Pathways to Participation: Health and Structural Racism as Determinants of Political Participation

A Dissertation

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Dedication

This dissertation is dedicated to my parents, Harold and Mary.

Abstract

Recent literature suggests that there is a relationship between health and political participation, indicating that individuals in poorer self-rated health are less likely to turn out to vote, compared to those in better health. While other research suggests that experiencing poor community conditions may mobilize people to vote or participate in politics in other ways, such as protesting or contacting a public official. This dissertation examines the relationship between political participation and health at multiple levels and investigates the connection between participation and structural racism. First, I use data from an NIH-funded study to examine the relationship between health and health-related factors at the individual-level and likelihood of voter turnout. Next, I use national-level datasets to examine associations between community public health conditions at the county-level and individuals' likelihood of political participation, including voter turnout in the 2018 U.S. midterm election, contacting a public official in the last year, and participating in a political protest, march, or demonstration in the last year. Finally, I use national-level data to examine associations between multiple dimensions of structural racism at the county-level and likelihood of political participation, using the same three participation outcomes from paper two. I discuss the implications of these findings for health policy, health equity, and future research.

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Chapter 1. Introduction

In the United States, there is an unequal distribution of the non-medical factors in society which produce health, otherwise known as *the social determinants of health (SDOH)* (Braveman, Egerter, & Williams, 2011; Solar & Irwin, 2010). How the social determinants of health are distributed is shaped by the larger social and political mechanisms that configure social hierarchies in our political institutions and shape cultural and societal values (Solar & Irwin, 2010). Achieving population health equity requires addressing racialized health inequities, or avoidable and unjust differences in health between racialized groups. Race is a socially constructed concept that has been a fundamental element around which people in power have oriented institutions, policies, values, and decision-making (Ford & Airhihenbuwa, 2010; Michener, 2019; Somers, 2010; White, Lawrence, Tchangalova, Huang, & Cummings, 2020). Across communities in the U.S. there are stark racialized inequities in health, where people who identify as Black, Indigenous, Hispanic, or as a person of color are more likely to experience poorer community conditions and health outcomes, compared to their white counterparts (Braveman, 2006). A root cause of these racialized inequities in health and opportunity is structural racism (Bailey et al., 2017). Structural racism is defined as the *"totality of ways in which societies foster racial discrimination through mutually reinforcing systems of housing, education, employment, earnings, benefits, credit, media, health care, and criminal justice. These patterns and practices in turn reinforce discriminatory beliefs, values, and the distribution of resources"* (Bailey et al., 2017). Empirical research indicates structural racism is a root cause of racialized inequities in health outcomes such

as infant mortality, risk of chronic disease, myocardial infarction, depression, and self-rated health (Bailey et al., 2017; O'Brien, Neman, Seltzer, Evans, & Venkataramani, 2020).

Additionally, research has demonstrated that individuals in poor health are less likely to participate politically through voting, signing petitions, and engaging with elected officials, compared to those in better health status (C. L. Brown, Raza, & Pinto, 2020; Burden, Fletcher, Herd, Jones, & Moynihan, 2017). These studies have examined measures of physical and mental well-being such as self-rated health, insurance status, and chronic condition diagnoses (C. L. Brown et al., 2020). Inconsistent research findings indicate that the mechanisms through which health impacts voter turnout and other political behaviors are still unclear. For example, poor health may impact the available resources necessary for an individual to participate, such as income (Pacheco & Fletcher, 2015). However, poor health could prompt an individual to increase their participation in support groups and enhance their social connections, which could lead to more political activity (Gollust & Rahn, 2015). Previous work also demonstrates that health may have different relationships with different political behaviors, such as poor physical health depressing turnout but not other measures of political participation. While poor cognitive function appears to affect measures of political participation, like donating to a campaign (Burden et al., 2017).

The study of health and political participation in the U.S. is increasingly important and complex given the major health inequities that persist across race and income (Baciu,

Negussie, Geller, & Weinstein, 2017). Income is a fundamental driver of health, and low-income populations are generally less healthy and participate in politics at lower levels, compared to those of higher income (Erikson, 2015; Marmot, 2002; Rosenstone, 1982). Yet, few studies of political participation focus exclusively on low-income populations and even fewer of those studies include measures of health. Furthermore, disparities in income are intertwined with race, as Black Americans and American Indians experience drastically lower wages and lower upward economic mobility compared to white Americans (Chetty, Hendren, Jones, & Porter, 2020). Black Americans also experience much higher rates of chronic conditions and premature death than white Americans (Baciu et al., 2017). A recent paper estimated that excess death among Black Americans between 1970 and 2004 compared to white Americans may account for the loss of 1 million votes in the 2004 election, suggesting that health disparities directly impact election outcomes (Rodriguez, Geronimus, Bound, & Dorling, 2015). These disparities in income and health disproportionately experienced among people of color have a profound impact on individuals' everyday life and ability to engage in political activity; this holds critical implications for whose interests are represented in politics.

The limited past research examining structural racism, political participation and health has considered participation as both an indicator of structural racism as well as an outcome. For instance, Lukachko et al. (2014) examined the relationship between political participation, as a measure of structural racism, and self-reported likelihood of a myocardial infarction. The authors measured political participation by estimating the

ratio of Black to white voter turnout at the state-level and the number of Black individuals elected to the state legislature, and found that higher odds of structural racism in the political participation domain was associated with greater odds of myocardial infraction among those who identified as Black (Lukachko, Hatzenbuehler, & Keyes, 2014). Other work has investigated voter suppression as measure of structural racism in the political participation domain (Hing, 2018), however the relationship between structural racism and political participation may be bidirectional, whereby structural racism and its manifestations in society influence how or if individuals and communities participate in the political process. Recent literature has moved beyond examining these measures of structural racism individually, using methodological approaches to incorporate multiple dimensions into one measure that allows researchers to operationalize the multifaceted and interconnected nature of structural racism (Chantarat, Van Riper, & Hardeman, 2021a; Dougherty, Golden, Gross, Colantuoni, & Dean, 2020; Hardeman, Homan, Chantarat, Davis, & Brown, 2022). The connection between the many dimensions of structural racism and political participation requires further research to understand how experiencing structural racism in one's community may impact an individual's decision-making and likelihood of political participation.

This dissertation includes 3 papers with distinct research questions and hypotheses to investigate the relationship between health, racism, and political participation.

Paper 1. Health and Voter Turnout among Low-wage Workers

The first paper examines associations between health and voter turnout in a national election within a sample of low-income workers in two U.S. cities in different regions of the country and to examine the relationship between race and turnout. This paper uses data from the Wages Study, a research study designed to evaluate the impacts of a minimum wage ordinance in Minneapolis. This dataset includes individuals in the case city, Minneapolis, MN, and the control site, Raleigh, NC. The study team sought to recruit a sample of participants who would likely be affected by the minimum wage ordinance, thus the dataset includes participants of relatively low-income compared to surveys with nationally representative samples. Previous work using data from the first wave of the Wages Study, focused on examining voter turnout in local elections and identified statistically significant associations between voter turnout and several health variables including BMI, smoking status, and health insurance (McGuire, Gollust, et al., 2021). Reporting a BMI greater than 30 was associated with lower likelihood of turnout in the last local election (McGuire, Gollust, et al., 2021). Never smoking or quitting, and having health insurance, were both significantly associated with higher likelihood of local voter turnout, compared to those who currently smoked or did not have insurance, respectively (McGuire, Gollust, et al., 2021). This paper focuses on three research questions and tests three hypotheses based on previous research and are outlined below:

(1) Are the health risks found to be associated with local voter turnout within this sample also associated with national election voter turnout within this sample?

Hypothesis 1. I hypothesize higher BMI is associated with reduced likelihood of voter turnout compared to those of lower BMI, in accordance with a previous study on this sample in which BMI was associated with local voter turnout.

Hypothesis 2. I hypothesize being a current smoker is associated with reduced likelihood of voter turnout compared to those who reported quitting or never smoking, in accordance with a previous study on this sample in which smoking status was associated with local voter turnout.

Hypothesis 3. I hypothesize that being uninsured is associated with reduced likelihood of voter turnout, compared to those with health insurance, in accordance with a previous study on this sample in which insurance status was associated with local voter turnout.

(2) Is self-rated health associated with national voter turnout within this sample?

(3) Does the health and voter turnout relationship vary across racial groups?

Paper 2. Community Public Health Conditions and Political Participation

The second paper uses national-level data to examine how the distribution of resources critical to health at the county-level influences citizens' ability to exercise their political rights. I examine associations between county-level public health measures and three individual political behaviors: (1) turnout in the 2018 U.S. midterm election, (2) contacting a public official, and (3) attending a political protest, march, or demonstration. This paper examines three research questions:

(1) Are county-level public health conditions associated with likelihood of individual political participation?

(2) Does the direction of the relationship between county-level public health and political participation vary by the type of participation behavior?

(3) Does the county-level public health and political participation relationship vary across defined racial groups?

Paper 3. Structural Racism and Political Participation

The third paper examines associations between county-level structural racism and individual-level political participation outcomes**.** To my knowledge this will be the first study to examine multiple dimensions of structural racism at the ecological-level as determinants of individual political behavior. This aim will produce knowledge on how the normalized dynamics deeply embedded in the culture of the U.S. that routinely advantage white Americans, impact Americans' ability to participate in democracy (Lawrence & Keleher, 2004). This study will examine how the racialized experiences of Black Americans influence their likelihood of participating politically. This paper examines three research questions and tests two hypotheses:

(1) Is structural racism at the county-level, measured using multiple dimensions, significantly associated with likelihood of political participation in the full population?

(2) Does the direction of the relationship between county-level structural racism and political participation vary by the participation behavior?

(3) What is the relationship between structural racism and political participation within defined racial groups?

Chapter 2. Conceptual model

Figure 1 shows the conceptual model guiding this dissertation. In this model, likelihood of political participation is determined by the larger socioeconomic and political context; social position; spatial position; and, individual-level politically relevant predispositions. The larger socioeconomic and political context in the U.S. includes white supremacy, culture and societal values, federalism, and capitalism. This context creates a cycle of social stratification into social and spatial positions where people experience differential conditions. Social position in society is defined by an individual's race/ethnicity, gender, and class, including education and income. Spatial position refers to an individual's community where they work and live. Spatial position is examined in papers 2 and 3 using measures of county-level public health conditions and county-level structural racism, respectively. There is an arrow from structural racism to community public health condition because structural racism is a root cause of racialized inequities. The social stratification of people into social and spatial positions creates a cycle of differential exposure to poor conditions and health risk, shaping individual-level politically relevant predispositions, including health status, political interest, partisanship, age-related experiences, and racism-related exposures. Paper 1 focuses on examining the connection between health status and the individual-level and voter turnout. In summary, the influence of the larger socioeconomic and political context on social position and

spatial position, shapes individual-level determinants of political participation, ultimately determining political behavior.

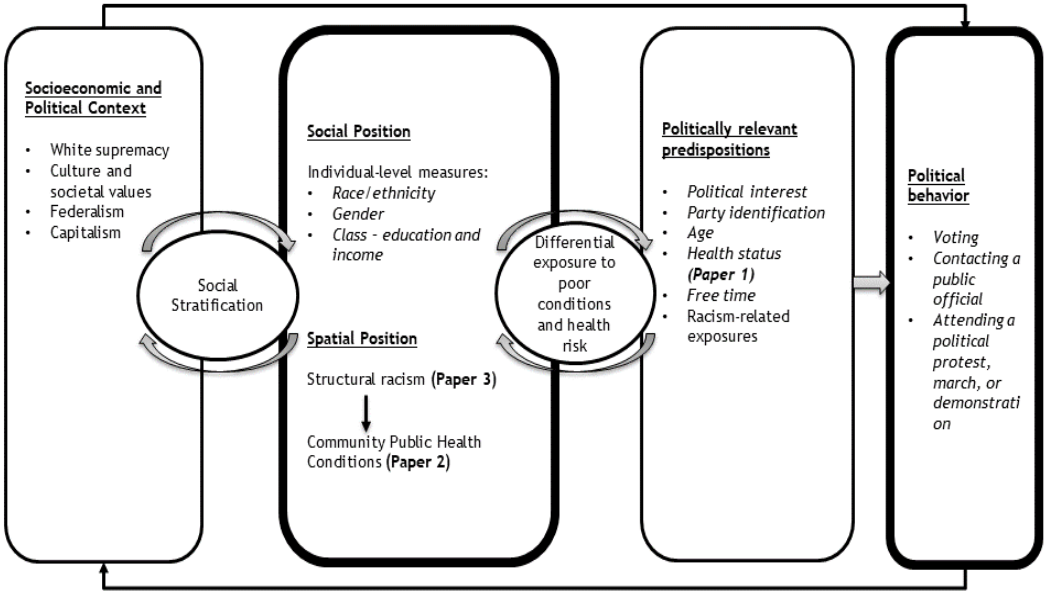

Figure 1. Conceptual Model

This conceptual model was adapted from the Commission on Social Determinants of Health (CSDH) conceptual framework which was published by the World Health Organization (WHO) in 2010 (Solar & Irwin, 2010). The framework was designed to address the complexities of the social production of health (Solar & Irwin, 2010). The adapted conceptual model includes elements from Marshall's theory on citizenship and social class (Marshall, 1950). Similar to Marshall, social position is defined by economic-related characteristics such as an individual's education and income, however, in this model social position is also determined by race/ethnicity and gender (Marshall, 1950). Social stratification into social and spatial positions produces differences in access to

social rights which are necessary for the realization of political rights, measured in this model through three political behaviors (Marshall, 1950).

The conceptual model for this study incorporates tenets of Critical Race Theory and individual-level determinants of political participation identified in previous studies. Critical Race Theory asserts that racism is integrated into society, therefore white supremacy is included in the larger socioeconomic and political context, influencing all of the subsequent boxes (Delgado & Stefancic, 2013). Furthermore, race/ethnicity is included in the social position box to assert that individual's social position is determined by the current racialization of their race/ethnicity in society which is consistent with the tenet of CRT which claims that race is socially constructed (Delgado & Stefancic, 2013). Health status, political interest, party identification, and age have all been identified as key determinants of political participation in previous studies (C. L. Brown et al., 2020; Van Deth, 2015). Next, I will discuss each paper and the measurement of the key independent variables and how they fit into this conceptual model.

Paper 1. Measures of Health Status and Health-related Politically Relevant Predispositions

The key health variables in paper 1 are self-rated health, BMI, smoking status, health insurance status, physical disability, mental disability, food security, housing security, governmental assistance, and stress. These measures were selected based on previous work examining health and voter turnout overall and specifically within this

sample (McGuire, Gollust, et al., 2021; McGuire, Rahn, & Gollust, 2021). I measure health at the individual level using self-rated health, which is a subjective overall measure of health, and across four domains – physical, mental, behavioral, and social. The physical domain includes body mass index (BMI) and physical disability. The mental domain includes one measure of mental health. The behavioral health domain includes smoking status. While the rest of the measures included in paper 1 fall into the social domain, including health insurance status, food security, housing security, governmental assistance, and stress. Further details on the measurement of each of these variables is included in Chapter 3.

Paper 2. Measures of Spatial Position – Community Public Health Conditions

In paper 2, I measure community public health conditions at the county-level across 5 domains: population health; access to health care; behavioral health; environmental health, and; social capital and networks. The population health domain includes measures of poor physical health days, poor mental health days, and adults with BMI ≥30. These are measures of the conditions in which we live. Poor physical health days is a measure of health-related quality of life and indicator for how well people are living within the county and provides insight into the burden of disability and chronic conditions within the population (Andresen, Catlin, Wyrwich, & Jackson-Thompson, 2003; Jia, Muennig, Lubetkin, & Gold, 2004; RWJF, 2020). Poor mental health days is another measure of health-related quality of life and an indicator for the burden of disability and chronic conditions on cognitive health and function (Andresen et al., 2003;

Jia et al., 2004; RWJF, 2020). Adults with BMI ≥30 is a proxy measure for poor diet and limited physical activity, which acts an indicator for food access and opportunities for physical activity available within the county (Pierannunzi, Hu, & Balluz, 2013; RWJF, 2020).

The access to health care domain includes measures of mental health providers and primary care providers. Mental health providers is measured by a ratio which represents the number of individuals who would be served by one provider in the county if the population were equally distributed across providers (RWJF, 2020). Primary care physicians is measured similarly, as the ratio of the county population to physicians if the population were equally distributed (RWJF, 2020). Both of these are key measures of the conditions in which individuals live which may have implications for health and political participation. Even if an individual has insurance it is critical providers are actually available within their area.

The behavioral domain includes measures of excessive drinking and adult smoking. Excessive drinking measures the percentage of the county's population which reports binge or heavy drinking in the last 30 days (RWJF, 2020). Excessive drinking is a risky health behavior which is associated with many poor health outcomes, such as sexually transmitted infections, unintended pregnancy, fetal alcohol syndrome, suicide, interpersonal violence, and motor vehicle crashes (Centers for Disease Control and Prevention (CDC), 2009), and these types of outcomes can shape county-level conditions. Adult smoking measures the percentage of the adult population in the county who

reported both smoking every day or most days and have smoked at least 100 cigarettes in their lifetime (RWJF, 2020). Cigarette smoking is a cause various cancers and cardiovascular disease and smoking measured at the individual-level has been associated with differences in political participation (Albright, Hood, Ma, & Levinson, 2016).

The environmental domain includes measures of air pollution-particulate matter and drinking water violations. Air pollution measures the average daily density of fine particulate matter in micrograms per cubic meter (RWJF, 2020). Air pollution and particulate matter is associated with negative health outcomes, like asthma (Rückerl, Schneider, Breitner, Cyrys, & Peters, 2011). These particles may be emitted from power plants, automobiles, and forest fires, other sources (RWJF, 2020). Drinking water violations is a dichotomous indicator of whether or not within the county at least one community water system received at minimum one health-based violation (RWJF, 2020). Both of these measures are indicators of county-level conditions but also government investment in resources to minimize air pollution and maintain water systems.

The social capital and networks domain includes measures of violent crime, social associations, and severe housing problems. Violent crime is a measure number of violent crimes reported per 100,000 residents in the county. Violent crime effects both physical and psychological well-being (Ellen, Mijanovich, & Dillman, 2001; RWJF, 2020). Exposure to violent crime may increase stress or inhibit people from engaging in healthy behaviors, such as exercising (Johnson et al., 2009; RWJF, 2020). Social associations measures the number of membership associations, like sports, political, civic, and

professional organizations, per 10,000 residents in the county (RWJF, 2020). Involvement in community life and social networks helps build social capital and these factors are associated with positive health outcomes (Ichiro Kawachi, Subramanian, & Kim, 2008). Severe housing problems is a measure of the percentage of households in the county with at least 1 of 4 housing problems: lack of kitchen facilities, lack of plumbing facilities, overcrowding, high housing costs (RWJF, 2020). Housing is essential for good health and poor housing is associated with numerous negative health outcomes, including asthma, injury, and poor childhood development (RWJF, 2020; M. Shaw, 2004). In addition, the financial strain associated with high housing costs creates additional risk and stress (Braveman, Dekker, Egerter, & Sadegh-Nobari, 2011; RWJF, 2020). The variables in the social capital and networks domain are indicators of safety, whether there are opportunities to engage in community life, and whether community members have healthy homes. Violent crime is an indicator of county-level conditions and provides some insight into whether counties are allocating resources to keep neighborhoods safe, for example allocating resources towards therapy for offenders, crime deterrent strategies, and community policing (RWJF, 2020). Social associations is an indicator of the opportunities available in a county to build social trust with others in their community through voluntary organizations (RWJF, 2020). The measure of social associations also provides insight into how county-level resources are being invested in communities to build social support. Severe housing problems provides insight on which counties are investing resources into creating healthy homes and affordable housing. Severe housing problems is also an indicator of the conditions in which people in the county live, without

secure housing it is likely difficult for community members to connect with neighbors, which has implications for likelihood of political participation.

Paper 3. Measures of Spatial Position – Structural Racism

In paper 3, I measure structural racism at the county-level across 5 domains – education, employment, wealth, income, and spatial distribution. The education domain is operationalized through examining Black-white education inequity, measuring the ratio of white to Black college education rates among those aged 25 years and over. The employment domain is operationalized by examining Black-white employment inequity, measuring the ratio of white to Black employment rates among the civilians in the labor force aged 16 to 64 years. The wealth domain is operationalized by measuring Black-white homeownership inequity using the ratio of white to Black homeownership rates. The income domain is operationalized using Black-white income inequity, measured using the Index of Concentration at the Extremes (ICE). Finally, the spatial distribution domain is operationalized by measuring Black-white residential segregation using the index of dissimilarity.

Chapter 3. Health and Voter Turnout among Low-wage Workers

3.1 Introduction

People living in the U.S. experience avoidable systemic differences in health outcomes and conditions. People racialized as Black, Latinx, Indigenous, and other individuals of color experience worse health and more diagnoses of health conditions. Recent literature has focused on the connection between health and health conditions and

political participation, defined as any activity citizens engage in to affect politics (Van Deth, 2015). There are two main hypotheses among scholars to explain the relationship between health and political participation: (1) the health gap hypothesis, and (2) the politicization hypothesis. The health gap hypothesis "assumes there is a positive relationship between a person's health and the quantity of their political involvement" (Anderson, Hagemann, & Klemmensen, 2021). This hypothesis suggests that if someone has more health resources – physical, cognitive, social, or emotional – this promotes participation in politics (Anderson et al., 2021). In contrast, the politicization hypothesis assumes there is a relationship between the experience of being in poor health, social identity, and political participation, where those in poor health may develop a social identity or shared experience with others related to their health condition. This social identity or shared experience may then motivate those in poor health or those with experience of specific health conditions to mobilize to make their voices heard in politics (Anderson et al., 2021). Previous research has tested the relationship between political participation and several domains and measures of health, such as chronic health conditions, health insurance, and smoking (Gollust & Rahn, 2015; McGuire, Gollust, et al., 2021; McGuire, Rahn, et al., 2021). Literature using large national-level datasets consistently indicates that being in poor health, measured subjectively (e.g. self-rated health) is associated with lower likelihood of voter turnout (Denny & Doyle, 2007; Gagné, Schoon, & Sacker, 2019; Mattila, Söderlund, Wass, & Rapeli, 2013; McGuire, Rahn, et al., 2021; Pacheco & Fletcher, 2015). However, not much is known about the

relationship between subjective health and political participation specifically among citizens who are low-income or politically marginalized.

This relationship between health and political participation among citizens in the U.S. is further complicated by the stark racialized inequalities in resources including wealth and income across communities. Income is a fundamental driver of health, and low-income populations are generally less healthy and participate in politics at lower levels, compared to those of higher income (Erikson, 2015; Marmot, 2002; Rosenstone, 1982). Yet, few studies of political participation focus exclusively on low-income populations and even fewer of those studies include measures of health. Furthermore, disparities in income are intertwined with race, as Black Americans and American Indians experience drastically lower wages and lower upward economic mobility compared to white Americans (Chetty et al., 2020). Black Americans also experience much higher rates of chronic conditions and premature death than white Americans (Baciu et al., 2017). A recent paper estimated that excess death among Black Americans between 1970 and 2004 compared to white Americans may account for the loss of 1 million votes in the 2004 election, suggesting that health disparities directly impact election outcomes (Rodriguez et al., 2015). These disparities in income and health disproportionately experienced among people of color have a profound impact on individuals' everyday life and ability to engage in political activity; this holds critical implications for whose interests are represented in politics.

A person's income may be connected to their likelihood of political participation through several different pathways. For instance, inequity in income can lead to individuals being excluded from political activities that require money, such as donating to a campaign or paying for transportation to the polls to cast a vote (Slavina, 2020). One's income also influences their social interactions, social networks, and cultural disposition which impacts how comfortable they may feel participating politics (Slavina, 2020). Furthermore, as mentioned above income intersects with other individual-level characteristics, including gender and racialization, which influence and produce political activity (Bourdieu & Nice, 1986; Harrits, 2013; Slavina, 2020). Research focusing on income inequality using national-level data from the Cooperative Congressional Election Study (CCES) and the American National Election Studies (ANES) on the 2012 and 2016 US general elections, indicates that poor health significantly reduces likelihood of voter turnout among low-income individuals, but among high income individuals this effect is not as strong (Lyon, 2021). Additionally, research is necessary to understand how poor health conditions and low-income may influence likelihood of voter turnout across different racial groups, specifically Black Americans.

As previously noted, people of color and other marginalized groups generally experience worse health outcomes and community conditions compared to the majority group. Research examining the connections between income, political participation, and racialization in the U.S. indicates that people racialized as Black are less likely to turnout to vote compared to those who identify as white, and this relationship may vary based on the political context of the election (Canon, 2020). However, despite the overall

disparities in participation between individuals racialized as Black and those who identify as white, evidence using electoral data from 2006-2016 indicates that Black, Latino, and Asian American citizens that are young, low-income, or less educated are more likely to turnout compared to their white counterparts (Canon, 2020). Additionally, other research also shows that low-income people who identify as Black tend to turn out more than low-income people who identify as white, suggesting that the effect of income on turnout among those racialized as Black is different than those who identify as white (Fraga, 2018). Further research is necessary to better understand these connections between low-income, racialization, and political participation.

Research focusing on the intersection between racism, health, and voter turnout suggests there are several key reasons why the relationship between health and turnout may vary by racialization including structural racism, trust in government, political efficacy, political hypervigilance, neighborhood conditions, and carceral contact, among other factors (C. J. Cohen & Dawson, 1993; Davis, 2021; Mangum, 2003; McGregor, Bogart, Higgins-Biddle, Strolovitch, & Ojikutu, 2019; T. C. Shaw, Foster, & Combs, 2019). Many of these factors also impact an individual's health, for instance, structural racism or the interconnected inequitable systems such as housing, education, and criminal justice, which foster racial discrimination and perpetuate discriminatory beliefs and values that impact the distribution of resources and health risks (Bailey et al., 2017; O'Brien et al., 2020), is a root cause of racialized health disparities in mortality and myocardial infarction (Lukachko et al., 2014).

The purpose of this paper is to examine associations between health and voter turnout in a national election within a sample of low-income workers in two U.S. cities in different regions of the county and to examine the relationship between racialization of turnout. This paper uses data from the Wages Study, a research study designed to evaluate the impacts of a minimum wage ordinance in Minneapolis. This dataset includes individuals in the case city, Minneapolis, MN, and the control site, Raleigh, NC. The study team sought to recruit a sample of participants who would likely be affected by the minimum wage ordinance, thus the dataset includes participants of relatively low-income compared to surveys with nationally representative samples. Previous work using data from the first wave of the Wages Study, focused on examining voter turnout in local elections and identified statistically significant associations between voter turnout and several health variables including BMI, smoking status, and health insurance (McGuire, Gollust, et al., 2021). Reporting a BMI greater than 30 was associated with lower likelihood of turnout in the last local election (McGuire, Gollust, et al., 2021). Never smoking or quitting, and having health insurance, were both significantly associated with higher likelihood of local voter turnout, compared to those who currently smoked or did not have insurance, respectively (McGuire, Gollust, et al., 2021).

This paper focuses on three research questions and tests three hypotheses based on previous research and are outlined below:

(2) Are the health risks found to be associated with local voter turnout within this sample also associated with national election voter turnout within this sample?

Hypothesis 1. I hypothesize higher BMI is associated with reduced likelihood of voter turnout compared to those of lower BMI, in accordance with a previous study on this sample in which BMI was associated with local voter turnout.

Hypothesis 2. I hypothesize being a current smoker is associated with reduced likelihood of voter turnout compared to those who reported quitting or never smoking, in accordance with a previous study on this sample in which smoking status was associated with local voter turnout.

Hypothesis 3. I hypothesize that being uninsured is associated with reduced likelihood of voter turnout, compared to those with health insurance, in accordance with a previous study on this sample in which insurance status was associated with local voter turnout.

(2) Is self-rated health associated with national voter turnout within this sample?

(3) Does the health and voter turnout relationship vary across racial groups?

This study will fill gaps in the literature on health and political participation by identifying key health drivers of political participation among low-wage workers which can inform future research and efforts to address low voter turnout among this group. This study builds on previous work examining local voter turnout within this sample. Those of lower income generally participate in politics at lower levels compared to those of higher income, therefore identifying drivers or barriers to political participation among this sample is important for promoting equal access to opportunities to participate and equitable representation in politics.

3.2 Methods

Data

The data for this paper comes from a larger study designed to evaluate the minimum wage ordinance in Minneapolis, MN. The key outcome variable used in this study was collected during the second wave of this study during July 2019-January 2020 and includes 651 participants in Minneapolis, MN and in the comparison city Raleigh, NC. The key outcome variable asked participants: *Did you vote in the last general election, like for state representatives, senators and president?* Response options included yes or no and participants had the option of skipping any questions they were uncomfortable answering.

The key explanatory variables in this study come from the Wave 1 collection of the data that included 974 participants. I elected to use the health data collected in Wave 1 because this data was collected in from February to October in 2018 and would therefore be more reflective of participants' health at the time when the voting occurred, rather than using the Wave 2 health data which was collected in 2019. The key health variables in this study are self-rated health, BMI, smoking status, health insurance status, physical disability, mental disability, food security, housing security, governmental assistance, and stress based on previous work examining health and voter turnout overall and specifically within this sample (McGuire, Gollust, et al., 2021; McGuire, Rahn, et al., 2021). Self-rated health is a subjective measure of overall health and well-being which has been shown to be associated with voter turnout in the United States in previous work,

and was categorized into 3 groups for analysis (1 = Excellent/Very good, 3 = Good, 4 = Fair/Poor). The study team assessed body mass index (BMI) through calculations based on anthropometric measures of participants' height and weight by the research team. Smoking status is measured through one survey item that asks participants their smoking status; response options included "Current smoker"; "Quit less than 12 months ago"; "Quit more than 12 months ago"; and, "Never smoked"; this item was collapsed to be dichotomous (0 = Current Smoker, 1 = Never smoked/Quit). Participants' health insurance status is measured using a survey item that asks participants "What type(s) of health insurance/health coverage do you currently have?" Response were categorized into seven groups (1 = Uninsured, 2 = Medicaid, 3 = Employer, 4 = Other, 5 = Healthcare.gov, 6 = Medicare, 7 = Veterans Affairs). Participant responses were categorized to create a dichotomous variable indicating those who reported having health insurance and those who are uninsured (0 = Uninsured, 1 = Health insurance).

