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ABSTRACT

Is trust in the institution of medicine dependent on race? Are there racial differences in change of trust over time? The central hypotheses of this study are that a) white people will exhibit more trust in medicine than Black people, and b) white people's trust in medicine will increase over time, while Black people's trust in medicine will decrease over time. This study analyzes 2000-2018 data from the General Social Survey, conducted by NORC at the University of Chicago; the data has been narrowed down to include only Black and white participants in the analysis. Findings do not support the two hypotheses, showing marginally greater trust among Black participants and an increase in trust over time for both white and Black participants, the increase among Black participants of a greater magnitude. This increase in trust in medicine should not be equated with a lack of disparity, for these results suggest that more research needs to be conducted to examine the factors and possible causal mechanisms behind this increasing trust in medicine among both Black and white people.

The United States has an inequitable medical system. Much of the medical system is privatized and there is no affordable national comprehensive healthcare system. Good medical care is in reach of those who can afford it, and the U.S. is wrought with economic inequality. A major contributor to these disparities is race, for the wealth inequalities created and perpetuated by systemic racism are glaring. Research has shown that there are significant disparities in trust in medicine based on race as well as class, both key factors relating to trust in medicine (Corra and Carter 2008; Corbie-Smith et al. 2009; Freimuth et al. 2001; Corbie-Smith et al. 2002; Lillie-Blanton et al. 2000; Aslan and Wanamaker 2016; Nickerson et al. 1994; Mouton et al. 1997; Blendon et al. 1995).

This study explores how race might affect trust in medicine. The current study draws on the fundamental cause theory, which was developed by Jo C. Phelan and Bruce G. Link (1995) and draws connections between medical disparities and medical innovations. The theory asserts that socioeconomic status is a fundamental cause of health outcomes and mortality rates, that one's health is fundamentally dependent on access to resources (Link and Phelan 1995). Link and Phelan (1995) state that "the essential feature of fundamental social causes, is that they involve access to resources that can be used to avoid risks or to minimize the consequences of disease once it occurs" (Link and Phelan 1995:87). Multiple studies have provided some empirical support for this theory (Chang and Lauderdale 2009; Lutfey and Freese 2009; Phelan et al. 2004; Polonijo et al. 2013). The theory of fundamental causes applies to race as it does to socioeconomic status, as racism is deeply rooted in economic inequality. In a 2015 article, Link and Phelan assert that their theory can and should be applied to race and health (Link and Phelan 2015:311). A main example employed in the literature is the Tuskegee Syphilis Study of 1932-1972, a grossly dehumanizing and unethical research study conducted on Black participants.

Knowledge of this specific study has also been shown to differ by race, affecting trust levels in Black Americans specifically (Freimuth et al. 2001).

The current study follows the lead of Mamadi Corra and J. Scott Carter's (2008) work on trust in medicine by race and gender using data collected prior to 2000. This study seeks to explore this question using more recent data. Specifically considering the increasing nature of medical and technological innovations, how will trust be affected by such developments? One assumption is that as more medical treatments become available, trust will increase. The further nuance of how these medical innovations are being distributed and factors connecting to race may affect these levels of trust negatively, yet there are other possibly intervening mechanisms at play such as public awareness of medical innovations and their diffusion. The test at hand is to discern how innovative these medical discoveries actually are. The specific research question aims to determine whether the logical assumption described above holds true when controlling for race. Will there be differences in levels of confidence in medicine between Black and white participants? The first hypothesis is that, controlling for other factors, Black participants will exhibit less trust in medicine than white participants. The second hypothesis is that confidence levels will increase over time for white participants and decrease for Black participants.

THEORETICAL FRAMEWORK

Fundamental Cause Theory

The main theoretical framework for this study is the theory of fundamental causes, coined by Bruce G. Link and Jo C. Phelan (1995). The theory states that socioeconomic status is a fundamental cause of health inequalities, "despite changes in intervening mechanisms" (Link and Phelan 1995:87). The theory serves to answer the question: *why* is socioeconomic status such an enduring and persistent cause of health inequality and negative health outcomes? Authors explain that the reason for such persistent cause is that they involve significant access to resources that can serve to minimize both the risks and consequences of disease both before and after they occur (Link and Phelan 1995:87). Link and Phelan broadly define these resources to consist of money, knowledge, power, prestige, and support that various social networks provide (Link and Phelan 1995:87). This theory holds that even as knowledge and mechanisms increase and improve for a disease, SES will still remain an enduring barrier to access and good health outcomes; those with more economic privilege will be less affected by a disease (Link and Phelan 1995:87).

