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Policing and Health: Police Encounters as a Fundamental Cause Of Racial Health Disparities

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**POLICING AND HEALTH: POLICE ENCOUNTERS AS A FUNDAMENTAL CAUSE OF RACIAL HEALTH
DISPARITIES**

A Dissertation Presented

by

RICHARD S. CARBONARO

Submitted to the Graduate School of the University of Massachusetts Amherst
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

September 2021

Department of Sociology

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ABSTRACT

POLICING AND HEALTH: POLICE ENCOUNTERS AS A FUNDAMENTAL CAUSE OF RACIAL HEALTH DISPARITIES

SEPTEMBER 2021

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Structural racism has taken many forms throughout American history and to this day continues to drive social, economic, and health inequalities. Mass incarceration is a modern tool of social marginalization with well documented and deep-rooted racial inequalities. Research has continually shown that mass incarceration negatively impacts the health of disadvantaged communities. Even police stops, the most common and mundane form of criminal justice contact has been linked with deleterious health outcomes at the individual and community level. In this dissertation, I identify specific social and biological mechanisms connecting encounters with the police and health outcomes. In the first chapter, I introduce my overall argument and aims of my dissertation. In the second chapter, I argue that police contact is a fundamental cause of health disparities and discuss how it interacts with other fundamental causes. In chapter three I explore the roles of system avoidance and social isolation in driving this disparity. In the fourth chapter, I examine the role of the family and the proliferation of stress within the parent-child relationship. In the fifth chapter I observe biological ramifications of police discrimination, including accelerated biological aging and

disease activity. In the sixth chapter I conclude by discussing the implication of my empirical findings and theoretical approach. Overall, I argue that if we wish to address racial health disparities, we must confront the role of mass incarceration in our society.

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CHAPTER

CHAPTER 1: INTRODUCTION

“For centuries, structural racism in the United States has harmed Black and brown communities and served as a major barrier to health equity...” – The Anti-Racism Health Bill of 2020

“Antiracist work [is critical] to the core goals and values of public health.” - Jennifer Jee-Lyn

García & Mienah Zulfacar Sharif

Referring to the second-class citizenship experienced by Black Americans, W.E.B. DuBois famously said “The slave went free; stood for a brief moment in the sun; then moved back again toward slavery” (DuBois 1935). In this quote, DuBois is drawing attention to the continuation of the severe oppression of Black Americans, despite receiving a moment of hope when it was thought that freedom had been achieved. In a similar vein, Wacquant (2000) coined the term “peculiar institutions” to refer to major institutions which have kept Black Americans in a subjected position. Slavery gave way to Jim Crow laws in the south, and this gave way to high degrees of segregation in cities. The most modern systems holding down Black Americans he referred to as the “hyperghetto”, where Black neighborhoods ever exist within the carceral continuum, where Black neighborhoods become increasingly prison-like, with police serving as their guards (Wacquant 2000, 2001). This progression of the systems of oppression has entered the minds of many through the work of Michelle Alexander, in her popular book “The New Jim Crow” (2010), wherein she argues that mass incarceration is the new Jim Crow (Alexander 2010). Wacquant and Alexander would not argue that mass incarceration or the prisonization of

Black neighborhoods are the only source of anti-Black discrimination in America, but that they are major sources of social marginalization. These institutions not only are themselves oppressive but cause increased vulnerability to other social harms. These scholars, and many more, argue that the oppression of Black Americans has not vanished, but continues to take new forms. Mass incarceration is simply a current manifestation in the long history of anti-Blackness in America.

An important aspect of this progression is that it obscures the underlying anti-Black oppression. Davis (1997) argues that the criminalization of Black (and Brown) Americans allowed for the institution of a 'race-neutral' system of anti-Black oppression. In this system, Black and Latinx individuals become "exchangeable with the crimes they have or will allegedly commit" (Davis 1997). This allows the nation to 'wash their hands' of the reality of the anti-Black harm this system inflicts. It allows for a false innocence regarding racism, claiming a colorblind punishment of crime apart from the punishment of people. The harm this system inflicts is obscured by the lens of criminalization.

Although there is much to be said about the effects of incarceration and its associated lifelong stigmas, of inequality in probation and parole, prosecutorial decisions, sentencing, the harms of zero-tolerance policies, and many other aspects of mass incarceration, in this dissertation I focus on the initial police encounters. Police encounters are the most routine and common interaction with the criminal justice system, these encounters beginning early in the lives of many. An estimated 31 million Americans encounter the police each year (Langton and Durose 2015), with adolescents being the most likely to be stopped by the police (Kramer, Remster, and Charles 2017). This, taken together with Wacquant's 'prisonization of the ghetto' (Wacquant 2001; Western, Kleykamp, and Rosenfeld 2004) suggest police practices may be one of the most important aspects of mass incarceration to observe.

Policing plays a major role in the legal control of minority groups (Stuart, Armenta, and Osborne 2015), maintains a second-class citizenship (Young and Petersila 2016), and isolates individuals from essential legal and societal resources (Brayne 2014; Tyler, Fagan, and Geller 2013; Young and Petersila 2016). This marginalization is central to viewing policing as part of the modern ‘peculiar institution’ (Wacquant 2001). Black Americans, especially Black adolescents, are disproportionately stopped by the police (Crutchfield et al. 2012; Kramer et al. 2017; Pierson et al. 2020), and experience greater use of force than their peers (Kramer et al. 2017). Black men are more likely to be killed by the police than white men (Edwards, Lee, and Esposito 2019), with people of color losing over 50,000 years of life due to police violence between 2015 and 2016 (Bui, Coates, and Matthay 2018). In this dissertation I will be focusing on non-(physically) violent encounters with the police to demonstrate that even without physical violence, current policing tactics are a public health risk.

Policing and Health

As a driver of social stratification in the United States (Wakefield and Uggen 2010), mass incarceration shapes a wide variety of health outcomes (Kirk and Wakefield 2018; Pettit and Gutierrez 2018; Sewell 2017; Wildeman 2012). Current criminal justice practices are a form of structural violence, a part of a larger regime of racial oppression (Khenti 2014; Owusu-Bempah 2017; Sabo et al. 2014), and have been suggested to be a fundamental cause of racial health disparities, operating through numerous hidden mechanisms (Asad and Clair 2018; Phelan and Link 2015; Williams and Collins 2001). Research suggests that incarceration, heavy policing (Baćák and Nowotny 2018; Geller et al. 2014; Geller, Jaeger, and Page 2017; W. Sewell et al. 2016; Sewell and Jefferson 2016; A. A. Sewell, Jefferson, and Lee 2016), and other peripheral ramifications of mass incarceration (Turney 2017; Wakefield and Wildeman 2014) serve as

health risks for already disadvantaged minority communities. The intense police surveillance of Black and Latinx men, women, and children has widespread consequences, including diabetes, obesity, and general health (Sewell 2017), infant mortality (Legewie 2019), psychosocial distress (A. A. Sewell et al. 2016), depression (Baćak and Nowotny 2018; Toro, Lloyd, et al. 2019), criminogenic effects (Toro, Lloyd, et al. 2019), educational outcomes (Legewie and Fagan 2018), and suicide (Linsley, Johnson, and Martin 2007).