Both of the physical and mental disability items assume the participant can perform some amount of work but may be limited due to their condition, because these survey items to measure physical and mental disability were specifically designed for the larger study, assessing the effects of the minimum wage ordinance. The survey item assessing physical disability asked participants: "Do you have a physical health condition or disability that affects the number of hours of work you perform in a week?" (0 = No, 1 = Yes). Mental health is measured using one survey item asking participants: "Do you have mental health condition or disability that affects the number of hours of work you perform in a week?" (0 = No, 1 = Yes). The 6-item United States Department of

Agriculture (USDA) survey instrument was used to measured food security and categorized as “high food security”; “low food security”; or, “very low food security” (USDA ERS, 2012).

I measured housing insecurity using three survey items, that is selected based on previous research measuring basic needs (Goldrick-Rab, Richardson, & Kinsley, 2018): (1) “In the last year (12 months), was there a time when you were not able to pay the mortgage or rent on time?” (0 = No, 1 = Yes); (2) “In the last year (12 months), was there a time when you did not have a steady place to sleep or slept in a shelter (including now)?” (0 = No, 1 = Yes); and, 93) “In the last year (12 months), how many places have you lived?” Participants had the option of choosing zero, one, two, three, or more than three placed lived in the last year. Responses indicating that a participant lived in zero, three, or more than three places in the last year were categorized as “1=Yes” or housing insecure, while all other response were coded as “0=No” or housing secure. Participants who indicated “Yes” for any of the 3 survey items were categorized as housing insecure (0 = Housing secure, 1 = Housing insecure). I measure if participants use any form of governmental assistance using 5 survey items under the prompt: “In the last month (30 days) did you or anyone in your household receive any of the following?”. Participants could respond “Yes”, “No”, and “Not Sure” for the items under the prompt including: (1) Women, Infants, and Children program (WIC); (2) Food stamps (SNAP); (3) Free or reduced price school lunch; (4) Minnesota Family Investment Program (MFIP, Cash Assistance, Childcare Assistance); and, (5) State housing subsidy, (e.g., Bridges Housing Subsidy, HUD Rental Assistance, Section 8 Housing, Public Housing, Section 42

Housing). Participants who indicated “Yes” to any of the 5 options, reporting that they used one of the following services were categorized as using governmental assistance (0 = No, 1 = Yes). I measured stress using the Perceived Stress Scale 4 (PSS4), a validated measure using four survey items (S. Cohen, Kamarck, & Mermelstein, 1983). Stress was categorized into three groups: low (0–6), medium (7–8), and high (9–15).

Race or how a participant is racialized in society is measured using a survey item which asked participants to self-report their race; response options include American Indian/Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; white; Other. Due to few responses in some categories and limited sample size, this item was grouped into to three categories – white, Black, or People of Color (POC). The third racial category includes those who identified as Black and also participants who identified as American Indian/Alaska Native; Asian; Native Hawaiian or Other Pacific Islander, or Other. I elected to use these three groups so that I can make inferences about the relationship between health and political participation that are specific to the low-income Black participants in this sample who have a distinct shared history of oppression and poor health conditions. Due to low sample size, I am unable to have a large enough sample to make similar inferences about the other distinct racialized groups in this sample, so I created a third category (POC), that includes all the participants who reported identifying as a person of color.

I included several other demographic variables that were shown to be associated with voter turnout in previous studies(McGuire, Gollust, et al., 2021; McGuire, Rahn, et

al., 2021). Participants were asked to report the city in which they work (0 = Minneapolis, 1 = Raleigh). The amount of time participants spend working per week is measured using a survey item asking participants the usual number of hours worked during the week; if participants reported two jobs the hours reported for each job were summed for a total number of hours worked per week. Working time per week is included as a continuous variable. I measure participants household income using a survey item that asks participants their annual household income last year, before taxes. The response options included "Less than $5,000"; "$5,001 to $10,000"; "$10,001 to $20,000"; "$20,001 to $30,000"; "$30,001 to $40,000"; "$40,001 to $50,000"; "More than $50,000." I collapsed this variable into four categories (0 = ≤$5,000, 1 = $5,001 to $10,000, 2 = $10,001 to $20,000, 3 = >$20,000). I measure education attainment with a survey item that asks participants the highest grade or level of school they have completed. Participant response options include "less than high school"; "some high school; "high school diploma"; "associate/technical degree"; "some college"; "bachelor's degree"; "graduate degree." Responses were grouped into three categories for analysis (0 = Less than high school, 1 = High school degree or some college, 2 = Associate's/Technical/Bachelor's degree or more). Participants' age is measured with a survey item asking participants to report their age in years; this item was grouped into three categories (0 = 18–29, 1 = 30–49, 2 = 50+). Participants were asked to indicate their sex using a survey item with three response options including: "Male", "Female", and "Non-binary". This variable was collapsed to be dichotomous, due to few responses in the non-binary category (0 = Male, 1 = Female). Responses in the non-binary category

were coded as missing. Participants' marital status is measured with a survey item asking their status (0 = Married/partnered, 1 = Single). After accounting for all missing variables on the outcome and all covariates 495 observations remained.

Analysis

I computed descriptive statistics reporting the prevalence of each characteristic within the analytic sample and examined how the prevalence of each characteristic in my sample varied by racial group using chi-squared tests. I estimated bivariate logistic regression models with voter turnout for each covariate to examine the association between each characteristic and voter turnout individually, within the Black/white sample and within the POC/white sample. Then I employed a multivariate logistic regression model for each analytic sample to estimate likelihoods of voter turnout in the 2018 U.S. midterm election with the key independent variables being measures of health. These models controlled for annual household income, age, sex, educational attainment, marital status, racialization, and city of employment. I estimated whether the health and voter turnout relationship varied across racial groups by using multivariate logistic regression models stratified by racial group (i.e. Black, POC, and white). For each multivariate logistic regression model, I produced the marginal effects or predicted probabilities of turnout and estimated the difference in marginal effects relative to the comparison group. I also estimated models fully interacted with the race indicator variable. I checked the data for multicollinearity issues by estimating variance inflation factors (VIFs).

Results

Table 1 shows the descriptive statistics including the prevalence of each characteristic within the analytic sample, overall, and by racial group (i.e. white, Black, and POC). Results reported with the p-value indicate there was a statistically significant difference between the racial groups. Within the analytic samples the prevalence of voter turnout is about 68%. Among participants identifying as Black, voter turnout is about 71%, while it is 68% among those who identified as white and 68% including all participants categorized as a person of color. The majority of participants in the sample are 30 years old or older (74%), have a high school degree or less (54%), identify as female (62%), single (87%), identified as Black (75%), have a household income of less than $20,000 per year (75%). Within the analytic sample about 63% of respondents who identified as white live in Minneapolis and about 37% in Raleigh, while 38% of participants racialized as Black live in Minneapolis and 62% in Raleigh ($p<0.001$). The majority of white participants reported their highest level of school completed as an associate's, technical degree, bachelor's degree or higher (53%), while the majority of participants racialized as Black indicated their highest level of school completed as a high school degree or less ($p<0.001$).

Table 1. Prevalence of characteristics in analytics sample by racial/ethnic group.

	Racial Group					
Characteristic	White (n=97)	Black (n=369)	p-value	Black/Hispanic/ Asian/Other (POC) (n=398)	p-value	All (n=495)
	%	%		%		%
Voter Turnout						
No	32	29		32		32
Yes	68	71		68		68
			p=0.606		p=0.955	
City						
Minneapolis	63	38		40		45
Raleigh	37	62		60		55
			p < 0.001		p < 0.001	
Age						
18–29	20	29		29		27
30–49	43	39		39		40
50+	37	33		33		34
			p = 0.213		p = 0.196	
Educational Attainment						
High school degree or less	31	60		59		54
Some college	17	11		10		12
Associates, technical degree, bachelor's degree or higher	53	30		31		34
			p < 0.001		p < 0.001	
Sex						
Male	36	39		39		38
Female	64	61		61		62
			p = 0.563		p = 0.603	
Marital Status						

Married/Partnered	19	11		11		13
Single	81	89		89		87
			p = 0.050		p = 0.055	
Working Time						
Mean hours per week	29	33		32		
			p = 0.025		p = 0.027	
Household Income						
Less than $5,000	21	22		23		22
$5,001 to $10,000	18	25		26		24
$10,001 to $20,000	33	29		28		29
More than $20,000	29	24		23		24
			p = 0.384		p = 0.284	
Self-rated Health						
Excellent/Very Good	23	30		29		28
Good	51	40		39		42
Fair/Poor	27	31		31		30
			p = 0.154		p = 0.133	
BMI						
<25 Underweight/Normal	26	25		25		25
>=25 =<30 Overweight	34	23		23		25
>30 Obesity	40	52		53		50
			p = 0.051		p = 0.039	
Smoking Status						
Current smoker	55	50		51		52
Never smoked/Quit	45	50		49		48
			p = 0.430		p = 0.521	
Health Insurance Status						
Uninsured	21	27		26		25
Health insurance	79	73		74		75
			p = 0.231		p = 0.305	
Physical Disability						
No	80	87		87		86
Yes	20	13		13		14
			p = 0.100		p = 0.100	
Mental Health						

No	79	90		89		87
Yes	21	10		11		13
			p = 0.003		p = 0.012	
Food Security						
High food security	26	25		26		26
Low food security	32	33		33		33
Very low food security	42	42		41		41
			p = 0.978		p = 0.971	
Housing Insecurity						
No	41	26		27		30
Yes	59	74		73		70
			p = 0.003		p = 0.007	
Governmental Assistance						
No	44	37		36		37
Yes	56	63		64		63
			p = 0.195		p = 0.114	
Stress						
Low	34	38		38		37
Medium	37	37		37		37
High	29	26		25		26
			p = 0.718		p = 0.703	

Notes: Table displays the unadjusted column percentages or means with p-values and the results from a t-test or chi-squared test where appropriate comparing white and Black participants and then white and all POC participants.

Focusing on the measures of health and health-related factors included in this study, about 28 percent of participants reported being in excellent or very good health, about 42 percent reported being in good health, and about 30 percent reported being in fair or poor health. About half or more participants have a BMI greater than 30 (50%), are current smokers (52%), and have health insurance (74%). About 14% of participants reported have a physical disability that affects the number of hours of work they perform in a week. Among participants racialized as Black, 10% of participants reported having a

mental health condition or disability that affects the number of hours of work they perform in a week, while 21% of white participants indicated having a mental health condition or disability ($p=0.003$). In the overall analytic sample, 26% of participants indicated high food security, 33% indicated low food security, and 41% indicated very low food security. Among participants who identified as white, about 59% were categorized as housing insecure, while among participants racialized as Black about 74% were categorized as housing insecure ($p=0.003$). In the overall sample, about 63% of participants reported using at least one of the governmental assistance programs we asked about in the survey. About 37% of participants were categorized as low stress, 37 percent as medium stress, and 26% as high stress.

Table 2 shows the association between each covariate and the outcome using bivariate logistic regression models to estimate likelihood of voter turnout. Results indicated that known determinants of voter turnout, age and education, were both positively and significantly associated with likelihood of voter turnout. Participants who identified as female were significantly more likely to report turning out to vote, compared to participants who identified as male ($p<0.001$). Among the health variables, self-rated health was not associated with voter turnout within this sample. However, within the sample including only those who identified as Black or white, I did find statistically significant associations with turnout and participants having a BMI greater than 30 ($p=0.025$), never smoking or quitting ($p<0.001$), having health insurance ($p=0.023$), and using governmental assistance ($p=0.033$), compared to their respective comparison group in the bivariate models. I did not find a significant association with higher turnout and

participants reporting a physical disability, however reporting a mental health condition or disability was significantly associated with lower likelihood of voter turnout among the sample including only Black and white identifying participants ($p=0.011$). Within the broader sample including all participant groups (i.e., POC and white sample), reporting a mental health condition or disability marginally significant and negative association was found ($p=0.056$). Food insecurity, housing insecurity, and stress were not significantly associated with turnout in the bivariate logistic regression models in either sample. Finally, participants reporting using any of the forms of government assistance asked about in this survey was significantly and positively associated with voter turnout among respondents identifying as Black or white ($p=0.033$).

Table 2. Associations with voter turnout from individual bivariate logistic regression models.

	Black/white Sample (n=466)		POC/white Sample (n=495)	
Characteristic	Coefficient (se)	p-value	Coefficient (se)	p-value
City (ref=Minneapolis)				
Raleigh	0.29 (0.20)	0.150	0.30 (0.19)	0.125
Age (ref=18–29)				
30–49	0.61 (0.24)	0.013	0.65 (0.23)	0.006
50+	0.55 (0.31)	<0.001	1.02 (0.25)	<0.001
Educational Attainment (ref= High school degree or less)				
Some college	1.23 (0.40)	0.002	1.16 (0.38)	0.003
Associates, technical degree, bachelor's degree or higher	0.54 (0.22)	0.016	0.43 (0.21)	0.044
Sex (ref=Male)				
Female	0.78 (0.21)	<0.001	0.69 (0.20)	<0.001
Marital Status (ref=Married/Partnered)				
Single	-0.46 (0.33)	0.164	-0.45 (0.31)	0.151
Race (ref=Black or POC)				
white	-0.13 (0.25)	0.606	-0.01 (0.24)	0.955
Working Time (minutes)	-0.01 (0.01)	0.406	-0.01 (0.01)	0.304
Household Income (ref= Less than $5,000)				
$5,001 to $10,000	-0.05 (0.28)	0.864	0.03 (0.27)	0.922
$10,001 to $20,000	0.42 (0.28)	0.125	0.40 (0.26)	0.123
More than $20,000	1.56 (0.35)	<0.001	1.63 (0.34)	<0.001
Self-rated Health (ref= Excellent/Very Good)				
Good	0.00 (0.25)	0.989	0.07 (0.24)	0.787
Fair/Poor	-0.36 (0.26)	0.170	-0.41 (0.25)	0.102
BMI (ref=<25 Underweight/Normal)				
>=25 =<30 Overweight	0.25 (0.28)	0.357	0.34 (0.27)	0.201
>30 Obesity	0.55 (0.24)	0.025	0.53 (0.23)	0.023
Smoking Status (ref=Current smoker)				
Never smoked/Quit	0.75 (0.21)	<0.001	0.72 (0.20)	<0.001

Health Insurance Status (ref= Uninsured)				
Health insurance	0.51 (0.22)	0.023	0.50 (0.22)	0.022
Physical Disability (ref=No)				
Yes	-0.24 (0.28)	0.385	-0.18 (0.27)	0.495
Mental Health (ref=No)				
Yes	-0.74 (0.29)	0.011	-0.52 (0.27)	0.056
Food Security (ref=High food security)				
Low food security	0.29 (0.27)	0.275	0.33 (0.25)	0.193
Very low food security	0.04 (0.25)	0.865	0.09 (0.24)	0.701
Housing Insecurity (ref=No)				
Yes	-0.28 (0.23)	0.216	-0.18 (0.21)	0.406
Governmental Assistance (ref=No)				
Yes	0.44 (0.21)	0.033	0.37 (0.20)	0.063
Stress (ref=Low)				
Medium	-0.13 (0.24)	0.587	-0.09 (0.23)	0.677
High	-0.20 (0.26)	0.434	-0.16 (0.25)	0.509

Notes: Table displays the results from individual bivariate logistic regression analyses for each demographic variables and key health variables. Table shows logit coefficients, standard errors in parentheses, and p-values.

Table 3 shows results from the multivariate logistic regression models. In the multivariate model, including participants racialized as white or Black, smoking status was significantly associated with voter turnout, indicating that those participants who never smoked or quit were about 10 percentage points more likely to report voter turnout, compared to current smokers (p=0.015). I did not find any statistically significant associations between voter turnout and several other key health measures in this study, including self-rated health, BMI, and health insurance status, physical disability, mental health, food security, housing insecurity, and stress. However, I did find that participants who reported using any of the forms of governmental assistance asked about in this

survey were about 10 percentage points more likely to report turning out to vote in the last general election, like for state representatives, senators and president, compared to those using none of these forms of assistance ($p=0.019$). Consistent with previous work on voter turnout, age did significantly predict likelihood of voter turnout, as those in the older age categories were significantly more likely to report turning out to vote. Participants reporting a household income of $20,000 or more were significantly more likely to report voter turnout, compared to those with a household income of $5,000 or less ($p<0.001$).

Table 3. Associations with voter turnout from two multivariate logistic regression models.

	Black/white Sample (n=466)				POC/white Sample (n=495)			
	Coef. (se)	p-value	Marginal effect	p-value	Coef. (se)	p-value	Marginal effect	p-value
City (ref=Minneapolis)								
Raleigh	0.48 (0.29)	0.095	0.08	0.092	0.51 (0.27)	0.111	0.09	0.055
Age (ref=18–29)								
30–49	0.88 (0.29)	0.002	0.15	0.002	0.87 (0.27)	0.001	0.15	0.001
50+	1.09 (0.33)	0.001	0.18	0.001	1.15 (0.31)	<0.001	0.20	<0.001
Educational Attainment (ref= Less than high school degree)								
High school degree or some college	0.83 (0.46)	0.074	0.14	0.071	0.66 (0.44)	0.161	0.12	0.129
Associate's, technical degree, or bachelor's degree or higher	0.39 (0.27)	0.147	0.07	0.144	0.21 (0.25)	0.200	0.04	0.412
Sex (ref=Male)								
Female	0.80 (0.26)	0.002	0.13	0.001	0.70 (0.24)	0.002	0.12	0.003
Marital Status (ref=Married/Partnered)								
Single	-0.36 (0.38)	0.345	-0.06	0.343	-0.27 (0.35)	0.496	-0.05	0.439
Race (ref=Black or POC)								
white	-0.35 (0.38)	0.251	-0.06	0.248	-0.22 (0.30)	0.454	-0.04	0.464
Working Time (minutes)	-0.02 (0.01)	0.048	0.00	0.045	-0.02 (0.01)	0.037	0.00	0.035
Household Income (ref= Less than $5,000)								
$5,001 to $10,000	-0.21 (0.32)	0.520	-0.03	0.520	-0.06 (0.30)	0.768	-0.01	0.856
$10,001 to $20,000	0.03 (0.32)	0.926	0.00	0.926	0.11 (0.31)	0.641	0.02	0.730
More than $20,000	1.50 (0.41)	<0.001	0.25	<0.001	1.63 (0.39)	<0.001	0.28	<0.001
Self-rated Health (ref= Excellent/Very Good)								
Good	-0.09 (0.30)	0.752	-0.02	0.751	-0.07 (0.28)	0.743	-0.01	0.799
Fair/Poor	-0.25 (0.34)	0.463	-0.04	0.462	-0.45 (0.32)	0.124	-0.08	0.155

BMI (ref=<25 Underweight/Normal)								
>=25 =<30 Overweight	-0.12 (0.33)	0.716	-0.02	0.716	-0.04 (0.31)	0.941	-0.01	0.897
>30 Obesity	-0.03 (0.30)	0.907	-0.01	0.907	-0.02 (0.28)	0.958	0.00	0.941
Smoking Status (ref=Current smoker)								
Never smoked/Quit	0.59 (0.25)	0.017	0.10	0.015	0.54 (0.23)	0.035	0.09	0.018
Health Insurance Status (ref= Uninsured)								
Health insurance	0.48 (0.30)	0.116	0.08	0.113	0.53 (0.29)	0.085	0.09	0.066
Physical Disability (ref=No)								
Yes	-0.17 (0.39)	0.657	-0.03	0.657	-0.15 (0.37)	0.773	-0.03	0.685
Mental Health (ref=No)								
Yes	-0.73 (0.40)	0.067	-0.12	0.063	-0.53 (0.37)	0.143	-0.09	0.152
Food Security (ref=High food security)								
Low food security	0.36 (0.33)	0.270	0.06	0.267	0.40 (0.31)	0.171	0.07	0.186
Very low food security	0.33 (0.34)	0.341	0.05	0.339	0.35 (0.32)	0.250	0.06	0.271
Housing Insecurity (ref=No)								
Yes	-0.27 (0.31)	0.379	-0.05	0.377	-0.19 (0.29)	0.574	-0.03	0.514
Governmental Assistance (ref=No)								
Yes	0.59 (0.26)	0.021	0.10	0.019	0.49 (0.24)	0.047	0.09	0.042
Stress (ref=Low)								
Medium	0.05 (0.29)	0.871	0.01	0.871	0.09 (0.27)	0.803	0.02	0.741
High	-0.07 (0.34)	0.824	-0.01	0.824	0.00 (0.32)	0.997	0.00	0.993
Constant	-0.70 (0.73)	0.334			-0.98 (0.68)	0.078		

Notes: Table displays the results from two multivariate logistic regression models, one for white and Black respondents and one for white and all POC respondents. Table shows coefficients, standard errors in parentheses, the marginal effect, and p-value.

Table 4 shows results from three multivariate logistic regression models, one for each racial group. In the models stratified by racial group, among participants who identified as white, those who reported having health insurance were about 35 percentage points more likely to report turning out to vote compared to those who are uninsured (p=0.010). I did not find any other significant associations between voter turnout and the key health variables among those racialized as white. Among those racialized as Black, there was a statistically significant relationship between receiving any governmental assistance and likelihood of voter turnout among those racialized as Black. Those who reported receiving assistance were about 14 percentage points more likely to report voter turnout, compared to participants who did not report using any of these forms of assistance (p=0.003). I did not find any other statistically significant relationships between voter turnout and the key health variables in this study among participants who identified as Black.

Additionally, I estimated multivariate logistic regression models fully interacted with each racial category and in both of the samples (i.e. Black/white and POC/white) (Full models in Appendix A) and the results from a Wald test indicate that the addition of the interaction terms did significantly improve the fit of the model (p=0.006), however the likelihood ratio test was not statistically significantly (p=0.054).

Table 4. Associations with turnout from three multivariate logistic regression models stratified by racial/ethnic group.

	Racial/Ethnic Group											
	White (n=97)				Black (n=369)				POC (n=398)			
	Coef. (se)	p-value	Marginal effect	p-value	Coef. (se)	p-value	Marginal effect	p-value	Coef. (se)	p-value	Marginal effect	p-value
City (ref=Minneapolis)												
Raleigh	-1.14 (1.05)	0.276	-0.12	0.268	0.65 (0.34)	0.055	0.11	0.051	0.67 (0.31)	0.030	0.12	0.026
Age (ref=18–29)												
30–49	2.59 (1.15)	0.025	0.28	0.012	0.72 (0.33)	0.026	0.12	0.023	0.72 (0.30)	0.017	0.13	0.014
50+	2.45 (1.34)	0.069	0.27	0.048	1.13 (0.39)	0.004	0.18	0.002	1.19 (0.36)	0.001	0.21	0.001
Educational Attainment (ref= Less than high school degree)												
High school degree or some college	1.50 (1.34)	0.261	0.16	0.248	0.57 (0.54)	0.291	0.09	0.288	0.41 (0.50)	0.410	0.07	0.409
Associate's, technical degree, or bachelor's degree or higher	0.07 (1.01)	0.941	0.01	0.941	0.26 (0.31)	0.401	0.04	0.400	0.06 (0.28)	0.832	0.01	0.832
Sex (ref=Male)												
Female	0.14 (0.83)	0.870	0.01	0.870	0.96 (0.30)	0.001	0.16	0.001	0.82 (0.28)	0.003	0.14	0.002

Marital Status (ref=Married/Partnered)												
Single	-0.55 (0.99)	0.576	-0.06	0.572	-0.40 (0.45)	0.366	-0.07	0.364	-0.28 (0.41)	0.491	-0.05	0.490
Working Time (minutes)	-0.04 (0.03)	0.309	0.00	0.299	-0.02 (0.01)	0.214	0.00	0.211	-0.01 (0.01)	0.178	0.00	0.175
Household Income (ref= Less than $5,000)												
$5,001 to $10,000	2.57 (1.38)	0.063	0.28	0.047	-0.42 (0.37)	0.255	-0.07	0.252	-0.21 (0.34)	0.533	-0.04	0.532
$10,001 to $20,000	2.58 (1.56)	0.097	0.28	0.084	-0.07 (0.38)	0.847	-0.01	0.847	0.01 (0.35)	0.977	0.00	0.977
More than $20,000	4.24 (1.70)	0.013	0.46	0.006	1.30 (0.47)	0.006	0.21	0.005	1.48 (0.44)	0.001	0.26	<0.001
Self-rated Health (ref= Excellent/Very Good)												
Good	0.10 (0.99)	0.919	0.01	0.919	0.00 (0.34)	0.993	0.00	0.993	0.01 (0.36)	0.975	0.00	0.975
Fair/Poor	-0.44 (1.19)	0.708	-0.05	0.708	-0.16 (0.38)	0.667	-0.03	0.667	-0.42 (0.35)	0.224	-0.07	0.221
BMI (ref=<25 Underweight/Normal)												
>=25 =<30 Overweight	0.86 (1.07)	0.419	0.09	0.409	-0.01 (0.39)	0.972	0.00	0.972	0.09 (0.36)	0.812	0.02	0.812
>30 Obesity	0.95 (1.02)	0.354	0.10	0.345	-0.07 (0.34)	0.833	-0.01	0.833	-0.03 (0.31)	0.920	-0.01	0.920
Smoking Status (ref=Current smoker)												
Never smoked/Quit	1.20 (0.81)	0.141	0.13	0.125	0.44 (0.28)	0.111	0.07	0.107	0.40 (0.26)	0.121	0.07	0.117
Health Insurance Status (ref= Uninsured)												

Health insurance	3.27 (1.41)	0.020	0.35	0.010	0.13 (0.35)	0.707	0.02	0.707	0.21 (0.33)	0.515	0.04	0.515
Physical Disability (ref=No)												
Yes	0.09 (1.15)	0.938	0.01	0.938	-0.21 (0.46)	0.651	-0.03	0.650	-0.21 (0.43)	0.620	-0.04	0.620
Mental Health (ref=No)												
Yes	-0.62 (1.16)	0.594	-0.07	0.593	-0.94 (0.49)	0.053	-0.15	0.049	-0.63 (0.43)	0.143	-0.11	0.139
Food Security (ref=High food security)												
Low food security	0.63 (1.18)	0.596	0.07	0.592	0.26 (0.37)	0.480	0.04	0.479	0.34 (0.34)	0.312	0.06	0.310
Very low food security	-2.43 (1.59)	0.127	-0.26	0.118	0.50 (0.40)	0.203	0.08	0.200	0.53 (0.36)	0.139	0.09	0.136
Housing Insecurity (ref=No)												
Yes	2.32 (1.33)	0.082	0.25	0.070	-0.57 (0.36)	0.121	-0.09	0.117	-0.41 (0.32)	0.201	-0.07	0.198
Governmental Assistance (ref=No)												
Yes	-1.51 (0.96)	0.114	-0.16	0.099	0.85 (0.30)	0.004	0.14	0.003	0.73 (0.28)	0.008	0.13	0.006
Stress (ref=Low)												
Medium	1.25 (1.15)	0.279	0.14	0.271	0.08 (0.33)	0.804	0.01	0.804	0.14 (0.30)	0.636	0.02	0.636
High	0.90 (1.18)	0.443	0.10	0.439	-0.24 (0.38)	0.533	-0.04	0.532	-0.12 (0.35)	0.731	-0.02	0.731
Constant	-5.68 (2.69)	0.029			-0.47 (0.85)	0.578			-0.88 (0.78)	0.260		

Notes: Table displays the results from three multivariate logistic regression models, one for each racial/ethnic group. Table shows coefficients, standard errors in parentheses, the marginal effect, and p-value.

Discussion

The purpose of this paper was to examine associations between health and voter turnout among low wage working adults and to examine three research questions. First, I aimed to determine if the health variables associated with likelihood of local voter turnout are also associated with voter turnout at the national level in this study sample. In previous work using an analytic sample from the larger Wages study, BMI (*Hypothesis 1*), smoking status (*Hypothesis 2*), and health insurance status (*Hypothesis 3*) were significantly associated with likelihood of local voter turnout (McGuire, Gollust, et al., 2021). In this analysis, results from the bivariate models suggests there may be a relationship between participants likelihood of voter turnout for the last general election and BMI, smoking status, and health insurance status, independently. However, after controlling for other factors, in the multivariate logistic regression models, only smoking status was significantly associated with voter turnout, as never smoking or quitting was significantly associated with higher likelihood of voter turnout (marginal effect=0.10, p=0.015). This finding is consistent with previous research that identified a statistically significant negative relationship between smoking and voter turnout (Albright et al., 2016; Denny & Doyle, 2007).

The second research question asked whether self-rated health was associated with voter turnout among participants in our sample. I did not find that self-rated health is significantly associated with participants likelihood of voter turnout in this study, but I did find that the relationship between participants reporting fair/poor health and turnout

was relatively strong and negative relationship compared to participants who indicated excellent/very good health. Several previous studies using large national-level datasets found that subjective or self-rated health is associated with likelihood of voter turnout (Denny & Doyle, 2007; Gagné et al., 2019; Mattila et al., 2013; McGuire, Rahn, et al., 2021; Pacheco & Fletcher, 2015). However, in the previous study using data from the Wages study, self-rated health was not significantly associated with local voter turnout (McGuire, Gollust, et al., 2021). Lack of observing this relationship between self-rated health and voter turnout in this study may be due to using a small analytic sample with limited variation in income.