The fundamental cause theory has been extremely significant since its introduction, several studies testing the theory under various circumstances and examples (Change and Lauderdale 2009; Phelan et al. 2004; Polonijo and Carpiano 2013; Link et al. 1998)
Chang and Lauderdale (2009) study income's association with cholesterol levels (higher cholesterol levels are associated with cardiovascular disease) and the changes associated with the introduction and use of the cardiovascular treatment statins. Their findings show that prior to statins, those with higher incomes and more resources were likely to have higher cholesterol levels. This dynamic shifted once statins were introduced, those with more advantages having greater access to statins as a treatment; findings also show that income is positively associated with statin use. In this case, the introduction of the medical innovation statins created a disparity that wasn't there before (Chang and Lauderdale 2009).

Phelan et al. (2004) expand upon the theory of fundamental causes, studying socioeconomic status's effect on mortality rates using data from a longitudinal mortality study. Authors hypothesized that the more treatable a disease is, the more severe the socioeconomic disparities in mortality will be. Their hypothesis was supported, data showing, in continuation with past research, a strong association between socioeconomic status and mortality. This finding supports the fundamental cause theory, showing enduring disparities in mortality and more broadly health despite many diseases becoming increasingly treatable (Phelan et al. 2004). Further, Link et al. (1998) study access to and use of breast cancer screening and its association with socioeconomic status through analyzing medical data on breast cancer screening. Their findings are that people with higher socioeconomic status and higher education levels were more likely to get screened for breast cancer the recommended once per year. These findings are significant, for earlier detection of breast cancer is connected to lower mortality rates, and greater access and resources is connected to more frequent screenings (Link et al. 1998).

Since its inception in 1995, the theory of fundamental causes has centered on socioeconomic disparity and health, but race is an inextricable part of economic inequity. In a 2015 Annual Sociological Review article, Bruce Link and Jo Phelan expanded upon their theory, explaining that race is *also* a fundamental cause of health inequality and mortality. Their findings are that racism is a fundamental cause of socioeconomic inequalities, and racism is also a fundamental cause of health inequalities, *independent* of socioeconomic status. Link and Phelan assert that race has the same fundamental cause affects as socioeconomic status, stating that "race in the United States has also had a large and enduring association with health and mortality." Authors further state that "black Americans have substantially worse health and shorter life expectancies than white Americans. In 2010, life expectancy at birth for black Americans was almost 4 years shorter than for white Americans (75.1 versus 78.9). Even at age 65, life expectancy was about 1.5 years shorter for black Americans" (Link and Phelan 2015:313). The fact that race and SES function in a very similar manner as a fundamental cause of health and mortality is not surprising, for racism has been historically linked to economic inequality, dating back to the capitalist and racist control mechanisms of American slavery.

Link and Phelan's expansion of their theory creates room for a more in depth understanding of the fundamental causes, race being one of them. Do et al. (2012) suggest that previous research has not adequately connected SES to race when examining each social factors' respective statistical and sociological effect on health. Their 2012 study analyzed an income study, finding that Black participants are more likely (by a large margin) to be at a financial disadvantage, which thus translates to health (Do et al. 2012). Polonijo and Carpiano (2013) further test the fundamental cause theory connecting race and SES status. Studying adolescent use of the HPV vaccine (a preventative measure against cervical cancer) by race and SES, Polonijo and Carpiano find that SES and race are significant barriers to accessing this technology, specifically citing that the possible future affects: maintaining "future disparities in cervical cancer among adult populations" (Polonijo and Carpiano 2013:115). The future implications of these expansions of Link and Phelan's (1995) theory here are significant, as well as the attention to barriers to access to this specific preventative measure against this type of cancer, for a main tenant of the fundamental cause theory is the connection between medical innovations and continuing disparities in health. The connection of race to the theory of fundamental causes calls for a deeper examination of race's connection to medical innovations and those innovations' effects on racial health disparities.

A Legacy of Mistrust

Another crucial piece of theoretical framework is what scholars have referred to as a legacy of mistrust (Gamble 1993; Gamble 1997; Corra and Carter 2008). This legacy points to a deeply traumatic history of abuse of Black people in the name of American medicine, and the distrust in the system through which that abuse occurred. Gamble (1993) cites this mistrust as spanning centuries. Some of these abuses include, but are not limited to, Black bodies being stolen from graves in the antebellum south to be used for medical experimentation, enslaved Black women in the 1800s being used against their will as subjects for gynecological research by famous doctor J. Marion Sims, demonstrated bias among white doctors, and research studies such as the Tuskegee Syphilis study (Savitt 1982; Ivy 2016; Hoffman et al. 2016; Freimuth et al. 2001). The legacy of mistrust centers around the myriad of historical precedent that would warrant medical distrust among Black people.

LITERATURE REVIEW

The main research question examines the association between race, trust in medicine, the introduction of medical innovations and treatments, and the effect these factors have over time. The question serves to ascertain what affect these modern and continuously evolving medical innovations have on trust in medicine and whether race and other factors play a role in that relationship. Before exploring the literature on medical innovations and their connections to racial health disparities, it is important to understand the foundational inequalities that make this study relevant.

