific reason for biological differences between races was proposed. In 1988 at the American Heart Association conference, a scientist suggested that during the crossing of the Atlantic Ocean, slaves consumed vast amounts of salt water, and only those able to survive the high salt levels lived (Kendi 50). This was said to have resulted in

“African Americans [having] higher hypertension rates” (50). This is not only false science, but it makes the argument that slaves were already biologically different, as that was the primary false justification for slavery, and that they also became biologically different because of slavery. This is not only contradictory but promotes false ideas that contribute to racist beliefs. Recognizing the history of scientific racism is extremely important as that is the first step to doing something about it. With some today still believing and supporting the false claims of scientific racism, it is important to challenge statements and call them out as what they are, racist. Though scientific racism was most obvious in the past, the effects are still felt, and new ways of racist science have become the norm. Those that claim we now live in a colorblind society are blind to the discrimination, marginalization, and harm that continues to be done to people of color by society and science.

Queerphobia

The United States’ history of queerphobia can be tied to European colonization and the effects of their oppressing ideology. The strict ideas of gender and sexuality the Europeans brought with them were also tied to their believed racial hierarchies that saw people of color’s sexualities as inferior. The ideas the Europeans brought first affected Indigenous peoples and continue to affect today’s views. Indigenous peoples’ ideas of gender and sexuality were different and less strict than Europeans’. Gender and sexuality norms and expression varied across regions and tribes and by no means were homogenous (Bronski 2). The perceived same differences of expression that Indigenous peoples displayed was seen as a threat to their hegemonic gender and sexuality ideals. Indigenous peoples were dehumanized as being

“alarmingly innocent and dangerously sexual” because they wore little to no clothes, practiced “‘immoral’ sexual practices—not predicated on reproduction,” and did not have the same marriage practices as the Europeans (2). A major aspect that bothered Europeans was that many Indigenous tribes did not adhere to the paired sex and gender binary. Some people would take “on the dress and tribal duties” of a gender other than the one they were given at birth (3). Today, many trans Indigenous peoples refer to themselves as two-spirit, connecting themselves to their tribe’s culture and traditions and their trans identity. In the past, two-spirit peoples were considered to be “‘third sex’” peoples, and their roles in tribes’ societies differed, such as being in elevated societal positions, a part of warfare traditions, and concubinage (3). A person could be appointed to this role in society or realize and decide it for themselves (3). The experience of these peoples was similar to, but not truly comparable to trans peoples’ experiences today because of European values changing society’s norms of gender identity.

European colonization brought new and different ideas about sex and gender to what would later become the United States. The Europeans saw Indigenous peoples’ “sexual and gender ‘foreignness’” as a threat to their values and as one of the falsely justified reasons to deny and take Indigenous peoples’ “individuality, liberty, and life itself” (5). The Puritans that were among the first Europeans to arrive “established a religious society...to ensure that its members did not fall prey to...deviance from sexual and gender norms” (8). A sexual act that was not for reproduction was an “‘abomination’ and ‘the unspeakable crime against nature’” (8). This included masturbation, anal sex, and oral sex (8-9). It was not until later that “sodomy laws” explicitly targeted queer sexuality. Throughout the United States’ history, any queer sexuality or non-cisgender expression or identity was criminalized, with punishment sometimes being death.

As time passed and science progressed, sexuality and gender identity became something that supposedly needed to be explained, verified, and legitimized by science. Beginning in the late 1800s, sexology “attempted to explain sexual desire in a variety of ways, largely as a science of taxonomy” that categorized sexuality according to the essentialist view that people’s sexualities are inherent “since they were born that way” (78). False explanations, such as that homosexuality was due to “physical, emotional, or psychological ‘inversion’” were common (95). This meant that queer men supposedly had male bodies but female souls and queer women had female bodies but male souls, as that was the only way their attraction could be understood. Additionally, negatively associated stereotypes of gay men being feminine and lesbian women being masculine supposedly supported the inversion theory. This is by no means a real explanation, as it relies upon the idea of heteronormativity, in which it is okay to be attracted to someone of the same sex or gender if on the inside you are a different one. This implication later comes to affect trans people, as the idea was that trans people only wanted to transition to then be in heterosexual relationships rather than queer ones. Whether applied to sexuality or gender identity, inversion theory does more harm than good because it only legitimizes queerness in the light of heteronormativity and compulsory heterosexuality.

Along with the essentialist argument, which continues to be used today, queerness was pathologized and medicalized. People proposed that queerness was a “pathological type” of sexuality, that it was “sex degeneracy, or sex perversion,” and that it was a “neurotic condition” characterized by psychopathic tendencies (117, 186). Additionally, perceived queerness was sometimes considered to be a disability. Sexual perversion was seen to be emulated in attraction to the same sex, “oddity of dress,’ talkativeness, witticism,

facetiousness,' and 'unnatural actions, mannerisms, and other eccentricities'" not associated with one's sex (Nielsen 104-105). While there is no set of mannerisms that queer people emulate, stereotypes such as these were used against queer people and contributed to the pathologization that included considering "the desire for sexual contact with others of the same sex to be proof of an inheritable form of insanity" (105). This makes clear the intersectionality of queerness and disability, as they were once considered to be the same. In an interview, Kimberlé Crenshaw, the woman who coined the term, explained intersectionality as the following:

"It's basically a lens, a prism, for seeing the way in which various forms of inequality often operate together and exacerbate each other. We tend to talk about race inequality as separate from inequality based on gender, class, sexuality or immigrant status. What's often missing is how some people are subject to all of these, and the experience is not just the sum of its parts...When you add on top of that other inequality-producing structures like race, you have a compounding...Intersectionality is simply about how certain aspects of who you are will increase your access to the good things or your exposure to the bad things in life." (qtd. in Steinmetz)

Many queer people today face the marginalization of their queerness and their separate disability that contribute to more of a struggle in an ableist and queerphobic society. Additionally, as sterilization was often forced upon disabled peoples as a part of eugenic practices that saw disabled peoples as lesser with "mental and moral 'defects,'" queer people too were subjected to sterilization in an effort to remove their sexuality "for the protection and health of the state" (Nielsen 100; Bronski 133). Seen as an illness, being queer became something in the medical and psychological field that should and could be cured.