The third research question asked if the relationship between health and voter turnout within this sample varied across racialized groups. Results from the multivariate logistic regression models stratified by racial group indicate that health insurance is significantly associated with higher likelihood of turnout among participants racialized as white (marginal effect=0.35, p=0.010). I did not find this same association among participants racialized as Black or in the POC group. Previous work demonstrates that having health insurance is associated with higher likelihood of voter turnout, compared to those who are uninsured (McGuire, Rahn, et al., 2021). Health insurance provides citizens with access to health care and treatments which can help manage the effects of negative health conditions, however we know that levels of utilization and healthcare quality are racialized, where Black citizens experience worse conditions, including racism at the individual and structural levels (LaVeist, Nickerson, & Bowie, 2000; Ojeda & Slaughter, 2019). Black Americans are more likely to report racism and mistrust with

the health care system, leading to less satisfaction with their care (LaVeist et al., 2000). Therefore, although participants in our sample racialized as Black may have health insurance, they still may not have the same level of access or quality of care, compared to white participants and this could moderate the relationship between health and voter turnout. The right to health insurance and access to health care is a social justice issue and a key aspect of social citizenship, as conceptualized in T.H. Marshall's theory on social class and citizenship (Marshall, 1950). Access to health insurance is a foundational aspect of social life and future research should continue to explore racialized differences in voter turnout and the connection to health insurance.

Among those racialized as Black, reporting usage of any type of governmental assistance we asked about in this survey, such as food or housing assistance, was significantly associated with higher likelihood of voter turnout, compared to those who did not report using any of those services. In the stratified models including only white participants, it is interesting to note that the direction of the relationship between governmental assistance and voter turnout was strong and negative but it was not statistically significant. Finding a relationship between governmental assistance and voter turnout among participants racialized as Black may be connected to interactions with government institutions. Many scholars emphasize the influence of institutions and welfare policies on citizens' actions and decision-making (Campbell, 2011; Campbell & Shore-Sheppard, 2020; Mettler & Soss, 2004; Michener, 2019). Interactions with government institutions and public policy has been shown to produce policy feedback effects or influence citizens' future behavior and ways of interacting with politics

(Michener, 2018). Michener's (2018) Contextualized Model of Policy Feedback is a political institutional model of participation which integrates both individual and contextual factors into a common model (Michener, 2018). Consistent with the Social-Ecological Model of Health, the Contextualized Model of Policy Feedback contends that institutionally embedded structures at the city, county, state, and federal levels impact individual experiences and behavior (McLeroy, Bibeau, Steckler, & Glanz, 1988; Michener, 2018). The Contextualized Model of Policy Feedback argues that jurisdictional contexts influence the design and implementation of public policies, community organizations (e.g. churches and civic associations), and individual characteristics (e.g. racialization, gender, socioeconomic status) (Michener, 2018). These factors – experiences with public policy, community organizations, and individual characteristics – shape an individual's political capacity, defined as a citizen's ability or willingness to take political action, thereby determining likelihood of political participation (Michener, 2018). Having a politicized group identity may increase likelihood of participation but this paper uses a scale of political participation not individual measures (Garcia-Rios, Lajevardi, Oskooii, & Walker, 2021).

Additionally, the specific context of the 2018 U.S. midterm election may help to explain both the relationship between use of government assistance and voter turnout among the participants in this study racialized as Black and the relationship between health insurance and voter turnout among white participants in this analytic sample. Participants were surveyed at the end of 2019 beginning in July and a few participants were surveyed in January 2020, so when asked the question if they voted in the last

general election, like for state representatives, senators and president, ideally, they would recall their voting behavior from the 2018 U.S. Midterm election. The 2018 U.S. midterm election occurred during the term of President Donald Trump and polling leading up to the election indicated that, for many people, voting for a congressional candidate was their way to express their support or opposition for President Trump and his policies (Blendon, Benson, & McMurtry, 2018). In a review of 18 polls with sample sizes ranging from 419-1,201 voters, the majority of registered voters expressed that they disapproved of Trumps approach to health care and 40% of voters expressed that health care was a very important issues when making their voting decisions (Blendon et al., 2018). Some of the most important health care issues included health insurance coverage for people with preexisting conditions, lowering the cost of health care, ensuring Medicare benefits are not cut, and ensuring low-income people do not lose Medicaid coverage (Blendon et al., 2018). The results of this review of polling are consistent with peer-reviewed empirical literature that suggests health insurance, and specifically Medicaid enrollment and expansion has produced policy feedback effects leading to differences in political engagement (Haselswerdt, 2017; Haselswerdt & Michener, 2019; Hollingsworth, Soni, Carroll, Cawley, & Simon, 2019; Michener, 2018).

There are several limitations to this study. First, this study examines associations between health and voter turnout, therefore causal inferences cannot be made and there is the potential for omitted variable bias given that I cannot account for all unmeasured confounding variables. Second, there was some attrition in the Wages study, since the wave 2 data has 651 respondents, compared to 974 in wave 1. Third, these data are

specific to Minneapolis and Raleigh, thus not generalizable to other cities or the U.S. Fourth, social desirability bias may have caused over-reporting of voting (Holbrook & Krosnick, 2010). Finally, this study includes only one measure of context, city of employment, and other city-level factors may impact likelihood of voter turnout within this sample.

This study fills gaps in the literature on health and political participation by identifying health and health-related drivers of political participation among low-wage workers which can inform future research and efforts to address low voter turnout among this group. This study builds on previous work examining local voter turnout within this sample. Future research in this area should continue to examine the relationship between different measures and dimensions of health and voter turnout. This work should also examine voter turnout at various levels of government and investigate other forms of political involvement, such as protesting, volunteering for a campaign, and contacting a public official. This research should also consider political and social context, a person's social position, and how this influences their conceptualization of citizenship and engagement with government.

Chapter 4. Community Conditions and Political Participation

4.1 Introduction

In the United States, there is an unequal distribution of the non-medical factors in society which produce health, otherwise known as *the social determinants of health (SDOH)* (Braveman, Egerter, et al., 2011; Solar & Irwin, 2010). How the social determinants of health are distributed is shaped by the larger social and political mechanisms that configure social hierarchies in our political institutions and shape cultural and societal values (Solar & Irwin, 2010). Healthy People 2030 identified 5 key areas of the social determinants of health: economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context (U.S. Department of Health and Human Services, n.d.). The unequal distribution of social determinants of health is a critical public health issue because different groups experience differential exposure to poor community conditions and health risk, which is influenced by their social position in society (Solar & Irwin, 2010). Social stratification combined with the unequal distribution of the social determinants of health creates avoidable and unjust health inequities by neighborhood, racial/ethnic background, gender, ability, and other group statuses (Braveman, Egerter, et al., 2011; Braveman & Gottlieb, 2014). For example, Black Americans experience less access to quality education and employment opportunities (Gee & Ford, 2011; Whatley, 1992; Yearby, 2020). Inequities in the distribution of the SDOH have been linked to disparities in political behavior, such as voter turnout (Wasfy, Healy, Cui, & Stewart III,

2020). This is critical because disparities in political behavior may then further disenfranchise populations, leading to even greater inequities in access to resources. This paper investigates the relationship between the unequal distribution of social determinants of health at the county-level and individual-level political behaviors.

Sociopolitical Context, SDOH, and White Supremacy

One important explanation for the unequal social determinants of health and resulting health inequities is white supremacy, which operates within the larger U.S. socioeconomic and political context, driving structural racism. White supremacy refers to "…the glossary of conditions, practices, and ideologies that underscore the hegemony of whiteness and white political, social, cultural, and economic domination," (Alang et al., 2021). Historically, the white dominant society has racialized minority groups in response to shifting socioeconomic and political contexts, and this system of racialization has been embedded into U.S. institutions and structures (Delgado & Stefancic, 2013). For example, when the labor of enslaved Black Americans was believed to be integral to the economy by the dominant white society, many Americans fought to maintain it (Mettler & Lieberman, 2020). Then at another period of time Japanese Americans faced intense racism and scrutiny about their political loyalties, in response to an escalating world war (Delgado & Stefancic, 2013; Frasure & Williams, 2009). Today white supremacy persists through systems of mass incarceration, targeted voter suppression laws, and intergenerational drag, whereby subsequent generations can feel the effects of the racist actions and inequities experienced by previous generations (Gee & Ford, 2011). These

examples demonstrate that white supremacy has remained pervasive throughout U.S. history, but racialization and its consequences shift given the current socioeconomic and political context (Delgado & Stefancic, 2013).

White supremacy and the "societal allocation of privilege based on race" (Hardeman, Murphy, Karbeah, & Kozhimannil, 2018) within the larger socioeconomic and political context, play a major role in determining an individual's social position in society, who can exercise their rights as a citizens, and the distribution of health inequities. In the colonial period of the U.S. not all humans were recognized as even having the right to have rights (Somers, 2010; United Nations, n.d.). The acknowledgement of basic human rights, such as the right to life, freedom from slavery, and freedom of expression, are an essential precursor for the expression of citizenship rights, like participating in politics through voting (Somers, 2010). And even after many fought to established basic human rights for marginalized groups in the new nation, only those who owned property, were Protestant, and white could participate in politics (Frasure & Williams, 2009).

Today citizens of the U.S. hold civil, social, and political rights such as the right to own property, the right to education, and the right to vote, respectively. However, the social position of many people of color as a result of social stratification and white supremacy, obstructs full realization of these rights. For example, Black Americans are less likely to be homeowners, compared to white Americans (Collins & Margo, 2001). Additionally, Black, Hispanic, and American Indian/Alaska Natives are less likely

complete a high school education compared to their white counterparts (de Brey et al., 2019). This matters because many of the rights people of color are blocked from accessing are related to the social determinants of health, causing health inequities. Lack of access to community resources which are important social determinants of health hinders marginalized racial groups ability to fully realize their rights as a citizen, achieve good health, and participate in politics (Marshall, 1950). For example, previous research estimated that excess death among Black Americans between 1970 and 2004 compared to white Americans may account for the loss of 1 million votes in the 2004 election (Rodriguez et al., 2015). This indicates that community health disparities may impact individuals' ability to exercise their political right to vote and influence election outcomes. This relationship creates a cycle of inequity in which health inequities hinder equity in political participation and the resulting disparities in participation and election outcomes inhibit the achievement of population health equity.

Political Participation

Political participation is broadly defined as activity citizens engage in to affect politics (Van Deth 2015). Political participation activities can be divided into two types of behaviors – institutional and non-institutional (Mattila 2020; Slavina 2020). Institutional political behavior refers to forms of participation which occur in the political sector and under the jurisdiction of the government, like voting, working for a candidate or campaign, or contacting a public official (Van Deth 2014). Non-institutional political behaviors refers to activities that do not occur in the political sector but are targeted at

impacting government and politics, including protesting and petition signing (Van Deth, 2014). There is not consensus among scholars on whether the determinants of institutional verses non-institutional forms of participation are the same or if they vary by specific factors (Slavina, 2020). However, it is known that different forms of political participation have different levels of prevalence among the electorate (Burden et al. 2017). Most of the literature on political participation explains patterns of behavior through examining personal values and beliefs, conceptualizations of citizenship, social capital, resources, and contextual/community factors (Slavina, 2020; Smets & van Ham, 2013).

Previous research examining political participation has established that resources, such as education and income, are key determinants of institutional forms of political behavior like voting, but the relationship between resources and non-institutional political behavior is not as clear (Brady, Verba, & Schlozman, 1995; Slavina, 2020). Some studies have suggested that non-institutional political participation may be more inclusive in the number of people who can participate and the resources required (Marien, Hooghe, & Quintelier, 2010). However, other evidence suggests this is not true as participation in non-institutional behaviors is still associated with higher levels of education and income (Brady et al., 1995; Slavina, 2020).

There are disparities in political participation outcomes by racial/ethnic group and the determinants of participation among people of color may differ from those of their white counterparts (Frasure & Williams, 2009). In a study which focused on political

participation among Black and Latinx Americans, the authors found that contextual poverty was not significantly associated with political participation among Black participants, however contextual poverty was significantly and negatively associated with political participation among Latinx participants (T. C. Shaw et al., 2019). Additionally, political hypervigilance is a concept which has also been associated with variation in political participation outcomes by race/ethnicity (McGregor et al., 2019).

Health and Political Participation

In addition to the above research on inequities in participation, scholars have also investigated the relationships between health and political participation. For instance, research has demonstrated that individuals in poor health are less likely to participate politically through voting, signing petitions, and engaging with elected officials, compared to those in better health (Brown et al., 2020; Burden et al., 2017). These studies have examined individual-level measures of physical and mental well-being such as self-rated health, insurance status, and chronic condition diagnoses (C. L. Brown et al., 2020; McGuire, Rahn, et al., 2021). Inconsistent research findings indicate that the mechanisms through which health impacts voter turnout and other political behaviors are still unclear. Poor health may impact the available resources necessary for an individual to participate, such as income and education (McGuire, Gollust, et al., 2021; Pacheco & Fletcher, 2015). However, poor health could prompt an individual to increase their participation in support groups and enhance their social connections, which could lead to more political activity (Gollust & Rahn, 2015; McGuire, Rahn, et al., 2021). Previous work also

demonstrates that health may have different relationships with different political behaviors, such as poor physical health depressing turnout (Burden et al., 2017). While poor cognitive function appears to affect other measures of political participation, like donating to a campaign (Burden et al., 2017).

Public health literature focuses on community conditions and social determinants of health to explain disparities in individual health, but few studies have examined associations between community-level health and political participation. Those few studies that currently exist tend to focus only on voting behavior. For instance, one study found that poor county-level community health was associated with county-level changes in voting patterns at the national-level from 2012 to 2016 and in a follow up study found that the relationship persisted, comparing the 2016 presidential election to the 2018 U.S. House of Representatives election (Wasfy et al., 2017, 2020). Another study, which examined changes in death rates and voting patterns from 2008 to 2016, found that less reduction in the age-adjusted death rate at the county-level over this time period was associated with an increased percentage of votes for the Republican candidate for president (Goldman et al., 2019). These studies suggest that health at the county-level may impact individual-level political participation and that these changes in participation impact election outcomes. However, further research is necessary that uses individual measures of political behavior to establish this relationship, rather than using participation data aggregated to the population-level. County-level context is meaningful for health because county-level institutions regulate many of the structures which are critical social determinants of health, such as water, policies on housing, crime, business.

(Bailey et al., 2017) County jurisdictions play a large role in the allocation of resources, shaping the community conditions in which we live and work which influences individual-level behavior. This paper fills a gap in the literature on community health and political participation by examining individual political participation outcomes and their association with county-level public health measures.

The purpose of this paper is to examine how the unequal distribution of social determinants of health critical to health at the county-level influences citizens' ability to exercise their political rights. I examine associations between county-level public health measures and three individual political behaviors: (1) turnout in the 2018 U.S. midterm election, (2) contacting a public official, and (3) attending a political protest, march, or demonstration. This paper examines three research questions:

(1) Are county-level public health conditions associated with likelihood of individual political participation?

(2) Does the direction of the relationship between county-level public health and political participation vary by the type of participation behavior?

(3) Does the county-level public health and political participation relationship vary across defined racial groups?

This study fills a gap in the literature on health and political participation by producing evidence on how county-level community conditions influence individual-level behavior. Understanding how and why citizens participate is increasingly important

given the current polarized political climate in the U.S. and the global COVID-19 pandemic, which has exacerbated racial health inequities and imposed restrictions on resources, such as income and education, which are known determinants of political participation and health. Furthermore, this study will fill gaps in the literature by examining three different measures of political participation and health at the community-level.

4.2 Methods

Data

This study uses data from the 2018 Cooperative Congressional Election Survey (CCES) and the 2018 Robert Wood Johnson Foundation (RWJF) County Health Rankings (CHR). CCES is a national web-based survey of U.S. adults and is commonly used by scholars in political science to study Americans' voting behavior and electoral experiences with 60,000 respondents (Schaffner & Ansolabhere, 2019). The RWJF CHR dataset measures the health of nearly all of the counties in the U.S., using data compiled from sources including the American Community Survey, and Behavioral Risk Factor Surveillance System, among others (RWJF, 2020). I merged the CCES dataset and CHR data based on respondents' county of residence. The analytic sample for this analysis includes 2,683 counties, some counties were not included in this study because there was no match in the CCES dataset.

Measures

The three outcome variables for this study come from the CCES C, including (*1) turnout in the 2018 U.S. national election, (2) contacting a public official, and (3) attending a political protest, march, or demonstration*. I used the validated voted turnout measure included in CCES. The CCES uses voting records to confirm if respondents voted or not, if no record is found it is assumed the respondent did not vote. This item was dichotomized (0=No, 1=Yes). For the other two outcomes, contacting a public official and attending a protest, the CCES asks if respondents have done these activities in the last year. After removing observations with missing data on the political participation outcome variables the total number of observations was 51,808.

Other individual-level characteristics include age; respondents' reported year of birth was used to calculate their age in 2018, and then age was categorized into four groups. Respondents reported their highest level of education completed and responses were categorized into four groups. Response options for marital status included: married, separated, divorced, widowed, never married, domestic/civil partnership. Respondents who indicated married or domestic/civil partnership were categorized as "yes" for married, all other responses were categorized as "no". Survey response options for family income included 17 choices in $10,000 intervals, beginning with less than $10,000 and up to $500,000. Respondents could also select "prefer not to say" and these responses were coded as missing. Responses for annual family income were categorized into five groups. Survey responses for gender included two options: male or female. The survey asked respondents: *what racial or ethnic group best describes you?* Response options included: white, Black, Hispanic, Asian, Native American, Mixed, Other, and Middle

Eastern. Responses for race/ethnicity were categorized into four groups: white; Black; Hispanic; and, Asian, Native American, Middle Eastern, Mixed, or Other. Interest in politics is measured through one survey item which asks respondents: *would you say you follow what's going on in government and public affairs?* Response options included: most of the time; some of the time; only now and then; hardly at all; and, don't know. Responses which indicated only now and then, hardly at all, or don't know, were categorized as "no". All other responses were categorized as "yes". A single survey item asked respondents generally what party they think of themselves as and response options included: Democrat, Republican, Independent, or other.

The key independent variables are county-level indicators of public health similar to those used in previous studies (Wasfy et al., 2020; Wasfy, Stewart, & Bhambhani, 2017). Table 5 shows all of the key county-level variables measuring health and health-related factors, indicates the source survey, and explains how they were measured. I measure county-level public health across five domains: population health; access to health care; behavioral health; environmental health, and; social capital and networks. Drinking water violations is a dichotomous indicator for if a county had a violation or not. All other county-level variables were continuous numeric variables which were then binned into tertiles or three groups (i.e., lowest, intermediate, and highest tertiles). After accounting for all missing observations on the outcome variables and covariates, the total number of observations for the subsequent analysis was 45,393.

Table 5. Key Independent Variables

Domain	Variable Name	Source Survey	Measurement
Population Health	Poor physical health days	2016 Behavioral Risk Factor Surveillance System	Average number of physically unhealthy days reported in past 30 days.
Population Health	Adults with BMI ≥30	2014 CDC Diabetes Interactive Atlas	Percentage of the adult population (age 20 and older) that reports a body mass index (BMI) greater than or equal to 30 kg/m2
Population Health	Poor mental health days	2016 Behavioral Risk Factor Surveillance System	Average number of mentally unhealthy days reported in past 30 days
Access to Health care	Mental health providers	2017 CMS, National Provider Identification file	Ratio of the population to mental health providers
Access to Health care	Primary care physicians	Area Health Resource File/American Medical Association	Ratio of population to primary care physicians
Behavioral	Excessive drinking	2016 Behavioral Risk Factor Surveillance System	Percentage of the county adult population that reported binge or heavy drinking in the past 30 days Binge drinking is defined as a woman consuming more than four alcoholic drinks during a single occasion or a man consuming more than five alcoholic drinks during a single occasion. Heavy drinking is defined as a woman drinking more than one drink on average per day or a man drinking more than two drinks on average per day
Behavioral	Adult smoking	2016 Behavioral Risk Factor Surveillance System	Percentage of the adult population in a county who both report that they currently smoke every day or most days and have smoked at least 100 cigarettes in their lifetime
Environmental	Air pollution-particulate matter	Environmental Public Health Tracking Network	Average daily density of fine particulate matter in micrograms per cubic meter (PM2.5)

Environmental	Drinking water violations	2016 Safe Drinking Water Information System	Dichotomous; "Yes" indicates that at least one community water system in the county received at least one health-based violation during the specified time frame. "No" indicates that there were no health-based drinking water violations in any community drinking water system in the county.
Social	Violent crime	2012-2014 Uniform Crime Reporting – FBI	Number of violent crimes reported per 100,000 population
Social	Social associations	County Business Patterns	Number of membership associations per 10,000 population. The associations include membership organizations such as civic organizations, bowling centers, golf clubs, fitness centers, sports organizations, religious organizations, political organizations, labor organizations, business organizations, and professional organizations. These associations are identified by NAICS codes.
Social	Severe housing problems	2010-2014 Comprehensive Housing Affordability Strategy (CHAS) data	Percentage of households with one or more of the following housing problems: (1) Housing unit lacks complete kitchen facilities; (2) Housing unit lacks complete plumbing facilities; (3) Household is overcrowded (4) Household is severely cost burdened.
Source: Robert Wood Johnson Foundation, County Health Rankings: https://www.countyhealthrankings.org/			

Analysis

After generating an analytic sample, I computed descriptive statistics which show the prevalence of each outcome and characteristic within the analytic sample. Then I employed bivariate and multivariate logistic regression analyses. First, I estimated the associations between each outcome variable and county-level public health measure using bivariate logistic regression. Then I employed three mixed-effects multivariate logistic regression models, one for each of the outcome variables, with the county-level

public health measures as the key independent variables. The models were adjusted for individual-level characteristics, including age, education, marital status, race/ethnicity, annual family income, and gender. The models also control for individual political interest and party identification, each measured by a single item in the CCES dataset. The multivariate models are adjusted for county-level characteristics including the percentage of the county which consists of rural area, county-level population size, and county-level racial composition. All of the regression analyses use the CCES survey weights and state-fixed effects. I use state-fixed to account for state-level policies and differences in political participation access. I estimated multivariate logistic regression models stratified by racial/ethnic group to examine the relationship between county-level public health and political participation within each group. Additionally, I estimated logistic regression models with interaction terms to assess whether the relationship between county public health and participation varies across the defined racial/ethnic groups.

4.3 Results

Table 6 displays the weighted prevalence of each characteristic for the individual-level variables included in this study in the analytic sample. About 61 percent of respondents reported turning out to vote in the 2018 midterm election. About 28 percent of respondents reported contacting a public official and about 10 percent of respondents reported attending a political protest, march, or demonstration in the last year. The majority of those in the sample were aged 46 or older (59%) and have a 2-year, 4-year, or post-graduate degree (52%). Most respondents reported an annual family income of

$79,999 or less (69%) and a large share of those respondents (31%) reported an annual family income between $20,000 and $49,999. The majority of the sample reported being female (56%). About two-thirds of the sample identified as white (76%), 9 percent identified as Black, 8 percent identified as Hispanic and about 7 percent of respondents in the analytic sample identified as Asian, Native American, Middle Eastern, Mixed, or another race or ethnicity. The majority of respondents reported following what's going on in government and public affairs most of or some of the time (80%). About 38 percent of respondents reported being Democrat, while 27 percent reported being Republican, 27 percent reported being Independent, and about 8 percent reporting other or were unsure.

Table 6. Descriptive statistics of analytic sample – Individual-level variables (n=45,393)

Measure		%
2018 Voter Turnout		
	No	39
	Yes	61
Contacting a public official		
	No	72
	Yes	28
Attending a political protest, march, or demonstration		
	No	90
	Yes	10
Age		
	18-30	16
	31-45	24
	46-60	29
	Over 60	30
Education level		
	No HS or HS Degree	28
	Some College	21
	2- or 4-year Degree	37
	Post-grad	15
Married		
	No	43
	Yes	58
Annual family income		
	Less than 20,000	12
	20,000-49,999	31
	50,000-79,999	26
	80,000-119,999	17
	120,000 or more	14
Gender		
	Male	44
	Female	56
Race/ethnicity		
	white	76
	Black	9

Hispanic	8
	7
Asian, Native American, Middle Eastern, Mixed, or Other	
Would you say you follow what's going on in government and public affairs?	
Only now and then, hardly at all, don't know	20
Most or some of the time	80
Party identification	
Democrat	38
Republican	27
Independent	27
Other	4
Not sure	4

Notes: All estimates incorporate complex sample survey weights.

Table 7 shows the key county-level variables used to measure county-level public health in this study and the ranges for each category. Each variable was split into tertiles (i.e. lowest, intermediate, and highest), except for drinking water violations which is a dichotomous indicator. For example, poor mental health days per month is a measure from the Behavioral Risk Factor Surveillance System and is the average number of poor mental health days respondents reported for that county. Poor mental health days ranges from 2-6 days and the low tertile is about 2-3 days, the intermediate tertile is 3-4 days, and the high tertile is 4-6 days. Social associations is a measure of the number of membership associations per 10,000 people in the county. These are organizations such as civic groups, bowling centers, golf clubs, religious organizations, and labor organizations among others.

Table 7. Descriptive statistics of analytic sample – County-level			
Measure		Min	Max
Poor physical health days			
	Lowest Tertile	2.32	3.49
	Intermediate Tertile	3.49	3.88
	Highest Tertile	3.88	6.43
Adults with BMI≥30			
	Lowest Tertile	0.14	0.27
	Intermediate Tertile	0.27	0.31
	Highest Tertile	0.31	0.48
Poor mental health days			
	Lowest Tertile	2.47	3.63
	Intermediate Tertile	3.64	4.03
	Highest Tertile	4.03	5.96
Mental health providers			
	Lowest Tertile	0.00003	0.00141
	Intermediate Tertile	0.00141	0.00247
	Highest Tertile	0.00247	0.01411
Primary care physicians			
	Lowest Tertile	0.00000	0.00063
	Intermediate Tertile	0.00063	0.00086
	Highest Tertile	0.00086	0.00453
Excessive Drinking			
	Lowest Tertile	0.09	0.17
	Intermediate Tertile	0.17	0.20
	Highest Tertile	0.20	0.29
Adult smoking			
	Lowest Tertile	0.07	0.14
	Intermediate Tertile	0.14	0.17
	Highest Tertile	0.17	0.32
Air pollution-particulate matter			
	Lowest Tertile	4.50	9.10
	Intermediate Tertile	9.20	10.50
	Highest Tertile	10.60	15.40
Drinking water violations			
	No Violation	0	0
	Violation	1	1
Violent crime			
	Lowest Tertile	0.00	237.12
	Intermediate Tertile	237.20	426.46
	Highest Tertile	427.32	1702.75
Social associations			
	Lowest Tertile	0.00	7.49
	Intermediate Tertile	7.49	10.65
	Highest Tertile	10.65	50.70
Severe housing problems			
	Lowest Tertile	0.03	0.15
	Intermediate Tertile	0.15	0.19
	Highest Tertile	0.19	0.39

Notes: All estimates incorporate complex sample survey weights.

Bivariate Associations

Table 8 shows the key county-level variables and their associations with the 3 political behavior outcomes, produced from separate bivariate logistic regression models using the analytic sample and survey weights. The first panel of the table shows associations with voter turnout in the 2018 midterm election and the county-level variables. Respondents residing in counties in the intermediate or highest tertile of poor physical health days were significantly less likely to vote in 2018, compared to those in the lowest tertile ($p=0.031$ and $p<0.001$, respectively). Respondents in counties in the highest tertile of adults with a BMI greater than 30, were significantly less likely to vote, compared to those in the lowest tertile ($p=0.014$). Respondents in counties in the highest tertile of poor mental health days per month were significantly less likely to turn out to vote ($p=0.004$). Respondents residing in counties in the highest tertiles of mental health providers and primary care physicians were significantly more likely to vote, compared to those in the lowest tertile ($p=0.044$ and $p=0.001$, respectively). Respondents residing in counties in the highest and intermediate tertiles of excessive drinking were significantly more likely to vote, compared to those in the lowest tertile ($p<0.001$). Respondents in counties in the intermediate or highest tertile of violent crime were significantly less likely to turn out to vote compared to those in the lowest tertile ($p=0.004$ and $p=<0.001$, respectively). Respondents in counties in the intermediate or

highest tertile of social associations were significantly more likely to turn out to vote ($p<0.001$). Finally, respondents in counties in the highest tertile of severe housing problems were significantly less likely to turn out to vote. In the bivariate analyses no significant association with turnout was found with air pollution or drinking water violations.

Table 8. Bivariate associations – County-level variables (n=45,393)

Measure	2018 Voter Turnout		Contacting a public official		Attending a political protest, march, or demonstration	
	Coef. (se)	p-value	Coef. (se)	p-value	Coef. (se)	p-value
Poor physical health days						
Intermediate Tertile	-0.11 (0.05)	0.031	-0.15 (0.05)	0.002	-0.25 (0.09)	0.003
Highest Tertile	-0.27 (0.05)	<0.001	-0.23 (0.05)	<0.001	-0.60 (0.08)	<0.001
Adults with BMI≥30						
Intermediate Tertile	-0.05 (0.06)	0.342	-0.15 (0.05)	0.004	-0.47 (0.08)	<0.001
Highest Tertile	-0.13 (0.05)	0.014	-0.22 (0.05)	<0.001	-0.91 (0.08)	<0.001
Poor mental health days						
Intermediate Tertile	-0.10 (0.05)	0.057	-0.07 (0.05)	0.151	-0.12 (0.09)	0.185
Highest Tertile	-0.15 (0.05)	0.004	-0.09 (0.05)	0.071	-0.43 (0.09)	<0.001
Mental health providers						
Intermediate Tertile	0.04 (0.05)	0.438	0.00 (0.05)	0.925	0.24 (0.10)	0.013
Highest Tertile	0.10 (0.05)	0.044	0.19 (0.05)	<0.001	0.71 (0.09)	<0.001
Primary care physicians						
Intermediate Tertile	0.06 (0.05)	0.241	0.09 (0.05)	0.057	0.58 (0.08)	<0.001
Highest Tertile	0.16 (0.05)	0.001	0.19 (0.05)	<0.001	0.79 (0.07)	<0.001
Excessive drinking						
Intermediate Tertile	0.17 (0.05)	<0.001	0.10 (0.05)	0.038	0.23 (0.10)	0.026
Highest Tertile	0.36 (0.05)	<0.001	0.25 (0.05)	<0.001	0.46 (0.10)	<0.001
Adult smoking						
Intermediate Tertile	0.00 (0.06)	0.962	-0.09 (0.05)	0.089	-0.42 (0.08)	<0.001
Highest Tertile	-0.08 (0.05)	0.140	-0.13 (0.05)	0.013	-0.69 (0.09)	<0.001
Air pollution-particulate matter						

	-0.06	0.282	-0.11	0.022	-0.14	0.142
Intermediate Tertile	(0.06)		(0.05)		(0.09)	
	-0.06	0.255	-0.12	0.011	-0.02	0.813
Highest Tertile	(0.05)		(0.05)		(0.09)	
Drinking water violations						
	0.00	0.930	0.02	0.531	0.11	0.169
Violation	(0.04)		(0.04)		(0.08)	
Violent crime						
	-0.13	0.004	-0.04	0.336	0.20	0.018
Intermediate Tertile	(0.04)		(0.04)		(0.09)	
	-0.21	<0.001	-0.19	<0.001	0.28	0.001
Highest Tertile	(0.05)		(0.05)		(0.09)	
Social associations						
	0.22	<0.001	0.22	<0.001	0.05	0.593
Intermediate Tertile	(0.05)		(0.05)		(0.09)	
	0.18	<0.001	0.17	<0.001	-0.31	0.001
Highest Tertile	(0.05)		(0.05)		(0.09)	
Severe housing problems						
	-0.08	0.066	0.03	0.401	0.42	<0.001
Intermediate Tertile	(0.04)		(0.04)		(0.08)	
	-0.19	<0.001	-0.12	0.012	0.65	<0.001
Highest Tertile	(0.05)		(0.05)		(0.08)	

Notes: Table shows the results from separate bivariate logistic regression models for each variable, displaying the coefficient with standard errors in parentheses, and p-value. The reference for each category is the lowest tertile, excluding drinking water violations for which the reference is no violations. All estimates incorporate complex sample survey weights.