Social and economic marginalization contributes to negative health outcomes through numerous pathways (Link and Phelan 1995; Phelan and Link 2015; Phelan, Link, and Tehranifar 2010; Williams and Collins 2001). The deleterious health effects of police surveillance are frequently attributed to psychosocial stress (Baćak and Nowotny 2018; W. Sewell et al. 2016) and socialization (McFarland, Taylor, McFarland, et al. 2018; W. Sewell et al. 2016) as major contributors of this relationship, but little work has directly tested these pathways in a comprehensive modeling strategy. Stress models have been supported by self-reported distress (A. A. Sewell et al. 2016) and biomarker evidence (McFarland, Taylor, McFarland, et al. 2018). Researchers also suggest legal cynicism (Geller and Fagan 2019), procedural justice (McFarland, Geller, and McFarland 2019), and racial socialization (W. Sewell et al. 2016) may be major ways aggressive policing contributes to racial health disparities (McFarland et al. 2019; W. Sewell et al. 2016; A. A. Sewell et al. 2016). In fact, McFarland, Geller, and McFarland (2019) found that views of procedural injustice exacerbates the effects between police contact and health. Recent work has also explored the role of legal cynicism (Geller and Fagan 2019; Geller et al. 2017; Sewell 2017), examining how police surveillance forms a second-class citizenship (Young and Petersila 2016), socializing Black and Latinx adolescents in ways detrimental to their long-term health (Geller et al. 2017; Wildeman 2012), providing the framework for the examination of numerous potential mechanisms.

Research Questions

This dissertation seeks to demonstrate that policing is a major source of social marginalization associated with widespread negative health outcomes. I will investigate a number of social and biological mechanisms, exploring how policing helps generate racial health disparities through specific mechanisms. In this dissertation I ask and answer the following four questions.

1. How do social and biological mechanisms contribute to the relationship between aggressive policing and poor health outcomes?
2. How do system avoidance and social isolation contribute to the relationship between aggressive policing and poor health outcomes?
3. How does the stress and stigma resulting from police encounters impact the health of families?
4. How does police discrimination contribute to accelerated biological aging in adulthood?

Data

In each of the three empirical chapters I use a different dataset with three independent samples of distinct populations. This not only allows for the examination of questions no single dataset would allow, but it helps demonstrate the robust relationship between policing and negative health outcomes. In Chapter 2, I use the National Longitudinal Study of Adolescent to Adult Health (Add Health). The two waves I primarily use for analyses were collected in 2001-2002 and 2008-2009. Respondents for this dataset were selected from high schools across the United States during the respondent's adolescence. My analyses focus on early adulthood (aged 18-26), when exposure to police was measured. In Chapter 3, I use data from the Fragile

Families and Child Wellbeing Study (FFCWS). This sample began collection at the time of birth for the focal child, collecting information from single or unwed mothers. The wave primarily used in this sample was collected in 2014-2015, when the respondents were about 15 years old. This is a highly urban sample and has an overrepresentation of people of color. In Chapter 4 I draw from the Black Women's Experiences Living with Lupus (BeWELL) study (Chae et al., 2019). This sample draws respondents from Georgians Organized Against Lupus (GOAL), which gathered respondents from the Georgia Lupus Registry (Drenkard et al., 2013). This sample consisted of adult Black women with Lupus ages varying from 18-79 who live in the Atlanta, Georgia metropolitan area. Each of these samples focuses on different populations and provide evidence of the widespread negative effects of policing on health.

Significance

Overall, this research suggests that efforts to achieve health equity will ultimately fail if they do not address underlying issues of systemic racism and social marginalization. I draw on literature and produce new evidence to argue that policing is a major source of social marginalization with widespread effects on health, helping to generate racial health disparities. Policing shapes health through numerous social and biological mechanisms, such that we must address the underlying issue, not simply its manifestations. Finally, I argue that efforts for health equity will ultimately fail if they do not address underlying issues of social marginalization and systemic racism.

Chapter Overview

In Chapter 2, I seek to contextualize policing within the fundamental cause approach (Link and Phelan 1995; Phelan and Link 2015). Here, I briefly introduce readers to this framework, provide context for the rise of mass incarceration, and discuss whether policing is plausibly a fundamental cause of health disparities. This contextualizes the rest of the chapters within the larger societal and theoretical context. Chapters 3, 4, and 5 are empirical explorations of specific mechanisms, as displayed in Figure 1 below. In Chapters 3 and 4, I focus on specific socialization mechanisms connecting modern policing tactics with health disparities. In Chapter 3, I examine system avoidance disparities. In Chapter 4, I examine how policing shapes family relationships and serves as a source of stress for entire families. In Chapter 5 I focus on biological mechanisms,

observing how police discrimination contributes to accelerated biological aging and disease activity. The purpose of identifying these pathways is to

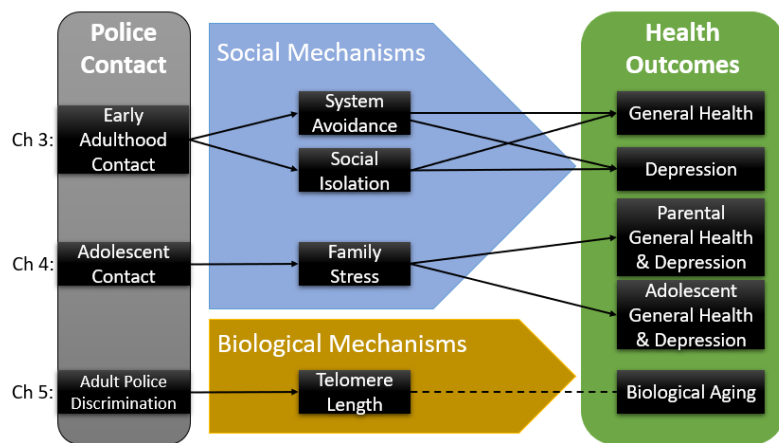


Figure 1. Social and Biological Mechanisms Connecting Police Contact and Health Outcomes

demonstrate how policing shapes health. I argue that we must not become overly focused on these specific mechanisms, but rather address the underlying social marginalization which drives each of these mechanisms. In other words, I wish to focus our attention on the fundamental cause of health disparities rather than individual manifestations.

CHAPTER 2: POLICING AS A FUNDAMENTAL CAUSE OF HEALTH DISPARITIES

The Fundamental Cause Approach

The fundamental cause approach examines how social contexts give rise to health inequalities which are resilient and persist over time (Hatzenbuehler, Phelan, and Link 2013; Link and Phelan 1995; Phelan and Link 2015; Williams and Collins 2001). It is predicated upon the idea that social context shapes health outcomes through numerous flexible and replaceable mechanisms; this is why health disparities persist despite advancement in services and technology. According to the earliest statement by Phelan and Link (1995):

"A fundamental social cause of disease involves resources that determine the extent to which people are able to avoid risks for morbidity and mortality.