Historical Background

Racism is deeply embedded in the institution of medicine, which takes many forms including discrimination, disparities, and inequity. There is much scholarship providing ample evidence to back up why there may be racial disparities regarding trust in medicine (Corra and Carter 2008; Gamble 1993; Gamble 1997). Scholar Vanessa Gamble (1993) asserts that "medicine is not a value-free discipline. Rather, it has reflected and reinforced the beliefs, values, and power dynamics of the wider society" (35). There are health disparities in medical access and treatment, and there are known instances of medical misconduct performed by white doctors on Black patients and research participants (Charatz-Litt, MP 1992; Aslan and Wanamaker 2016; Corra and Carter 2008; Freimuth et al. 2001; Nickerson et al. 1994; Cuffee et al. 2013). The purpose of this specific study is not to discern which phenomena are responsible for racial differences in trust, yet it is still necessary to understand the different dynamics of inequality.

Systems of racism have long lasting legacies on health (Gamble 1993; Gamble 1997; Franks et al. 2006;). The institution of racial segregation is one example, having longstanding effects on health, mortality, and trust (Collins 1999; Gibbons 2019). Residential segregation is associated with higher mortality rates for Black Americans than white Americans. Racial segregation has generated economic and racial disparities (Collins 1999). Many U.S. cities were heavily segregated for most of the 20th century, yet segregation is just one facet of a multidimensional system of racial oppression. Important findings show that mortality rates for many diseases, such as heart disease and cancer are higher for Black patients than their white counterparts (Collins 1999:507). The issue of socioeconomic status and race are inextricable from race, for Black people are more likely to have low socioeconomic status than their white counterparts (Collins 1999). Research shows that, as of the late 1990s "twenty-eight percent of African Americans live below the poverty line, compared to almost 8% of whites" (Collins 1999:507). These economic findings are pertinent, for a significant body of research points to the connection between socioeconomic status and health (Phelan et al. 2004; Link et al. 1998). Further, the interconnectedness of race and economic status warrant in-depth studies of race and medicine.

Another important historical precedent that serves as a factor in trust is unethical research practices, manifesting in abusive and often deadly experimentation on Black bodies at the hands of white doctors (Aslan and Wanamaker 2016; Corbie-Smith et al. 1999; Corbie-Smith et al. 2002; Freimuth et al. 2001; Gamble 1993; Corra and Carter 2008; Nix 2017). Perhaps the most cited example in existing literature is the Tuskegee Syphilis Study which ran from 1932 to 1972. The study is a harrowing example of medicine utterly failing Black participants. The study included a group of Black sharecroppers in Tuskegee, Alabama, 399 men who had syphilis and 201who did not (Nix 2017). The study took advantage of participants, concealing essential information about their health and what treatments they were actually receiving. "The men were deliberately denied effective treatment for syphilis in order to document what researchers called 'the natural history of syphilis in African Americans'… Estimates are that about 28 to 100 of the men died of syphilis, despite the fact that penicillin, an effective treatment of the disease, was then available (Corra and Carter 2008:61). The legacy of this study has been far reaching, for the deaths and infections affect the health of future generations and their trust in the medical system. The Tuskegee study has served as a symbol of medical neglect, exploitation, and injustice, "if not outright racial genocide" (Aslan and Wanamaker 2016).

Though the Tuskegee Syphilis study has become of symbol of this racialized medical mistreatment, this mistreatment dates back much further back than Tuskegee. There is historical evidence of unethical treatment in the name of medical research preceding the Tuskegee Syphilis study and dating back to slavery, enslaved Black people often being experimented and demonstrated on without proper knowledge or consent (Savitt 1982; Gamble 1993; Gamble 1997). Unable to resist, Black bodies were frequently stolen from graves in the antebellum south to be used for medical experimentation, often without the knowledge or consent of the person's family and loved ones (Gamble 1997). In this same time period of the antebellum south, gynecologist Dr. J. Marion Sims, widely thought of as the father of modern gynecology, subjected enslaved Black women to extraordinarily painful experimental operations, without their consent; these techniques he learned and perfected on these women would later be used on white women who volunteered to participate in research (Gamble 1993). As long as Black people have been in the U.S., subjected to enslavement and marginalization, their bodies have been mistreated and brutalized in the name of medicine.

Racial Disparities in Health

Aside from trust, deeply entrenched racial disparities exist in health and medicine. This is the case with regards to prevalence of diseases, for Black people experience higher rates of many diseases compared to white people (Wong et al. 2002). Mortality rates are generally higher for Black people, compared to their white counterparts; Black people as a group suffer 67,000 more deaths each year than white people (Franks et al. 2006). When mortality rates are measured by number of years lost, findings show that Black people have lost 2.2 million years of life, 1.1 million controlling for socioeconomic status (Franks et al. 2006:2472). This measurement of years lost is a striking image of the consequences of these health disparities, that they affect generations and futures of entire communities.