The next panel in Table 8 displays the bivariate associations with contacting a public official and the key county-level variables measuring public health. Respondents in counties in the intermediate or highest tertile of poor physical health days per month were significantly less likely to report contacting a public official in the last year, compared to respondents in the lowest tertile ($p=0.002$ and $p<0.001$, respectively). Respondents in counites in the highest or intermediate tertile of adults with BMI ≥ 30, were significantly less likely to report contacting a public official in the last year compared to respondents in the lowest tertile ($p=0.004$ and $p<0.001$, respectively). Respondents in counties in the highest tertile of both mental health providers and primary care physicians were significantly more likely to report contacting a public official, compared to those in the lowest tertile ($p<0.001$). Compared to those in the lowest tertile, respondents in counties in the highest tertile of excessive drinking were significantly more likely to report contacting a public official ($p<0.001$). Respondents in the highest tertile of adult smoking were less likely to report contacting a public official in the last year compared to those in the lowest tertile ($p=0.013$). Those in counties in the intermediate or highest tertile of air pollution-particulate matter were significantly less likely to report contacting a public official compared to respondents in the lowest tertile ($p=0.022$ and $p=0.011$, respectively). Compared to respondents in the lowest tertile, those in counties in the highest tertile of violent crime were significant less likely to report contacting a public official in the last year ($p<0.001$). Respondents in counties in the intermediate or highest tertile of social associations were significantly more likely to report contacting a public official, compared to those in the lowest tertile ($p<0.001$).

Respondents in counties in the highest tertile of severe housing problems were significantly less likely to report contacting a public official in the last year, compared to those in the lowest tertile ($p=0.012$). In the bivariate analyses, no significant association with contacting a public official in the last year was found with poor mental health days or drinking water violations.

The last panel in Table 8 shows the bivariate associations with attending a political protest, march, or demonstration and the key county-level variables measuring public health. Respondents in counties in the intermediate or highest tertile of poor physical health days per month were significantly less likely to report attending a political protest, march, or demonstration in the last year, compared to respondents in counties in the lowest tertile ($p=0.003$ and $p<0.001$, respectively). Compared to respondents in counties in the lowest tertile, respondents in counties in the intermediate or highest tertile of adults with BMI ≥30 were significantly less likely to report attending a political protest, march, or demonstration in the last year ($p<0.001$). Respondents in counties in the highest tertile of poor mental health days per month were significantly less likely to report attending a political protest, march, or demonstration, compared to those in the lowest tertile ($p<0.001$). Respondents in counties in the intermediate or highest tertile of mental health providers were significantly more likely to report attending a political protest, march, or demonstration in the last year ($p=0.013$ and $p<0.001$, respectively). Respondents in counties in the intermediate or highest tertile of primary care physicians were significantly more likely to report attending a political protest, march, or demonstration in the last year, compared to respondents in the lowest tertile

($p<0.001$). Respondents in counties in the intermediate or highest tertile of excessive drinking were significantly more likely to report attending a political protest, march, or demonstration in the last year ($p=0.026$ and $p<0.001$, respectively), while respondents in counties in the intermediate or highest tertile of adult smoking were significantly less likely to report attending a political protest, march, or demonstration ($p<0.001$). Respondents in counties in the intermediate or highest tertile of violent crime were significantly more likely to report attending a political protest, march, or demonstration in the last year ($p=0.018$ and $p=0.001$, respectively). Compared to those in the lowest tertile, respondents in the highest tertile of social associations were significantly less likely to report attending a political protest, march, or demonstration ($p=0.001$). Respondents in counties in the intermediate or highest tertile of severe housing problems were significantly more likely to report attending a political protest, march, or demonstration in the last year ($p<0.001$). In the bivariate analyses no significant association with attending a political protest, march, or demonstration in the last year was found with air pollution-particulate matter or drinking water violations.

Multivariate Associations

Tables 9 and 10 display the results from multivariate logistic regression models for each political participation outcome. These models include the individual-level characteristics, key county-level public health variables, and control for state-fixed effects, county population size, county racial composition, and the percentage of the county which is rural. Table 9 displays all of the individual-level variables included in

these models. Associations between the individual-level variables and political participation outcomes are not the focus of this study but were consistent with previous studies (C. L. Brown et al., 2020). For instance, respondents of older age and higher education were significantly more likely to report voter turnout in 2018 and also contacting a public official in the last year. Higher income was also significantly associated with higher likelihood of voter turnout and contacting a public official. Respondents who identified as Black and those who identified as Asian, Native American, Middle Eastern, Mixed, or Other, were significantly less likely to report turning out to vote in 2018, compared to respondents who identified as white ($p<0.001$). While respondents who identified as Black, Hispanic, or in the group including Asian, Native American, Middle Eastern, Mixed, or Other were significantly less likely to report contacting a public official in the last year compared to those who identified as white ($p<0.001$). Respondents of older age were significantly less likely to report attending a political protest, march, or demonstration in the last year ($p<0.001$), which differs from the associations with age and voting in 2018 or contacting a public official. However, those of higher education levels were significantly more likely to report attending a political protest, march, or demonstration ($p<0.001$). Respondents who reported an annual family income of $50,000 or more were significantly more likely to report attending a political protest, march, or demonstration. Finally, respondents who identified as Black or Asian, Native American, Middle Eastern, Mixed, or Other were significantly less likely to report attending a political protest, march, or demonstration in the last year, compared to white respondents ($p<0.001$ and $p=0.002$, respectively).

Table 9. Multivariate associations – individual-level variables

Measure	2018 Voter Turnout				Contacting a public official				Attending a political protest, march, or demonstration			
	Coef. (se)	p-value	Marginal Effect	p-value	Coef. (se)	p-value	Marginal Effect	p-value	Coef. (se)	p-value	Marginal Effect	p-value
Age (Ref=18-30)												
31-45	0.43 (0.04)	<0.001	0.10	<0.001	0.23 (0.05)	<0.001	0.03	<0.001	-0.43 (0.06)	<0.001	-0.04	<0.001
46-60	0.98 (0.04)	<0.001	0.22	<0.001	0.52 (0.05)	<0.001	0.08	<0.001	-0.54 (0.07)	<0.001	-0.05	<0.001
Over 60	1.52 (0.05)	<0.001	0.32	<0.001	0.82 (0.05)	<0.001	0.13	<0.001	-0.68 (0.07)	<0.001	-0.06	<0.001
Education (Ref=HS degree or less)												
Some College	0.30 (0.05)	<0.001	0.06	<0.001	0.74 (0.05)	<0.001	0.11	<0.001	0.67 (0.10)	<0.001	0.04	<0.001
2- or 4-year Degree	0.40 (0.04)	<0.001	0.08	<0.001	0.83 (0.04)	<0.001	0.13	<0.001	0.95 (0.08)	<0.001	0.06	<0.001
Post-grad	0.51 (0.06)	<0.001	0.10	<0.001	1.16 (0.05)	<0.001	0.19	<0.001	1.28 (0.09)	<0.001	0.09	<0.001
Marital Status (Ref=No)												
Yes	-0.02 (0.04)	0.655	0.00	0.655	-0.08 (0.03)	0.011	-0.01	0.011	-0.18 (0.05)	<0.001	-0.01	<0.001
Annual family income (Ref=less than 20,000)												
20,000-49,999	0.22 (0.05)	<0.001	0.05	<0.001	0.03 (0.06)	0.672	0.00	0.671	0.04 (0.09)	0.655	0.00	0.652

50,000-79,999	0.36 (0.06)	<0.001	0.07	<0.001	0.24 (0.06)	<0.001	0.04	<0.001	0.25 (0.10)	0.010	0.02	0.007
80,000-119,999	0.52 (0.07)	<0.001	0.11	<0.001	0.25 (0.07)	<0.001	0.04	<0.001	0.36 (0.11)	0.001	0.03	0.001
120,000 or more	0.52 (0.07)	<0.001	0.11	<0.001	0.34 (0.07)	<0.001	0.06	<0.001	0.37 (0.11)	0.001	0.03	0.001
Gender (Ref=Male)												
Female	-0.02 (0.03)	0.457	0.00	0.457	-0.07 (0.03)	0.019	-0.01	0.020	-0.03 (0.05)	0.480	0.00	0.480
Race/ethnicity (Ref=white)												
Black	-0.27 (0.06)	<0.001	-0.06	<0.001	-0.99 (0.07)	<0.001	-0.14	<0.001	-0.65 (0.11)	<0.001	-0.04	<0.001
Hispanic	-0.25 (0.06)	<0.001	-0.05	<0.001	-0.47 (0.09)	<0.001	-0.08	<0.001	-0.04 (0.11)	0.703	0.00	0.700
Asian, Native American, Middle Eastern, Mixed, or Other	-0.51 (0.07)	<0.001	-0.11	<0.001	-0.41 (0.09)	<0.001	-0.07	<0.001	-0.29 (0.09)	0.002	-0.02	0.001
Political interest (Ref=Only now and then, hardly at all, don't know)												
Most or some of the time	0.87 (0.04)	<0.001	0.19	<0.001	1.90 (0.08)	<0.001	0.23	<0.001	1.53 (0.12)	<0.001	0.08	<0.001
Party Identification (Ref=Democrat)												
Republican	-0.18 (0.04)	<0.001	-0.04	<0.001	-0.54 (0.04)	<0.001	-0.09	<0.001	-1.61 (0.08)	<0.001	-0.11	<0.001

Independent	-0.42 (0.04)	<0.001	-0.09	<0.001	-0.16 (0.04)	<0.001	-0.03	<0.001	-0.73 (0.05)	<0.001	-0.06	<0.001
Other	-0.16 (0.07)	0.031	-0.03	0.033	0.38 (0.07)	<0.001	0.07	<0.001	-0.09 (0.10)	0.355	-0.01	0.344
Not sure	-1.54 (0.11)	<0.001	-0.32	<0.001	-0.90 (0.25)	<0.001	-0.14	<0.001	-0.71 (0.35)	0.041	-0.06	0.009

Notes: Table shows the results from three multivariate logistic regression model, one for each political participation outcome variable, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. All estimates incorporate complex sample survey weights.

Table 10 shows the multivariate associations with the 3 political participation outcomes and county-level public health measures. The first panel of Table 10 displays the associations with voter turnout in 2018. In the overall model, I did not find any statistically significant associations between turnout and the county-level public health variables included in this study. The second panel of Table 10 shows the associations between contacting a public official and the key county-level measures of public health from a multivariate logistic regression model. Respondents in counties in the highest tertile of adults with BMI ≥30 were significantly less likely to report contacting a public official in the last year (p=0.039). Respondents in counties in the highest tertile of poor mental health days per month were significantly more likely to report contacting a public official in the last year (p=0.021). Respondents in counties in the highest tertile of excessive drinking were significantly more likely to report contacting a public official in the last year (p=0.035). Respondents in counties in the intermediate or highest tertile of social associations were significantly more likely to report contacting a public official in the last year (p=0.032 and p=0.025, respectively). No other significant associations were found with the county-level public health measures and contacting a public official in the multivariate model.

The third panel of Table 10 displays the associations between attending a political protest, march, or demonstration in the last year and the county-level public health measures. Respondents in counties in the highest tertile of adults with BMI ≥30 were significantly less likely to report attending a political protest, march, or demonstration (p=0.021). Respondents in counties in the intermediate tertile of poor mental health days

per month were significantly less likely to report attending a political protest, march, or demonstration ($p=0.026$). Respondents in counties in the highest tertile of excessive drinking were significantly more likely to report attending a political protest, march, or demonstration in the last year ($p<0.001$). Respondents in counties in the intermediate or highest tertile of severe housing problems were significantly more likely to report attending a political protest, march, or demonstration ($p=0.035$ and $p=0.009$, respectively).

Table 10. Multivariate associations – County-level variables

Measure	2018 Voter Turnout				Contacting a public official				Attending a political protest, march, or demonstration			
	Coef. (se)	p-value	Marginal Effect	p-value	Coef. (se)	p-value	Marginal Effect	p-value	Coef. (se)	p-value	Marginal Effect	p-value
Poor physical health days												
Intermediate Tertile	-0.02 (0.06)	0.699	0.00	0.699	-0.03 (0.06)	0.637	0.00	0.637	-0.11 (0.09)	0.209	-0.01	0.213
Highest Tertile	-0.11 (0.07)	0.144	-0.02	0.144	-0.01 (0.08)	0.901	0.00	0.901	-0.09 (0.12)	0.423	-0.01	0.423
Adults with BMI≥30												
Intermediate Tertile	-0.02 (0.05)	0.637	0.00	0.636	-0.09 (0.05)	0.063	-0.01	0.064	-0.12 (0.07)	0.067	-0.01	0.068
Highest Tertile	-0.05 (0.07)	0.456	-0.01	0.456	-0.13 (0.06)	0.039	-0.02	0.040	-0.21 (0.09)	0.021	-0.02	0.020
Poor mental health days												
Intermediate Tertile	-0.01 (0.06)	0.905	0.00	0.905	0.08 (0.05)	0.122	0.01	0.120	0.21 (0.09)	0.026	0.02	0.023
Highest Tertile	0.01 (0.08)	0.880	0.00	0.880	0.18 (0.08)	0.021	0.03	0.021	0.18 (0.12)	0.140	0.01	0.140
Mental health providers												
Intermediate Tertile	0.05 (0.05)	0.319	0.01	0.319	-0.06 (0.05)	0.186	-0.01	0.187	-0.11 (0.08)	0.170	-0.01	0.175
Highest Tertile	0.01 (0.06)	0.808	0.00	0.808	-0.02 (0.06)	0.793	0.00	0.793	0.04 (0.09)	0.642	0.00	0.641
Primary care physicians												
Intermediate Tertile	-0.01 (0.05)	0.834	0.00	0.834	0.01 (0.04)	0.813	0.00	0.813	0.10 (0.07)	0.169	0.01	0.165

	-0.02	0.763	0.00	0.763	-0.04	0.467	-0.01	0.467	0.11	0.155	0.01	0.152
Highest Tertile	(0.05)				(0.05)				(0.08)			
Excessive drinking												
	0.08	0.077	0.02	0.077	0.07	0.111	0.01	0.110	0.13	0.092	0.01	0.090
Intermediate Tertile	(0.04)				(0.04)				(0.08)			
	0.10	0.075	0.02	0.076	0.11	0.035	0.02	0.035	0.32	<0.001	0.02	<0.001
Highest Tertile	(0.06)				(0.05)				(0.08)			
Adult smoking												
	0.02	0.741	0.00	0.741	-0.02	0.720	0.00	0.721	-0.12	0.101	-0.01	0.106
Intermediate Tertile	(0.05)				(0.05)				(0.08)			
	0.07	0.388	0.01	0.388	0.02	0.846	0.00	0.846	-0.14	0.230	-0.01	0.227
Highest Tertile	(0.08)				(0.08)				(0.12)			
Air pollution-particulate matter												
	0.07	0.195	0.01	0.195	-0.04	0.430	-0.01	0.431	-0.05	0.536	0.00	0.538
Intermediate Tertile	(0.05)				(0.05)				(0.09)			
	0.03	0.652	0.01	0.652	-0.03	0.670	0.00	0.671	-0.11	0.306	-0.01	0.308
Highest Tertile	(0.07)				(0.06)				(0.11)			
Drinking water violations												
	-0.04	0.371	-0.01	0.371	-0.04	0.276	-0.01	0.276	0.00	0.949	0.00	0.949
Violation	(0.04)				(0.04)				(0.06)			
Violent crime												
	-0.08	0.112	-0.02	0.112	-0.02	0.629	0.00	0.629	0.11	0.114	0.01	0.111
Intermediate Tertile	(0.05)				(0.04)				(0.07)			
	-0.03	0.610	-0.01	0.610	-0.02	0.733	0.00	0.733	0.15	0.066	0.01	0.065
Highest Tertile	(0.06)				(0.06)				(0.08)			
Social associations												
	0.09	0.127	0.02	0.128	0.11	0.032	0.02	0.032	0.10	0.302	0.01	0.300
Intermediate Tertile	(0.06)				(0.05)				(0.10)			
	0.05	0.432	0.01	0.432	0.14	0.025	0.02	0.025	0.03	0.770	0.00	0.770
Highest Tertile	(0.07)				(0.06)				(0.10)			

Severe housing problems												
	0.00	0.980	0.00	0.980	0.03	0.456	0.01	0.455	0.15	0.035	0.01	0.031
Intermediate Tertile	(0.05)				(0.04)				(0.07)			
	0.02	0.739	0.00	0.739	0.02	0.787	0.00	0.788	0.29	0.009	0.02	0.009
Highest Tertile	(0.07)				(0.07)				(0.11)			

Notes: Table shows the results from three multivariate logistic regression model, one for each political participation outcome variable, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. The reference for each category is the lowest tertile, excluding drinking water violations for which the reference is no violations. All estimates incorporate complex sample survey weights.

Tables 11 and 12 display the results from the multivariate logistic regression models stratified by racial/ethnic group focusing on voter turnout. Panel 1 of Table 12 displays the results for respondents who identified as white. Among those who identified as white, respondents in counties in the intermediate tertile of social associations were significantly more likely to turnout compared to those in the lowest tertile (p=0.041).

Panel 2 of Table 12 displays the results for respondents who identified as Black. Of the respondents who identified as Black in this sample, respondents in counties in the high tertile of BMI were about 10 percentage points less likely to report voter turnout, compared to those in the low tertile (p=0.036). Black respondents in counties in the intermediate tertile of poor mental health days were significantly less likely to turnout (p=0.017), while Black respondents in counties in the highest tertile of county smoking prevalence were about 12 percentage points more likely to turn out to vote (p=0.023). I did not find any other significant associations with turnout and the other county-level public health variables among the respondents who identified as Black.

Panel 3 of Table 12 displays the results for respondents who identified as Hispanic. Among those who identified as Hispanic, respondents in counties in the intermediate tertile of poor mental health days were about 8 percentage points less likely to turn out to vote compared to respondents in the low tertile (p=0.035). I did not find any other significant associated with turnout and the other county-level public health variables among the respondents who identified as Hispanic.

Panel 4 of Table 12 displays the results for respondents who identified as Asian, Native American, Middle Eastern, Mixed, or another group. Of the respondents who identified as Asian, Native American, Middle Eastern, Mixed, or Other, county-level poor physical health days, mental health providers, and smoking prevalence were all significantly associated with turnout. Respondents in this racial category residing in the intermediate or high tertile of poor physical health days were significantly less likely to turn out to voter, compared to those in the low tertile ($p=0.002$ and $p=0.003$, respectively). Among the respondents who identified as Asian, Native American, Middle Eastern, Mixed, or Other, those in counties in the intermediate tertile mental health providers were about 11 percentage points more likely to turn out to vote, compared to respondents in the low tertile ($p=0.005$). Finally, respondents in this racial category in counties in the intermediate or high tertile of county smoking prevalence were significantly more likely to turn out to vote ($p=0.040$ and $p<0.001$, respectively).

Table 11. Associations with turnout from multivariate logistic regression models stratified by racial/ethnic group – individual-level control variables

	Racial Category															
Measure	White (n=34,681)				Black (n= 4,111)				Hispanic (n=3,553)				Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)																
31-45	0.46 (0.05)	<0.001	0.10	<0.001	0.34 (0.14)	0.012	0.07	0.011	0.55 (0.14)	0.000	0.11	<0.001	0.32 (0.15)	0.033	0.06	0.032
46-60	0.96 (0.05)	<0.001	0.21	<0.001	1.15 (0.14)	0.000	0.26	<0.001	0.88 (0.15)	0.000	0.18	<0.001	1.18 (0.18)	<0.001	0.24	<0.001
Over 60	1.49 (0.05)	<0.001	0.31	<0.001	1.53 (0.15)	0.000	0.34	<0.001	1.77 (0.20)	0.000	0.36	<0.001	1.63 (0.19)	<0.001	0.33	<0.001
Education (Ref=HS degree or less)																
Some College	0.33 (0.05)	<0.001	0.07	<0.001	0.08 (0.13)	0.557	0.02	0.557	0.29 (0.15)	0.058	0.06	0.056	0.60 (0.21)	0.004	0.12	0.004
2- or 4-year Degree	0.50 (0.04)	<0.001	0.10	<0.001	0.12 (0.12)	0.321	0.03	0.321	0.13 (0.17)	0.421	0.03	0.421	0.51 (0.20)	0.009	0.10	0.008

Post-grad	0.59 (0.06)	<0.001	0.12	<0.001	0.53 (0.20)	0.008	0.11	0.007	0.01 (0.20)	0.947	0.00	0.947	0.43 (0.22)	0.053	0.08	0.051
Marital Status (Ref=No)																
Yes	0.03 (0.04)	0.431	0.01	0.432	-0.07 (0.11)	0.522	-0.02	0.523	-0.34 (0.12)	0.007	-0.07	0.006	-0.15 (0.12)	0.217	-0.03	0.215
Annual family income (Ref=less than 20,000)																
20,000-49,999	0.33 (0.06)	<0.001	0.07	<0.001	0.10 (0.15)	0.528	0.02	0.527	-0.12 (0.19)	0.531	-0.02	0.532	0.36 (0.23)	0.122	0.07	0.117
50,000-79,999	0.49 (0.06)	<0.001	0.10	<0.001	-0.05 (0.15)	0.742	-0.01	0.742	0.17 (0.20)	0.408	0.03	0.407	0.54 (0.24)	0.022	0.11	0.020
80,000-119,999	0.63 (0.07)	<0.001	0.13	<0.001	0.29 (0.18)	0.102	0.06	0.102	0.44 (0.22)	0.045	0.09	0.044	0.34 (0.24)	0.161	0.07	0.157
120,000 or more	0.61 (0.07)	<0.001	0.12	<0.001	0.15 (0.21)	0.468	0.03	0.468	0.51 (0.24)	0.037	0.10	0.037	0.72 (0.25)	0.004	0.15	0.004
Gender (Ref=Male)																
Female	-0.02 (0.03)	0.528	0.00	0.528	0.00 (0.10)	0.967	0.00	0.967	0.07 (0.12)	0.555	0.01	0.554	-0.21 (0.12)	0.094	-0.04	0.094
Political interest (Ref=Only now																

and then, hardly at all, don't know)																
Most or some of the time	1.03 (0.04)	<0.001	0.22	<0.001	0.44 (0.12)	0.000	0.09	<0.001	0.91 (0.16)	0.000	0.19	<0.001	0.60 (0.14)	<0.001	0.12	<0.001
Party Identification (Ref=Democrat)																
Republican	-0.07 (0.04)	0.069	-0.01	0.068	-0.28 (0.23)	0.216	-0.06	0.217	-0.42 (0.14)	0.003	-0.09	0.002	-0.53 (0.18)	0.004	-0.11	0.003
Independent	-0.29 (0.04)	<0.001	-0.06	<0.001	-0.64 (0.13)	0.000	-0.14	<0.001	-0.72 (0.15)	0.000	-0.15	<0.001	-0.67 (0.15)	<0.001	-0.14	<0.001
Other	-0.02 (0.08)	0.766	0.00	0.766	-0.96 (0.28)	0.001	-0.21	<0.001	-0.35 (0.29)	0.228	-0.07	0.228	-0.18 (0.26)	0.477	-0.04	0.478
Not sure	-1.70 (0.11)	<0.001	-0.35	<0.001	-0.95 (0.30)	0.002	-0.20	0.001	-1.75 (0.39)	0.000	-0.33	<0.001	-1.63 (0.36)	<0.001	-0.31	<0.001

Notes: Table shows the results from four multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. All estimates incorporate complex sample survey weights.

Table 12. Associations with turnout from multivariate logistic regression models stratified by racial/ethnic group – county-level public health variables

	Racial Category															
	White (n=34,681)				Black (n= 4,111)				Hispanic (n=3,553)				Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Poor physical health days																
Intermediate Tertile	0.02 (0.06)	0.804	0.00	0.804	0.10 (0.20)	0.617	0.02	0.618	0.16 (0.23)	0.496	0.03	0.494	-0.67 (0.21)	0.002	-0.13	0.001
Highest Tertile	-0.10 (0.08)	0.206	-0.02	0.206	0.02 (0.27)	0.931	0.00	0.931	0.26 (0.31)	0.408	0.05	0.405	-0.89 (0.30)	0.003	-0.18	0.002
Adults with BMI≥30																
Intermediate Tertile	0.01 (0.05)	0.887	0.00	0.887	-0.04 (0.15)	0.792	-0.01	0.791	0.10 (0.19)	0.609	0.02	0.608	-0.06 (0.20)	0.776	-0.01	0.776
Highest Tertile	0.04 (0.07)	0.546	0.01	0.545	-0.49 (0.24)	0.040	-0.10	0.036	0.37 (0.29)	0.214	0.07	0.208	0.13 (0.29)	0.653	0.03	0.653
Poor mental health days																
Intermediate Tertile	0.10 (0.07)	0.141	0.02	0.142	-0.43 (0.18)	0.017	-0.09	0.016	-0.40 (0.19)	0.037	-0.08	0.035	-0.08 (0.20)	0.686	-0.02	0.687

Highest Tertile	0.08 (0.08)	0.354	0.02	0.353	-0.25 (0.24)	0.295	-0.05	0.292	-0.32 (0.29)	0.278	-0.06	0.276	-0.07 (0.30)	0.826	-0.01	0.826
Mental health providers																
Intermediate Tertile	-0.03 (0.05)	0.510	-0.01	0.509	0.16 (0.16)	0.314	0.03	0.315	0.15 (0.18)	0.377	0.03	0.377	0.54 (0.19)	0.005	0.11	0.004
Highest Tertile	0.00 (0.06)	0.973	0.00	0.973	-0.06 (0.22)	0.794	-0.01	0.794	0.09 (0.24)	0.720	0.02	0.720	0.48 (0.25)	0.059	0.09	0.054
Primary care physicians																
Intermediate Tertile	-0.03 (0.05)	0.527	-0.01	0.527	-0.12 (0.19)	0.519	-0.03	0.518	0.20 (0.18)	0.264	0.04	0.263	0.05 (0.19)	0.781	0.01	0.781
Highest Tertile	-0.01 (0.06)	0.884	0.00	0.884	-0.23 (0.21)	0.286	-0.05	0.284	0.23 (0.23)	0.315	0.05	0.315	-0.02 (0.22)	0.933	0.00	0.933
Excessive drinking																
Intermediate Tertile	0.04 (0.05)	0.470	0.01	0.470	-0.07 (0.14)	0.642	-0.01	0.642	0.25 (0.17)	0.150	0.05	0.150	0.15 (0.16)	0.354	0.03	0.354
Highest Tertile	0.05 (0.06)	0.403	0.01	0.403	0.06 (0.20)	0.754	0.01	0.754	0.21 (0.22)	0.360	0.04	0.361	0.26 (0.20)	0.199	0.05	0.200
Adult smoking																
Intermediate Tertile	-0.08 (0.06)	0.188	-0.01	0.186	0.29 (0.16)	0.075	0.06	0.071	0.03 (0.17)	0.840	0.01	0.840	0.35 (0.17)	0.040	0.07	0.038

Highest Tertile	-0.08 (0.08)	0.288	-0.02	0.287	0.56 (0.25)	0.025	0.12	0.023	-0.09 (0.27)	0.740	-0.02	0.740	1.03 (0.29)	<0.001	0.20	<0.001
Air pollution-particulate matter																
Intermediate Tertile	0.07 (0.05)	0.209	0.01	0.209	0.18 (0.21)	0.389	0.04	0.389	0.11 (0.23)	0.626	0.02	0.625	-0.10 (0.20)	0.623	-0.02	0.623
Highest Tertile	-0.01 (0.07)	0.845	0.00	0.845	0.31 (0.24)	0.207	0.06	0.206	0.16 (0.23)	0.493	0.03	0.492	-0.21 (0.20)	0.286	-0.04	0.285
Drinking water violations																
Violation	-0.04 (0.04)	0.370	-0.01	0.369	0.08 (0.12)	0.508	0.02	0.507	0.04 (0.15)	0.806	0.01	0.806	-0.15 (0.14)	0.289	-0.03	0.289
Violent crime																
Intermediate Tertile	-0.07 (0.05)	0.152	-0.01	0.152	-0.29 (0.18)	0.116	-0.06	0.115	0.17 (0.24)	0.489	0.03	0.487	0.09 (0.18)	0.622	0.02	0.622
Highest Tertile	-0.08 (0.06)	0.169	-0.02	0.170	-0.09 (0.19)	0.631	-0.02	0.631	0.22 (0.26)	0.388	0.04	0.384	0.36 (0.22)	0.104	0.07	0.100
Social associations																
Intermediate Tertile	0.11 (0.06)	0.041	0.02	0.042	0.06 (0.16)	0.713	0.01	0.713	-0.09 (0.22)	0.697	-0.02	0.697	-0.21 (0.20)	0.288	-0.04	0.286
Highest Tertile	0.05 (0.07)	0.459	0.01	0.460	0.03 (0.22)	0.893	0.01	0.893	-0.19 (0.29)	0.510	-0.04	0.507	0.09 (0.24)	0.700	0.02	0.701

Severe housing problems																
Intermediate Tertile	0.01 (0.05)	0.781	0.00	0.781	-0.03 (0.17)	0.860	-0.01	0.860	-0.07 (0.25)	0.786	-0.01	0.787	-0.04 (0.20)	0.859	-0.01	0.859
Highest Tertile	0.03 (0.07)	0.636	0.01	0.636	0.05 (0.24)	0.821	0.01	0.821	0.10 (0.31)	0.746	0.02	0.745	-0.13 (0.27)	0.635	-0.03	0.635

Notes: Table shows the results from four multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. The reference for each category is the lowest tertile, excluding drinking water violations for which the reference is no violations. All estimates incorporate complex sample survey weights.