Because resources are important determinants of risk factors, fundamental causes are linked to multiple disease outcomes through multiple risk-factor mechanisms. Moreover, because social and economic resources can be used in different ways in different situations, fundamental social causes have effects on disease even when the profile of risk factors changes radically. It follows that the effect of a fundamental cause cannot be explained by the risk factors that happen to link it to disease" (p.88)

What makes a cause of health disparities "fundamental" is that it is the underlying cause of unequal exposures to factors which contribute to poor health, and that it is robust to common public health interventions. In other words, it is the bedrock upon which flexible mechanisms of health inequality stand. Without addressing the underlying

fundamental causes of health disparities, new mechanisms will continue to manifest, resulting in health disparities which are resilient to change over time.

Fundamental cause examine “*metamechanisms*” rather than specific proximate causes which are focused on by traditional public health interventions (Lutfeey and Freese 2005). As opposed to a direct cause which influences a specific outcome, fundamental causes are related to inequalities across health outcomes, working through numerous mechanisms (Williams and Collins 2001). Social context shapes not only care received, but also exposure to health risks such as unhealthy physical and psychologically stressful environments. Social inequality shapes numerous system such that if one cause of unequal health were removed, it is easily replaced by another (Lieberson, 1985; Phelan, Link, Diez-Roux, Kawachi, & Levin, 2004; Phelan & Link, 2015). In this way, you cannot effectively address health inequalities without addressing the underlying social inequalities which drive them; if you address a single direct cause of poor health, a new mechanism will arise.

In this chapter, I aim to contextualize police contact within the fundamental cause theory. Extant literature has described racism as a fundamental cause (Phelan and Link 2015; Williams and Collins 2001), but I extend this, arguing that there is evidence to believe policing also resembles a fundamental cause. Policing has a long history of anti-Blackness in the United States and has been linked with numerous deleterious health outcomes (Billies 2015; Fagan et al. 2016; McFarland et al. 2019; Sewell 2017; A. A. Sewell et al. 2016). Between 2015-2016, encounters with the police resulted in over 57,000 years of life lost with over half of these years belonging to people of color (Bui et al. 2018). Although it is only one facet of mass incarceration, policing is the most common form of contact with the criminal justice system, being experienced by over 31

million U.S. citizens each year (Langton and Durose 2015). In this chapter, I briefly contextualize policing in the larger context of systemic racism and previously identified fundamental causes. This theoretical grounding within a fundamental cause framework usefully contextualizes our current state of policing within the historic context of anti-Black social marginalization. To do so, I discuss whether and how police contact fits the requirements of a fundamental cause and briefly discuss how the following chapters will aim to support this claim. If police contact is a fundamental cause, this indicates that if we desire to achieve health equity, we must address modern policing.

Evolution of the Fundamental Cause Approach

In 1995, Phelan and Link published the foundational work for the Fundamental Cause approach. Although Phelan and Link were by no means the first to acknowledge the deep impacts social conditions have on disease, their framework helped solidify the importance of underlying social causes. As early as 1848, it had been declared that “medicine is a social science” (Virchow, 1848; as cited in Phelan and Link, 1995). However, just thirty years prior to their seminal work, notable scholar Charles Kadushin famously -and erroneously- predicted that the mechanisms by which socioeconomic status influenced health were largely addressed and that health outcomes would soon be equal across classes (Kadushin 1964). Kadushin argued that since the mechanisms by which SES were influencing health were being addressed through improving conditions for the impoverished, public sanitation and mass immunization, health inequalities would be addressed. However, Phelan and Link (1995) explained that while some mechanisms were addressed, new mechanisms soon arose which allowed for the persistence of SES health disparities. For much of the early years of Fundamental Cause

Theory, it was largely focused on explaining the stubborn persistence of SES health inequality.

In 2001, Williams and Collins provided one of the first extensions of the Fundamental Cause approach outside of disparities based on SES. In their work, Williams and Collins argued that racial residential segregation was a fundamental cause of health disparities (Williams and Collins 2001). As part of this, they showed first that race has effects on health separate from SES, then explored numerous mechanisms by which segregation specifically shapes racial health disparities. Notably, they discussed the interconnected of segregation and SES, including the fact segregation causes disparities in SES, but also that there are unique race-segregation effects. This innovation complicated the way we view fundamental causes, noting that fundamental causes can cause and reinforce one another while also having unique effects.

Later work extended the fundamental cause approach to numerous other topics. As early as 2007, there was a call for medical sociologists to examine the role of incarceration as a potential fundamental cause (Schnittker and John 2007). Hatzenbuehler, Phelan, and Link conceptualized stigma as a fundamental cause in 2013 (Hatzenbuehler et al. 2013), and in 2015 Phelan and Link formally conceptualized racism as a fundamental cause independent of SES (Phelan and Link 2015). Similar to Williams and Collins (2001), these extensions acknowledged how these fundamental causes were related to each other and to SES inequalities, while also acknowledging unique impacts of their respective fundamental causes. These theoretical innovations also more concretely defined the parameters by which something could be considered a fundamental cause and provided three primary characteristics of a fundamental cause (Hatzenbuehler et al. 2013). First, a fundamental cause works through multiple

mechanisms to impact a wide variety of health outcomes for many people. Second, it shapes access to resources which allow individuals to avoid disease risk factors and/or treat illness. Third, a fundamental cause influences health across time and place (Hatzenbuehler et al. 2013).

The majority of studies testing the fundamental cause theory have used regression-based approaches (Clouston et al. 2017; Masters, Link, and Phelan 2015; Phelan et al. 2004; Rubin, Clouston, and Link 2014; Saldana-Ruiz et al. 2013; Vanthomme et al. 2017), with a notable exception of an ethnography which has extended this theory (Lutfey and Freese 2005). Specific outcomes which have been observed in research specifically testing the fundamental cause approach include colorectal cancer (Clouston et al. 2017; Saldana-Ruiz et al. 2013), pancreatic cancer (Rubin et al. 2014) and mortality (Masters et al. 2015; Phelan et al. 2004; Vanthomme et al. 2017), but the theoretical work which has supported the fundamental cause approach has drawn on a vast body of literature which indirectly supports it (Link and Phelan 1995; Phelan and Link 2015; Williams and Collins 2001). Many of these empirical tests were focused on SES disparities, so relatively little work has specifically explored the interconnectedness of these fundamental causes and their joint influence on health, though there is much work that supports that they are interconnected and interact with one another.