As time passed, queerness has remained a marginalized identity because it is not heterosexuality, and people hate what they do not understand. More recently in history, trans and intersex people have been faced with marginalization in addition to people with queer sexuality. Transgender people are those whose gender does not align with their sex assigned at birth. The idea of “inversion” for homosexuality “combined gender identity and sexuality” well into the 1960s, which has contributed to the fact that trans “people are often erased from the history of the gay rights movement,” though we have always existed even before the concept of transgender existed (Schneiderman 145-146).

Intersex people have also always existed, though the “word ‘intersex’ ... [only] began being used in the early 20th century, and by the 1960s, intersex became the dominant term to describe any person whose chromosomes, hormones, gonads, or genitalia did not fit neatly into the anatomical expectations for males or females” (199). Intersex people do not fit within the constructed and false sex binary and have been medicalized, pathologized, and dehumanized for exhibiting normal biological variance. As intersex bodies became noticed and deemed abnormal in society, the medicalization of intersex people began:

From the 1950s, a new belief in the malleability of infants’ gender identities brought an “optimal gender model” into being: intersex children identified at or close to birth could be “normalized” by aligning their bodies, gender roles and sex of rearing. Surgical limitation meant that most affected intersex infants were assigned female. “Successful” cases were heterosexuals, who identified with their assigned gender. (Carpenter 75)

Due to the medicalization of intersex people, doctors’ priorities “seemed more or less to erase the existence of intersex people by ‘correcting’ them before the child ever knew that there was

anything that needed ‘correction’” (Schneiderman 199). Thus, “[i]n the past decades, a primary focus of intersex activism has been preventing these invasive surgeries on infants” (200). Queer bodies and queer gender identity have become the focus of science. Especially with many trans and intersex people desiring healthcare to feel comfortable with themselves, as many people go to the doctor or therapist, transgender and intersex bodies have become almost wholly medicalized and pathologized. It was not until more recently that trans and intersex people have become prominent and acknowledged in society, which comes with both benefits and harm. Queer people, specifically trans and intersex people, continue to be discriminated, marginalized, and harmed by a society and medical science that should be there to support them.

III. Now

Today, diverse groups continue to be marginalized and not given the same attention, focus, or resources as those with more advantages in a society filled with racism and queerphobia. Specifically, people of color, trans, and intersex people’s circumstances and discrimination are not addressed in many areas. I will be focusing on the lack of knowledge and focus in college and medical school education, scientific and clinical research, and medical practice. These areas are by no means the only places in which diverse groups are underrepresented or mistreated, but exemplify how important it is to incorporate diverse marginalized groups and their best interests in all areas of science and society. In addition to knowing the history of racism and queerphobia in science and medicine, it is also important to know the current state of affairs as well.

Education

Education can be used to help people learn about diverse groups of people. However, there is an evident lack of attention of diverse and marginalized peoples in education, specifically in biology and medicine. When it comes to people of color, trans, and intersex people, little time is devoted to discussing the specific and intersectional disadvantages that people face in society or relating to science and medicine. When students studying biology or medicine are not taught critical aspects and results of a discriminatory society with intricate systems of advantage and disadvantage that people experience, they are left ignorant without that knowledge. In the following section, I will explore the lack of structured education regarding the marginalized groups of people of color and trans and intersex people while also highlighting some specific diversity education programs that have been enacted on small, school-specific, scales despite efforts to limit this type of education.

Today, biology undergraduate and medical school students do not necessarily receive diversity training covering important and extremely relevant information regarding marginalized groups in society and how it applies to science and medicine. No matter the field a biology student plans to enter after their college education, being aware of the history and present state of discrimination, marginalization, and mistreatment is critical in order to be an ethical scientist. Whether one plans to work in environmental science, a research lab, or medical practice, knowing how scientific practices and results impact real people is necessary.

An area of study in which all students, especially biology and medical school students, should have experience and knowledge is sociology. Since we all live in a society with diverse peoples, students' ability to "[u]nderstand diversity and explain its impacts, both positive and

negative, on the world” is a critical aspect of sociology that should be taught to all students (Brignall and Van Valey 117). When teaching and learning about sociology and diversity, the content covered is extremely important. One study assessing different approaches to diversity education analyzed the contents of some diversity textbooks, focusing on “white identity and privilege, color-blindness, and the nature of the definition that are employed” in these various texts (117). One book that the study analyzed defined white identity “as ‘a racial privilege that is largely invisible to whites because, unlike minority group members, they don’t have to deal with its restrictions. Our racist cultural traditions make whiteness normal. The standard against which others are contrasted and differentiated’” (119). Few of the books specifically discussed white privilege, and when they did, it was often brief, which is a problem when “many white students find it difficult to understand the notion of white privilege” when it is all they have ever experienced (119). Few textbooks also covered color-blindness, which is often used as an excuse for people to be racist. Generally, “colorblind racists claim not to see race or experience racial inequalities” and are often marked with “abstract liberalism,” “cultural racism,” and “minimization of racism” (121 & 120). If textbooks do not explain how color-blindness is bad, and not even a real thing, students will not learn that those claiming to be colorblind and not racist are using that as an excuse to ignore and deny the past and present state of structural and interpersonal racism. One of the most relevant findings from these analyses for this paper is that most of the textbooks had “a biological approach in their definition of the core concept of race” (121). Many of the texts were interpreted to be able to “easily mislead students to focus on biology” even though they were “explicitly critical of biological and genetic definitions of race [because] they do not frame these definitions as either outdated or incorrect (121). Especially for

biology and medical students, who will most likely be focusing on the biological aspects of content they study, it is critical to “include cultural and social construction concepts, as well as a socio-historical discussion of pseudo-scientific definitions” of race and how there is “no correlation between race and genetics...[and] no scientific support for the notion that human populations are discrete, non-overlapping entities” (121). When considering the lack of sufficient and accurate content regarding diverse marginalized populations, it is critical that the texts and sources being used are truthful and encompass all areas of the subject, because as of now, that is not the case.