Tables 13 and 14 display the results from the multivariate logistic regression models stratified by racial/ethnic group focus on contacting a public official. Panel 1 of Table 14 displays the results for respondents who identified as White. Among the respondents who identified as white, I did not find any significant associations with the county-level public health variables and respondents' likelihood of contacting a public official in the last year.

Panel 2 of Table 14 displays the results for respondents who identified as Black. Among the respondents who identified as Black, those in counties in the highest tertile of poor mental health days were about 9 percentage points less likely to report contacting a public official in the last year, compared to Black respondents in the low tertile ($p=0.009$). Respondents who identified as Black in counties in the intermediate or high tertile of smoking prevalence were significantly more likely to report contacting a public official ($p=0.011$ and $p=0.001$, respectively).

Panel 3 of Table 14 displays the results for respondents who identified as Hispanic. Of the respondents who identified as Hispanic, those in counties in the intermediate or high tertile of poor mental health days per month were significantly more likely to report contacting a public official in the last year, compared to respondents in the low tertile ($p=0.019$ and $p=0.006$, respectively). Additionally, Hispanic respondents in counties in the intermediate tertile of violent crime were significantly more likely to report contacting a public official ($p=0.002$) and respondents in counties in the highest

tertile of severe housing problems were significantly more likely to report contacting a public official in the last year, compared to those in the low tertile (p=0.025).

Panel 4 of Table 14 displays the results for respondents who identified as Asian, Native American, Middle Eastern, Mixed, or another group. Among these respondents, those in counties in the intermediate tertile of BMI were significantly less likely to report contacting a public official, compared to respondents in the low tertile (p=0.035). Additionally, among those who identified as Asian, Native American, Middle Eastern, Mixed, or Other, respondents in counties in the high tertile of mental health providers were significantly less likely to report contacting a public official (p=0.010) and respondents in counties in the high tertile of primary care providers were significantly less likely to report contacting a public official in the last year, compared to respondents in the low tertile (p=0.019). Finally, among respondents in this racial category, those in counties in the high tertile of severe housing problems were significantly less likely to report contacting a public official in the last year (p=0.050).

Table 13. Associations with contacting a public official from multivariate logistic regression models stratified by racial/ethnic group – individual-level variables

	Racial Category															
	White (n=34,681)				Black (n= 4,111)				Hispanic (n=3,553)				Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)																
31-45	0.35 (0.06)	0.000	0.06	0.000	0.11 (0.25)	0.647	0.01	0.642	-0.33 (0.18)	0.067	-0.03	0.073	-0.04 (0.19)	0.847	0.00	0.848
46-60	0.65 (0.06)	0.000	0.11	0.000	0.25 (0.21)	0.240	0.02	0.216	-0.03 (0.19)	0.878	0.00	0.878	0.45 (0.22)	0.040	0.06	0.033
Over 60	0.93 (0.06)	0.000	0.16	0.000	0.67 (0.22)	0.003	0.07	0.001	0.57 (0.25)	0.020	0.07	0.028	0.39 (0.24)	0.105	0.05	0.100
Education (Ref=HS degree or less)																
Some College	0.79 (0.05)	0.000	0.13	0.000	0.45 (0.19)	0.017	0.04	0.015	0.74 (0.24)	0.003	0.08	0.002	0.57 (0.22)	0.008	0.07	0.007
2- or 4-year Degree	0.87 (0.04)	0.000	0.15	0.000	0.61 (0.21)	0.003	0.06	0.002	0.79 (0.21)	0.000	0.08	0.000	0.73 (0.22)	0.001	0.10	0.000
Post-grad	1.23 (0.06)	0.000	0.22	0.000	0.94 (0.24)	0.000	0.10	0.000	1.20 (0.29)	0.000	0.14	0.000	0.72 (0.25)	0.003	0.09	0.003
Marital Status (Ref=No)																
Yes	-0.08 (0.03)	0.019	-0.01	0.020	-0.22 (0.17)	0.184	-0.02	0.176	-0.02 (0.17)	0.926	0.00	0.926	-0.20 (0.15)	0.163	-0.03	0.162
Annual family income																

(Ref=less than 20,000)																
20,000-49,999	-0.01	(0.07)	0.866	0.00	0.866	0.16	(0.21)	0.456	0.01	0.448	0.33	(0.29)	0.252	0.03	0.234	-0.03	(0.28)	0.922	0.00	0.922
50,000-79,999	0.19	(0.07)	0.005	0.03	0.005	0.64	(0.23)	0.007	0.06	0.005	0.48	(0.27)	0.076	0.05	0.058	0.18	(0.27)	0.512	0.03	0.506
80,000-119,999	0.23	(0.07)	0.002	0.04	0.001	0.60	(0.26)	0.023	0.06	0.027	0.44	(0.32)	0.167	0.04	0.163	0.05	(0.28)	0.846	0.01	0.845
120,000 or more	0.33	(0.08)	0.000	0.06	0.000	0.56	(0.32)	0.081	0.05	0.097	0.73	(0.30)	0.014	0.08	0.010	0.03	(0.31)	0.928	0.00	0.928
Gender (Ref=Male)																
Female	-0.06	(0.03)	0.050	-0.01	0.050	-0.03	(0.13)	0.830	0.00	0.831	-0.14	(0.15)	0.336	-0.02	0.336	-0.17	(0.13)	0.200	-0.02	0.203
Political interest (Ref=Only now and then, hardly at all, don't know)																
Most or some of the time	1.97	(0.09)	0.000	0.26	0.000	1.54	(0.22)	0.000	0.12	0.000	1.93	(0.24)	0.000	0.16	0.000	2.11	(0.31)	0.000	0.21	0.000
Party Identification (Ref=Democrat)																
Republican	-0.61	(0.04)	0.000	-0.11	0.000	0.26	(0.29)	0.360	0.03	0.392	-0.40	(0.24)	0.092	-0.04	0.076	0.12	(0.20)	0.559	0.02	0.562
Independent	-0.23	(0.04)	0.000	-0.04	0.000	0.10	(0.15)	0.512	0.01	0.520	0.08	(0.14)	0.585	0.01	0.590	0.12	(0.14)	0.397	0.02	0.396
Other	0.34	(0.08)	0.000	0.07	0.000	0.29	(0.43)	0.508	0.03	0.539	0.46	(0.38)	0.232	0.06	0.271	0.82	(0.25)	0.001	0.13	0.002
Not sure	-1.24	(0.22)	0.000	-0.20	0.000	-0.77	(0.48)	0.111	-0.06	0.036	-0.01	(0.61)	0.983	0.00	0.983	-0.19	(0.69)	0.781	-0.02	0.773

Notes: Table shows the results from four multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. All estimates incorporate complex sample survey weights.

Table 14. Associations with contacting a public official from multivariate logistic regression models stratified by racial/ethnic group – county-level variables

	Racial Category															
	White (n=34,681)				Black (n= 4,111)				Hispanic (n=3,553)				Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Poor physical health days																
Intermediate Tertile	-0.01 (0.06)	0.899	0.00	0.899	-0.14 (0.21)	0.498	-0.01	0.504	-0.03 (0.31)	0.920	0.00	0.920	0.01 (0.25)	0.973	0.00	0.973
Highest Tertile	0.05 (0.08)	0.548	0.01	0.548	-0.30 (0.27)	0.264	-0.03	0.270	-0.35 (0.39)	0.361	-0.04	0.372	-0.39 (0.32)	0.214	-0.05	0.209
Adults with BMI≥30																
Intermediate Tertile	-0.07 (0.05)	0.136	-0.01	0.137	0.29 (0.20)	0.137	0.03	0.122	0.39 (0.26)	0.132	0.04	0.132	-0.41 (0.20)	0.035	-0.06	0.035
Highest Tertile	-0.08 (0.06)	0.219	-0.01	0.219	0.35 (0.29)	0.232	0.03	0.230	-0.32 (0.40)	0.417	-0.03	0.398	-0.39 (0.27)	0.142	-0.05	0.132
Poor mental health days																
Intermediate Tertile	0.02 (0.05)	0.697	0.00	0.697	-0.40 (0.22)	0.069	-0.05	0.084	0.65 (0.28)	0.019	0.07	0.013	0.50 (0.26)	0.057	0.07	0.052
Highest Tertile	0.14 (0.08)	0.094	0.02	0.093	-0.91 (0.33)	0.006	-0.09	0.009	1.12 (0.41)	0.006	0.13	0.010	0.68 (0.35)	0.051	0.10	0.053
Mental health providers																
Intermediate Tertile	-0.05 (0.05)	0.231	-0.01	0.231	0.07 (0.20)	0.744	0.01	0.742	-0.22 (0.30)	0.463	-0.03	0.478	-0.21 (0.21)	0.330	-0.03	0.334
Highest Tertile	0.02 (0.06)	0.741	0.00	0.741	0.48 (0.30)	0.112	0.05	0.113	-0.57 (0.46)	0.219	-0.06	0.227	-0.69 (0.27)	0.010	-0.10	0.012
Primary care physicians																
Intermediate Tertile	0.03	0.504	0.01	0.504	-0.08	0.712	-0.01	0.715	0.11	0.677	0.01	0.675	-0.01	0.956	0.00	0.956

	(0.05)				(0.21)				(0.26)				(0.20)			
Highest Tertile	0.00 (0.06)	0.985	0.00	0.985	-0.12 (0.29)	0.682	-0.01	0.684	0.50 (0.35)	0.146	0.06	0.160	-0.60 (0.26)	0.019	-0.08	0.020
Excessive drinking																
Intermediate Tertile	0.08 (0.05)	0.072	0.02	0.071	0.20 (0.18)	0.276	0.02	0.272	-0.33 (0.23)	0.152	-0.03	0.157	0.18 (0.19)	0.354	0.02	0.351
Highest Tertile	0.08 (0.06)	0.158	0.02	0.158	0.21 (0.24)	0.399	0.02	0.404	0.44 (0.28)	0.124	0.05	0.136	0.45 (0.24)	0.065	0.06	0.066
Adult smoking																
Intermediate Tertile	-0.05 (0.05)	0.311	-0.01	0.313	0.46 (0.18)	0.011	0.04	0.007	0.21 (0.26)	0.423	0.02	0.426	-0.02 (0.21)	0.922	0.00	0.922
Highest Tertile	-0.03 (0.08)	0.716	-0.01	0.716	1.02 (0.30)	0.001	0.10	0.001	-0.23 (0.45)	0.605	-0.02	0.591	-0.26 (0.32)	0.424	-0.04	0.414
Air pollution-particulate matter																
Intermediate Tertile	-0.05 (0.05)	0.338	-0.01	0.339	-0.47 (0.25)	0.061	-0.05	0.078	0.30 (0.29)	0.300	0.03	0.304	-0.19 (0.25)	0.454	-0.03	0.456
Highest Tertile	-0.04 (0.06)	0.547	-0.01	0.547	-0.36 (0.27)	0.175	-0.04	0.194	0.28 (0.28)	0.318	0.03	0.317	-0.21 (0.28)	0.455	-0.03	0.456
Drinking water violations																
Violation	-0.05 (0.04)	0.243	-0.01	0.243	-0.17 (0.18)	0.346	-0.02	0.345	-0.37 (0.20)	0.063	-0.04	0.074	-0.19 (0.16)	0.221	-0.03	0.223
Violent crime																
Intermediate Tertile	-0.01 (0.05)	0.780	0.00	0.780	-0.23 (0.21)	0.269	-0.02	0.282	0.61 (0.26)	0.022	0.07	0.014	-0.15 (0.21)	0.464	-0.02	0.470
Highest Tertile	0.04 (0.06)	0.547	0.01	0.548	-0.21 (0.23)	0.346	-0.02	0.360	0.05 (0.29)	0.865	0.00	0.865	-0.03 (0.25)	0.900	0.00	0.900
Social associations																
Intermediate Tertile	0.09 (0.05)	0.083	0.02	0.082	0.12 (0.18)	0.506	0.01	0.507	0.06 (0.26)	0.816	0.01	0.817	0.23 (0.22)	0.315	0.03	0.315

Highest Tertile	0.10 (0.06)	0.118	0.02	0.117	0.06 (0.24)	0.795	0.01	0.796	0.29 (0.34)	0.391	0.03	0.413	0.52 (0.27)	0.056	0.08	0.060
Severe housing problems																
Intermediate Tertile	0.02 (0.05)	0.665	0.00	0.665	0.09 (0.21)	0.645	0.01	0.639	0.59 (0.32)	0.063	0.05	0.041	-0.20 (0.20)	0.320	-0.03	0.327
Highest Tertile	0.04 (0.07)	0.580	0.01	0.580	-0.32 (0.32)	0.324	-0.03	0.339	0.89 (0.40)	0.025	0.08	0.011	-0.55 (0.28)	0.050	-0.08	0.055

Notes: Table shows the results from four multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. The reference for each category is the lowest tertile, excluding drinking water violations for which the reference is no violations. All estimates incorporate complex sample survey weights.

Tables 15 and 16 display the results from the multivariate logistic regression models stratified by racial/ethnic group focusing on protesting. Panel 1 of Table 16 displays the results for respondents who identified as white. Among the respondents who identified as white, respondents in counties in the intermediate tertile of poor mental health days per month were significantly more likely to report attending a political protest, march, or demonstration in the last year, compared to respondents in the low tertile ($p=0.022$). Additionally, of the respondents who identified as white, those in counties in the higher tertile of excessive drinking were significantly more likely to report attending a protest ($p<0.001$), while respondents in counties in the intermediate tertile of smoking prevalence were significantly less likely to report attending a political protest, march, or demonstration in the last year, compared to those in the low tertile ($p=0.003$). Respondents who identified as white in counties in the intermediate or high tertile of violent crime were significantly more likely to report attending a protest in the last year, compared to respondents in the low tertile ($p=0.017$ and $p=0.014$, respectively). Among those who identified as white, respondents in the high tertile of severe housing problems were significantly more likely to report attending a political protest, march, or demonstration in the last year ($p=0.017$).

Panel 2 of Table 16 displays the results for respondents who identified as Black. Among the respondents who identified as Black, respondents in the intermediate tertile of BMI were significantly less likely to report attending political protest, march, or demonstration in the last year ($p=0.001$), while those in counties in the intermediate tertile of excessive drinking were significantly more likely to report attending a protest,

compared to those in the low tertile (p=0.012). Additionally, respondents who identified as Black in the intermediate or high tertile of air pollution were both about 8 percentage points less likely to report attending a political protest, march, or demonstration, compared to those in the low tertile (p=0.007 and p=0.018, respectively). Among those who identified as Black, respondents in counties in the intermediate or high tertile of violent crime were significantly less likely to report attending a political protest, march, or demonstration in the last year (p=0.007 and p=0.001, respectively).

Panel 3 of Table 16 displays the results for respondents who identified as Hispanic. Among the respondents who identified as Hispanic, respondents in counties in the intermediate or high tertile of poor physical health days per month were significantly less likely to report attending a political protest, march, or demonstration in the last year, compared to those in the low tertile (p=0.009 and p=0.036, respectively). Respondents who identified as Hispanic in counties in the intermediate or high tertile of primary care providers were significantly more likely to report attending a political protest, march, or demonstration in the last year, compared to respondents in the low tertile (p=0.016 and p=0.038, respectively).

Panel 4 of Table 16 displays the results for respondents who identified as Asian, Native American, Middle Eastern, Mixed, or another group. Among the respondents who identified as Asian, Native American, Middle Eastern, Mixed, or Other, respondents in counties in the intermediate tertile of poor mental health days per month were significantly more likely to report attending a political protest, march, or demonstration in

the last year, compared to those in the low tertile (p=0.038). Among respondents in these racial categories, respondents in the intermediate or high tertile of excessive drinking were significantly more likely to report attending a protest in the last year, compared to those in the low tertile (p=0.029 and p=0.004, respectively). Additionally, among the respondents who identified as Asian, Native American, Middle Eastern, Mixed, or Other, respondents in counties in the intermediate tertile of smoking prevalence were significantly more likely to report attending a protest, compared to those in the low tertile (p=0.045). Finally, among respondents in these racial categories, those in counties in the intermediate or high tertile of air pollution-particulate matter were significantly less likely to report attending a political protest, march, or demonstration in the last year, compared to respondents in the low tertile (p=0.045 and p=0.038, respectively). Additionally, I estimated multivariate logistic regression models with interaction terms to test which indicate that there are plausible differences in how people experience these county conditions based on the race/ethnicity of the respondent (Appendix B).

Table 15. Associations with attending a political protest, march, or demonstration from multivariate logistic regression models stratified by racial/ethnic group – individual-level variables

	Racial Category															
	White (n=34,681)				Black (n= 4,111)				Hispanic (n=3,553)				Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)																
31-45	-0.37 (0.08)	0.000	-0.03	0.000	-0.84 (0.20)	0.000	-0.07	0.000	-0.18 (0.20)	0.370	-0.02	0.376	-0.73 (0.23)	0.002	-0.07	0.002
46-60	-0.43 (0.08)	0.000	-0.04	0.000	-1.22 (0.22)	0.000	-0.09	0.000	-0.50 (0.19)	0.010	-0.04	0.015	-0.69 (0.25)	0.005	-0.07	0.005
Over 60	-0.58 (0.08)	0.000	-0.05	0.000	-1.57 (0.27)	0.000	-0.10	0.000	-0.48 (0.39)	0.217	-0.04	0.188	-1.04 (0.28)	0.000	-0.09	0.000
Education (Ref=HS degree or less)																
Some College	0.91 (0.10)	0.000	0.05	0.000	-0.18 (0.26)	0.490	-0.01	0.496	0.39 (0.29)	0.170	0.03	0.166	0.35 (0.32)	0.281	0.02	0.266
2- or 4-year Degree	1.16 (0.09)	0.000	0.07	0.000	0.20 (0.24)	0.401	0.01	0.391	0.67 (0.23)	0.004	0.05	0.002	0.64 (0.33)	0.052	0.05	0.030
Post-grad	1.51 (0.09)	0.000	0.10	0.000	0.53 (0.34)	0.119	0.03	0.142	0.81 (0.29)	0.005	0.07	0.010	0.73 (0.37)	0.047	0.06	0.038
Marital Status (Ref=No)																
Yes	-0.13 (0.05)	0.008	-0.01	0.009	-0.38 (0.17)	0.027	-0.02	0.024	-0.53 (0.20)	0.010	-0.04	0.013	-0.07 (0.21)	0.750	-0.01	0.750
Annual family income																

(Ref=less than 20,000)																
20,000-49,999	0.08 (0.10)	0.399	0.01	0.392	0.05 (0.30)	0.872	0.00	0.871	0.31 (0.40)	0.446	0.02	0.412	-0.37 (0.30)	0.212	-0.03	0.232
50,000-79,999	0.26 (0.10)	0.009	0.02	0.006	0.72 (0.30)	0.018	0.04	0.012	0.37 (0.40)	0.354	0.03	0.313	-0.37 (0.31)	0.235	-0.03	0.254
80,000-119,999	0.37 (0.10)	0.000	0.03	0.000	0.50 (0.36)	0.160	0.03	0.169	0.65 (0.46)	0.159	0.05	0.129	-0.09 (0.31)	0.770	-0.01	0.771
120,000 or more	0.37 (0.10)	0.000	0.03	0.000	0.72 (0.39)	0.064	0.04	0.083	0.82 (0.48)	0.089	0.07	0.066	-0.43 (0.33)	0.199	-0.04	0.214
Gender (Ref=Male)																
Female	0.05 (0.05)	0.317	0.00	0.317	-0.03 (0.18)	0.864	0.00	0.865	-0.23 (0.18)	0.203	-0.02	0.204	-0.41 (0.15)	0.005	-0.03	0.005
Political interest (Ref=Only now and then, hardly at all, don't know)																
Most or some of the time	1.96 (0.14)	0.000	0.09	0.000	1.65 (0.27)	0.000	0.07	0.000	1.06 (0.26)	0.000	0.07	0.000	1.13 (0.27)	0.000	0.08	0.000
Party Identification (Ref=Democrat)																
Republican	-1.84 (0.08)	0.000	-0.13	0.000	0.44 (0.37)	0.234	0.03	0.293	-0.97 (0.23)	0.000	-0.07	0.000	-0.94 (0.26)	0.000	-0.07	0.000
Independent	-0.85 (0.05)	0.000	-0.08	0.000	-0.02 (0.23)	0.944	0.00	0.944	-0.56 (0.25)	0.025	-0.05	0.019	-0.55 (0.20)	0.006	-0.05	0.005
Other	-0.21 (0.11)	0.064	-0.02	0.052	0.12 (0.55)	0.825	0.01	0.832	0.20 (0.53)	0.706	0.02	0.719	0.67 (0.25)	0.008	0.08	0.019
Not sure	-1.95 (0.38)	0.000	-0.13	0.000	-0.35 (0.56)	0.534	-0.02	0.483	-0.96 (0.40)	0.015	-0.07	0.002	0.52 (0.48)	0.282	0.06	0.333

Notes: Table shows the results from four multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. All estimates incorporate complex sample survey weights.

Table 16. Associations with attending a political protest, march, or demonstration from multivariate logistic regression models stratified by racial/ethnic group – county-level variables

	Racial Category															
	White (n=34,681)				Black (n= 4,111)				Hispanic (n=3,553)				Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Poor physical health days																
Intermediate Tertile	-0.11 (0.08)	0.190	-0.01	0.193	0.43 (0.41)	0.296	0.02	0.267	-0.90 (0.34)	0.009	-0.09	0.030	-0.24 (0.26)	0.361	-0.02	0.364
Highest Tertile	-0.08 (0.12)	0.532	-0.01	0.531	0.68 (0.52)	0.189	0.04	0.179	-1.03 (0.49)	0.036	-0.09	0.052	-0.03 (0.35)	0.937	0.00	0.937
Adults with BMI≥30																
Intermediate Tertile	-0.01 (0.07)	0.866	0.00	0.866	-0.80 (0.23)	0.001	-0.04	0.003	-0.02 (0.27)	0.935	0.00	0.935	-0.40 (0.24)	0.105	-0.03	0.105
Highest Tertile	-0.12 (0.10)	0.229	-0.01	0.228	-0.38 (0.37)	0.298	-0.02	0.298	-0.71 (0.40)	0.079	-0.05	0.047	-0.45 (0.37)	0.217	-0.04	0.194
Poor mental health days																
Intermediate Tertile	0.21 (0.09)	0.022	0.02	0.019	-0.22 (0.28)	0.429	-0.01	0.443	0.35 (0.29)	0.222	0.03	0.208	0.60 (0.29)	0.038	0.05	0.036
Highest Tertile	0.19 (0.13)	0.144	0.01	0.144	-0.18 (0.40)	0.644	-0.01	0.645	0.46 (0.43)	0.285	0.04	0.302	0.50 (0.42)	0.235	0.04	0.259
Mental health providers																
Intermediate Tertile	-0.05 (0.08)	0.545	0.00	0.547	-0.04 (0.29)	0.886	0.00	0.887	-0.58 (0.32)	0.069	-0.05	0.091	-0.26 (0.32)	0.408	-0.02	0.429
Highest Tertile	0.15	0.087	0.01	0.085	-0.07	0.854	0.00	0.855	-0.65	0.066	-0.06	0.081	-0.01	0.972	0.00	0.972

	(0.09)				(0.39)				(0.35)				(0.37)			
Primary care physicians																
Intermediate Tertile	0.05 (0.07)	0.511	0.00	0.508	-0.15 (0.27)	0.593	-0.01	0.602	0.60 (0.25)	0.016	0.04	0.011	0.21 (0.27)	0.424	0.02	0.405
Highest Tertile	0.08 (0.09)	0.375	0.01	0.372	-0.16 (0.37)	0.667	-0.01	0.670	0.72 (0.35)	0.038	0.05	0.049	0.14 (0.33)	0.684	0.01	0.680
Excessive drinking																
Intermediate Tertile	0.09 (0.07)	0.189	0.01	0.188	0.63 (0.25)	0.012	0.03	0.012	-0.08 (0.26)	0.754	-0.01	0.755	0.51 (0.23)	0.029	0.04	0.031
Highest Tertile	0.30 (0.08)	0.000	0.02	0.000	0.41 (0.33)	0.213	0.02	0.229	0.25 (0.30)	0.395	0.02	0.399	0.79 (0.27)	0.004	0.07	0.005
Adult smoking																
Intermediate Tertile	-0.22 (0.07)	0.003	-0.02	0.003	0.41 (0.32)	0.195	0.02	0.163	0.00 (0.23)	0.998	0.00	0.998	0.54 (0.27)	0.045	0.05	0.056
Highest Tertile	-0.19 (0.11)	0.087	-0.01	0.086	0.05 (0.55)	0.927	0.00	0.927	-0.42 (0.53)	0.426	-0.03	0.384	0.66 (0.36)	0.070	0.06	0.098
Air pollution-particulate matter																
Intermediate Tertile	0.08 (0.08)	0.302	0.01	0.300	-1.22 (0.35)	0.001	-0.08	0.007	-0.16 (0.28)	0.576	-0.01	0.580	-0.59 (0.30)	0.045	-0.06	0.056
Highest Tertile	0.01 (0.10)	0.929	0.00	0.929	-1.16 (0.42)	0.006	-0.08	0.018	0.12 (0.32)	0.705	0.01	0.705	-0.72 (0.34)	0.038	-0.06	0.048
Drinking water violations																
Violation	0.04 (0.06)	0.511	0.00	0.510	-0.01 (0.21)	0.946	0.00	0.946	-0.32 (0.25)	0.198	-0.03	0.223	-0.12 (0.23)	0.592	-0.01	0.595
Violent crime																
Intermediate Tertile	0.16 (0.07)	0.017	0.01	0.016	-0.71 (0.26)	0.007	-0.05	0.021	0.34 (0.30)	0.264	0.03	0.244	-0.14 (0.28)	0.627	-0.01	0.630
Highest Tertile	0.22	0.014	0.02	0.014	-1.03	0.001	-0.07	0.008	0.29	0.377	0.02	0.355	-0.23	0.414	-0.02	0.421

	(0.09)				(0.32)				(0.33)				(0.28)			
Social associations																
Intermediate Tertile	0.03 (0.08)	0.682	0.00	0.681	-0.31 (0.30)	0.300	-0.02	0.311	0.45 (0.28)	0.111	0.04	0.144	0.58 (0.35)	0.100	0.05	0.111
Highest Tertile	-0.04 (0.09)	0.667	0.00	0.668	-0.35 (0.34)	0.313	-0.02	0.316	0.19 (0.36)	0.587	0.02	0.603	0.54 (0.38)	0.155	0.05	0.173
Severe housing problems																
Intermediate Tertile	0.10 (0.07)	0.137	0.01	0.133	0.34 (0.31)	0.264	0.02	0.232	0.45 (0.35)	0.195	0.03	0.143	-0.03 (0.27)	0.911	0.00	0.911
Highest Tertile	0.25 (0.10)	0.017	0.02	0.018	0.55 (0.41)	0.179	0.03	0.156	0.72 (0.48)	0.139	0.05	0.093	-0.23 (0.35)	0.506	-0.02	0.517

Notes: Table shows the results from four multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors in parentheses, p-value, marginal effect, and p-value. The reference for each category is the lowest tertile, excluding drinking water violations for which the reference is no violations. All estimates incorporate complex sample survey weights.

4.4 Discussion

The purpose of this paper was to examine associations between individual-level political behaviors and county-level public health. I examined three forms of political behavior: voting, contacting a public official, and attending a political protest, march, or demonstration. I identified numerous associations between these political participation outcomes and county-level measures of public health in bivariate analyses, with the only exception being no significant associations with drinking water violations. In the bivariate analyses, I found that respondents in counties in the highest tertile of poor physical health days were less likely to have engaged in all of the political behaviors examined in this study, compared to those in the lowest tertile, which is consistent with previous individual-level studies which found that poor health is associated with lower likelihood of political participation (C. L. Brown et al., 2020; Burden et al., 2017). However, one finding was counterintuitive, as respondents in counties in the intermediate or highest tertiles of excessive drinking were significantly more likely to engage in all three of the behaviors I examined. I expected excessive drinking to be associated with lower likelihood of political participation given that engaging in excessive drinking for individuals is associated with numerous poor health outcomes, however I found the opposite and I cannot assume that those who engaged in excessive drinking are the same respondents who participated. Further research is necessary to investigate this relationship. Previous research suggests binge or excessive drinking is associated with increased social cohesion among those who engage in this behavior (Ichiro Kawachi, 1999) and social cohesion may impact likelihood of political participation. In this study,

respondents in a county spatial environment where more of their peers are engaging in excessive drinking, relative to other counties may have prompted more community political engagement. Future research examining the relationship between excessive drinking and political participation could investigate differences by age group or other demographic characteristics and geographic context.