Racism as a Fundamental Cause

Previous research identifies racism (Phelan and Link 2015) and its resulting segregation (Williams and Collins 2001) as fundamental causes of health disparities. The present chapter seeks to continue this intellectual project by conceptualizing invasive policing as a fundamental cause. Racial inequalities in health are not explained by poverty, but are driven in part by the

racial stressors associated with various forms of anti-Black discrimination (Geronimus et al. 2006). Due to the flexibility of power, racial disparities in health are as malleable, institutionalized, and resistant to change as racism itself (see Wacquant, 2000, 2001). Although some existing racial health disparities can be explained by economic inequality, there are many mechanisms which are unique to racial inequalities (Phelan and Link 2015; Williams and Collins 2001; Williams and Mohammed 2013). Figure 2 below was presented by Phelan and Link (2015) to emphasize that there are important differences in resources by race which are not

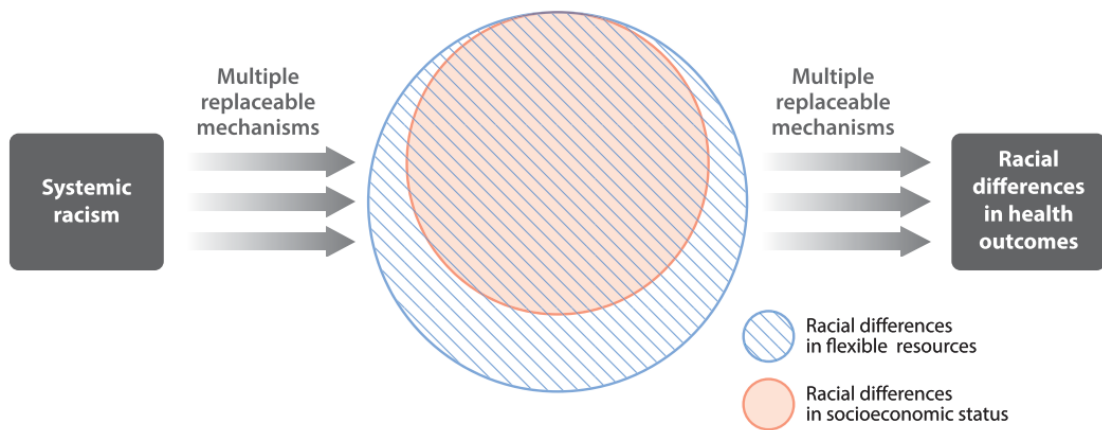


Figure 2. Systemic Racism as a Fundamental Cause (Phelan and Link 2015)¹

explained by SES. In fact, it is racism which gave rise to racial residential segregation, another fundamental cause identified in the literature (Williams and Collins 2001). Likewise, racial racism and segregation gave rise to ethnoracial prisons and modern policing.

Racial Residential Segregation

Researchers suggest that racial segregation rose drastically in the 20th century, replacing much of the class-based segregation of the 19th century (Hershberg 1971; Kellogg 1977; Massey

¹ Modified with permission from the Annual Review of Sociology, Volume 41 © 2015 by Annual Reviews, <http://www.annualreviews.org>

and Denton 1993). Prior to this time, Black poverty could be explained primarily by discrimination, but segregation became a way to formalize and institutionalize racism, resulting in the obscuring of racial oppression. The racial isolation index in New York increased from 41.8 in 1930 to 60.2 in 1970 (Lieberson 1980). In 1962, 61% of white Americans believed that Black people should live in different parts of towns and attend different schools than whites (Schuman, Steeh, and Bobo 1988). The proliferation of anti-Black violence may have played a role in the rise of racial segregation, but researchers identify housing discrimination as one of the most powerful tools for the creation and maintenance of racial segregation (Massey and Denton 1993). White people had little racial tolerance in their neighborhoods; as soon as a few Black people moved in, whites would quickly move out. In Schelling's (2006) classic simulation of residential segregation, he displays how slight preference results in drastic patterns of residential segregation. However, the institutionalization of racism has created structures which would enact racial boundaries apart from interpersonal racism. Whites banded together to lobby for zoning restrictions, boycotted agencies which sold houses to Black people, and intentionally removed things which may attract Black people to their neighborhoods (Massey and Denton 1993; Spear 1967). Laws served to reinforce this institutionalization of racism (Rice 1968). After these legal restrictions were lifted, discrimination persisted, research having identified over twenty ways realtors continued excluding Blacks from living in white neighborhoods (Helper 1969), and subsequent policies served to reinforce segregation using "colorblind" means (see Massey & Denton, 1993).

Acknowledging and understanding segregation is essential to understanding the social standing of Black Americans (Massey and Denton 1993). Segregation exacerbates pre-existing inequality and protects countless mechanisms of inequality. As Massey and Denton (1993) state, "residential segregation is the institutionalized apparatus that supports other racially

discriminatory processes and binds them together into a coherent and uniquely effective system of racial subordination” (p.8). Residential segregation also gave rise to ethnoracial prisons and modern policing tactics (Wacquant 2009). For a more complete explanation of the formation of residential segregation, see (Massey and Denton 1993; Wacquant 2000).

Ethnoracial Prisons

Segregation and its resulting symbolic boundaries gave rise to what Wacquant calls the ‘prisonization of the ghetto’ (Wacquant 2009). Wacquant describes the ‘prisonization of the ghetto’ as being among the many ‘peculiar institutions’ aimed at the social control of Black Americans. Wacquant’s four ‘Peculiar Institutions’ include chattel slavery, Jim Crow, the formation of the ghetto (racial segregation), and the prisonization of the ghetto (which is considered part of mass incarceration). Peculiar institutions involve the stigmatization, territorial confinement, and institutional encasement of African Americans in a distinct physical and symbolic space (Wacquant 2009). While there may not be physical barriers separating these stigmatized spaces, these symbolic barriers are very real, bounding interactions by these physical and symbolic spaces, with few interactions piercing them (Wang et al. 2018). Because of this, ghetto neighborhoods now serve as “ethnoracial prisons” in that it is a spatial location which is physically, socially, and economically limiting (Wacquant 2009; Wang et al. 2018; Weber, Roth, and Wittich 1978).²

² This is not to say that only those in Black neighborhoods are impacted by police nor the symbolic barriers held up by mass incarceration or ethnoracial prisons. Wacquant and the other scholars cited would agree that these symbolic barriers serve as an obstacle to all Black (and Latinx) individuals. However, this rise of ethnoracial prisons is part of the oppression of all Black Americans by the maintenance of symbolic barriers.

Today, ethnoracial prisons are marked by the integration of neighborhoods into the carceral continuum (Wacquant, 2000). The prisonization of the ghetto forms a single carceral continuum where all members of the community are part of the criminal justice system, being under heavy police surveillance. Much like the other peculiar institutions, this hyper-surveillance of Black neighborhoods is not just a byproduct of racism, but an active component in the maintenance of racism. It passively results in increased vulnerability to the reproduction of racism and actively reinforces the stereotyping of young Black men as the "typical criminal" (Wacquant, 2001). This causes Black individuals to become interchangeable with the "crimes" they supposedly commit (Davis 1997). This dehumanization is an insidious form of racism which then excuses the mistreatment of Black and Brown individuals and communities. Additionally, this hyper-surveillance of Black neighborhoods is not only ineffective in preventing crime, but has well-documented harms on communities (W. Sewell et al. 2016; Sewell and Jefferson 2016; Shedd 2012).