The source of such health disparities is heavily linked to economic inequality between Black and white people (Do 2012; Goettlich 2019; Phelan 2015). There are several measures of socioeconomic status, and there are significant disparities between Black and white Americans along many of these lines. Black people's median household income is three fifths of white people's median household income (DeNavas-Walt et al. 2012). Familial wealth of white people is over six times that of Black families (McKernan et al. 2013). 25.4% of Black people hold service jobs compared to 16.6% of white people; 6.4% of Black people hold managerial jobs compared to 11.6% of white people (BLS 2013). Lending to Link and Phelan's (1995) theory of fundamental causes, asserting socioeconomic status as a fundamental cause of health disparities, the connection between race and economic disparity undeniably leads to health disparities. Health disparities are so deeply connected with socioeconomic status and socioeconomic status is deeply connected with race and racism.

Mistrust in Medicine

Given scholarship on the Tuskegee Syphilis study and other historical precedents, there are clear racial disparities in health. Further: how much does one trust an institution that systemically discriminates against them? Knowledge of disparities is influential in this question, for there is a significant difference in how Black and white people view racial identity as an influence on treatment in the medical field (Lillie-Blanton et al. 2000). Knowledge of the Tuskegee Syphilis trial is connected with participation in medicinal research and trust in the medical system in general. Research shows that, with knowledge of the 1932-1972 study, Black research participants exhibited overwhelming belief in the necessity of caution as a Black person interacting with the medical system and medical professionals (Freimuth et al. 2001). This dynamic holds true with or without significant knowledge of the Tuskegee Syphilis trial, showing that knowledge of this specific trial is not solely or fully responsible for differing levels of trust by race (Corbie-Smith et al. 1999). Research conducted with a sample of only Black participants have shown that few have detailed knowledge or facts about the Tuskegee Syphilis trial, yet findings still showed general distrust in systems of medical research, proving trust a significant barrier to Black people's participation in clinical research (Corbie-Smith et al. 1999).

Previous research on trust in medicine has shown significant findings that would suggest racial and gendered differences in trust (Corra and Carter 2008; Thompson et al. 2004). Findings assert that there is a significant difference in trust in medicine between white men and Black women, white men being more likely to exhibit the most trust and Black women exhibiting the least trust in medicine (Corra and Carter 2008). This evident lack of trust can lead to patient delay in seeking care, for fear of treatment by the medical system and medical professionals (Finnegan et al. 2000; Thompson et al. 2004). Findings show that Black participants are more likely than white participants to describe negative feelings about ambulatory and EMS-911 care, a specific fear being whether or not they're choice of hospital to be transported to would be upheld and respected (Finnegan et al. 2000). Further, Thompson et al. (2004) find that trust is a significant barrier to Black women seeking out mammograms for breast cancer detection, a cancer that can be deadly if not caught early enough through regular screenings. These findings speak to the question of what harm result from a lack of trust in the medical system, reluctance to seek treatment for a serious condition undoubtedly contributes to racial disparities in mortality and negative health outcomes in general.

Medical Innovations, Technologies, and Access

As medical technology continues to evolve, more and more innovations and treatments for many common diseases and conditions are introduced. While these innovations are increasingly being released into the field, access is complicated and often unequal. Some scholars have focused on the effects of education and SES on use of various innovations (Glied and Lleras-Muney 2008; Wang et al. 2012). Research on education and use of medical innovations finds that for diseases with more medical technologies associated with it, those with more education have a significantly greater survival advantage than those with less education

(Glied and Lleras-Muney 2008). While education level is a different measure than SES, it has deep connections to SES and race, educational disparities being present along racial and economic lines. Examining diffusion of technologies along the lines of SES here may be more meaningful; Research analyzing SES and mortality from colorectal cancer, finds that SES has a significant impact on colorectal cancer mortality (Wang et al. 2012). The intricacies of these findings are illuminating, for authors also find that SES's protective impact increases over time. Perhaps their most significant finding: "the faster diffusion of information reduces both colorectal mortality and inequalities in colorectal cancer mortality, although it is not sufficient to eliminate SES inequalities" (Wang et al. 2012:592). Diffusion of information is significant, but not enough to eliminate the inequalities of SES, an enduring cause of inequalities according to the fundamental cause theory.