In the multivariate logistic regression analyses, there was variation in which county-level public health measures were associated with which political behavior. Figures 2-5 display the direction for the statistically significant associations found between county-level public health and political participation in the multivariate models. I did not find any statistically significant association with voter turnout and the county-level public health variables in the overall multivariate model. However, several county-level variables were significantly associated with respondents' likelihood of contacting a public official in the last year, including adults with BMI ≥30, poor mental health days per month, excessive drinking, and social associations. Adults with BMI ≥30 was included in this study as an indicator for food access and available opportunities for physical activity. Respondents in counties in the intermediate or highest tertiles of adults with BMI ≥30 may experience a spatial environment which provides few opportunities for community members to be physically active. As previously mentioned, excessive drinking is associated with increased social cohesion which may be related to why there is a relationship with likelihood of contacting a public official (Ichiro Kawachi, 1999). Social associations is a measure of the number of membership associations per 10,000 people in the county population. These membership associations are identified using

North American Industry Classification System (NAICS) codes and include sports, civic, religious, political, labor, professional, and business organizations. The relationship between contacting a public official and social associations may be related to community social capital and the ability to mobilize, which has long been theorized as a determinant of political behavior, as these groups may provide tools or resources to help community members be engaged (Brady et al., 1995; Ichiro Kawachi, 1999; Lindström, 2009).

Figure 2. Direction of the statistically significant associations found in the overall multivariate logistic regression models for each political participation outcome.

Measure	Voter Turnout	Contacting a public official	Attending a political protest, march, or demonstration
Poor physical health days			
Adults with BMI≥30		—	—
Poor mental health days		+	+
Mental health providers			
Primary care physicians			
Excessive drinking		+	+
Adult smoking			
Air pollution-particulate matter			
Drinking water violations			
Violent crime			
Social associations		+	
Severe housing problems			+
Notes: The table displays a minus sign where the relationship between the county-level measure and political participation outcome is negative and displays a plus sign where positive. If no significant relationship was identified the box remains empty.			

Figure 3. Direction of the statistically significant associations found in the multivariate logistic regression models stratified by racial/ethnic group for voter turnout.

Measure	White (n=34,681)	Black (n= 4,111)	Hispanic (n=3,553)	Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)

Poor physical health days				—
Adults with BMI≥30		—		
Poor mental health days		—		
Mental health providers				+
Primary care physicians				
Excessive drinking				
Adult smoking		+		+
Air pollution-particulate matter				
Drinking water violations				
Violent crime				
Social associations	+			
Severe housing problems				

Notes: The table displays a minus sign where the relationship between the county-level measure and political participation outcome is negative and displays a plus sign where positive. If no significant relationship was identified the box remains empty.

Figure 4. Direction of the statistically significant associations found in the multivariate logistic regression models stratified by racial/ethnic group for contacting a public official.

Measure	White (n=34,681)	Black (n= 4,111)	Hispanic (n=3,553)	Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)
Poor physical health days				
Adults with BMI≥30				—
Poor mental health days		—	+	
Mental health providers				—
Primary care physicians				—
Excessive drinking				
Adult smoking		+		
Air pollution-particulate matter				
Drinking water violations				
Violent crime			+	
Social associations				
Severe housing problems			+	—
Notes: The table displays a minus sign where the relationship between the county-level measure and political participation outcome is negative and displays a plus sign where positive. If no significant relationship was identified the box remains empty.				

Figure 5. Direction of the statistically significant associations found in the multivariate logistic regression models stratified by racial/ethnic group for attending a political protest, march, or demonstration.

Measure	White (n=34,681)	Black (n= 4,111)	Hispanic (n=3,553)	Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)
Poor physical health days			—	
Adults with BMI≥30		—		
Poor mental health days	+			+
Mental health providers				
Primary care physicians			+	
Excessive drinking	+	+		+
Adult smoking	—			+
Air pollution-particulate matter		—		—
Drinking water violations				
Violent crime	+	—		

Social associations				
Severe housing problems	+			
Notes: The table displays a minus sign where the relationship between the county-level measure and political participation outcome is negative and displays a plus sign where positive. If no significant relationship was identified the box remains empty.				

It is interesting to note that both likelihood of contacting a public official and likelihood of attending a political protest, march, demonstration in the last year were significantly associated with county-level prevalence of adults with BMI ≥30, poor mental health days per month, and excessive drinking. Contacting a public official is considered an institutional form of political participation by scholars because theoretically people must interact with a person or institution (Van Deth, 2014), however its is unclear what method of contacting the respondents in the CCES employed. Respondents could have sent a tweet or email, or may have engaged more interactively, such as a phone or office visit. Attending a political protest, march, or demonstration is the only non-institutional political behavior included in this study, meaning it is an activity that does not occur in the political sector but is targeted at impacting government and politics (Van Deth, 2014). Additionally, attending a political protest, march, or demonstration is a political behavior which requires more physical faculties to participate, compared to voting. Respondents in counties in the high tertile of adults with BMI ≥30 may also experience limited access to foods for a healthful diet which may contribute to fatigue or the development of chronic conditions, in turn limiting one's ability to participate in physically active political behaviors.

It seems intuitive that poor mental health days is associated with lower likelihood contacting a public official and attending a protest. This may indicate that respondents are in a spatial environment where fewer resources are dedicated to addressing poor mental health in their community, and they themselves may experience more poor mental health days relative to their peers, and/or others around them experience a high number of poor

mental health days. This health burden may reduce community capacity to enhance political knowledge and heighten political interest which are both determinants of political participation. These numerous significant associations suggest individuals' likelihood of contacting and protesting may be more sensitive to these public conditions, in comparison to the other participation measure in this study (i.e. voting).

Additionally, it is notable that severe housing problems was significantly associated with attending a political protest, march, or demonstration and not associated with voting or contacting a public official. Housing problems are contentious issues in many jurisdictions as affordable housing is very limited in large urban cities (Kingsley, 2017); such issues may also be a proxy variable for racial residential segregation. Measures related to housing problems including residential segregation and inequity in homeownership has been used as a measure of structural racism in previous research, as indications of spatial isolation and wealth, respectively (Chantarat, Van Riper, & Hardeman, 2021b). Research on political participation and homeownership suggests that buying or owning a home increases likelihood of turnout in local elections (Hall & Yoder, 2022; Holian, 2011; Jiang, 2018). Research looking at housing more broadly indicates that higher neighborhood eviction and foreclosure rates are associated with lower voted turnout (Estrada-Correa & Johnson, 2012; Slee & Desmond, 2021). Future research is necessary that investigates how housing is connected to political participation. In this study, respondents in counties with the most severe housing problems may be prompted to protest given their own challenging housing circumstances or interacting

with others in their community struggling with overcrowding, lack of quality housing, or high cost burdens.

Examining the results from the models stratified by racial/ethnic group, the only county-level variable associated with voter turnout, among people who identified as white was social associations. While among those who identified as Black, adults with BMI ≥30 and poor mental health days were significantly associated with lower likelihood of voter turnout. I also found that poor mental health days was associated with likelihood of voter turnout among respondents who identified as Hispanic. Among the respondents who identified as Asian, Native American, Middle Eastern, Mixed, or Other, poor physical health days, mental health providers, and adult smoking prevalence were all associated with voter turnout.

Looking at the models examining associations with contacting by racial/ethnic group, among both Black and Hispanic respondents, poor mental health days per month was significantly associated with likelihood of contacting a public official. However, the direction of this relationship differed by racial/ethnic group, as Black respondents in counties in the high tertile of poor mental health days per month were less likely to contact a public official in the last year and respondents who identified as Hispanic were more likely to contact a public official in the last year, compared to respondents in the lowest tertile. Additionally, in the regression model with the interaction terms, comparing white and Hispanic identifying respondents, the interaction term for poor mental health days was statistically significant, suggesting that the experience of being a person who

identifies as Hispanic in a county with a high prevalence of poor mental health days is different than the experience of being a white identifying person in the same counties.

Focusing on the models examining associations with protesting by racial/ethnic group, among both respondents who identified as white and those who identified as Black, county-level violent crime was significantly associated with likelihood of attending a political protest, march, or demonstration in the last year. Yet, the direction of this relationship for Black and white respondents is different, where Black people in high violent crime counties were less likely to report attending a protest, while white people in high violent crime counties were more likely to report protesting. However, in the multivariate logistic regression model with the interaction terms, the term examining the experience of being Black and living in a high violent crime county, was not significant. Previous research suggests that being a victim of crime may lead to increased likelihood of engaging in a protest (Bateson, 2012), however other research is critical of this claim, arguing that the results are impacted by response bias because respondents who are more efficacious, opinionated, and extroverted are more likely to answer sensitive survey questions about violent crime and are also more likely to participate in politics (Boulding, Mullenax, & Schauer, 2022). More research is necessary to understand this connection between violent crime, protesting, and racialized groups.

The implications of these findings for public health are complex. Within public health we must employ structural solutions to address these structural problems, which have created poor community conditions and related health inequities. The COVID-19

pandemic has highlighted how political interference can make it more difficult to address widespread health issues, as there have been politically-motivated efforts to suppress and distort data (Diamond, 2020; Krieger, 2021). Addressing health inequities in addition to addressing access to voting and exercising political rights may promote more political participation. These findings of significant differences in political participation by county-level public health indicators suggests poor health conditions could further disenfranchise those who already experience fewer resources and wield the least amount of political power or it could prompt them to engage more in politics to protect their rights.

Policy recommendations to increase political participation include expanding access to voting, such as no-excuse mail in ballots, early voting, and automatic voter registration (Root, 2018). Although public health conditions are measured at the county-level in this study, many of the policy levers to address these issues exist at the state and federal levels. Legislation at the federal level has the potential to provide funding to address many of the social determinants of health discussed in this paper. In August 2021 the U.S. Senate passed the Infrastructure Investment and Jobs Act to improve highways, transit, and safety infrastructure and also includes allocations for investments in water systems and environmental remediation (Snell, 2021b). Additionally, Democratic Congress members have proposed a $3.5 trillion spending bill which would expand Pell Grant eligibility in higher education, invest in public housing and clean energy, as well as, increase access to citizenship for immigrants (Snell, 2021a). However, there has been significant push back on passing the large spending bill from moderates and

conservatives in the Senate and House of Representatives on issues included in the bill, such as the expansion of Medicare and reducing carbon emissions (Scholtes, Caygle, & Emma, 2021).

This study has several limitations. First, this study examines associations, therefore I can only describe the correlation between county-level public health and political participation. Causal inferences cannot be made and there is the potential for omitted variable bias given that I cannot account for all unmeasured confounding variables. Second, and related, it is tempting to infer individual level mechanisms from the ecological characteristics; however, this is an ecological inference bias and should be avoided (Wakefield & Shaddick, 2006; Wasfy et al., 2020). For instance, it's not necessarily the case that people in high-drinking counties who turn out to vote more are those who are engaged in heavy drinking – it is just as plausible that people who abstain or drink less are the ones turnout more, perhaps as a response to the unhealthy alcohol consumption they perceive in their community. Third, about 13 percent of the CCES dataset had missing observations on the political participation outcome variables, and after accounting for missing observations on covariates an additional 10 percent of the sample was lost. Future versions of this paper will explore methods of data imputation on covariates to retain sample size.

Chapter 5. Structural Racism and Political Participation

5.1 Introduction

Achieving population health equity requires addressing racialized health inequities, or avoidable and unjust differences in health between racialized groups. Race is a socially constructed concept that has been a fundamental element around which people in power have oriented institutions, policies, values, and decision-making (Ford & Airhihenbuwa, 2010; Michener, 2019; Somers, 2010; White et al., 2020). Across communities in the U.S. there are stark racialized inequities in health, where people who identify as Black, Indigenous, Hispanic, or as a person of color are more like to experience poorer community conditions and health outcomes, compared to their white counterparts (Braveman, 2006). A root cause of these racialized inequities in health and opportunity is structural racism (Bailey et al., 2017). Structural racism is defined as the *"totality of ways in which societies foster racial discrimination through mutually reinforcing systems of housing, education, employment, earnings, benefits, credit, media, health care, and criminal justice. These patterns and practices in turn reinforce discriminatory beliefs, values, and the distribution of resources"* (Bailey et al., 2017). Empirical research indicates structural racism is a root cause of racialized inequities in health outcomes such as infant mortality, risk of chronic disease, myocardial infarction, depression, and self-rated health (Bailey et al., 2017; O'Brien et al., 2020). Equal access to resources to achieve good health is an important social right that enables people to exercise their other rights such as participating in politics (Marshall, 1950). Black Americans' restricted access to health-related resources as the result of structural racism is a critical public health issue that holds implications for political participation and inequality in political voice (Pacheco, 2021; Schlozman, 2018).

Structural Racism

Structural racism can be measured across many domains such as wealth, income, spatial social polarization, and one of the most common methods of operationalizing structural racism in empirical research, residential segregation (Bailey et al., 2017; Chambers, Baer, McLemore, & Jelliffe-Pawlowski, 2019; Groos, Wallace, Hardeman, & Theall, 2018). Other measures of structural racism available in the literature include inequity in employment, education, and political participation (Chantarat et al., 2021a; Hing, 2018; Lukachko et al., 2014). Measures across these domains are indicative of how structural racism manifests in societal institutions and policies to discriminate against people racialized as Black and other marginalized racial groups (Dougherty et al., 2020). The limited past research examining structural racism, political participation and health has considered participation as both an indicator of structural racism as well as an outcome. For instance, Lukachko et al. (2014) examined the relationship between political participation, as a measure of structural racism, and self-reported likelihood of a myocardial infarction. The authors measured political participation by estimating the ratio of Black to white voter turnout at the state-level and the number of Black individuals elected to the state legislature, and found that higher odds of structural racism in the political participation domain was associated with greater odds of myocardial infraction among those who identified as Black (Lukachko et al., 2014). Other work has investigated voter suppression as measure of structural racism in the political participation domain (Hing, 2018), however the relationship between structural racism and political participation may be bidirectional, whereby structural racism and its

manifestations in society influence how or if individuals and communities participate in the political process. Recent literature has moved beyond examining these measures of structural racism individually, using methodological approaches to incorporate multiple dimensions into one measure which captures the multifaceted nature of structural racism (Chantarat et al., 2021a; Dougherty et al., 2020; Hardeman et al., 2022). The connection between the many dimensions of structural racism and political participation requires further research to understand how experiencing structural racism in one's community may impact an individual's decision-making and likelihood of political participation.

Health and Political Participation

Political participation, defined as any activity citizens engage in to affect politics (Van Deth, 2015), has been linked to disparities in health (C. L. Brown et al., 2020; Denny & Doyle, 2007; Mattila et al., 2013; McGuire, Rahn, et al., 2021; Ojeda & Slaughter, 2019). For example, previous research has established that those in poorer health are less likely to turn out to vote compared to those who reported a better self-rated health status (Denny & Doyle, 2007; Gagné et al., 2019; Mattila et al., 2013; McGuire, Rahn, et al., 2021). Furthermore, scholars found that county-level public health community conditions are associated with changes in voting patterns (Wasfy et al., 2020, 2017). For instance, one study found that poor county-level community health was associated with county-level changes in voting patterns at the national-level from 2012 to 2016 and in a follow up study found that the relationship persisted, comparing the 2016 presidential election to the 2018 U.S. House of Representatives election (Wasfy et al.,

2020, 2017). However, both of these studies examined voter turnout at the population level, rather than estimating the effect of county-level conditions on individual-level political participation. Another study, which examined changes in death rates and voting patterns from 2008 to 2016, found that less reduction in the age-adjusted death rate at the county-level over this time period was associated with an increased percentage of votes for the Republican candidate for president (Goldman et al., 2019). The deleterious impact of poor health and poor community conditions on participation in politics is a critical issue because people must be able to participate and express their political rights for democracy to function effectively (Marshall, 1950). Achievement of health equity in communities requires shifts in who has political power and a key aspect of that is the opportunity to make one's voice heard in politics.

Political Participation, Community Conditions, & Social Identity

Previous research in social science has investigated the relationship between political participation, community conditions, and social identity, and some of these factors are connected to structural racism, such as neighborhood poverty, political hypervigilance, carceral contact, homeownership, and income inequality (C. J. Cohen & Dawson, 1993; Davis, 2021; Huckfeldt, 1979; Mccabe, 2013; McGregor et al., 2019; T. C. Shaw et al., 2019; Szewczyk & Crowder-Meyer, 2020). Contextual or neighborhood poverty is associated with differences in political participation and political efficacy among people who identify as Black (C. J. Cohen & Dawson, 1993; T. C. Shaw et al., 2019). Additionally, inequity in homeownership has been used as a measure of structural

racism in previous research, as an indication of wealth (Chantarat et al., 2021b). Research on political participation and homeownership suggests that buying or owning a home increases likelihood of turnout in local elections (Hall & Yoder, 2022; Holian, 2011; Jiang, 2018). Research looking at housing more broadly indicates that higher neighborhood eviction and foreclosure rates are associated with lower voted turnout (Estrada-Correa & Johnson, 2012; Slee & Desmond, 2021). Research on income inequality and political participation using data from 2012 and 2016, found that income inequality at the zip code-level is associated with increased political participation but this relationship was the strongest among more wealthy groups (Szewczyk & Crowder-Meyer, 2020). Additionally, an international comparative study examined political participation and structural disadvantage, operationalized by a single item asking about people in need in their country, found that perceptions about structural disadvantage were associated with higher odds of political participation (Corcoran, Pettinicchio, & Young, 2015). Additionally, research focusing on the intersection between social identity and political participation, suggests that likelihood of participation may increase if individuals have a politicized group identity and believe they need to defend their rights (Garcia-Rios et al., 2021). Taken collectively, this literature suggests that community-level inequality and the experiences within these communities that shape identity impact likelihood of political participation. However, the three previous studies mentioned (e.g. Szewczyk & Crowder-Meyer, 2020; Corcoran et al., 2015; and, Garcia-Rios, Lajevardi, Oskooii, & Walker, 2021) used a scale of political participation rather than looking separately at individual measures of participation to see whether these contextual factors shape

participation differently depending on the type. Further research is necessary which explicitly examines measures of structural racism as the ecological-level to understand how community conditions may impact individuals' likelihood of participating in politics.

Finally, existing literature has examined disparities in voter turnout, indicating that sociodemographic factors such as income, education, and age have differential effects on voter turnout overall and within different racial groups (Canon, 2020; Fraga, 2018). For instance, research shows low-income people who identify as Black tend to turn out more than low-income people who identify as white, suggesting that the effect of income on turnout among those racialized as Black is different than those who identify as white (Fraga, 2018). However, this previous research only focused on voter turnout and did not include other forms of participation such as contacting a public official or attending a political protest. Thus, further research is necessary investigating individual measures of political participation and associations with having a racialized identity.

Research Questions and Hypotheses

The purpose of this paper is to examine associations between county-level structural racism and individual-level political participation outcomes**.** To my knowledge this will be the first study to examine multiple dimensions of structural racism at the ecological-level as determinants of individual political behavior. This aim will produce knowledge on how the normalized dynamics deeply embedded in the culture of the U.S. that routinely advantage white Americans, impact Americans' ability to participate in

democracy (Lawrence & Keleher, 2004). This study will examine how the racialized experiences of Black Americans influence their likelihood of participating politically. This paper examines three research questions and tests two hypotheses:

(1) Is structural racism at the county-level, measured using multiple dimensions, significantly associated with likelihood of political participation in the full population?
(2) Does the direction of the relationship between county-level structural racism and political participation vary by the participation behavior?
(3) What is the relationship between structural racism and political participation within defined racial groups?

H1. I hypothesize that high county-level structural racism is associated with lower likelihood of voter turnout for the full population, compared to those in counties with lower county-level structural racism, given the constraints structural racism exerts on resources which are key determinants of political participation.

H2. I hypothesize that high county-level structural racism is associated with a lower likelihood of voter turnout among those identifying as Black, given the constraints structural racism exerts on resources – especially for people racialized as Black – which are key determinants of political participation.

5.2 Methods

Data

The three outcome variables for this study come from the Congressional Cooperative Election Survey (CCES), including (*1) turnout in the 2018 U.S. national election, (2) contacting a public official, and (3) attending a political protest, march, or demonstration*. I used the validated voted turnout measure included in CCES. The CCES

uses voting records to confirm if respondents voted or not; if no record is found it is assumed the respondent did not vote. This item was dichotomized (0=No, 1=Yes). For the other two outcomes, contacting a public official and attending a protest, the CCES asks if respondents have done these activities in the last year. After removing observations with missing data on the political participation outcome variables the total number of observations was 51,808.

Other individual-level characteristics were also calculated using the CCES. For age, respondents' reported year of birth was used to calculate their age in 2018, and then age was categorized into four groups. Respondents reported their highest level of education completed and responses were categorized into four groups. Response options for marital status included: married, separated, divorced, widowed, never married, domestic/civil partnership. Respondents who indicated married or domestic/civil partnership were categorized as "yes" for married, all other responses were categorized as "no". Survey response options for family income included 17 choices in $10,000 intervals, beginning with less than $10,000 and up to $500,000. Respondents could also select "prefer not to say" and these responses were coded as missing. Responses for annual family income were categorized into five groups: Less than 20,000; 20,000-49,999; 50,000-79,999; 80,000-119,999; 120,000 or more. Survey responses for gender included two options: male or female. The survey asked respondents: *what racial or ethnic group best describes you?* Respondents could select one of the following response options including: white, Black, Hispanic, Asian, Native American, Mixed, Other, and Middle Eastern. The analytic sample for this paper was limited to those who identified as

Black or white, given that the measures of structural racism used in this study pertain to Black-white inequities. Interest in politics was measured through one survey item which asks respondents: *would you say you follow what's going on in government and public affairs?* Response options included: most of the time; some of the time; only now and then; hardly at all; and, don't know. Responses which indicated only now and then, hardly at all, or don't know, were categorized as "no". All other responses were categorized as "yes". A single survey item asked respondents generally what party they think of themselves as and response options included: Democrat, Republican, Independent, or other. After accounting for all missing variables on the covariates and limiting the sample to only those who identified as Black or white, the total number of observations in the analytic sample was 38,329.

The key explanatory variables in this study are measures of how structural racism manifests in society, estimated using data from the 2018 American Community Survey: 5-Year Data (2014-2018), presented in Table 17. The ACS is a national survey of over 3.5 million households each year and includes information on social, economic, housing, and demographic characteristics of the U.S. population (U.S. Department of Commerce, 2017). These measures of structural racism were selected based on previous work which indicates that these unidimensional measures are linked to disparities in health (Chantarat et al., 2021b; Dougherty et al., 2020; Hardeman et al., 2022). Inequity in education is measured by estimating the ratio of white to Black college education rates at the county-level among individuals aged 25 and over. Employment inequity is measured using data on the labor force which includes individuals aged 16 years and over. I estimate the ratio

of white to Black employment rates in each county. Inequity in homeownership is measured by estimating the ratio of the white to Black homeownership rates in each county. Income inequity is measured using the index of concentration at the extremes (ICE), comparing the number of white identifying people in the U.S. with income in the 80th percentile or higher (privileged group) and the number of people who identify as Black with income in the 20th percentile or lower (deprived group); using the cut-points of < $25,000 and ≥$100,0000 (Chambers et al., 2019; Krieger, Kim, Feldman, & Waterman, 2018). Black-white residential segregation is measured using the index of similarity to compare residents in census tracts within counties. I use county-level and census-level data from the 2018 ACS 5-year dataset to estimate the percentage of residents that would have to switch census tracts in order to create a uniform distribution of racial composition across the county. The use of these measures at the ecological-level allows me to operationalize structural racism as the inequitable racialized restriction on economic and social resources and capture aspects of structural racism that people experience in their county environment, as opposed to using individually reported experiences of structural racism (Hardeman et al., 2022).

I use data from the 2020 Robert Wood Johnson Foundation (RWJF) County Health Rankings (CHR) to control for the percentage of the county which consists of rural area, county-level population, and county racial composition. The RWJF CHR uses data from the 2018 U.S. Census to measure each of these variables.

Table 17. Domains and Measurement of Structural Racism

Domain	Measurement	Description

Education	Education Inequity	The ratio of white to Black college education rates among those aged 25 years and over.
Employment	Employment Inequity	The ratio of white to Black employment rates among the civilians in the labor force aged 16 to 64 years.
Wealth	Homeownership Inequity	The ratio of white to Black homeownership rates.
Income	Income Inequity	Measured using the Index of Concentration at the Extremes or ICE. $ICE = \frac{A - P}{T}$ where A = number of white identifying people with income in the 80th percentile or higher (privileged group); P = number of Blacks with income in the 20th percentile or lower (deprived group); T = total number of Blacks and Whites. Using the cut-points of < $25,000 and ≥$100,0000.
Spatial distribution	Residential Segregation	Measured using the index of dissimilarity $D = \frac{1}{2}\sum_{i=1}^{n}\left(\frac{w_i}{W_T} - \frac{b_i}{B_T}\right)$ where n = number of counties; w_i = number of Whites in census tract i; W_T = total number of Whites in the county; b_i = number of Blacks in census tract i; B_T = total number of Blacks in the county
Notes: All data used to create these measures comes from the NHGIS County-level Data 2018 American Community Survey: 5-Year Data (2014-2018). Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0		

Analysis

I merged the structural racism data with the CCES and RWJF CHR data, linked based on respondents' county of residence. I computed descriptive statistics estimating the prevalence of each characteristic within the analytic sample. Then I employed bivariate and multivariate logistic regression analyses. First, I estimated the association between each outcome variable and county-level structural racism using bivariate logistic regression. Then I employed three mixed-effects multivariate logistic regression models, one for each of the outcome variable, with the county-level structural racism variables as

the key independent variables. These models control for individual-level characteristics, including age, marital status, self-identified race, gender, level of interest in politics, and partisanship. These models are adjusted for county-level characteristics including the percentage of the county which consists of rural area, county-level population, and county racial composition. All of these multivariate analyses use survey weights and state-fixed effects. Additionally, I estimated multivariate logistic regression models stratified by racial group for each political participation outcome variable to assess whether the structural racism and political participation relationship varies among those who identified as Black and those who identified as white.

5.3 Results

Descriptive

Table 18 displays the prevalence of each characteristic in the analytic sample. In the analytic sample about 64% of respondents turned out to vote, using the validated voting measures included in the CCES dataset. About 30% of respondents reported contacting a public official in the last year and about 10% of respondents reported attending a political protest, march, or demonstration in the last year. The majority of the respondents were aged 46 years or older (63%) and most have a 2-year, 4-year, or post-graduate degree (52%). The majority of respondents were married or partnered (58%), have an income of $79,999 or less (70%), and identified as female (56%). In the analytic sample, about 11% of respondents identified as Black, 88% identified as white. The majority of respondents stated that they follow what is going on in government or public

affairs most of or some of the time (81%). About 37% of respondents identified as Democrats, 29% as Republican, 27% as Independents, and about 7% of respondents selected other or not sure.

Table 18. Prevalence of each characteristic in the analytic sample (n=38,329)			
	Racial Group		
	White (n=34,079)	Black (n=4,241)	All (n=38,329)
Voter Turnout			
No	35	49	37
Yes	65	51	64
Contacting			
No	68	87	70
Yes	32	14	30
Protesting			
No	89	93	90
Yes	11	7	10
Age			
18-30	14	17	15
31-45	21	32	23
46-60	29	33	30
Over 60	35	18	33
Educational Attainment			
No HS or HS Degree	29	24	29
Some College	19	27	20
2- or 4-year Degree	35	41	36
Post-grad	16	9	16
Marital Status			
No	40	62	42
Yes	60	38	58
Family Household Income			
Less than 20,000	11	20	12
20,000-49,999	31	36	32
50,000-79,999	26	24	26
80,000-119,999	18	12	17
120,000 or more	15	9	14
Gender			
Male	46	32	44
Female	54	68	56

Would you say you follow what's going on in government and public affairs?			
Only now and then, hardly at all, don't know	18	30	19
Most or some of the time	82	70	81
Party Identification			
Democrat	33	70	37
Republican	32	5	29
Independent	28	18	27
Other	4	2	4
Not sure	3	5	3
Notes: Table shows the weighted prevalence of each characteristic within the analytic sample, by racial group, and for all respondents.			

Table 19 displays the measures of structural racism which are the key independent variables in this study, including Black-white education inequity, employment inequity, homeownership inequity, income inequity, and residential segregation. Black-white inequity in education at the county-level is a ratio comparing the college education rates of white residents compared to Black residents. Education inequity ranges between 0.14 and 71.06 and the mean value is 1.87 among the counties where respondents in the analytic sample reside. Employment inequity is also a ratio measuring the rates of employment in each county comparing white to Black residents and ranges from 0.86 to 15.02 with a mean of 1.06. Homeownership inequity is a ratio comparing the rate of homeownership among white residents to Black residents in the county. The mean value of homeownership inequity is 2.04 and it ranges from 0.58 to 70.41. Income inequity at the county-level is measured using the index of concentration at the extremes and the mean value is 0.21 and the measure ranges from -0.47 to 0.61. Finally, county-level

residential segregation is measured using the index of dissimilarity to compare census tracts within counties, meaning that values are higher when a census tract consists of only one group and is lower when the proportion of Black to white individuals in each census tract is the same as the proportion in the county (Forest, 2005). The mean value among respondents in the analytic sample is 0.48 and the measure ranges from 0 to 0.84.

Table 19. County-level Measures of Structural Racism

Domain	Measurement	Mean	Std. dev.	Min	Max
Education	Education Inequity	1.87	1.72	0.14	71.06
Employment	Employment Inequity	1.06	0.14	0.86	15.02
Wealth	Homeownership Inequity	2.04	1.61	0.58	70.41
Income	Income Inequity	0.21	0.13	-0.47	0.61
Spatial distribution	Residential Segregation	0.48	0.12	0.00	0.84

Notes: All data comes from the NHGIS County-level Data 2018 American Community Survey: 5-Year Data (2014-2018).
Steven Manson, Jonathan Schroeder, David Van Riper, Tracy Kugler, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 16.0 [dataset]. Minneapolis, MN: IPUMS. 2021. http://doi.org/10.18128/D050.V16.0

Bivariate regression results

Table 20 shows the results from separate bivariate logistic regression models estimated for each outcome and each covariate. Panel 1 displays the results for the analysis on voter turnout. In the bivariate logistic regression models estimating associations with voter turnout, significant and positive associations were identified between older age and being married ($p<0.001$). Identifying as a female was significantly associated with lower likelihood of turning out to vote, compared to respondents who identified as male ($p<0.001$). Respondents who identified as Black were significantly less

likely to have turned out to vote compared to those who identified as white ($p<0.001$). Respondents who reported that they follow what is going on in government or public affairs most of or some of the time were significantly more likely to have turned out to vote ($p<0.001$).