By transforming these communities into ethnoracial prisons (Wacquant 2009), the negative impacts of the carceral state reach beyond those with criminal records. Intense policing of these areas not only further criminalizes young Black men (Wacquant 2001), but pulls all members of community into contact with the carceral state, to the point that surveillance becomes a regular part of their lives (Gilliom 2001). Pervasive police presence is an intense form of social marginalization, serving as a chronic stressor, having widespread effects on socialization, and shaping access to key societal resources. For these reasons it may resemble a fundamental cause. In fact, racialized legal status has been identified as a potential fundamental cause (Asad and Clair 2018), but I seek to extend this to include all police contact/surveillance.

Policing and Second-Class Citizenship

The frequency of police contact creates a second-class citizenship. Based on interviews with Black communities, researchers suggest “based on personal and shared experiences, Blacks believe that the police are constantly watching them and treat them as if they don’t belong; Blacks fear that every small offense will result in a stop and that every encounter with the police can escalate and turn ugly” (Epp, Maynard-Moody, & Haider-Markel, 2014 p.47, as cited in Young & Petersilia, 2016). In his ethnography of skid row, one of Stuart's (2016) respondents likened police to lions seeking prey, saying "remember, you don't gotta outrun the lion. Shit, nobody can do that. All you really gotta do is outrun the slowest [person] on the safari" (p.135) in this quote, you see how the respondent sees escaping this surveillance as impossible ("shit, nobody can do that"), and equates the police with a predator which you must evade in order to survive. These quotes display the fear and dread of encounters with the police which many communities express.

For these communities, the criminal justice system serves as an obstacle to success rather than a service (Young and Petersilia 2016), creating “climates of fear” (Shedd 2012) and “communities of exile” (Stuart 2017). This operates in numerous ways. Members of the ‘hyperghetto’ are relegated to second-class citizenship, being separated from health and educational resources, banks, and even police as protectors (Brayne 2014; Goffman 2014; Stuart 2017; Wacquant 2001; Young and Petersilia 2016). Hyper-surveillance breeds distrust not only between the community and police, but also amongst members of the community by transforming each social tie into potential informants against them (Goffman 2014; Young and Petersilia 2016). Police aggressively try to get information on a potential suspect from their friends, partners, and parents, sometimes threatening them with arrest, eviction, or loss of public aid (Goffman 2014). Thus, social connections are harmful for people under direct

surveillance, as well as members of the community who are not suspected of anything. Stuart (2016) also describes instances where the police intentionally break up informal community support groups, when police threatened a group of bodybuilders with arrest if they continued meeting together (p.157). Much like SES, systemic racism, and segregation each contribute to a second-class citizenship, so too can police contact when it is frequent, aggressive, and intrusive on the daily lives of citizens.

Is Police Surveillance a Fundamental Cause of Health Disparities?

Three factors are required in order to qualify as a fundamental cause (Hatzenbuehler et al. 2013). Requirements include 1) work through multiple mechanisms to influence numerous health outcomes for a large group of people; 2) influence access to resources that are used to avoid disease risk factors or treat illness; and 3) impacts health across time and place (Hatzenbuehler et al. 2013; Link and Phelan 1995). Using this framework, I argue that policing is a fundamental cause of health disparities and identify areas where more research is needed. However, similar to racial residential segregation, police contact and the larger system of mass incarceration are manifestations of other fundamental causes; current policing tactics are shaped by systemic racism.

The first requirement of a fundamental cause is that it operates through multiple mechanisms to influence a disparate range of health outcomes for many people. In Table 1 below, I briefly outline the wide range of health outcomes identified by previous literature. There is consistent evidence that a wide variety of conditions and health outcomes are influenced by police contact, including mortality (Lee et al. 2015), asthma (Coogan et al. 2014), diabetes and obesity (Sewell 2017; Sewell and Jefferson 2016), suicide (Linsley et al. 2007), infant mortality (Legewie 2019), and many more. However, relatively little work has examined

specific mechanisms driving these relationships. Stress is commonly cited as a major driver of these negative health outcomes (Legewie 2019; Sewell 2017; W. Sewell et al. 2016), and this has been supported by biomarker evidence (Boen 2020; McFarland, Taylor, McFarland, et al. 2018). However, specific examinations of social mechanisms remain largely unexplored.

Please note that the individual constructions of exposure to police vary across the studies included in Table 1. Some use dichotomous measures of contact (Brayne 2014), others specifically use unfair treatment by police (McFarland, Taylor, McFarland, et al. 2018), and others use indicators of PTSD due to the encounter (Geller et al. 2014; Geller and Fagan 2019). Additionally, the unit of analysis varies, with Sewell and Jefferson (2016) observing outcomes of community-level stop and frisk encounters, while Turney (2019) observes individual-level encounters with the police. Although this variation makes direct comparison difficult, it shows a consistent relationship link between various aspects of policing and deleterious outcomes.

The second requirement of a fundamental cause, that it shapes access to resources that are used to avoid disease risk factors or treat illness is also supported by the literature. Table 1 below shows the disparate social ramifications of police stops, many which isolate individuals from key societal resources. Police contact can lead to system avoidance, including the avoidance of formal health systems (Brayne 2014). Policing disrupts social capital (Lee et al. 2015), isolating individuals from social support, a key health resource (Thoits 2011). It can also contribute to financial strain (Alang et al. 2017), with poverty shaping health outcomes. Family stress (W. Sewell et al. 2016), deviant attitudes (Wiley and Esbensen 2016), and reduced educational performance (Toro, Thomas, et al. 2019) each may also result in isolation from health resources. Additionally, by shaping minority stress and racial vigilance (W. Sewell et al. 2016) policing itself is a public health risk. Thus, there is a wealth of evidence suggesting policing shapes resources that are used to treat illness and avoid disease risk.