An example that has bothered me that I have experienced is the lack of acknowledgment of the history of scientific racism. Specifically, the connection between the theory of evolution and racism has never been discussed. When learning about Darwin’s theory, we were only ever taught how it was applied to finches and other non-human animals. We never learned how it was applied and exploited with scientific racism. Additionally, while we were taught about Carl Linnaeus’s taxonomy in classifying and naming animal species, his racist applications to rank races into subspecies were never discussed either (Kendi 41). I only learned of that when reading Imbram X. Kendi’s *How To Be an Antiracist*, and it scares me that the rest of my peers were not taught the racist history of a man who is praised for his contributions to science. When students are not taught that scientific theories and practices were either applied or sometimes based on racism, they are not aware of how that history impacts peoples’ lives today.

While there is an overwhelming lack of uniform and structured coursework or training on diverse and marginalized populations, some colleges and medical schools have started to implement training or units in classes to increase students’ knowledge of the populations they

will be studying or eventually interacting with in their profession. One example is a course that was implemented poorly and received a lot of criticism. In 2007 at the University of Delaware, undergraduate resident assistants provided “diversity education for all students within the residence halls” (Johnson 14). Many different problems arose due to the content and organizing of the programs. While the intentions were good, to help foster “‘global citizens’ who possess vast knowledge of complex multicultural competencies,” the results fell short (15). Criticisms included that no faculty were involved in developing the content, that unqualified undergraduate students made and led the sessions, and that student participants were stereotyped during the programs (18). Additionally, students “were asked to publicly identify their stances on hot-button political issues such as gay marriage and affirmative action,” to “write down all the stereotypes of the ethnicities of other students,” and all the white students were called racists (12). I fully believe that all students should receive diversity training, but it needs to be effective and approached in a way that will not make the participants defensive and make marginalized groups uncomfortable by encouraging racist stereotypes to be proclaimed or to hear that their peers do not accept their sexuality. The program ended up being suspended because of the controversy, but whether it was because of the poor implementation or because of conservatives not wanting students to learn progressive ideas regarding diversity is unclear. While this particular plan did not work, there is certainly still a need for “educational systems to develop mechanisms for community members to enhance multicultural competencies related to diversity including race, ethnicity, gender and gender identity, sexual orientation, age, religion, and the like” (13). After all, if students are knowledgeable and accepting of other peoples’ differences, society can grow to be better.

Another type of diversity education studied for medical practices is, rather than “‘cultural competency’ coursework,” one that focuses “on culture, self-reflection, and medicine” (White et al. 34). Medical students were given the opportunity to take “a selective course in Social Medicine,” which later became an elective that was later completely phased out of the curriculum (36 & 40). This specific course focused on creating a “safe learning environment where differences [could] be explored, voiced, and engaged to facilitate dialogue across differences (37). The authors of the study decided to approach diversity education in this way because it has been found that terms such as “‘diversity’ and ‘cultural competence’ can elicit strong emotions, often triggering feelings of anger, shame, guilt, and dread” that then make the person defensive and claim they do not need to learn about any marginalized groups (37). Therefore, the learning environment was made to be “mutually respectful” and “minimize the shame participants might feel” so that they can grow and learn (37-38). The coursework consisted of “readings, reflection questions, journaling, writing personal narratives, and a final reflection paper” and everything “focused on engaging the students...to reflect on the experience and social significance associated with belonging to certain [marginalized] groups” (38). Though the course was removed from the curriculum, the authors of the study hope “that the content of the course may become a higher priority in the future” as they found that many students “felt the course ‘opened their eyes’ to their personal biases and blind spots,” and they had an “increased awareness of the effects of demographic ‘difference’ both in their own life and in the delivery of healthcare” (41, 39-40). Ultimately, the implementation of this study’s findings shows how there are different types of diversity education and that creating an environment where people can confront their biases or bigotry can lead to the realization of one’s privilege and marginalized

groups' disadvantage. It also shows how currently, diversity education is not a priority as the course was removed from a medical school when it should be a priority that all medical schools and undergraduate schools address and teach all of their students.

While most of the diversity education I have discussed is either general or specific to race, I will now discuss queer education, focusing on trans and intersex people. Overall, there is often little focus on queer people in biology and medical school classes. When queer people are brought up, it is more often than not about white cisgender gay men and lesbian women's sexual practices, and trans and intersex people are not even acknowledged. Additionally, education is not standardized, so students from different schools learn different amounts and different types of information. One specific example that bothered me in which queerness was not addressed was during a genetics lesson in which sex chromosomes were being discussed. The professor stated that someone with the sex chromosomes of XX was a female and that someone with the sex chromosomes of XY was male. The professor then said that any other chromosomal genotype or physical phenotype was an anomaly, and the subject was not mentioned again. Trans people, whose sex chromosomes do not match their gender identity, and intersex people, who can have different sex chromosomes, such as XXX, XXY, or other phenotypical differences, were not discussed at all. This greatly bothered me because it was a genetics class. We should have taken the opportunity to discuss that sex, like gender, is not a binary. We should have discussed the falseness of the paired sex and gender binary because it is likely that many of my peers do not understand that concept, let alone trans or intersex people. While it was an introductory genetics course, just covering the basics of trans and intersex people would have been impactful and taught students about marginalized groups of people that are rarely given

attention. When intersex and trans people are brought up, they are treated negatively as anomalies.