Table 20. Associations with the three political participation outcomes from individual bivariate logistic regression models (n=38,329)						
	Political Participation Outcome					
	Voting		Contacting		Protesting	
	Coef. (se)	p-value	Coef. (se)	p-value	Coef. (se)	p-value
Age (Ref=18-30)						
31-45	0.54 (0.05)	<0.001	0.47 (0.06)	<0.001	-0.22 (0.07)	0.001
46-60	1.05 (0.05)	<0.001	0.71 (0.05)	<0.001	-0.44 (0.07)	<0.001
Over 60	1.61 (0.05)	<0.001	1.00 (0.05)	<0.001	-0.59 (0.07)	<0.001
Marital Status (Ref=No)						
Yes	0.38 (0.03)	<0.001	0.26 (0.03)	<0.001	-0.10 (0.04)	0.021
Gender (Ref=Male)						
Female	-0.11 (0.03)	<0.001	-0.18 (0.03)	<0.001	0.01 (0.05)	0.900
Racial Category (Ref=white)						
Black	-0.51 (0.05)	<0.001	-1.15 (0.07)	<0.001	-0.48 (0.09)	<0.001
Would you say you follow what's going on in government and public affairs? (Ref=Only now and then, hardly at all, don't know)						
Most or some of the time	1.39 (0.04)	<0.001	2.40 (0.08)	<0.001	2.18 (0.14)	<0.001
Party Identification (Ref=Democrat)						
Republican	0.03 (0.04)	0.400	-0.34 (0.04)	<0.001	-1.82 (0.08)	<0.001
Independent	-0.29 (0.04)	<0.001	-0.06 (0.04)	0.121	-0.70 (0.05)	<0.001
Other	0.03 (0.08)	0.724	0.55 (0.08)	<0.001	-0.08 (0.11)	0.431
Not sure	-2.18 (0.11)	<0.001	-2.39 (0.19)	<0.001	-2.40 (0.41)	<0.001
Education Inequity	0.02 (0.01)	0.043	0.00 (0.01)	0.517	0.00 (0.01)	0.648
Employment Inequity	-0.18 (0.18)	0.334	-0.01 (0.12)	0.932	-0.42 (0.28)	0.131
Homeownership Inequity	0.01 (0.01)	0.222	0.02 (0.01)	0.018	-0.02 (0.02)	0.234
Income Inequity	1.00	<0.001	1.29	<0.001	2.26	<0.001

	(0.14)		(0.15)		(0.29)	
Residential Segregation	0.11 (0.16)	0.494	0.07 (0.14)	0.613	1.06 (0.25)	<0.001
Notes: Table shows the results from separate bivariate logistic regression models for each variable with each outcome, displaying the coefficient with standard errors in parentheses. All estimates incorporate complex sample survey weights.						

In the separate bivariate logistic regression models with county-level measures of structural racism and voter turnout, higher education inequity and higher income inequity were significantly associated with higher likelihood of turnout ($p=0.043$ and $p<0.001$, respectively). In the bivariate models, employment inequity, homeownership inequity, and residential segregation were not significantly associated with voter turnout.

Panel 2 of Table 20 displays the bivariate associations with contacting a public official in the last year and each covariate in this study. In this analytic sample, older age and being married were significantly associated with higher likelihood of respondents reporting that they contacted a public official in the last year ($p<0.001$). While identifying as female or as Black was significantly associated with lower likelihood of contacting a public official in the last year, compared to those identifying as male or white, respectively ($p<0.001$). Respondents who reported that they follow what is going on in government or public affairs most of or some of the time were significantly more likely to have contacted a public official in the last year ($p<0.001$).

In the bivariate models with the structural racism measures, higher homeownership inequity and higher income inequity were both significantly associated with higher likelihood of contacting a public official in the past year ($p=0.018$ and

p<0.001, respectively). I did not find any significant associations between education inequity, employment inequity, or residential segregation with respondents' likelihood of contacting a public official.

Panel 3 of Table 20 shows the results from bivariate logistic regression models with protesting and each covariate used in this study. Older age was significantly associated with lower likelihood of reporting attending a political protest, march, or demonstration in the last year (p<0.001). Being married was associated with lower likelihood of reporting attending a protest (p=0.001). Respondents who identified as Black were less likely to report attending a political protest, march, or demonstration in the last year, compared to respondents who identified as white (p<0.001). Respondents who reported that they follow what is going on in government or public affairs most of or some of the time were significantly more likely to have attended a political protest, march, or demonstration in the last year (p<0.001).

Among the measures of structural racism, higher income inequity and higher residential segregation were both associated with higher likelihood of respondents reporting they attended a political protest, march, or demonstration in the last year (p<0.001). In the bivariate logistic regression models, I did not find any statistically significant associations between education inequity, employment inequity, or homeownership inequity with respondents' likelihood of attending a political protest, march, or demonstration.

Multivariate regression results

Table 21 displays the results from three multivariate logistic regression models, one for each political participation outcome. The first panel of Table 21 shows associations with turnout from a multivariate logistic regression model. Older age was significantly and positively associated with likelihood of voter turnout ($p<0.001$). Respondents who identified as Black were significantly less likely to turn out to vote compared to respondents who identified as white ($p<0.001$). Among the measures of structural racism included in this study, education inequity was significantly associated with higher likelihood of turnout ($p=0.024$). Income inequity was associated with higher likelihood of voter turnout ($p<0.001$). I did not find any other statistically significant associations with voter turnout with the other measures of structural racism in this study (i.e. employment inequity, homeownership inequity, and residential segregation).

The second panel of Table 21 shows associations with contacting a public official from a multivariate logistic regression model. Older age was significantly associated with higher likelihood of respondents reporting contacting a public official in the last year ($p<0.001$). Respondents who identified as Black were significantly less likely to report contacting a public official in the last year compared to those who identified as white ($p<0.001$). Education inequity was associated with higher likelihood of contacting a public official in the last year ($p=0.044$). In the overall model, I did not find any statistically significant relationships between the other measures of structural racism used in this study and respondents' likelihood of reporting contacting a public official in the last year (i.e., employment inequity, homeownership inequity, income inequity, and residential segregation).

The third panel of Table 21 shows associations with attending a political protest, march, or demonstration from a multivariate logistic regression model. Older age was significantly associated with lower likelihood of respondents reporting attending a political protest, march, or demonstration in the last year ($p<0.001$). Respondents who identified as Black were significantly less likely to report attending a political protest, march, or demonstration in the last year ($p<0.001$). Of the measures of structural racism included in this study, education inequity and income inequity were both significantly associated with higher likelihood of respondents reporting attending a political protest, march, or demonstration in the last year ($p<0.001$ and $p=0.005$, respectively). I did not find any significant associations between employment inequity, homeownership inequity, and residential segregation and respondents' likelihood of attending a political protest march or demonstration.

Table 21. Associations with political participation outcomes from three multivariate logistic regression models (n=38,329)												
	Political Participation Outcomes											
	Voting				Contacting				Protesting			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)												
31-45	0.45 (0.05)	<0.001	0.09	<0.001	0.34 (0.06)	<0.001	0.06	<0.001	-0.37 (0.07)	<0.001	-0.03	<0.001
46-60	0.91 (0.05)	<0.001	0.18	<0.001	0.53 (0.06)	<0.001	0.09	<0.001	-0.59 (0.07)	<0.001	-0.04	<0.001
Over 60	1.35 (0.05)	<0.001	0.27	<0.001	0.70 (0.06)	<0.001	0.12	<0.001	-0.85 (0.07)	<0.001	-0.06	<0.001
Marital Status (Ref=No)												
Yes	0.17 (0.05)	<0.001	0.03	<0.001	0.07 (0.03)	0.023	0.01	0.023	0.03 (0.04)	0.510	0.00	0.510
Gender (Ref=Male)												
Female	-0.01 (0.03)	0.791	0.00	0.791	-0.06 (0.03)	0.054	-0.01	0.054	0.05 (0.05)	0.300	0.00	0.300
Racial Category (Ref=white)												
Black	-0.32 (0.06)	<0.001	-0.07	<0.001	-1.16 (0.07)	<0.001	-0.21	<0.001	-0.85 (0.11)	<0.001	-0.06	<0.001
Would you say you follow what's going on in government and public affairs? (Ref=Only now and then, hardly at all, don't know)												
Most or some of the time	1.02 (0.04)	<0.001	0.21	<0.001	2.13 (0.08)	<0.001	0.38	<0.001	2.13 (0.14)	<0.001	0.16	<0.001
Party Identification (Ref=Democrat)												

Republican	-0.16 (0.04)	<0.001	-0.03	<0.001	-0.66 (0.04)	<0.001	-0.12	<0.001	-1.85 (0.08)	<0.001	-0.14	<0.001
Independent	-0.36 (0.04)	<0.001	-0.07	<0.001	-0.21 (0.04)	<0.001	-0.04	<0.001	-0.80 (0.06)	<0.001	-0.06	<0.001
Other	-0.10 (0.08)	0.207	-0.02	0.207	0.33 (0.08)	<0.001	0.06	<0.001	-0.21 (0.11)	0.047	-0.02	0.045
Not sure	-1.68 (0.12)	<0.001	-0.34	<0.001	-1.55 (0.21)	<0.001	-0.27	<0.001	-1.61 (0.43)	<0.001	-0.12	<0.001
Education Inequity	0.03 (0.01)	0.024	0.01	0.024	0.02 (0.01)	0.044	0.00	0.044	0.03 (0.01)	<0.001	0.00	<0.001
Employment Inequity	-0.13 (0.17)	0.451	-0.03	0.451	0.14 (0.10)	0.171	0.03	0.171	-0.16 (0.29)	0.589	-0.01	0.589
Homeownership Inequity	0.00 (0.01)	0.990	0.00	0.990	0.01 (0.01)	0.497	0.00	0.497	-0.01 (0.01)	0.377	0.00	0.378
Income Inequity	1.04 (0.29)	<0.001	0.21	<0.001	0.44 (0.23)	0.055	0.08	0.055	1.09 (0.38)	0.005	0.08	0.005
Residential Segregation	0.06 (0.20)	0.754	0.01	0.754	0.27 (0.19)	0.151	0.05	0.151	0.28 (0.30)	0.356	0.02	0.356
Notes: Table shows the results from three multivariate logistic regression models, one for each outcome variable, displaying the coefficient with standard errors in parentheses and the marginal effect with p-value. All estimates incorporate complex sample survey weights.												

Table 22 displays the results from the multivariate logistic regression models stratified by race, focusing on voter turnout. Among those who identified as white, higher education inequity was significantly associated with higher likelihood of voter turnout (p=0.029) and income inequity was significantly associated with higher likelihood of turnout (p<0.001). Among respondents racialized as Black, homeownership inequity was significantly associated with lower likelihood of voter turnout (p=0.020).

Table 22. Associations with voter turnout from two multivariate logistic regression models stratified by racial group (n=38,329)

	Racial Group							
	White (n=34,079)				Black (n=4,241)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)								
31-45	0.46 (0.05)	<0.001	0.09	<0.001	0.40 (0.14)	0.004	0.09	0.004
46-60	0.86 (0.05)	<0.001	0.17	<0.001	1.13 (0.14)	<0.001	0.24	<0.001
Over 60	1.31 (0.05)	<0.001	0.26	<0.001	1.51 (0.13)	<0.001	0.32	<0.001
Marital Status (Ref=No)								
Yes	0.20 (0.04)	<0.001	0.04	<0.001	-0.03 (0.11)	0.812	-0.01	0.812
Gender (Ref=Male)								
Female	-0.02 (0.03)	0.432	0.00	0.432	0.10 (0.10)	0.319	0.02	0.319
Would you say you follow what's going on in government and public affairs? (Ref=Only now and then, hardly at all, don't know)								
Most or some of the time	1.18 (0.04)	<0.001	0.23	<0.001	0.38 (0.12)	<0.001	0.09	<0.001
Party Identification (Ref=Democrat)								
Republican	-0.12 (0.04)	0.002	-0.02	0.002	-0.27 (0.23)	0.253	-0.06	0.252
Independent	-0.31	<0.001	-0.06	<0.001	-0.62	<0.001	-0.13	<0.001

	(0.04)				(0.13)			
Other	-0.02 (0.08)	0.791	0.00	0.791	-0.84 (0.27)	0.002	-0.18	0.002
Not sure	-1.83 (0.11)	<0.001	-0.36	<0.001	-1.06 (0.32)	0.001	-0.23	0.001
Education Inequity	0.03 (0.01)	0.029	0.01	0.029	0.03 (0.07)	0.662	0.01	0.662
Employment Inequity	-0.11 (0.16)	0.508	-0.02	0.508	-3.51 (1.85)	0.058	-0.75	0.057
Homeownership Inequity	0.00 (0.01)	0.829	0.00	0.829	-0.31 (0.13)	0.020	-0.07	0.020
Income Inequity	1.08 (0.27)	<0.001	0.21	<0.001	0.53 (0.88)	0.545	0.11	0.545
Residential Segregation	0.04 (0.22)	0.855	0.01	0.855	0.55 (0.56)	0.327	0.12	0.328
Notes: Table shows the results from two multivariate logistic regression models, one for each racial group, displaying the coefficient with standard errors in parentheses and the marginal effect with p-value. All estimates incorporate complex sample survey weights.								

Table 23 displays the results from multivariate logistic regression models stratified by race, focusing on contacting a public official. Among those who identified as white, income inequity and residential segregation were associated with higher likelihood of voter turnout (p=0.041 and p=0.007, respectively). I did not find any statistically significant relationships between the measures of structural racism and likelihood of contacting a public official in the last year among respondents who identified as Black.

Table 23. Associations with contacting public official from two multivariate logistic regression models stratified by racial group (n=38,329)

	Racial Group							
	White (n=34,079)				Black (n=4,241)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)								
31-45	0.37 (0.06)	<0.001	0.07	<0.001	0.13 (0.23)	0.569	0.01	0.568
46-60	0.57 (0.06)	<0.001	0.11	<0.001	0.24 (0.20)	0.239	0.02	0.236
Over 60	0.72 (0.06)	<0.001	0.14	<0.001	0.55 (0.21)	0.011	0.05	0.011

Marital Status (Ref=No)								
Yes	0.08 (0.03)	0.010	0.01	0.010	-0.04 (0.14)	0.763	0.00	0.763
Gender (Ref=Male)								
Female	-0.07 (0.03)	0.038	-0.01	0.038	0.02 (0.14)	0.876	0.00	0.876
Would you say you follow what's going on in government and public affairs? (Ref=Only now and then, hardly at all, don't know)								
Most or some of the time	2.21 (0.09)	<0.001	0.42	<0.001	1.71 (0.21)	<0.001	0.17	<0.001
Party Identification (Ref=Democrat)								
Republican	-0.69 (0.04)	<0.001	-0.13	<0.001	0.28 (0.27)	0.299	0.03	0.298
Independent	-0.25 (0.04)	<0.001	-0.05	<0.001	0.27 (0.15)	0.069	0.03	0.066
Other	0.31 (0.08)	<0.001	0.06	<0.001	0.56 (0.40)	0.158	0.06	0.155
Not sure	-1.65 (0.24)	<0.001	-0.31	<0.001	-0.86 (0.48)	0.072	-0.09	0.072
Education Inequity	0.01 (0.01)	0.075	0.00	0.074	0.13 (0.09)	0.129	0.01	0.128
Employment Inequity	0.15 (0.10)	0.161	0.03	0.161	1.71 (2.39)	0.475	0.17	0.475
Homeownership Inequity	0.01 (0.01)	0.433	0.00	0.433	-0.19 (0.16)	0.255	-0.02	0.255
Income Inequity	0.48 (0.24)	0.041	0.09	0.041	0.97 (0.86)	0.256	0.10	0.255
Residential Segregation	0.50 (0.19)	0.007	0.09	0.007	-0.93 (0.71)	0.192	-0.09	0.190
Notes: Table shows the results from two multivariate logistic regression models, one for each racial group, displaying the coefficient with standard errors in parentheses and the marginal effect with p-value. All estimates incorporate complex sample survey weights.								

Table 24 displays the multivariate logistic regression models focusing on protesting. Among those who identified as white, county-level education inequity and income inequity were significantly associated with higher likelihood of respondents reporting they attended a political protest, march, or demonstration in the last year

($p<0.001$ and $p=0.020$, respectively). Among respondents who identified as Black, I did not find any statistically significant relationships between any of the measure of structural racism used in this study and likelihood of respondents reporting attending a protest.

Table 24. Associations with attending a political protest, march, or demonstration from two multivariate logistic regression models stratified by racial group (n=38,329)								
	Racial Group							
	White (n=34,079)				Black (n=4,241)			
	Coef. (se)	p-value	Marg. Eff.	p-value	Coef. (se)	p-value	Marg. Eff.	p-value
Age (Ref=18-30)								
31-45	-0.31 (0.08)	<0.001	-0.02	<0.001	-0.78 (0.20)	<0.001	-0.04	<0.001
46-60	-0.48 (0.07)	<0.001	-0.04	<0.001	-1.17 (0.22)	<0.001	-0.06	<0.001
Over 60	-0.75 (0.07)	<0.001	-0.06	<0.001	-1.47 (0.25)	<0.001	-0.08	<0.001
Marital Status (Ref=No)								
Yes	0.05 (0.05)	0.313	0.00	0.313	-0.13 (0.16)	0.028	-0.01	0.416
Gender (Ref=Male)								
Female	0.06 (0.05)	0.225	0.00	0.226	0.03 (0.18)	0.912	0.00	0.854
Would you say you follow what's going on in government and public affairs? (Ref=Only now and then, hardly at all, don't know)								
Most or some of the time	2.28 (0.15)	<0.001	0.18	<0.001	1.69 (0.27)	<0.001	0.09	<0.001
Party Identification (Ref=Democrat)								
Republican	-1.98 (0.08)	<0.001	-0.16	<0.001	0.59 (0.39)	0.132	0.03	0.137
Independent	-0.89 (0.06)	<0.001	-0.07	<0.001	0.07 (0.22)	0.759	0.00	0.759
Other	-0.26 (0.11)	0.019	-0.02	0.018	0.02 (0.57)	0.977	0.00	0.977
Not sure	-2.37 (0.40)	<0.001	-0.19	<0.001	-0.13 (0.63)	0.842	-0.01	0.841
Education Inequity	0.03 (0.01)	<0.001	0.00	<0.001	0.06 (0.15)	0.676	0.00	0.676
Employment Inequity	-0.19 (0.31)	0.544	-0.01	0.545	-0.01 (4.18)	0.998	0.00	0.998
Homeownership Inequity	-0.01 (0.01)	0.423	0.00	0.423	-0.46 (0.28)	0.100	-0.03	0.107
Income Inequity	0.93 (0.40)	0.020	0.07	0.021	2.25 (1.44)	0.118	0.12	0.122
Residential Segregation	0.49 (0.32)	0.127	0.04	0.127	-1.83 (1.15)	0.111	-0.10	0.115

Notes: Table shows the results from two multivariate logistic regression models, one for each racial group, displaying the coefficient with standard errors in parentheses and the marginal effect with p-value. All estimates incorporate complex sample survey weights.

5.4 Discussion

The purpose of this paper was to examine associations between multiple dimensions of structural racism at the ecological-level and individuals' likelihood of participating in politics. I measured structural racism at the county-level and investigated if the relationship between county-level structural racism and political participation varies by racial group. In the overall model with all covariates included, Black-white education inequity was significantly and positively associated with all three of the political participation outcomes examined in this study. In this study, I examined Black-white inequity in education at the county-level, comparing the county-level rate of white people over the age of 25 with the college degree to the rate of Black people in the county age 25 and over with a college degree, to try to operationalize the inequitable restriction on education as a resource at the ecological-level (Hardeman et al., 2022). Both education inequity and income inequity were associated with higher voter turnout in the bivariate models and in the multivariate models.

Although the marginal effect of education inequity at the county level on contacting a public official and likelihood of protesting is less than one percentage point, it is certainly interesting that this is the only measure which was found to be statistically significant in all three overall multivariate logistic regression models and speaks to the foundational relationship of educational attainment and political participation. The connection between educational attainment and voter turnout has been well-established in the political science literature. Education is considered to be political resource through

fostering the development of organizational, communication, attitudes, and other skills which are need for political involvement (Brady et al., 1995; Verba, Schlozman, Brady, & Nie, 1993). In addition, people who attain a level of education are also more likely to have higher paying jobs and thus acquire more political resources (Verba et al., 1993). In my study, it is interesting to note that the direction is the same in the relationships between education inequity and voter turnout, contacting, and protesting. For all three, I found that a higher level of racialized education inequity was associated with a higher likelihood of participation. However, when I examined the models stratified by racial group, only respondents who identified as white experienced this association of higher likelihood of political participation, as education inequity was significantly associated with higher likelihood of voter turnout ($p=0.029$) and likelihood of attending a political protest march or demonstration in the last year ($p<0.001$). These same significant relationships were not present in any of the models for those who identified as Black. Among those who identified as Black, the only measure of structural racism in this study which was significantly associated with any of the measures of political participation was inequity in homeownership and the direction of this relationship was negative, such that homeownership inequity was associated with a 7-percentage point decrease in likelihood of voter turnout in the 2018 midterm election ($p=0.020$).

These findings connect to how scholars have conceptualized racism as a system of *advantages* for those in power (i.e., white people) and structural racism is sustained through white supremacy (Adkins-Jackson, Chantarat, Bailey, & Ponce, 2021; Alang et al., 2021; Merolla & Jackson, 2019; Murray & Loyd, 2020; Strand, 2019). Alang, et al.

(2021), asserts that white supremacy or *"…the glossary of conditions, practices, and ideologies that underscore the hegemony of whiteness and white political, social, cultural, and economic domination,"* makes it possible for structural racism to persist and reproduce into difference forms, from mass incarceration to inequitable access to resources. A recent paper put forth the *Health Power Resource Theory* which contends that power relations impact the distributions of resources and expounds upon how these resources have differential meaning for people of different social identities (Reynolds, 2021). Reynolds (2021) argues that the benefits of being a part of the privileged group not only produces advantages for the individual but also advantages aggregated at the group level. The *Health Power Resource Theory* further explains that institutions affect health through the stratification of resources and that discrimination is a key mechanism through which the meaning of health-relevant resources are translated (Reynolds, 2021). Discrimination lowers the worth of health-relevant resources for those experiencing it, relative to their more advantaged counterparts, and power relations moderate the intensity of the discrimination (Reynolds, 2021). Taken together, scholars across disciplines in social science have determined that there are avoidable and unjust differences in health and these inequities are the result of power structures, including white supremacy which maintains structural racism, therefore it is critical we address these power structures which are negatively impacting health. However, the challenge in doing so is ever-growing as the evidence here suggests that the manifestation of structural racism as inequities in health-relevant resources is feeding back into the production of democracy through influencing political participation.

It is important to contextualize these findings in terms of the specific context of the 2018 U.S. midterm election. The 2018 U.S. midterm election occurred during the term of President Donald Trump and polling leading up to the election indicated that, for many people, voting for a congressional candidate was their way to express their support or opposition for President Trump and his policies (Blendon et al., 2018). Further, protests undertaken in the previous year may have been reactions to the policies regarding building a wall at the U.S.-Mexico border, the climate crisis and the Paris Climate Agreement, and/or the Deferred Action for Childhood Arrivals (DACA) program (Alexander, Graham, & Rubenstein, 2017; Beavers, 2017). I did adjust for individual-level political party affiliation and political interest to account for some of the ideological predictors that may contribute to these relationships.

This study has several limitations. First, this study examines associations, therefore I can only describe the correlation between county-level structural racism and political participation and causal inferences cannot be made. There is the potential for omitted variable bias because I cannot account for all unmeasured confounding variables. Second, measuring structural racism at the county-level may be too broad of a geographic area to shape individual experiences and influence behavior (Hardeman et al., 2022; Wong, 2004). Geographic boundaries such as counties and census tracts can change over time, thus there is the modifiable area unit problem or the problem of using different geographical boundary systems, which create different datasets therefore different results (Wong, 2004). Third, I was only be able to estimate the relationships between each outcome and each measure of structural racism, independently, rather than in a

multidimensional measure; recent studies have used latent class models to jointly estimate structural racism domains as a multifaceted system (T. Brown & Homan, 2022; Chantarat et al., 2021b; Dougherty et al., 2020; Hardeman et al., 2022). In addition, this paper focuses on measures of structural racism based on Black-white differences and only examines their associations on Black and white respondents, future research should investigate other forms of structural racism which may be specific to other racialized groups and have different types of impacts on people racialized as Asian or Latinx, for instance (Tawa, Suyemoto, & Roemer, 2012).

This study holds implications for future research and policymaking. A considerable amount of public money at the county, state, and federal levels of government is spent on addressing social determinants of health which we know are key drivers of racialized disparities in health. In this study, structural racism is measured at the county-level and counties can have big impact on the distribution of socioeconomic and health-relevant resources; however recently states have begun implementing preemption policies which prevent local policymakers from passing certain policies which could address inequities in housing, income, and education, for example the state of North Carolina passed a policy that prevents local jurisdictions from enacting minimum wages ordinances (Hardeman et al., 2022; Huizar & Lathrop, 2019). Efforts to invest in addressing social determinants of health that do not address the connection between power, institutions, and structural racism will likely struggle to improve population health in the U.S. or contribute to the achievement of health equity (Hardeman et al., 2022). Scholars have clearly demonstrated that racialized disparities in health exist

and it is becoming increasingly clear that health and racism shape political life in the U.S. Future research should further investigate the connection between political participation and structural racism within institutions, such as higher education, as institutions play a critical role in the distribution of resources which are necessary for political involvement (Michener, 2019). Finally, future work in this area should seek to investigate other domains of structural racism. Community-based participatory research using qualitative methods may help elicit new domains and methods of measuring structural racism and their relationship to political participation (Hardeman et al., 2022).

Chapter 6. Conclusions

The overarching purpose of this dissertation was to produce new knowledge on the connections between health, racism, and political participation. This dissertation includes extensive analyses on three measures of political participation and health at the individual- and community-level. This dissertation expands the literature on health and political participation through examining health across various domains and connecting it to the literature on structural racism. This work demonstrates that health at the individual- and community-level is associated with likelihood of political participation. These findings also indicate that racism and power structures play a role in determining this relationship. The connections between various measures of health and political participation are complex, as these papers indicate some health measures and health-relevant resources may increase likelihood of political participation, while others may decrease likelihood. The findings regarding structural racism and political participation

highlight the deep power structures embedded in the U.S. which maintain white supremacy and a system of advantages for those with political power. Further research in this area is important to build our understanding of how health influences political decision-making and can inform optimal health care policymaking.

More research is necessary on the relationship between health and forms of political participation other than voting. Voting is only one of the many ways in which people can be involved in the political process. People may express their political views through protesting, contacting a politician, or even volunteering for a campaign. They could choose to participate in national or local elections to express their views.

Additionally, different measures of health may matter differently for various forms of participation. Therefore, another area for further scholarship on health and political participation, is examining various measurements and dimensions of health. For instance, health can be measured using reported diagnoses like chronic health condition, measures of cognitive function, or subjective measures such as self-rated health. It is important to consider how we are measuring health in each study and conceptualizing the physical and mental demands related to these health experiences. Future work should focus on politically marginalized and systematically underrepresented groups, as they experience health conditions typically worse than that of the majority group in power.

Furthermore, scholars need to move forward, past identifying associations between health and political participation. One way to do that may be through designing natural or quasi-experiments or using microsimulation modelling where researchers can

examine quasi-exogenous health shocks to communities to uncover how health inequities impact peoples' lives, and their political participation behaviors.

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Appendices

Appendix A. Paper 1 – Multivariate logistic regression models fully interacted with each racial category.

Table 1. Associations with voter turnout from two multivariate logistic regression models fully interacted with race indicator variable.