The third requirement of a fundamental cause is that it shapes health across time and place (Hatzenbuehler et al. 2013; Link and Phelan 1995). This requirement is harder to meet, given the lack of data. Data on policing within the United States is scarce, especially in conjunction with health outcomes. The scarce data which are now available are relatively recent, making it hard to empirically demonstrate that this relationship is maintained over time. However, scholars have long pointed out the role of policing in social marginalization (Durr 2015; Soss and Weaver 2017) and suggested it contributes to health disparities (Geller et al. 2017; McLeod et al. 2020; W. Sewell et al. 2016; Sewell and Jefferson 2016; Turney 2020). The persistence of this relationship across place is complicated by the fact that policing in the United States is different than most other countries. Many argue that the origin of the policing in the United States is intertwined with slave patrols (Durr 2015), giving it a history of racial oppression since its inception. Beginning in the 1970s, incarceration grew hastily (Travis, Western, and Stevens Redburn 2014), providing the police a unique role in American society. Racial disparities in policing and their relationship with health outcomes has been identified in cities across the United States (Jackson et al. 2019; A. A. Sewell et al. 2016; Turney 2020), but effects among rural populations are largely unexplored. Although policing in the United States is

Table 1. Summary of Potential Social Mechanisms and Health Outcomes of Police Contact

Social	Legal cynicism (Geller and Fagan, 2019)	Procedural injustice (Geller and Fagan, 2019; Tyler et al. 2013)
	Minority stress (W. Sewell et al., 2016)	Racist public reactions (Alang et al. 2017)
	Disrupts social capital (Lee et al. 2015)	Financial strain (Alang et al. 2017)
	Police legitimacy (Shedd 2012; Tyler 2006)	Family stress (W. Sewell et al., 2016)
	Deviant attitudes (Wiley and Esbensen 2016)	Criminogenic influence (Del Toro, Lloyd et al. 2019)
	Educational performance (Del Toro, Thomas et al., 2019; Legewie and Fagan 2018)	Feelings of citizenship (Epp 2014)
		Social isolation (Stuart 2016; Goffman 2014)
		System avoidance (Brayne 2014) Feelings of citizenship (Epp 2014)
Health	Allostatic load biomarkers ^{†*} (Barr et al. 2018a; Thomas et al. 2019)	Telomere length (Chae et al. 2014; McFarland, Taylor, McFarland, et al. 2018)
	High blood pressure (Krieger and Sidney 1996; Sewell 2017)	Uterine myomas (Wise et al. 2007)
	Infant mortality (Legewie 2019)	Physiological stress responses (Bagby et al. 2019)
	Mental health (Sugie and Turney 2017; Geller, Jaeger, Page 2017)	General health (Sewell & Jefferson, 2016; Sewell, 2017)
	Mortality (Lee et al. 2015)	Asthma (Coogan et al. 2014)
	Parental mental health (Turney 2019)	Suicide (Linsley et al. 2007)
	Infant mortality (Legewie 2019)	Psychosocial distress (Sewell, Jefferson, and Lee 2016)
	Depression (Baćak and Nowotny 2018)	Diabetes and obesity (Sewell & Jefferson, 2016; Sgewell, 2017)
	Trauma and anxiety symptoms (Geller et al. 2014)	
	Chronic illness (Bagby et al. 2019)	

Note: This table summarizes the different types of impacts aggressive policing, police contact, and police discrimination has on individuals and communities. This table is not exhaustive but aims to summarize much of the extant literature. The magnitude of some of these relationships vary by race and gender. Italic citations indicates that the study includes police discrimination in a scale with other forms of discrimination. These are included to show a small amount of the line of research begun by Williams and colleagues (Williams et al. 2008), who measure police discrimination within other measures of discrimination in a scale of “major experiences of discrimination”. However, this line of work typically uses an overall scale of discrimination, not parsing to specifically see the unique impacts of discrimination by police/courts, and it should be noted that police discrimination does not have as strong inter-item correlation compared to its fellow indicators (Krieger et al. 2005). [†]allostatic load biomarkers are measured as a scale including numerous biomarkers. In the listed studies, this included HDL, LDL, waist size, BMI, glucose levels, HbA1c, cholesterol, triglycerides, systolic and diastolic blood pressure, epinephrine, norepinephrine, cortisol, IL-6, and HSCRP.

different than other countries, similar findings have been observed in the UK (Linsley et al. 2007). While this third requirement would benefit from further exploration, there is some evidence that it meets the third requirement as well.

I argue that police contact meets each of the requirements to be considered a fundamental cause. However, the purpose of the fundamental cause approach is to get at the bedrock of health disparities. Systemic racism gives rise to modern policing tactics, which should cause a reluctance to call policing a “fundamental” cause. As a manifestation of a deeper fundamental cause, is it proper to call policing a fundamental cause? Williams and Collins (2001) argue that racial residential segregation is a fundamental cause of health disparities, despite segregation based on systemic racism. Perhaps there exist ‘intermediary’ causes which help complicate and perpetuate underlying fundamental causes. Neither policing nor segregation are direct causes of health disparities, as they operate through distinct pathways, yet both are built upon the bedrock of systemic racism. Just as they would not exist in their current form without racism, racial health disparities cannot be addressed without addressing segregation and policing. Figure 3 below depicts this process. The size of the circles is not indicative of relative influence and is by no means meant to be exhaustive; there are many other ‘metamechanisms’ by which systemic racism maintains a resilient relationship with racial health disparities.

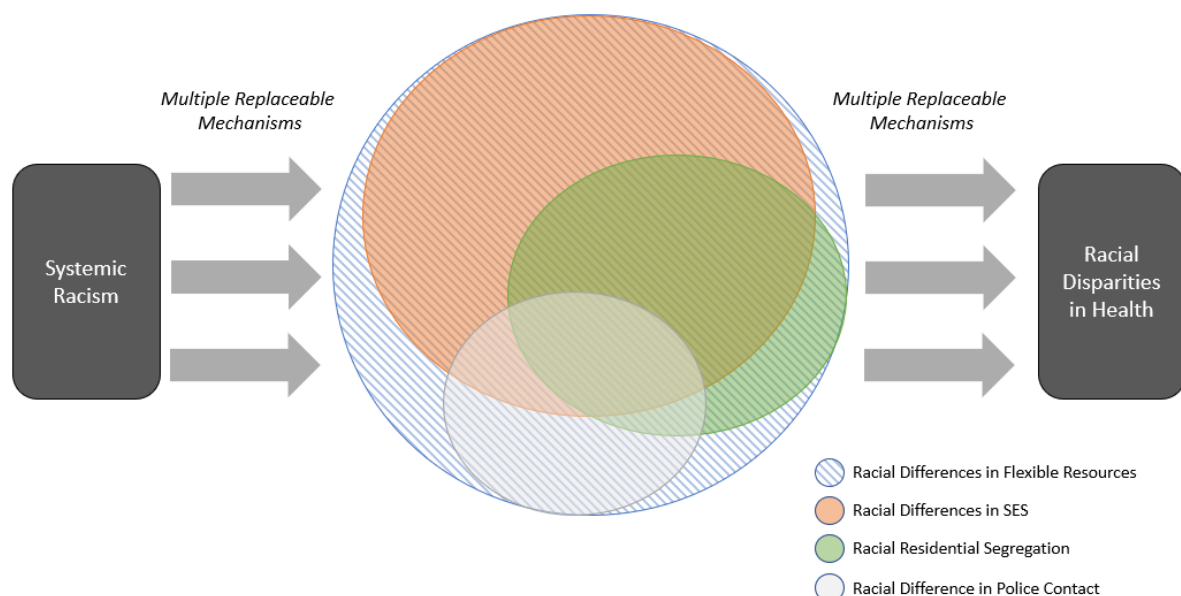


Figure 3. Police Contact Embedded in the Fundamental Cause Approach (inspired by Phelan & Link, 2015)