While education and socioeconomic status are deeply connected to race, other scholars have gotten more specific on the racial dynamics of medical innovations and their diffusion and outcomes (Mehrotra et al. 2016; Ferris et al. 2006; Rubin et al. 2010). Scholars have researched racial disparities in kidney disease treatment rates of usage and outcomes (Mehrotra et al. 2016; Epstein et al. 2000). Findings show that non-white people are significantly less likely to receive a kidney transplant than their white counterparts, further, authors find that there are significant racial disparities in use and outcomes of home dialysis kidney treatments (Mehrotra et al. 2016). Another test is the relationship between race and ethnicity and the use of asthma inhalers over time; research shows that racial and ethnic minority patients are less than half as likely to be prescribed an asthma inhaler than white patients, further, the diffusion of inhalers is unequal (Ferris et al. 2006). Asthma, a common disorder, quite treatable at this point, still shows significant racial disparities as those treatments available for asthma are not equally distributed.

These findings also have implications regarding doctor-patient treatment and present biases among doctors: why are doctors less likely to prescribe asthma inhalers to non-white patients?

The disease HIV/AIDS ravaged communities, largely communities of color, throughout the 1980s, and many people today are able to live full lives while being HIV positive. Despite this, socioeconomic status and race still have a significant effects on HIV/AIDS mortality. Examining SES and race's effect on HIV/AIDS mortality rates, before and after the introduction of highly active antiretroviral therapy (HAART), Rubin et al. (2010) find that racial and ethnic and SES disparities in HIV/AIDS mortality *grew* after HAART was introduced as a treatment for HIV/AIDS. Authors conclude that their "findings support the fundamental cause hypothesis, as the introduction of a life-extending treatment exacerbated inequalities in HIV/AIDS mortality by SES and by race (Rubin et al. 2010). The literature suggests that medical innovations may be the cause of creating or exacerbating health inequalities. The example of HIV/AIDS is particularly concerning, for a disease that is widely seen as being treatable, an epidemic that has supposedly ended, still has a deeper layer of inequality that shows we are not rid of the disease, but that more privileged people have access to treatments for the disease.

Historical background suggests a deeply entrenched legacy of mistrust in medicine (Gamble 1993; Gamble 1997). Significant health disparities exist along racial lines, inextricably connected to socioeconomic status, which is a fundamental cause of health inequalities (Link and Phelan 1995). Findings suggest a significant racial difference in trust in medicine also exists (Corra and Carter 2008; Gamble 1993; Gamble 1997; Freimuth et al. 2001; Corbie-Smith et al. 1999; Thompson et al. 2004). With regards to change of trust over time, research suggests that as time moves forward and medical innovations increase, health disparities are also exacerbated (Timmermans 2020; Arcaya and Figueroa 2017). The literature supports the hypothesis that, as medical disparities increase, trust will decrease. Research also supports that there will be significant racial disparities in trust in the institution of medicine. Future research should analyze data from more recent years to measure current levels of trust.

DATA AND METHODS

Data

I use data from the 2000-2018 General Social Survey (GSS) (Smith et al. 2018). The GSS is a dataset, which has been conducted about every two years since 1972. The unit of analysis in this data set are individual people participating in the survey. Sample sizes range from year to year between 1,300 and 1,600 participants. The population consists of un-institutionalized adults. The sample is gathered through a random area probability selecting process to find those in households in the various regions in which the interviews are conducted, a subsampling process occurs while still maintaining a geographically diverse and nationally representative sample. The survey is conducted through face-to-face in person interviews affiliated with NORC at the University of Chicago. The sample size for the years of data I examine, 2000 to 2018, is N = 11736. For more information on the GSS, direct inquiry to the GSS data explorer website: https://gssdataexplorer.norc.org/.

Variables

The dependent variable being used is called ‘conmedic,’ standing for confidence in medicine. The specific wording of the question is: “I am going to name some institutions in this country. As far as the people running these institutions are concerned, would you say you have a great deal of confidence, only some confidence, or hardly any confidence at all in them?” The participant goes through different named institutions, ‘Medicine’ being one of them. The answer options are: ‘Hardly Any = 3,’ ‘Only Some = 2,’ ‘A Great Deal = 1’. In the GSS, the variable is reverse-coded. The variable has been recoded to reflect a measure that goes from least amount of trust to greatest amount of trust. The reverse coded values are: ‘Hardly Any’ = 1, ‘Only Some’ = 2, ‘A Great Deal’ = 3. Missing variables were removed through listwise deletion.

The main independent variable is ‘race’. The wording of the question is as follows: “What race do you consider yourself?” The answer options are ‘Black’, ‘White’, and ‘Other. For the purposes of this study the variable has been recoded, classifying the value ‘Other’ as ‘missing’ so the relationship between Black and white participants can be highlighted. A dummy variable was then created, where Black = 1 and white = 0; this is the form of the variable that will used in statistical analyzes. There were no missing values for this variable, so listwise deletion was not necessary.