	Black/white Sample (n=466)			POC/white Sample (n=495)		
	Coef.	se	p-value	Coef.	se	p-value
City (ref=Minneapolis)						
Raleigh	0.65	0.34	0.055	0.67	0.31	0.030
Race (ref=Black or POC)						
white	-5.20	2.73	0.057	-4.80	2.71	0.076
City (ref=Minneapolis) x Race						
Raleigh x white	-1.79	1.10	0.104	-1.81	1.09	0.097
Age (ref=18–29)						
30–49	0.72	0.33	0.026	0.72	0.30	0.017
50+	1.13	0.39	0.004	1.19	0.36	0.001
Age (ref=18–29) x Race						
30–49 x white	1.86	1.20	0.120	1.86	1.19	0.118
50+ x white	1.31	1.40	0.347	1.26	1.39	0.365
Educational Attainment (ref= High school degree or less)						
Some college	0.57	0.54	0.291	0.41	0.50	0.410
Associates, technical degree, bachelor's degree or higher	0.26	0.31	0.401	0.06	0.28	0.832
Educational Attainment (ref= High school degree or less) x Race						
Some college x white	0.93	1.44	0.521	1.09	1.43	0.446
Associates, technical degree, bachelor's degree or higher x white	-0.19	1.06	0.859	0.01	1.05	0.989
Sex (ref=Male)						
Female	0.96	0.30	0.001	0.82	0.28	0.003
Sex (ref=Male) x Race						
Female x white	-0.82	0.88	0.352	-0.69	0.88	0.432
Marital Status (ref=Married/Partnered)						
Single	-0.40	0.45	0.366	-0.28	0.41	0.491

Marital Status (ref=Married/Partnered) x Race						
Single x white	-0.15	1.09	0.889	-0.28	1.07	0.797
Working Time (minutes)	-0.02	0.01	0.214	-0.01	0.01	0.178
Working Time (minutes) x Race						
Working Time (minutes) x white	-0.02	0.04	0.582	-0.02	0.04	0.574
Household Income (ref= Less than $5,000)						
$5,001 to $10,000	-0.42	0.37	0.255	-0.21	0.34	0.533
$10,001 to $20,000	-0.07	0.38	0.847	0.01	0.35	0.977
More than $20,000	1.30	0.47	0.006	1.48	0.44	0.001
Household Income (ref= Less than $5,000) x Race						
$5,001 to $10,000 x white	2.99	1.43	0.037	2.78	1.42	0.051
$10,001 to $20,000 x white	2.66	1.60	0.097	2.57	1.60	0.107
More than $20,000 x white	2.94	1.77	0.097	2.75	1.76	0.118
Self-rated Health (ref= Excellent/Very Good)						
Good	0.00	0.34	0.993	0.01	0.32	0.975
Fair/Poor	-0.16	0.38	0.667	-0.42	0.35	0.224
Self-rated Health (ref= Excellent/Very Good) x Race						
Good x white	0.10	1.04	0.921	0.09	1.04	0.930
Fair/Poor x white	-0.28	1.25	0.822	-0.02	1.24	0.985
BMI (ref=<25 Underweight/Normal)						
>=25 =<30 Overweight	-0.01	0.39	0.972	0.09	0.36	0.812
>30 Obesity	-0.07	0.34	0.833	-0.03	0.31	0.920
BMI (ref=<25 Underweight/Normal) x Race						
>=25 =<30 Overweight x white	0.87	1.13	0.441	0.77	1.13	0.492
>30 Obesity x white	1.02	1.08	0.344	0.98	1.07	0.360
Smoking Status (ref=Current smoker)						
Never smoked/Quit	0.44	0.28	0.111	0.40	0.26	0.121
Smoking Status (ref=Current smoker) x Race						
Never smoked/Quit x white	0.75	0.86	0.381	0.79	0.85	0.352
Health Insurance Status (ref= Uninsured)						

Health insurance	0.13	0.35	0.707	0.21	0.33	0.515
Health Insurance Status (ref= Uninsured) x Race						
Health insurance x white	3.14	1.45	0.031	3.06	1.45	0.034
Physical Disability (ref=No)						
Yes	-0.21	0.46	0.651	-0.21	0.43	0.620
Physical Disability (ref=No) x Race						
Yes x white	0.30	1.24	0.809	0.30	1.23	0.806
Mental Health (ref=No)						
Yes	-0.94	0.49	0.053	-0.63	0.43	0.143
Mental Health (ref=No) x Race						
Yes x white	0.32	1.26	0.797	0.02	1.24	0.989
Food Security (ref=High food security)						
Low food security	0.26	0.37	0.480	0.34	0.34	0.312
Very low food security	0.50	0.40	0.203	0.53	0.36	0.139
Food Security (ref=High food security) x Race						
Low food security x white	0.37	1.24	0.768	0.29	1.23	0.815
Very low food security x white	-2.93	1.64	0.074	-2.96	1.63	0.069
Housing Insecurity (ref=No)						
Yes	-0.57	0.36	0.121	-0.41	0.32	0.201
Housing Insecurity (ref=No) x Race						
Yes x white	2.88	1.38	0.037	2.73	1.37	0.046
Governmental Assistance (ref=No)						
Yes	0.85	0.30	0.004	0.73	0.28	0.008
Governmental Assistance (ref=No) x Race						
Yes x white	-2.37	1.00	0.018	-2.25	1.00	0.024
Stress (ref=Low)						
Medium	0.08	0.33	0.804	0.14	0.30	0.636
High	-0.24	0.38	0.533	-0.12	0.35	0.731
Stress (ref=Low) x Race						
Medium x white	1.17	1.20	0.330	1.10	1.19	0.354
High x white	1.14	1.24	0.357	1.02	1.23	0.404
Notes: Table displays the results from two multivariate logistic regression models, one for white and Black respondents and one for white and all POC respondents. Table shows coefficients, standard errors, and p-value.						

Appendix B. Paper 2 – Multivariate logistic regression models with racial/ethnic group interaction terms.

Table 1. Associations with turnout from multivariate logistic regression models fully interacted with racial/ethnic group.

	Black (n= 4,111)			Hispanic (n=3,553)			Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)		
	Coef.	se	p-value	Coef.	se	p-value	Coef.	se	p-value
Age (Ref=18-30)									
31-45	0.50	0.05	0.000	0.49	0.05	0.00	0.45	0.05	0.000
46-60	1.06	0.05	0.000	0.99	0.05	0.00	1.01	0.05	0.000
Over 60	1.58	0.05	0.000	1.55	0.05	0.00	1.53	0.05	0.000
Education (Ref=HS degree or less)									
Some College	0.31	0.05	0.000	0.33	0.05	0.00	0.37	0.05	0.000
2- or 4-year Degree	0.48	0.04	0.000	0.47	0.04	0.00	0.52	0.04	0.000
Post-grad	0.62	0.06	0.000	0.55	0.06	0.00	0.59	0.06	0.000
Marital Status (Ref=No)									
Yes	0.03	0.04	0.381	-0.02	0.04	0.68	0.01	0.04	0.725
Annual family income (Ref=less than 20,000)									
20,000-49,999	0.25	0.06	0.000	0.28	0.06	0.00	0.34	0.06	0.000
50,000-79,999	0.36	0.06	0.000	0.49	0.06	0.00	0.51	0.06	0.000
80,000-119,999	0.55	0.07	0.000	0.64	0.07	0.00	0.62	0.07	0.000
120,000 or more	0.49	0.07	0.000	0.63	0.07	0.00	0.62	0.07	0.000
Gender (Ref=Male)									
Female	-0.01	0.03	0.652	-0.01	0.03	0.84	-0.03	0.03	0.325
Race/ethnicity (Ref=white)									
Black OR Hispanic OR Asian, Native American, Middle Eastern, Mixed, or Other	-0.66	0.25	0.007	-0.69	0.28	0.01	-0.95	0.28	0.001
Political interest (Ref=Only now and then, hardly at all, don't know)									
Most or some of the time	0.89	0.04	0.000	1.00	0.04	0.00	0.98	0.04	0.000

Party Identification (Ref=Democrat)									
Republican	-0.13	0.04	0.001	-0.12	0.04	0.00	-0.11	0.04	0.005
Independent	-0.37	0.04	0.000	-0.34	0.04	0.00	-0.34	0.04	0.000
Other	-0.12	0.08	0.115	-0.06	0.08	0.41	-0.04	0.08	0.576
Not sure	-1.43	0.14	0.000	-1.62	0.11	0.00	-1.56	0.14	0.000
Poor physical health days									
Intermediate Tertile	0.00	0.06	0.947	0.02	0.06	0.78	-0.01	0.06	0.847
Highest Tertile	-0.10	0.08	0.214	-0.09	0.08	0.26	-0.13	0.08	0.101
Adults with BMI≥30									
Intermediate Tertile	0.01	0.05	0.919	0.02	0.05	0.76	0.01	0.05	0.827
Highest Tertile	0.03	0.07	0.699	0.05	0.07	0.44	0.06	0.07	0.383
Poor mental health days									
Intermediate Tertile	0.08	0.07	0.227	0.09	0.07	0.16	0.09	0.07	0.171
Highest Tertile	0.05	0.08	0.535	0.08	0.08	0.37	0.08	0.09	0.342
Mental health providers									
Intermediate Tertile	-0.03	0.05	0.525	-0.01	0.05	0.82	-0.01	0.05	0.864
Highest Tertile	-0.01	0.06	0.924	0.02	0.06	0.72	0.05	0.06	0.412
Primary care physicians									
Intermediate Tertile	-0.02	0.05	0.618	-0.04	0.05	0.46	-0.04	0.05	0.425
Highest Tertile	0.00	0.06	0.936	-0.01	0.06	0.84	-0.01	0.06	0.808
Excessive drinking									
Intermediate Tertile	0.06	0.05	0.229	0.03	0.05	0.49	0.05	0.05	0.322
Highest Tertile	0.08	0.06	0.193	0.06	0.06	0.34	0.09	0.06	0.161
Adult smoking									
Intermediate Tertile	-0.07	0.06	0.209	-0.07	0.06	0.22	-0.05	0.06	0.397
Highest Tertile	-0.09	0.08	0.273	-0.08	0.08	0.30	-0.04	0.08	0.638
Air pollution-particulate matter									
Intermediate Tertile	0.03	0.05	0.641	0.08	0.05	0.15	0.06	0.05	0.257
Highest Tertile	-0.02	0.07	0.794	0.00	0.07	1.00	-0.05	0.07	0.447
Drinking water violations									
Violation	-0.03	0.04	0.487	-0.04	0.04	0.32	-0.06	0.04	0.167
Violent crime									
Intermediate Tertile	-0.07	0.05	0.123	-0.07	0.05	0.14	-0.07	0.05	0.129
Highest Tertile	-0.09	0.06	0.144	-0.08	0.06	0.21	-0.06	0.06	0.294
Social associations									
Intermediate Tertile	0.11	0.06	0.040	0.12	0.06	0.04	0.14	0.06	0.014
Highest Tertile	0.05	0.07	0.432	0.05	0.07	0.45	0.08	0.07	0.272

Severe housing problems									
Intermediate Tertile	0.01	0.05	0.821	0.02	0.05	0.70	0.01	0.05	0.868
Highest Tertile	0.05	0.07	0.462	0.05	0.07	0.48	0.00	0.07	0.985
Poor physical health days x RACE									
Intermediate Tertile x RACE	-0.02	0.17	0.885	0.20	0.18	0.25	-0.32	0.16	0.049
Highest Tertile x RACE	0.03	0.20	0.902	0.28	0.24	0.25	-0.49	0.27	0.072
Adults with BMI≥30 x RACE									
Intermediate Tertile x RACE	-0.01	0.12	0.903	-0.04	0.14	0.78	-0.13	0.17	0.448
Highest Tertile x RACE	-0.50	0.16	0.002	0.00	0.22	0.98	-0.37	0.23	0.106
Poor mental health days x RACE									
Intermediate Tertile x RACE	-0.33	0.15	0.028	-0.40	0.16	0.01	0.14	0.15	0.365
Highest Tertile x RACE	-0.14	0.20	0.485	-0.25	0.23	0.27	0.20	0.25	0.417
Mental health providers x RACE									
Intermediate Tertile x RACE	0.07	0.14	0.588	-0.03	0.14	0.86	0.20	0.18	0.269
Highest Tertile x RACE	-0.15	0.15	0.314	-0.08	0.17	0.62	-0.01	0.20	0.957
Primary care physicians x RACE									
Intermediate Tertile x RACE	0.01	0.15	0.940	0.34	0.14	0.01	0.25	0.17	0.160
Highest Tertile x RACE	-0.08	0.15	0.621	0.17	0.19	0.36	0.08	0.18	0.656
Excessive drinking x RACE									
Intermediate Tertile x RACE	-0.13	0.11	0.267	0.26	0.12	0.03	0.11	0.15	0.455
Highest Tertile x RACE	-0.25	0.13	0.042	-0.02	0.15	0.92	-0.03	0.16	0.872
Adult smoking x RACE									
Intermediate Tertile x RACE	0.32	0.13	0.011	0.01	0.15	0.92	0.25	0.19	0.191
Highest Tertile x RACE	0.58	0.20	0.003	-0.05	0.24	0.83	0.57	0.30	0.056
Air pollution-particulate matter x RACE									
Intermediate Tertile x RACE	0.28	0.14	0.052	0.01	0.13	0.96	-0.01	0.17	0.938
Highest Tertile x RACE	0.41	0.13	0.002	0.07	0.13	0.58	0.18	0.15	0.236
Drinking water violation x RACE	0.04	0.10	0.692	0.14	0.13	0.27	0.21	0.15	0.160
Violent crime x RACE									
Intermediate Tertile x RACE	0.01	0.17	0.972	0.19	0.19	0.32	0.06	0.16	0.700

Highest Tertile x RACE	0.16	0.17	0.366	0.35	0.19	0.07	0.20	0.19	0.291
Social associations x RACE									
Intermediate Tertile x RACE	-0.01	0.13	0.917	-0.16	0.18	0.36	-0.34	0.18	0.062
Highest Tertile x RACE	0.15	0.16	0.351	-0.22	0.21	0.31	0.05	0.18	0.796
Severe housing problem x RACE									
Intermediate Tertile x RACE	0.01	0.15	0.948	-0.25	0.22	0.25	-0.03	0.17	0.867
Highest Tertile x RACE	0.10	0.16	0.539	-0.14	0.22	0.53	-0.11	0.22	0.624
Notes: Table shows the results from three multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors, p-value. All estimates incorporate complex sample survey weights.									

Table 2. Associations with contacting from multivariate logistic regression models fully interacted with racial/ethnic group.

	Black (n= 4,111)			Hispanic (n=3,553)			Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)		
	Coef.	se	p-value	Coef.	se	p-value	Coef.	se	p-value
Age (Ref=18-30)									
31-45	0.33	0.06	0.000	0.28	0.06	0.000	0.30	0.06	0.000
46-60	0.61	0.06	0.000	0.58	0.06	0.000	0.61	0.06	0.000
Over 60	0.91	0.06	0.000	0.88	0.05	0.000	0.88	0.06	0.000
Education (Ref=HS degree or less)									
Some College	0.75	0.05	0.000	0.79	0.05	0.000	0.79	0.05	0.000
2- or 4-year Degree	0.84	0.04	0.000	0.87	0.04	0.000	0.87	0.04	0.000
Post-grad	1.20	0.06	0.000	1.24	0.06	0.000	1.20	0.05	0.000
Marital Status (Ref=No)									
Yes	-0.09	0.03	0.013	-0.07	0.03	0.025	-0.09	0.03	0.007
Annual family income (Ref=less than 20,000)									
20,000-49,999	0.01	0.06	0.909	0.02	0.07	0.737	-0.02	0.06	0.752
50,000-79,999	0.23	0.07	0.001	0.21	0.07	0.001	0.18	0.07	0.005
80,000-119,999	0.26	0.07	0.000	0.24	0.07	0.001	0.20	0.07	0.004
120,000 or more	0.36	0.07	0.000	0.36	0.07	0.000	0.30	0.08	0.000
Gender (Ref=Male)									
Female	-0.07	0.03	0.041	-0.07	0.03	0.033	-0.07	0.03	0.021
Race/ethnicity (Ref=white)									
Black OR Hispanic OR Asian, Native American, Middle Eastern, Mixed, or Other	-0.93	0.30	0.002	-0.97	0.37	0.009	-0.30	0.30	0.317
Political interest (Ref=Only now and then, hardly at all, don't know)									
Most or some of the time	1.90	0.08	0.000	1.95	0.09	0.000	1.97	0.08	0.000
Party Identification (Ref=Democrat)									
Republican	-0.59	0.04	0.000	-0.59	0.04	0.000	-0.57	0.04	0.000
Independent	-0.20	0.04	0.000	-0.20	0.04	0.000	-0.21	0.04	0.000
Other	0.35	0.08	0.000	0.36	0.08	0.000	0.37	0.08	0.000
Not sure	-1.19	0.20	0.000	-0.98	0.28	0.001	-1.10	0.21	0.000

Poor physical health days									
Intermediate Tertile	-0.02	0.06	0.739	0.00	0.06	0.956	-0.02	0.06	0.796
Highest Tertile	0.03	0.08	0.739	0.05	0.08	0.493	0.04	0.08	0.599
Adults with BMI≥30									
Intermediate Tertile	-0.07	0.05	0.142	-0.06	0.05	0.195	-0.08	0.05	0.101
Highest Tertile	-0.08	0.07	0.218	-0.06	0.06	0.322	-0.09	0.06	0.174
Poor mental health days									
Intermediate Tertile	0.01	0.06	0.808	0.03	0.06	0.613	0.02	0.05	0.737
Highest Tertile	0.11	0.08	0.185	0.14	0.08	0.090	0.13	0.08	0.101
Mental health providers									
Intermediate Tertile	-0.05	0.05	0.327	-0.05	0.05	0.273	-0.05	0.05	0.247
Highest Tertile	0.04	0.06	0.515	0.02	0.06	0.689	0.00	0.06	0.942
Primary care physicians									
Intermediate Tertile	0.03	0.05	0.571	0.03	0.05	0.517	0.02	0.05	0.605
Highest Tertile	0.01	0.06	0.907	0.01	0.06	0.916	0.00	0.06	0.959
Excessive drinking									
Intermediate Tertile	0.09	0.05	0.054	0.08	0.05	0.076	0.08	0.05	0.072
Highest Tertile	0.09	0.06	0.125	0.08	0.06	0.158	0.08	0.06	0.163
Adult smoking									
Intermediate Tertile	-0.04	0.05	0.442	-0.06	0.05	0.282	-0.05	0.05	0.342
Highest Tertile	0.01	0.08	0.910	-0.04	0.08	0.624	-0.02	0.08	0.835
Air pollution-particulate matter									
Intermediate Tertile	-0.06	0.06	0.310	-0.03	0.05	0.561	-0.06	0.05	0.247
Highest Tertile	-0.07	0.06	0.301	-0.02	0.06	0.800	-0.04	0.06	0.552
Drinking water violations									
Violation	-0.05	0.04	0.223	-0.05	0.04	0.177	-0.05	0.04	0.187
Violent crime									
Intermediate Tertile	-0.03	0.05	0.556	-0.02	0.05	0.676	-0.02	0.04	0.702
Highest Tertile	0.00	0.06	0.999	0.03	0.06	0.617	0.03	0.06	0.647
Social associations									
Intermediate Tertile	0.11	0.05	0.049	0.11	0.06	0.053	0.09	0.05	0.095
Highest Tertile	0.10	0.06	0.109	0.11	0.06	0.083	0.10	0.06	0.092
Severe housing problems									
Intermediate Tertile	0.02	0.05	0.717	0.03	0.05	0.490	0.01	0.05	0.776
Highest Tertile	0.00	0.07	0.988	0.06	0.07	0.404	0.03	0.07	0.702
Poor physical health days x RACE									
Intermediate Tertile x RACE	0.16	0.20	0.412	-0.31	0.24	0.193	0.22	0.21	0.305

Highest Tertile x RACE	0.16	0.26	0.536	-0.70	0.35	0.044	-0.24	0.29	0.401
Adults with BMI≥30 x RACE									
Intermediate Tertile x RACE	0.12	0.15	0.442	0.22	0.25	0.384	-0.30	0.18	0.101
Highest Tertile x RACE	-0.02	0.23	0.937	-0.72	0.38	0.056	-0.30	0.26	0.262
Poor mental health days x RACE									
Intermediate Tertile x RACE	-0.24	0.17	0.148	0.54	0.27	0.041	0.47	0.26	0.072
Highest Tertile x RACE	-0.41	0.29	0.156	0.78	0.42	0.062	0.60	0.30	0.049
Mental health providers x RACE									
Intermediate Tertile x RACE	0.02	0.19	0.922	-0.29	0.23	0.216	-0.21	0.20	0.288
Highest Tertile x RACE	0.08	0.24	0.732	-0.71	0.30	0.017	-0.49	0.21	0.023
Primary care physicians x RACE									
Intermediate Tertile x RACE	-0.17	0.20	0.386	0.05	0.23	0.818	0.06	0.20	0.754
Highest Tertile x RACE	-0.35	0.24	0.136	0.29	0.35	0.420	-0.58	0.24	0.016
Excessive drinking x RACE									
Intermediate Tertile x RACE	-0.16	0.17	0.368	-0.24	0.20	0.221	0.15	0.16	0.358
Highest Tertile x RACE	-0.20	0.20	0.330	0.49	0.23	0.037	0.38	0.18	0.035
Adult smoking x RACE									
Intermediate Tertile x RACE	0.30	0.14	0.031	0.38	0.25	0.124	-0.10	0.20	0.633
Highest Tertile x RACE	0.41	0.30	0.165	0.38	0.51	0.462	-0.50	0.29	0.082
Air pollution-particulate matter x RACE									
Intermediate Tertile x RACE	-0.31	0.19	0.107	-0.08	0.23	0.741	0.24	0.19	0.205
Highest Tertile x RACE	-0.10	0.18	0.557	-0.04	0.21	0.860	0.11	0.17	0.531
Drinking water violation x RACE	0.02	0.16	0.923	-0.13	0.19	0.516	0.08	0.16	0.638
Violent crime x RACE									
Intermediate Tertile x RACE	0.01	0.22	0.964	0.63	0.26	0.014	-0.18	0.20	0.360
Highest Tertile x RACE	0.05	0.21	0.800	0.13	0.24	0.603	-0.08	0.22	0.713
Social associations x RACE									
Intermediate Tertile x RACE	-0.02	0.16	0.917	-0.20	0.30	0.493	0.35	0.20	0.076
Highest Tertile x RACE	-0.01	0.21	0.976	0.15	0.35	0.670	0.56	0.24	0.019

Severe housing problem x RACE									
Intermediate Tertile x RACE	0.13	0.21	0.532	0.40	0.31	0.196	-0.03	0.20	0.899
Highest Tertile x RACE	0.14	0.21	0.496	0.37	0.29	0.205	-0.36	0.24	0.125
Notes: Table shows the results from three multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors, p-value. All estimates incorporate complex sample survey weights.									

Table 3. Associations with protesting from multivariate logistic regression models fully interacted with racial/ethnic group.									
	Black (n= 4,111)			Hispanic (n=3,553)			Asian, Native American, Middle Eastern, Mixed, or Other (n=3,035)		
	Coef.	se	p-value	Coef.	se	p-value	Coef.	se	p-value
Age (Ref=18-30)									
31-45	-0.43	0.07	0.000	-0.33	0.08	0.000	-0.42	0.07	0.000
46-60	-0.54	0.07	0.000	-0.42	0.07	0.000	-0.47	0.08	0.000
Over 60	-0.69	0.07	0.000	-0.55	0.08	0.000	-0.61	0.07	0.000
Education (Ref=HS degree or less)									
Some College	0.73	0.10	0.000	0.81	0.10	0.000	0.88	0.10	0.000
2- or 4-year Degree	1.01	0.09	0.000	1.07	0.09	0.000	1.13	0.09	0.000
Post-grad	1.37	0.09	0.000	1.41	0.09	0.000	1.46	0.09	0.000
Marital Status (Ref=No)									
Yes	-0.15	0.05	0.002	-0.19	0.05	0.000	-0.12	0.05	0.024
Annual family income (Ref=less than 20,000)									
20,000-49,999	0.05	0.09	0.632	0.11	0.11	0.300	0.01	0.09	0.941
50,000-79,999	0.28	0.10	0.004	0.29	0.11	0.007	0.18	0.10	0.070
80,000-119,999	0.35	0.10	0.000	0.42	0.12	0.000	0.29	0.10	0.005
120,000 or more	0.38	0.10	0.000	0.44	0.12	0.000	0.26	0.11	0.013
Gender (Ref=Male)									
Female	0.03	0.05	0.511	0.01	0.05	0.783	0.00	0.05	0.984
Race/ethnicity (Ref=white)									
Black OR Hispanic OR Asian, Native American, Middle Eastern, Mixed, or Other	-0.32	0.44	0.464	0.16	0.55	0.775	-0.66	0.35	0.061
Political interest (Ref=Only now and then, hardly at all, don't know)									
Most or some of the time	1.86	0.13	0.000	1.68	0.15	0.000	1.71	0.13	0.000
Party Identification (Ref=Democrat)									
Republican	-1.72	0.08	0.000	-1.76	0.08	0.000	-1.78	0.07	0.000

Independent	-0.76	0.06	0.000	-0.81	0.05	0.000	-0.82	0.05	0.000
Other	-0.16	0.11	0.141	-0.17	0.11	0.120	-0.14	0.10	0.162
Not sure	-1.35	0.36	0.000	-1.62	0.27	0.000	-0.82	0.36	0.024
Poor physical health days									
Intermediate Tertile	-0.11	0.09	0.215	-0.12	0.09	0.159	-0.13	0.08	0.130
Highest Tertile	-0.07	0.13	0.573	-0.11	0.12	0.400	-0.07	0.12	0.551
Adults with BMI≥30									
Intermediate Tertile	-0.05	0.07	0.487	-0.01	0.07	0.872	-0.01	0.07	0.878
Highest Tertile	-0.17	0.10	0.081	-0.13	0.10	0.193	-0.11	0.10	0.235
Poor mental health days									
Intermediate Tertile	0.23	0.09	0.010	0.20	0.09	0.033	0.21	0.09	0.023
Highest Tertile	0.25	0.13	0.052	0.18	0.13	0.158	0.19	0.13	0.142
Mental health providers									
Intermediate Tertile	-0.09	0.08	0.248	-0.04	0.07	0.592	-0.04	0.07	0.615
Highest Tertile	0.12	0.09	0.190	0.17	0.09	0.047	0.16	0.09	0.062
Primary care physicians									
Intermediate Tertile	0.07	0.07	0.367	0.05	0.07	0.528	0.03	0.07	0.661
Highest Tertile	0.09	0.08	0.292	0.09	0.08	0.305	0.08	0.09	0.347
Excessive drinking									
Intermediate Tertile	0.07	0.07	0.296	0.07	0.07	0.304	0.09	0.07	0.185
Highest Tertile	0.29	0.08	0.000	0.29	0.08	0.000	0.29	0.07	0.000
Adult smoking									
Intermediate Tertile	-0.21	0.07	0.003	-0.22	0.07	0.003	-0.20	0.07	0.007
Highest Tertile	-0.22	0.11	0.059	-0.22	0.12	0.057	-0.17	0.11	0.133
Air pollution-particulate matter									
Intermediate Tertile	0.03	0.08	0.686	0.09	0.08	0.257	0.04	0.08	0.599
Highest Tertile	-0.08	0.10	0.416	0.01	0.11	0.918	-0.04	0.10	0.681
Drinking water violations									
Violation	0.03	0.06	0.581	0.02	0.06	0.717	0.03	0.06	0.593
Violent crime									
Intermediate Tertile	0.14	0.07	0.044	0.16	0.07	0.020	0.14	0.07	0.034
Highest Tertile	0.18	0.09	0.042	0.21	0.09	0.020	0.19	0.08	0.027
Social associations									
Intermediate Tertile	0.02	0.08	0.778	0.06	0.08	0.445	0.06	0.08	0.458
Highest Tertile	-0.04	0.09	0.648	-0.01	0.09	0.883	0.00	0.09	0.970

Severe housing problems									
Intermediate Tertile	0.09	0.07	0.220	0.10	0.07	0.153	0.09	0.07	0.169
Highest Tertile	0.25	0.11	0.017	0.25	0.11	0.023	0.22	0.10	0.036
Poor physical health days x RACE									
Intermediate Tertile x RACE	0.45	0.30	0.131	-0.53	0.39	0.171	0.16	0.23	0.478
Highest Tertile x RACE	0.63	0.40	0.112	-0.94	0.49	0.055	0.11	0.37	0.760
Adults with BMI≥30 x RACE									
Intermediate Tertile x RACE	-0.37	0.20	0.061	0.12	0.21	0.572	-0.38	0.21	0.075
Highest Tertile x RACE	0.23	0.34	0.502	-0.54	0.37	0.145	-0.34	0.36	0.333
Poor mental health days x RACE									
Intermediate Tertile x RACE	-0.47	0.23	0.039	0.29	0.28	0.306	0.46	0.29	0.109
Highest Tertile x RACE	-0.70	0.34	0.039	0.29	0.39	0.455	0.23	0.40	0.558
Mental health providers x RACE									
Intermediate Tertile x RACE	0.03	0.32	0.937	-0.42	0.40	0.298	-0.53	0.34	0.115
Highest Tertile x RACE	-0.33	0.33	0.320	-0.98	0.44	0.026	-0.49	0.29	0.091
Primary care physicians x RACE									
Intermediate Tertile x RACE	-0.22	0.30	0.449	0.45	0.26	0.084	0.34	0.28	0.229
Highest Tertile x RACE	0.03	0.36	0.937	0.38	0.29	0.186	0.04	0.32	0.889
Excessive drinking x RACE									
Intermediate Tertile x RACE	0.59	0.23	0.011	-0.09	0.30	0.760	0.39	0.21	0.069
Highest Tertile x RACE	0.08	0.28	0.765	0.13	0.21	0.537	0.48	0.21	0.022
Adult smoking x RACE									
Intermediate Tertile x RACE	0.55	0.25	0.028	0.23	0.27	0.395	0.43	0.22	0.056
Highest Tertile x RACE	0.47	0.39	0.230	0.44	0.43	0.308	0.43	0.32	0.181
Air pollution-particulate matter x RACE									

Intermediate Tertile x RACE	-0.82	0.24	0.001	-0.30	0.27	0.272	-0.16	0.23	0.491
Highest Tertile x RACE	-0.34	0.27	0.208	0.00	0.24	0.987	-0.09	0.21	0.653
Drinking water violation x RACE	-0.09	0.19	0.637	-0.13	0.30	0.670	-0.09	0.22	0.673
Violent crime x RACE									
Intermediate Tertile x RACE	-0.39	0.32	0.216	0.21	0.29	0.479	-0.23	0.26	0.376
Highest Tertile x RACE	-0.60	0.33	0.065	0.16	0.33	0.635	-0.03	0.25	0.920
Social associations x RACE									
Intermediate Tertile x RACE	-0.01	0.28	0.971	0.36	0.38	0.349	0.40	0.38	0.284
Highest Tertile x RACE	-0.07	0.31	0.830	0.28	0.40	0.472	0.30	0.35	0.394
Severe housing problem x RACE									
Intermediate Tertile x RACE	0.44	0.34	0.195	0.19	0.38	0.620	0.09	0.25	0.725
Highest Tertile x RACE	0.23	0.34	0.510	0.07	0.35	0.831	-0.06	0.30	0.832
Notes: Table shows the results from three multivariate logistic regression models, one for each racial/ethnic group, displaying the coefficient with standard errors, p-value. All estimates incorporate complex sample survey weights.									