Figure 3 displays how racial difference is embedded with other metamechanisms which shape racial health disparities. Fundamental causes which overlap and intersect are not a new concept; Phelan and Link (2015) discussed how racial health disparities are partially explained by systemic racism, and Williams and Collins (2001) argue that racial residential segregation, which is a major facet of systemic racism, is a fundamental cause. In regard to police contact specifically, Wacquant (2000) and others argue that racial residential segregation made it easier for police to surveil Black communities, but African Americans are more likely to be targeted by police across locations. Additionally, racial differences in SES cause increased susceptibility to police surveillance and police punishment, but this is not the entire effect because Black folk are more likely to be targeted by the police across socioeconomic status. Likewise, the criminal justice system deeply shapes inequalities in SES (Wakefield and Uggen 2010). Thus, while there are overlaps and intersections

among these metamechanisms, encounters with the police shapes racial health disparities through mechanisms unique from SES and segregation.

The Current Study

The purpose of this dissertation is to better understand the role of policing within the fundamental cause framework. In the next two chapters I examine socialization pathways by which policing impacts health outcomes. In Chapter 3 I establish that frequent police contact contributes to system avoidance and social isolation. System avoidance is the avoidance of formal systems which gather information, which includes doctors and clinics. This chapter establishes that policing isolates individuals from health resources, limiting their ability to treat illness, one of the key requirements of being a fundamental cause. In Chapter 4 I provide evidence that the stress and stigma of encounters with the police influences adolescents' relationships with their parents and that this contributes to deleterious health outcomes. Since families are a key source of support, this also influences individual's ability to avoid disease risk factors and treat illness. In Chapter 5, I show that police discrimination is associated with accelerated biological aging, disease activity, and psychological distress. In this chapter I focus on adult Black women with Lupus and suggest that police discrimination directly affects the biological system, and influences people's ability to control their chronic conditions.

The following chapters provide evidence that policing meets the requirements of a fundamental cause. They identify specific social and biological mechanisms by which policing shapes health, which is part of the first requirement. Chapters 3 and 4 in

particular also provide evidence that policing influences access to resources that are used to avoid disease risk factors and treat illness, which the second requirement. Finally, the third requirement is a consistent relationship across time and space. This finds evidence in the fact that three very different samples, collected in different parts of the United States at different times each show a relationship between policing and health outcomes. Together, this dissertation provides evidence that policing resembles a fundamental cause of health disparities.

CHAPTER 3: SYSTEM AVOIDANCE AND SOCIAL ISOLATION: MECHANISMS CONNECTING POLICE CONTACT AND DELETERIOUS HEALTH OUTCOMES

Introduction

Mass incarceration is a major tool of social stratification in the United States (Wakefield and Uggen 2010), impacting a wide variety of health outcomes (Kirk and Wakefield 2018; Pettit and Gutierrez 2018; Sewell 2017; A. A. Sewell et al. 2016; Wildeman 2012). Even more “mundane” forms of contact such as being stopped by the police, can have serious impacts on health, especially when they are frequent or aggressive (Geller et al. 2014; Legewie and Fagan 2018; A. A. Sewell et al. 2016). In this paper I explore two specific mechanisms by which police stops contribute to deleterious health outcomes. I focus on police stops to demonstrate that even the most routine and low-level forms of criminal justice contact can be public health risks.

Previous research suggests that criminal justice contact can isolate individuals from key health resources. Criminal justice contact contributes to the distrust and avoidance of formal information-gathering institutions, including key health providers such as clinics, doctors, and hospitals (Berg et al. 2016; Brayne 2014; Geller and Fagan 2019). Other researchers have noted that police surveillance may undermine social resources (Baćak and Apel 2019; Goffman 2014; Stewart 2017), which are vital to good health (Thoits 2011). Despite the importance of these potential mechanisms, little research examines how they contribute to the relationship between criminal justice contact and poor health. In this paper, I aim to bridge this gap, examining the roles of system avoidance and social isolation in explaining the relationship between police stops and negative health outcomes. Additionally, I examine how these relationships change over time, and vary by race and gender.

I explore these relationships across several models. First, I examine whether criminal justice contact contributes to system avoidance and social isolation. Second, I explore how the relationship between police contact and health is explained by system avoidance and social isolation. Together, these two tests explore their potential roles as mechanisms. Third, I test how these relationships vary by time, estimating acute and long-term relationships. This allows us to understand the long-lasting influences of negative socialization arising from police stops. Finally, I test how these relationships vary by race and gender in order to better understand how these processes contribute to health disparities. Overall, I find that both system avoidance and social isolation may be important mechanisms by which police contact contributes to negative health outcomes. Police contact is associated with an increased likelihood of avoiding formal healthcare and feelings of loneliness, each of these contributing to poor health outcomes. The relationship between police contact and these mechanisms persist seven years later, and they explain more of the relationship between police stops and health. Notably, women were more likely than men to exhibit system avoidance following police contact, and experienced worse health outcomes than men, and this difference is largely driven by the higher likelihood of system avoidance. Results suggest frequent police contact negatively socializes adolescents and young adults in a way which has long lasting detrimental impacts on their health.

Background

Interactions with police are powerful moments of socialization. Many Black Americans describe police encounters as highly distressing events, undermining feelings of citizenship and belonging (Epp, Maynard-Moddy, and Haider-Markel 2014). For these over-surveilled communities, the criminal justice system often serves as an obstacle to success (Young and Petersila 2016), creating “climates of fear” (Shedd 2012) and “communities of exile” (Stuart

2017). This results in many people being isolated from vital health resources, including formal health institutions (Brayne 2014; Anna R Haskins and Jacobsen 2017; Patler and Gonzalez 2020) and harming social well-being (Baćak and Apel 2019). By separating individuals from these societal resources, hyper-surveillance serves as a mechanism of social stratification (Wakefield and Uggren 2010; Western and Muller 2013) and a public health risk (Baćak and Apel 2019; Bailey et al. 2017; Bowleg et al. 2020; García and Sharif 2015; Sewell and Jefferson 2016). Many people in highly policed communities express a shared belief that police are “constantly watching them and treat them as if they don’t belong; Blacks fear that every small offense will result in a stop and that every encounter with the police can escalate and turn ugly” (Epp et al. 2014). This creates a highly stressful environment, where vital resources available to most of the population have been made off-limits for the most vulnerable in our society. Notably, this is done by the very people meant to protect these rights (Young and Petersila 2016).