Even in medical school, the degree of education regarding queer people is minimal. In a study that surveyed 132 deans of medical schools in the United States and Canada, the “time dedicated to LGBT-related topics in 2009-2010 was small across US and Canadian schools, [and] the quantity, content covered, and perceived quality of instruction varied substantially” (Obedin-Maliver et al. 971). Although queer people, specifically trans and intersex people, are significantly marginalized peoples, especially regarding medical care, education is not standardized or enforced. It was even stated in 2007 that:

The Association of American Medical Colleges (AAMC) has recommended that “medical school curricula ensure that students master the knowledge, skills, and attitudes necessary to provide excellent, comprehensive care for [LGBT] patients” by including “comprehensive content addressing the specific healthcare needs of [LGBT] patients” and “training in communication skills with patients and colleagues regarding issues of sexual orientation and gender identity.” (Obedin-Maliver et al. 972)

Unfortunately, this ten-year-old research arguing that queer education is not sufficient in undergraduate biology classes or medical school is still relevant. The survey found that the median “hours dedicated to LGBT content was 5 hours... [and that] preclinical hours were significantly greater than the clinical hours” (973). Of the 132 schools that replied to the survey, 44 “reported 0 hours of LGBT content during clinical years..., 9... reported 0 hours during preclinical years, and 5...reported 0 combined hours (973). It is astonishing and scary to think that medical students that went to school only ten years have likely received little to no training

regarding queer people. It is especially concerning when one compares the hours devoted to queer sexuality to those devoted to trans and intersex individuals. This exemplifies why it is so important for medical students to learn about trans and intersex people because older doctors of past generations did not, and we need doctors knowledgeable on queerness and trans and intersex bodies in order to receive equitable and affirming healthcare. Additionally, when one considers how little time is devoted to trans and intersex people, who are increasingly medicalized, the lack of attention to these groups is troubling and potentially dangerous.

When considering knowledge and education specifically regarding trans and intersex queer people, it is often lacking and has room for improvement. A specific hurdle that some students must overcome is their own transphobia, specifically the “stigma towards transgender individuals which includes negative reactions and attitudes of fear, aversion, and discriminatory treatment of people who are of who are perceived to be transgender or gender nonconforming” (Mizock et al. 1). A study with the goal of reducing transphobia was conducted in which a webinar format was used to teach 303 undergraduate students about trans people and analyzed the participants’ level of transphobia before and after (1). During the webinar, content including “topics such as appropriate terminology, pronoun usage, qualities of respectful interaction, the impact of transphobia, and resilience in the trans population. Concepts included gender transition/affirmation, the notion of gender as a spectrum, as well as distinctions between sexual orientation and gender identity” (7). The researchers found that the participants had “significant increases in disagreement with transphobic attitudes according to pretest, posttest test scores (8). They also found that those that had prior knowledge “about trans issues disagreed more with transphobic attitudes,” which is likely due “to *intergroup contact theory* or the *contact*

hypothesis, where contact between groups can reduce stereotypes and bias (8 & 3). Therefore, it is important to recognize that experience with trans people is likely to help with students learning about trans people and decreasing their transphobia. Another study found that “education alone that simply fills gaps in the knowledge without addressing the systematically socialized transphobia of healthcare professionals...will not likely be effective” (Stroumsa et al. 402). These findings support the fact that when educating students, “the effectiveness of such programs may depend not only on increasing informational knowledge, but also on addressing providers’ biases, whether conscious or unconscious” including educational courses, “direct patient contact, [and] experiential training (404). Additionally, the study emphasized “that the transphobia in medicine is not simply a reflection of societal transphobia. Rather, the construction of current social conceptions of gender and sex as binary, permanent and objectively identifiable, derive directly from the psychiatric construction of transgender identity as a distinct, pathological and medicalized entity” (405). This shows how important it is for education about marginalized groups to be comprehensive and explain not just the content but the surrounding influences that have a part in adding to the societal marginalization. Thus, it is not only the amount of education that needs to increase, but the quality too.

Research

Through medical and clinical research and trials, new treatments, medications, and therapies can be tested and determined to be effective in helping people. Historically, clinical trials have been non-diverse and have disproportionately “been conducted by White researchers and [have] targeted mostly White research participants” (George et al. e16). Thus, the study

population is usually not representative of the population that the results are then applied to in medical practice. Marginalized populations which are already at various states of disadvantage in society are then further disadvantaged because research being done on medications, chronic illnesses, surgeries, and more are not including them. Both people of color and trans and intersex people are not proportionately involved in or the focus or target population for most medical research. There are many different reasons for this, including researchers not seeing it as a priority and marginalized populations' mistrust with various aspects of scientific research and medical practice.

Since clinical research lacks representation of diverse marginalized peoples, efforts have been and are being made to fix this problem. "In 1993, the National Institute of Health (NIH) Revitalization Act was passed by the United States...call[ing] for the NIH to require that all federally funded clinical research prioritize the inclusion of women and minorities" (Oh et al. 1). To determine the effectiveness of the Revitalization Act, a study was performed to "evaluate the impact...[on] diversifying study populations by race/ethnicity" (2). As stated earlier, it is important to remember that race is a construct. However, while race is "rooted in cultural identity and shaped by historic and current events,... [g]enetic variation correlates with self-identified race, and this genetic variation also correlates with clinical presentation and therapeutic response" (2). This is by no means challenging the fact that race is a construct or supporting the beliefs of scientific racism, but rather stating that genetic variation among people can lead to differences in how one's body reacts to some medication, is more likely to have a certain illness, and other such factors. Importantly, "the complex relationship of ancestral [or genetic] influences, environmental exposures, and social factors" must all be considered and

accounted for in clinical studies, so “biomedical studies [should] focus recruitment efforts on attaining adequate minority representation... [and] focus their research attention to factors most relevant to minority health” (2 & 3). However, when the composition of research participants is analyzed, it is found that marginalized peoples are still largely left out:

Since the passage of the Revitalization Act in 1993, less than 2% of more than 10,000 cancer clinical trials funded by the National Cancer Institute included enough minority participants to meet the NIH’s own criteria and goals... and less than 5% of NIH-funded respiratory research reported inclusion of racial/ethnic minorities. Minority enrollment in cancer clinical trials remains inadequate despite striking racial/ethnic disparities in cancer incidence and mortality. Similar incongruities between disease burden and representation in biomedical research exist for cardiovascular diseases and diabetes. (Oh et al. 3)

When people recognize that the research is not representative of the country’s population and that marginalized populations are disproportionately being affected by health disparities, it must be remembered that the reason they are disproportionately affected is because of their historical and present marginalization in society, not their genetics or biology.