The main control variable is family income. This variable is labeled ‘realinc’ in the GSS and it asks the respondent to name their ‘family income in dollars’. This variable is a ratio measure, for respondents state their exact income in dollars. The second control variable is respondents’ highest year of school completed, named ‘educ’ in the GSS, referring to the grade of school completed. The scale goes from 1st grade to year 20, which would indicate years of post-graduate education. The third control variable is gender, labelled as “sex” in the GSS, there are two binary categories to choose from: Male and Female. This variable was dummied into “Woman” where Female = 1 and Male = 0. There were no missing cases for this variable. The fourth control variable is political party affiliation, the GSS variable is named “partyid”. It is coded through a scale that goes from least to most republican.

Lastly, dummy variables were created for the years 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, and 2018, all with the reference group 2000.

FINDINGS

Univariate Findings

The distribution of confidence in medicine, displayed in Figure 1, shows a general lack of trust with 37.9% of respondents reporting having hardly any confidence in medicine, 50.1% having only some confidence, and 12% having a great deal of confidence. The mean value is 1.74 ± .6, falling between hardly any confidence and only some confidence. The median value is 2, respondents having only some confidence in medicine (see Table 1).

The distribution of the race of the respondent, displayed in Figure 2, shows a vast majority of white participants; 83.3% of the sample is white and 16.2% of the sample is Black. The mean value is .16 ± .4, again showing the majority white sample, and the median value is 0, or white.

Bivariate Findings

The correlation (r) between confidence in medicine and black race is positive, very weak, and statistically significant at the .001 level. This correlation reflects that Black participants are likely to have more confidence in medicine than white participants (r = .05*). There is also a positive, weak, statistically significant correlation between confidence in medicine and "woman" gender dummy variable, meaning that women are likely to have more confidence in medicine than men. The correlation between confidence in medicine and income is negative, weak, and statistically significant (r = -.071), meaning the lower a participant's income is the higher their confidence in medicine will be. Further, more education shows less confidence in medicine, with a weak, negative, and statistically significant correlation. The correlation between Black race and income is negative, weak to moderate and statistically significant, meaning Black participants are likely to have lower income than white participants. Black participants are also likely to have less years of education than white participants, with a weak, negative and statistically significant correlation. There is also a weak, negative and statistically significant correlation between Black race and education, Black participants likely to have completed less years of education than white participants.

Figure 3 shows the distribution of confidence over time, showing the continued dynamic where most respondents have 'only some' confidence and fewest have 'a great deal' of confidence. The time graph also showed a slight increase in confidence between 2014 and 2018.

Multivariate Findings

There are three models in the regression analysis (see table 3). Model 1 shows regression results for all participants in the sample, model 2 shows results for Black participants, and model 3 shows results for white participants. These different models were created to assess and compare the time affect between Black and white participants. All models had statistically significant ($p<.001$) F values; for model 1, $F = 11.007^*$, for model 2, $F = 2.751^*$, for model 3, $F = 9.485^*$. These F values tell us the general significance of each model, that each model is a better fit for the data than a model without any independent variables in it. For model 1, the $R^2 = .015$, which means that 1.5% of the variation in confidence in medicine can be explained by the other variables in the model. For model 2, 2.2% of the variation in confidence could be attributed to the independent variables, and for model 3, 1.4% of the variation in confidence could be explained by the independent variables in the model. Model 1 showed a positive and statistically significant standardized coefficient for Black race ($\beta = .042^*$), showing that Black people are likely to exhibit more trust in medicine than white people, rejecting the first hypothesis. Comparing model 1 and 2, with Black and white participants, the demographic categories of

Black participants were all statistically insignificant, while those same categories were significant for white participants, suggesting that the demographic variation in the regression model with all participants can be heavily attributed to the variation among white participants. The model 1 regression coefficient for income was negative and statistically significant (β = -.052*): the more income a respondent has, the less confidence in medicine they will have. The model 1 regression coefficient for education showed a similar relationship to income: a negative and statistically significant coefficient (β = -.04*), thus the more education a participant has, the less confidence in medicine they will have. Further, models 1 and 2 show a statistically significant positive trend in confidence in medicine between the years 2014 and 2018; model 3 shows this trend between the years 2016 and 2018. Comparing models 2 and 3, the positive year affect is stronger for Black participants than it is for white participants, the beta (β) values for Black participants being of a higher magnitude. The second hypothesis was not supported.

DISCUSSION

Contrary to hypotheses, results show more trust in medicine among Black participants compared to white participants, an increase in trust over time for all models, Black participants having a greater increase in trust than white participants. These results dispute past research showing significant differences in trust between Black and white people (Blendon et al. 1995; Corbie-Smith et al. 1999; Corbie-Smith et al. 2002; Cuffee et al. 2013; Corra and Carter 2008; Finnegan et al. 2000; Freimuth et al. 2001; Gamble 1993; Gamble 1999; Lillie-Blanton et al. 2000; Nickerson et al. 1994; Thompson et al. 2004; Gibbons 2019). It should be noted that the majority of research on trust in medicine have been conducted before 2010, some using data that are over two decades old. Corra and Carter (2008) studied trust using the same GSS variable, but sampling from the year 1972-1998. Their regression results show that the less income and education participants have, the less confidence they will have; the current study's findings show the opposite interaction. Since the years sampled in their study, there has been a shift in trust in medicine, and that increase in trust could be attributed to a myriad of factors such as levels of knowledge of health disparities or knowledge of and benefits from progressive healthcare policies over the past twenty years, which is beyond the scope of the current study.