There are multiple factors that contribute to marginalized populations not being properly represented in clinical research. In regard to research studies, it has been proposed that even though the “Revitalization Act specifically prohibits cost considerations from being a reason to exclude minorities...proposals [are submitted] with inadequate budgets to recruit minority participants” to increase the likelihood of receiving a grant for their research (4). Additionally, the lack of making “inclusion and diversity important by default—not just in biomedical science, but in all aspects of society” leads to there not being an incentive for researchers to diversify

their research participants (6). Aside from simply having research being populations representative of a community in which the study is being conducted, issues regarding marginalized populations are not a priority for researchers to study. In a literature review of 249 public health journals published from 2002 to 2015, only 25 articles explicitly mentioned or discussed “institutionalized racism as a core concept or secondary concept” (Hardeman et al. 240, 242). The small number of articles about institutional racism shows how the issue of systematic racism in society and healthcare is not a topic that researchers are focusing on when they should. Additionally, “institutional to interpersonal to internalized levels of racism” can serve as barriers for participation as a result of their societal effects, including that racial “[m]inority populations often have limited access to specialty care centers that serve as referral sources for clinical studies (George et al. e17; Oh et al. 3). Other factors that de-incentivize marginalized populations, specifically people of color, from wanting to or being able to participate in research include “fears of exploitation in medical research, financial constraints, competing demands of time, lack of access to information and comprehension about research, unique cultural and linguistic differences, fears of unintended outcomes, stigmatization, and health care discrimination” (Oh et al. 3). Other reasons include concerns stemming from “psychosocial issues such as mistrust, fear, and lack of confidence to logistical concerns including childcare, schedule conflicts, lack of transportation, and appropriate support to research-related factors such as lengthy consent documents and lack of adequate information about clinical research (George et al. e17). A major source of distrust is the previously mentioned Tuskegee syphilis study, in which more than 400 black men were unknowingly refused treatment for the study. This infamous study has garnered well-deserved mistrust in

scientific research studies. Additionally, it has been found that a failure of researchers to have “culturally sensitive and meaningful discussions about informed consent to ensure truly informed choices” makes participants feel less in control of their own bodily autonomy (e16). Barriers found to impact access to medical research participation that were shared by African Americans, Latinos, Asian Americans, and Pacific Islanders include “mistrust and lack of access to information” (e21). Additionally, language barriers, concern about health insurance, fear of outcomes, and legal citizenship status were concerns that some shared (e21-e22). These reasons and barriers are by no means comprehensive but merely a small part contributing to the underrepresentation of racially marginalized peoples in clinical research.

Clinical research is also especially lacking in the representation of trans and intersex peoples. Many of the same barriers that people of color experience to participating in research are present for trans people. While intersex and trans people are pathologized and medicalized, they are not necessarily the focus of scientific studies. Today, “systematically collected data...at present are scarce or lacking” and “are often based on convenience samples...or retrospective” (Reisner et al. 2). Aside from not purposefully and meaningfully including trans people in more generalized research, the research that does include trans people often “focus on substance use and abuse, sexual health, and mental health issues...[rather than] other relevant issues such as healthcare access and utilization patterns over time, determinants of hormonal and surgical treatment complications, and rates of chronic age-related conditions thought to be affected by hormone exposures” (2). Importantly, some clinical trials involving drugs largely targeted towards the queer community have explicitly excluded trans people from the research. A new HIV prevention drug, Descovy, was only tested “in men and transgender women” and thus has

not been approved by the FDA for “‘individuals who have receptive vaginal sex,’ which may include cisgender women and many transgender men” (Mandavilli). In general, HIV prevention drugs are targeted towards men who have sex with men, and it is certainly a step that they included transgender women in the study, but extremely problematic that trans men were excluded because they too have sex with men who have sex with men, and it bothers me that they seem to liken trans women with men and trans men with women in how they conduct their studies based on sexual practices that only seem to prioritize cis gay men. It is also important to note that in the trial they conducted, of the “5,313 men and 74 transgender women who have sex with men... 84 percent of the participants were white,” which also does not proportionately represent those at risk of HIV (Mandavilli). While there are plans for trials to include trans men and cis women and for a trial to be conducted in Africa, the FDA and Gilead Sciences have set “a dangerous precedent by allowing companies to dodge the expensive trials needed to test medicines in cisgender women and other groups at risk of H.I.V. infection” (Mandavelli). Trans people should not be explicitly excluded from research when they are already underrepresented.

While there is certainly an underrepresentation of trans people in research, some efforts and trans-specific studies are being conducted as well. A recent study was conducted regarding the sexual arousal of transgender men compared to cisgender men and cisgender women. The reason this study was conducted is that there are general patterns of difference regarding sexual arousal when comparing cisgender men and women. It was of interest “to examine whether the arousal patterns of transgender men reflect their gender identity (gender-specific sexual arousal like most men) or their birth sex (gender-nonspecific sexual arousal like most women)” (Raines et al. 2). Jamie Raines, the primary author of this study, noted that his research is just a stepping

stone in studying trans people's sexual arousal and that he felt that since he is a trans man and that was his area of expertise, he could best construct and organize a study specific to trans men ("What Science Says About Trans Men"). He also noted that this type of research has the chance to be expanded to include trans women, intersex people, and nonbinary people assigned both male or female at birth ("What Science Says About Trans Men"). In both transgender men and cisgender men, "men who reported stronger attraction to women had greater genital responses to women, whereas those who reported stronger responses to men responded more strongly to men (Raines et al. 5). The effective genital response was stronger in cisgender men; thus, "results for transgender men were between those for cisgender men and cisgender women" (5). These findings therefore suggest and support the idea that "the existence of both male-typical and female-typical sexual-arousal patterns in transgender men because they showed some gender-specific sexual arousal, similar to cisgender men, but also showed bisexual arousal, similar to cisgender women" (9). These findings in a study specific to and conducted by a transgender man are influential in their novelty and in showing that "transgender men appear to show a combination of male-typical and female-typical patterns of genital sexual arousal... [and] differences in sexual arousal may not be solely based on their natal sex but may also be influenced by their gender identity" (10). This research shows how the inclusion of marginalized groups, specifically trans men, in medical research contributes to new findings and understanding for others and ourselves and has the potential to grow into more diverse and representative research.

The lack of representation of marginalized peoples in scientific and clinical research is a problem that has been a part of the United States' history and continues to affect scientific

findings today. It is also important to remember that marginalized groups are not mutually exclusive. Intersectionality plays an enormous role in one's ability and willingness to participate in research, especially to focus on a study. Marginalized groups include people of color, queer people, trans people, and intersex people, but many other aspects of marginalization such as citizenship status, disability, and class also have an impact. With various barriers in place that either prevent or dissuade marginalized populations from being included and participating in research, the progress being made to increase diversity in research is important.

Medical Practice

Today, there are vast health disparities experienced by marginalized peoples in medical practice. All people, including people of color, queer, trans, and intersex people, need and deserve equitable and affirming healthcare in which they feel safe and seen as people with bodily autonomy. There is currently both “public discourse remain[ing] resistant to identify racism as a root cause of racial health inequality” and evidence that “transgender people are less likely than cisgender people to have [their health] needs met” (Bailey et al. 209; Merkel 41-42).

Additionally, intersex people continue to be subjected to “human rights violations... in medical settings, intended to make intersex bodies conform to narrow social norms for females or males” (Carpenter 74). In this section, I will outline the current state and issues with medical practices in regards to their treatment of people of color, trans, and intersex peoples.

When considering healthcare and medical practice for marginalized races in society, structural racism built into healthcare systems and medical providers' biases contribute to health disparities. Specifically, the structurally racist systems that built the healthcare systems have

resulted in “inadequate access to health insurance and health care facilities, and substandard medical treatment due to implicit or explicit racial bias or discrimination” (Bailey et al. 217). Additionally, the racial health disparities that people of color face that are due to numerous social factors include their treatment when afforded healthcare. The “systematic disinvestment in public and private sectors renders it difficult to attract primary care providers and specialists to predominately black neighborhoods” and these neighborhoods often have “lower-quality facilities with fewer clinicians...[that] have lower clinical and educational qualifications than those in other neighborhoods” (222-223). Additionally, providers’ implicit and overt biases have been shown to affect the care they give to people of different races. “Despite their explicit commitment to providing equal care, some studies suggest that implicit prejudice and stereotyping can impact the judgment and behavior of health care providers when they interact with stigmatized patients (Zescott et al. 529). Examples include healthcare providers having “more negative attitudes” towards African Americans, Latinos, and Indigenous peoples than white patients, believing “that African American patients are less compliant and less cooperative,” and stereotyping disease diagnoses based on race (530). However, it has been shown that some efforts are being made to “tackle structural racism [and] health inequalities” by implementing “antiracism training into staff professional development” in healthcare systems and placing “neighborhood offices in areas with poor outcomes” (Bailey et al. 228, 227). Ultimately, “removing racism from institutions is essential to protect and promote the health of our increasingly diverse communities” (228). Recently, racial health disparities have become increasingly evident with COVID -19. Data has shown that “ethnic minorities, in particular African American or black populations, are more vulnerable to COVID-19 infection and

mortality” (Hamidian Jahromi and Hamidianjahromi 1). The current state of structural, interpersonal, and implicit racial biases continue to leave a mark on medical practices, and the care people of color receive, but change is happening to help lessen the health disparities that are a result of racism.

When considering healthcare and medical practice for the marginalized groups of trans and intersex people, one must approach it differently. Today, trans and intersex people are inherently medicalized in the eyes of society and still tend to be subjected to “essentialist ideologies about sex, gender, and sexuality, which hold that sex is a binary biological phenomenon correlated with gender identity and sexuality” (Davis et al. 492). Ultimately, “intersex and trans bodies have been—and unfortunately still are, despite some changing beliefs—constructed as abnormal” (493). This results in most providers aiming to “‘fix’ bodies that deviate from normative expectations” (494). Additionally, it is important to note that the way in which trans and intersex people medicalized is quite different. As a result, “[p]roviders for intersex people are inclined to approach intersex as an emergency that necessitates medical attention, whereas providers for trans people attempt to slow down their patients’ urgent requests for transitioning services” (490). This difference of medicalization is because when intersex people are born, doctors are trying to make “an infant’s genitals and reproductive organs more normal,” while trans people desire to change their supposedly already normal bodies (Greenfield 205-206). When discussing the similarities and differences between how trans and intersex people are medicalized:

In the case of intersex, the medical profession precipitously medicalizes healthy bodies as pathological without conferring with the intersex person (or with their parents if they are

too young for consultation); in the case of trans, this medical pathologization occurs slowly due to the numerous steps required by the current SOC guidelines that slow down any requested medical interventions, regardless of the desires of trans people. (Davis et al. 493)

By framing “intersex and trans embodiments as pathologies on the basis of a belief that people are either male or female,” doctors that interact with both intersex and trans people invalidate bodies and gender identities that do not adhere to the sex and gender binary (493). This ultimately can create an environment in which patients are not comfortable or knowledgeable about options available to them.