A possible limitation to this study lies in the survey question wording for the variable 'confidence in medicine'. In the GSS, the question associated with this variable is as follows: respondents are given a list of many different institutions and are asked to rate their confidence for each of those institutions. In terms of survey question design, a question that centers solely on medicine would focus attention that could have been pulled towards the other institutions in question. Future research would do well to conduct surveys specifically on trust in medicine, expanding upon previously studied scales of mistrust (Thompson et al. 2004). Other limitations include control variables that could have added to the findings; it would have been useful to see what levels in trust would be controlling also for age and region of residence, as those factors could very well cause variation in trust. In connection to Corra and Carter's (2008) research, the two scholars operationalized race and gender together by creating dummy variables for 'white man', 'white woman', 'Black man', and 'Black woman' to highlight the more nuanced and intersectional relationships at play. They only find significant differences in trust between white men and Black women, their results highlighting the unique positioning and experiences of Black women within the institution of medicine. Future research on race and trust in medicine should operationalize race and gender in this way to get a fuller picture of how trust plays out along the lines of these identities.

CONCLUSION

Literature and theory support that there are significant economic and racial barriers to health outcomes and access (Chang and Lauderdale 2009; Charatz-Litz 1992; Collins 1999; DeHavas-Walt et al. 2012; Do et al. 2012; Epstein et al. 2000; Ferris et al. 2006; Franks et al. 2006; Glied and Lleras-Muney 2008; Hill and Nydeggar 2020; Link and Phelan 1995; Link and Phelan 2015; Luftey and Freese 2005; Phelan et al. 2004; Rubin et al. 2016; Wong et al. 2002; Timmermans and Kaufman 2020). The research question of this study aims to examine whether there is a difference in trust between Black and white people and if there is a difference in trust over time between the two racial groups. It was hypothesized that a) white people would exhibit more trust in medicine than Black people, and b) white people would exhibit increasing trust in medicine over time, and Black people would exhibit decreasing trust in medicine over time. To test this hypothesis survey data from the 2000-2018 General Social Survey was analyzed through univariate, bivariate, and multivariate analyses (N = 11410). Findings supported neither of the two hypotheses, showing more trust in medicine for Black participants, and an increase in trust over time among both Black and white participants, that increase being stronger for Black participants.

The measurement employed for this study was trust, yet a large body of past research shows significant racial disparities in health, regardless of levels of trust. Future research should a) examine different factors contributing to levels of trust in medicine and how these levels of trust might impact health outcomes, and b) study disparities further in order to find mechanisms to alleviate them. This study of medical disparities is especially important in this year, 2020, as the world is experiencing a global pandemic due to COVID-19. Statistics have shown that, in the U.S., Black people have been suffering and dying from COVID-19 at rates disproportionate to non-Black people (Coughlin et al. 2020; Hill and Nydeggar 2020). The urgency and importance of future research on race and medicine cannot be overstated.

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TABLES AND FIGURES

Table 1. Means and Standard Deviations, N = 11410

Variable	Mean	Median	SD
Confidence in Medicine	1.74	2	0.6
Black (R's race)	0.16	0	0.4
Woman (R's gender)	0.55	1	0.5
R's Family Income	32,741	24,097.5	32,338
R's Highest Year of School	13.6	13	2.9
Political Party	2.73	3	1.9

Table 2. Bivariate Correlations, N = 11410

	Black	Woman	Income	Education	Political Party
Confidence in Medicine	.05*	.045*	- .071*	- .078*	- .026*
Black		.052*	- .154*	- .092*	- .307*
Woman			- .087*	.002	- .081*
Income				.362*	.125*
Education					.005

**p* < .001; time dummies excluded from correlation matrix

Table 3. Linear Regression of Confidence in Medicine, N = 11410

	All β	Black β	White β
Black	.042*	—	—
Woman	.037*	.026	.041*
Income	-.052*	.039	-.063*
Education	-.04*	.031	-.056*
Political Party	-.005	-.009	-.003
2002	.032	.063	.029
2004	.043*	.068	.038
2006	.033	.088	.025
2008	.053*	.106*	.044*
2010	.02	.027	.021
2012	.027	.049	.024
2014	.046*	.11*	.036
2016	.072*	.127*	.064*
2018	.064*	.152*	.048*
F	11.007*	2.751*	9.485*
R^2	.015	.022	.014
n	10131	1602	8528