Specifically, there are many barriers in the healthcare system that prevent trans people from accessing care, especially gender-affirming care. Some barriers are that “many transgender people have to travel greater distances to access proper medical care, lack access to health insurance, or have issues obtaining coverage for transitional services under their insurance” (Merkel 42). Additionally, the “[e]rasure of information about transgender issues leads to the production of systematic barriers to healthcare for trans people,” and “erasure [can] be passive or active. Passive erasure include[s] a lack of knowledge of trans issues and the assumption that this information [is] neither important nor relevant. Active erasure [can] involve a range of responses from visible discomfort to refusal of services to violent responses that aim to intimidate or harm” (44). The erasure of the knowledge of trans people also includes the lack of education that doctors receive, thus resulting in a less accepting environment for trans patients. Other types of erasure “include the inability to schedule a hysterectomy for a trans male, or the refusal to accommodate and in-patient placement consistent with a patient’s expressed gender at

an institution with separate male and female wards” (Snelgrove et al. 2). Additionally, non-binary or gender non-conforming trans people often face additional hurdles when trying to access gender-affirming care. This is due to the continuing upholding of the gender binary even among trans people, where some healthcare providers will only prescribe hormones or recommend surgery if a person ““want[s] to be a ‘full’ man or a ‘full’ woman”” (Merkel 43). Often when erasure such as this occurs, a “lack of training, limited medical knowledge, and scant access to information sources are likely contributors to physician-side healthcare provision barriers” (Snelgrove et al. 3). In a study conducted to see what physicians perceived to be barriers, it was found that many did not know “the available resources or care strategies appropriate for the trans patient population,” did not know how to access “referral networks and information sources regarding trans medical care,” recognized that they had a lack of “formal education around trans healthcare...from medical school and residency curricula,” and “some physicians [had] entrenched personal beliefs about gender identity, sexuality, and sexual health that are at odds with trans patients’ lives” (4-5). The current state of healthcare opportunities for trans patients is improving, albeit unevenly, but it still has a long way to go before trans people can all receive affirming and fitting care.

There are also specific aspects of healthcare that apply to intersex people. Intersex people are medicalized from the moment that they are born, and doctors realize that they were “born with one of over 30 variations of sex anatomy resulting in neither purely male or female bodies (internal and/or external)” and decide that that is a problem (Inter/Act Youth 201). The present state of medical intervention on intersex infants and children is extremely problematic. When children are born intersex, doctors often perform “hush-hush operations” in which they

subjectively decide if it would be easier to surgically alter an infant's genitals to be more like a cis man's or a cis woman's, as they are seen as "disordered children whose bodies need finishing or disambiguating"(Rumlow 219; Carpenter 74). Often, parents of the children are fear-mongered into believing that the surgeries are needed for their child to have a normal life, or the doctors hide the truth from the parents and the children, not telling them that their child was intersex or precisely what surgery had been performed (Rumlow 219). Doctors' view on sex as a binary "disallows unaltered intersex bodies to be viewed as healthy...[because] its natural sex ambiguity cannot be aligned with a singular gender (Davis et al. 498). Ultimately, this "biopower" that doctors have, enables them to permanently alter a child's natural variation of sex without their consent or even their understanding (494). When considering healthcare for intersex people, the non-consensual surgeries at birth continue today despite activists bringing awareness to what are ultimately "human rights violations" (Carpenter 74). Intersex peoples, as a marginalized group in society, do not receive equitable or fair healthcare treatment because they do not fit into the widely accepted but false sex binary.

IV. People

Ultimately, the lack of focus on diverse marginalized groups in biological education, clinical research, and medical practice affects real people. Specifically, it is those marginalized peoples that are harmed and suffer the consequences of a society that not only does not prioritize the recognition of diversity but actively punishes and marginalizes those that are different. In the United States, people of color, queer, trans, and intersex people are undeniably harmed because of false scientific beliefs as well as narrow-mindedness and hate towards difference. It is also

important to remember the intersectionality of any combination of these and more marginalized identities that create both shared and specific experiences. In this section, I will specifically cover the harm that these marginalized people face in healthcare as a result of the lack of focus on diversity.

Race

The effect of the history of scientific racism and the current structural racism and interpersonal racism greatly harms people of color in the United States. One of the most discussed harmful effects is the resulting mistrust in the healthcare system. A major contributing factor to black Americans' mistrust in the healthcare system is the Tuskegee syphilis study (Zescott et al. 529). While Tuskegee contributes to mistrust, the current mistreatment of people of color happening now in the healthcare system is more often at the forefront of peoples' minds. Current events also contribute to experienced health disparities. It has been found that doctors' biases can result in their "perceptions and treatment recommendations for hypothetical Black patients differed significantly from those made for the hypothetical White patients with the exact same symptoms" (529). It is not just hypothetical, "racial minorities report greater dissatisfaction with their health care providers," contributing to more mistrust and leading to avoiding healthcare or not following the doctor's instructions (529 & 532). Additionally, it has been "found that providers' implicit race bias predicted less prescribed postsurgical pain medication for African American than White patients," likely stemming from the scientific racism idea that they experience less pain (532). Additionally, other harmful health disparities include the fact that "Black women are three to four times more likely to die from pregnancy-related causes than

are White women” and there have been “five hundred Black babies dying each year in Birmingham ‘because of the lack of proper food, shelter and medical facilities’” (qtd. in Kendi 189 & 221). Ultimately, mistrust and not seeking care, misdiagnoses, mistreatment and discrimination, and non-treatment are effects experienced. These examples are by no means the only harm done to people of color in the healthcare system as a result of racism, and unfortunately, disparities will likely continue as long as marginalized groups are ignored in education, research, and medical practice.

Queer

The effects of queerphobia hurt trans and intersex people in healthcare. Intersex people often have forced, non-consensual, and non-reversible surgeries done to them when they are infants or children. Before children even understand their gender identity or what their sex is, it is changed simply because it does not adhere to the desired sex binary. Today, intersex activists have been trying to bring this to the attention of the world, and “parents have been discouraged from surgery purely for reasons of social acceptability, thereby allowing the child a decision when they are older” (Rumbelow 220). Unfortunately, for intersex people that have decided they were wronged by their non-consensual surgeries as children, “there have been no successful legal actions by intersex persons subjected to interventions during infancy or childhood, due in part to statutes of limitations, and claims of clinical consensus” (Carpenter 77). Intersex people’s lives and bodies are irreversibly changed by doctors that want to enforce the false idea of a sex binary. It is then important to note the difference in healthcare harm done to intersex and trans people: intersex people have their bodily autonomy denied to them through non-consensual surgeries to

fit in the false sex binary, and trans people have their bodily autonomy denied to them through hurdles and denial of treatment and surgeries to keep them in the false sex binary.

Trans people are harmed by transphobia and the lack of focus on trans people in education, research, and medical practice. In the 2015 U.S. Transgender Survey, a “third of respondents reported having at least one negative experience with a healthcare provider within the past year related to being transgender...[including] verbal harassment, refusal of treatment, or having to teach a healthcare provider about transgender individuals in order to receive appropriate care” (Merkel 42). Many trans people, after having or fearing negative experiences are left “feeling uncomfortable and ashamed of [themselves] as a trans individual, and made [them] hesitant to return” to receive healthcare (43). Additional reasons for avoiding care are when the care or specialty needed is related to one’s sex assigned at birth. I know many trans men, including myself, that have avoided going to the gynecologist like cisgender women are expected to once they reach a certain age, as “sitting in [the] OB-GYN’s waiting room, as a trans man, was another source of discomfort” (Stovieck). Additionally, other organ-specific cancer screenings, such as for breast, testicular, or prostate cancer, could be avoided and cause further trouble later in life. There have also been instances in which trans people have been extremely mistreated in a healthcare system. One trans man with endometriosis was hospitalized for “ovarian hyperstimulation syndrome (OHSS) and ovarian torsion, or the twisting of both ovaries,” and claims his treatment at the hospital was “transphobic and disrespectful” (Stovieck). After surgery, “he was denied pain medication and was forced to undergo an excruciating transvaginal ultrasound in front of gawking nurses...[and then] the doctor denied him a hysterectomy—which he was scheduled to undergo two weeks late—allegedly telling [him] that

he ‘didn’t feel comfortable aiding in [his] transition’” (Stovieck). Fears of being mistreated due to transphobia or having a medical provider that is not well educated on trans topics discourage many trans people, including me, from seeking healthcare when they need it.

V. Science

Ultimately, the lack of focus on diverse marginalized groups in biological education, clinical research, and medical practice not only harms real people, but also hinders the progression of scientific knowledge and medical advancements as well.

Regarding education, the lack of time spent studying and learning about marginalized groups in biology and medical school has consequences. Students, no matter what field of study they are going into, need to be aware of systems in society that marginalized diverse groups of people and how that affects them and their health. Whether a biology student plans to just work in a lab, work with animals, perform clinical research, or practice medicine, they must be aware and knowledgeable of the diversity of humans and the systems of advantage and disadvantage that make certain people marginalized in society. Thus, scientists are receiving an incomplete education in which they are not qualified to be doing what they do.

Regarding clinical research, that lack of representation and focus on marginalized populations has consequences. Due to the past exploitation of black men in the Tuskegee syphilis study, many African Americans are rightfully hesitant to be a part of any research. Despite the NIH’s regulations, studies do not make concerted efforts to make their research participants representative of the respective populations affected by the study. This is extremely problematic because when study populations are homogenous rather than representative of the diversity of

humans, conclusions cannot then be generalized on the whole population, but they are often presented as being so.

Regarding medical practice, the lack of providers' knowledge about marginalized populations and their implicit or explicit biases towards diverse peoples has consequences. Doctors take an oath to help and serve all patients that come to them, yet sometimes they themselves are barriers that dissuade patients from seeking care. Medical professionals should be well-versed and knowledgeable about marginalized peoples' situations and the disadvantages that they face in society, especially within the healthcare system. When they are not knowledgeable on matters such as racial health disparities and queerphobia experienced by trans and intersex people, their patients are affected. Ultimately, when doctors are under-educated, the healthcare they provide to marginalized groups is sub-par. Thus, there is limited success and progression of the individual doctor's and the entire healthcare system's healthcare practices when ignorance and bias are involved in patient care.

VI. Possible solutions

With the historical and current lack of knowledge and focus given to marginalized groups, especially people of color, trans, and intersex people, both people in need of healthcare are harmed as well as the scientific processes and medical practices that are meant to help others. There is change happening, and there is only more to come. I by no means intend to solve the problem but aim to suggest possible solutions that can serve as steps and contribute to the minimization of harm and the maximization of benefit to marginalized peoples in healthcare and the progression of scientific and medical knowledge and practice.

One major contributing factor that would help increase the knowledge and focus given to marginalized groups at the educational, research, and medical levels is to increase diversity the diversity of those working in each field. There should be more diverse professors that would then teach about diversity. There should be more diverse researchers that would then devote time to make sure they incorporate diverse populations into their studies or wholly devote studies to diverse peoples' situations in medicine. There should be more diverse medical professionals that would be more open to patients' diversity and would be able to connect with them and provide them with a sense of safety. It has been shown that there are many "benefits of diversity to science and medicine" and that this often begins with educating and hiring more diverse people in scientific fields (Swartz et al. S33). Additionally, in regard to research, "evidence suggests that teams that include different kinds of thinkers outperform homogeneous groups on complex tasks, including problem solving, increased innovation, and more-accurate predictions—all of which lead to better performance and results" (S33). An extremely impactful effect of this includes that more diverse "scientific teams can generate new research questions that have yet to be asked by our field, develop methodical and analytical approaches to better understand study populations, and offer approaches to problem solving from multiple different perspectives" (S33). Therefore, increasing the diversity and the number of marginalized peoples working in the scientific field is one way in which the knowledge and focus of marginalized populations can increase.

The other main way in which this can occur is for there to be better diversity education and training covering the disadvantages that marginalized peoples face in society and in the healthcare system. By implementing programs that have shown to increase acceptance and decrease racism and queerphobia, students, researchers, and medical professionals will be better

equipped and knowledgeable about diverse peoples, better represent them in research, and give them equitable healthcare.

VII. Conclusion

Ultimately, the lack of knowledge and focus on diverse marginalized groups in education, research, and medical practice is harmful both to diverse peoples and the progression of scientific and medical knowledge. It has been lacking and insufficient in our country's history, and it continues to be an issue today. In understanding the history of scientific racism and queerphobia and how this has affected all aspects of science and healthcare, one has the foundation to understand the disadvantage that marginalized peoples face in our society. When considering how diversity is addressed in the past and now, it is clear how this affects both marginalized peoples and science's progression. Eventually, I hope that the field of science and medicine will become more diverse and more able to affirmingly and equitably serve marginalized populations that have been and continue to be harmed today.

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