* $p < .001$

Figure 1. Distribution of Confidence in Medicine, N = 11410

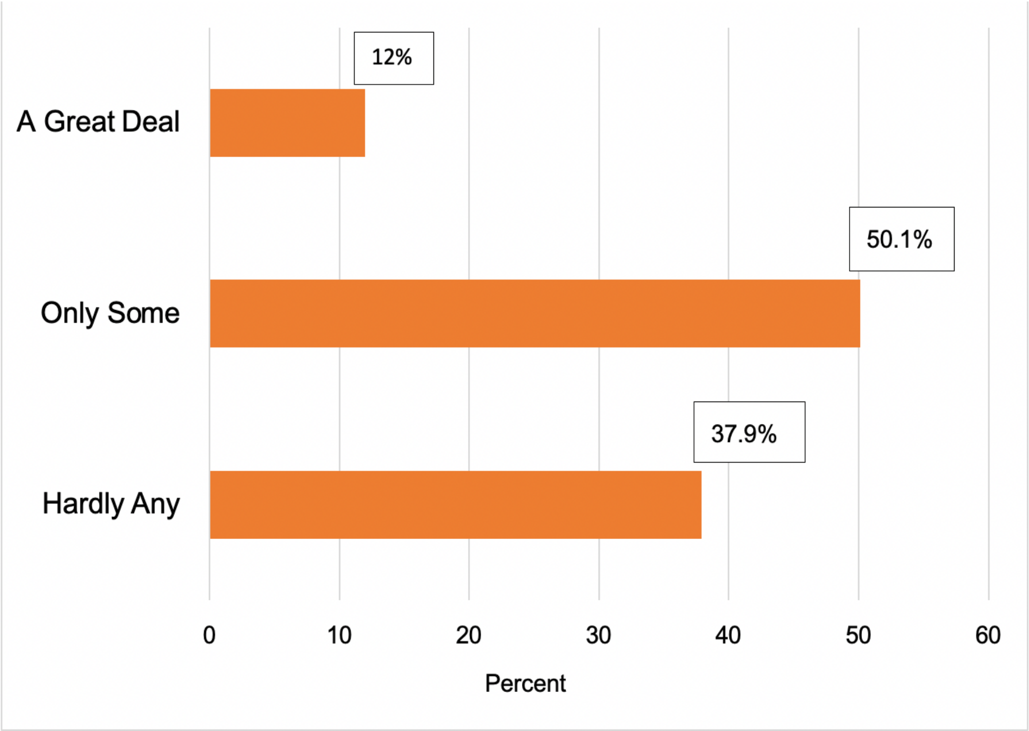

Figure 2. Distribution of Race of Respondent, N = 11410

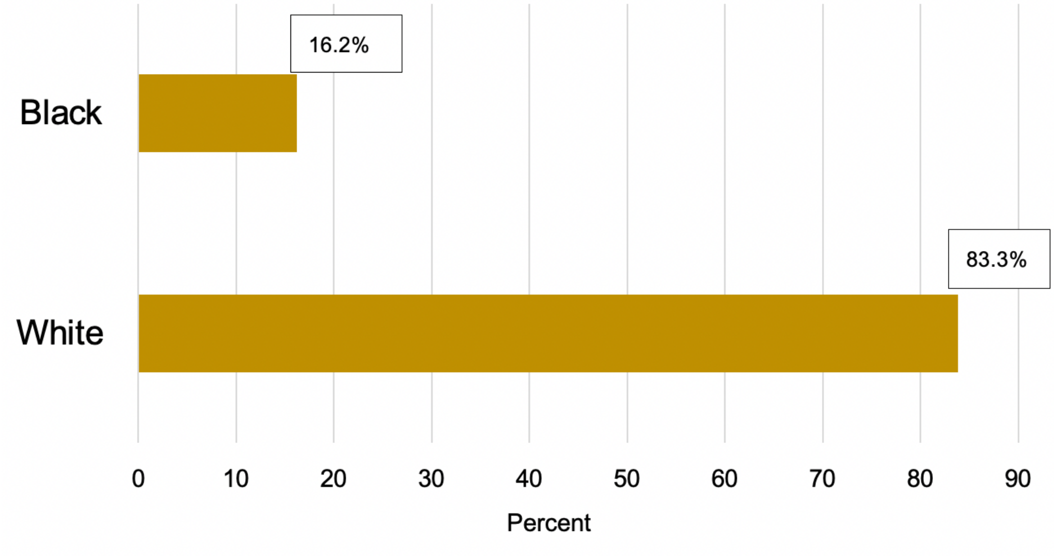

Figure 3. Distribution of Confidence in Medicine Over Time, N = 11410