Research suggests aggressive policing has deleterious influences on health (Baćak and Nowotny 2018; Geller et al. 2014, 2017; W. Sewell et al. 2016; Sewell and Jefferson 2016; A. A. Sewell et al. 2016; Turney 2020). Researchers link aggressive policing with widespread consequences on health, including diabetes, obesity, and poor general health (Sewell 2017), infant mortality (Legewie 2019), worsening mental health (Geller et al. 2014), psychosocial distress (Jackson et al. 2019; A. A. Sewell et al. 2016), PTSD symptoms (Jackson et al. 2019), depression (Turney 2020), and criminogenic effects (Toro, Lloyd, et al. 2019). These widespread effects are why many researchers call mass incarceration a public health risk (Haskins and McCauley 2019).

The negative health effects of police surveillance are often attributed to stress (Baćak and Nowotny 2018; W. Sewell et al. 2016) and socialization (Geller and Fagan 2019; McFarland et al. 2019). However, relatively little research examines specific ways socialization from police

encounters shape health outcomes. The fundamental cause framework explains that social marginalization shapes health outcomes through numerous flexible mechanisms (Link and Phelan 1995; Phelan and Link 2015; Williams and Collins 2001), and research suggests aspects of the criminal justice system may serve as a fundamental cause of health disparities (Asad and Clair 2018). Policing specifically has been linked with numerous potential mechanisms, including legal cynicism (Geller and Fagan 2019; Kirk and Matsuda 2011), procedural justice (McFarland et al. 2019), and racial socialization (W. Sewell et al. 2016). Research has recently begun exploring the role of these social mechanisms in the maintenance of health disparities, but relatively little is known. In this paper, I focus specifically on non-(physically) violent police stops, one of the most routine and mundane forms of criminal justice contact. I do this because it is experienced by over 31 million Americans each year (Langton and Durose 2015), it can have widespread influences on socialization, and routine stops are a form of social marginalization which is often overlooked in discussions of criminal justice reform.

Socialization

Police interactions are particularly powerful tools of socialization (Geller and Fagan 2019). Research suggests that interactions with the police can shape people's self-conceptions, their relations with the law, and ideas of their place in society, thereby reproducing legal hegemony and sustaining social marginalization (Silbey 2005; Silbey et al. 2018; Young and Billings 2020). Evidence suggests that individual's socialization with the police shape trust in "the system" overall (Fagan and Davies 2000; Sunshine and Tyler 2003). In other words, for poor Black communities in particular "the police are our government" (Soss and Weaver 2017)- but more than this, they become representative of society at large (Fagan and Davies 2000;

Sunshine and Tyler 2003). Thus, the social marginalization experienced via encounters with the police is a stand-in for social marginalization of the entire society.

Although socialization is an on-going process, it is particularly powerful during key periods of socialization, such as adolescence and young adulthood (Fagan and Tyler 2005; Geller and Fagan 2019). Adolescence and young adulthood in particular have disproportionate effects on health through the life course (Halfon and Hochstein 2002; Hertzman and Boyce 2010; Kuh 2003), with police playing central role in how young people view legal authority and rules (Weitzer and Tuch 2006), shaping legal cynicism and legal reasoning (Geller and Fagan 2019). Importantly, adolescents and young adults are also the most likely to be stopped by the police (Kramer et al. 2017). Taken together, the higher likelihood of exposure and the disproportionate impacts make adolescence and young adulthood a particularly important period of life to consider when exploring the socialization effects of policing. In this paper, I focus on two potential socialization mechanisms by which policing may influence health outcomes: system avoidance and social isolation. In the next two sections I briefly explain how policing may be related to these socialization patterns, and how these socialization patterns in turn explain some of the relationship between policing and health outcomes.

System Avoidance

Research suggests that people are more likely to avoid information-gathering institutions following contact with the criminal justice system (Brayne 2014). Since police can easily gain access to information from these institutions, participation increases vulnerability to police surveillance. For example, Goffman (2014) describes how some Black men with warrants avoid visiting hospitals because the police check visitor and patient lists. In an effort to avoid

police contact, individuals avoid information-gathering institutions altogether, losing access to vital societal resources. However, similar patterns of avoiding information gathering institutions are observed among people without active warrants (Brayne 2014; Anna R. Haskins and Jacobsen 2017). Contact with the criminal justice system results in isolation from the labor market, health systems, education, and more (Brayne 2014). Brayne (2014) coined the term “system avoidance” to describe this pattern. System avoidance is a mechanism by which the police become a powerful means of legal control, contributing to social stratification even when individual officers are not intentionally malevolent (Brayne 2014; Stuart et al. 2015). Since I am interested in health outcomes, I focus specifically on the avoidance of formal medical systems, such as doctors or clinics.

Police contact is a powerful source of socialization (Geller and Fagan 2019; Tyler et al. 2013) and the most common, with over 31 million Americans each year are stopped by the police (Langton and Durose 2015). Previous work has already identified a relationship between police stops and system avoidance using a dichotomous measure (Brayne 2014). However, little work has examined how frequency of police stops may be related to system avoidance. Previous literature has found that frequent police contact may be particularly harmful (Hirschtick et al. 2019; Legewie and Fagan 2018), suggesting that increasingly frequent police contact may be associated with an increasing likelihood of system avoidance. This suggests that:

H1.1: Respondents who experience more police stops are less likely to seek formal medical care compared to individuals who were stopped less often.

As a tool of social marginalization (Brayne 2014; Stuart et al. 2015), system avoidance has far-reaching consequences. System avoidance impacts involvement in schooling (Anna R Haskins and Jacobsen 2017), depression (Bowleg et al. 2020) and social stratification (van Brakel

2017). However, despite system avoidance including the avoidance of medical institutions (Brayne 2014), little research explores how it may contribute to deleterious physical health outcomes, although research suggests avoiding going to the doctor while sick is associated with worse outcomes (Tran et al. 2020). By cutting people off from key health resources, system avoidance may contribute to negative health outcomes and should explain some of the relationship between police stops and health outcomes. This would suggest:

H1.2: The relationship between frequent police stops and health outcomes is attenuated by system avoidance.

If system avoidance attenuates the relationship between police stops and health outcomes, this would suggest that system avoidance is a mechanism by which police stops are associated with health outcomes. Unmet health needs in adolescence are common and can have negative effects on adult health (Hargreaves et al. 2015), and can set a negative health trajectory (Halfon and Hochstein 2002; Hertzman and Boyce 2010; Kuh 2003). If system avoidance socializes individuals to avoid seeking treatment when it is needed, it may result in negative health outcomes which increase over time. This may suggest its role as a mechanism may become more pronounced over time. This would suggest:

H1.3: System avoidance will attenuate more of the relationship between police stops and health later in life.

Police Contact and Social Isolation

Relatively little research examines the relationship between police contact and social isolation. Theorists suggest that high levels of police surveillance may contribute to the loss of social capital and social cohesion within communities of color (Calcararo 2016). Some

researchers argue contact with the criminal justice system harms social well-being (Baćák and Apel 2019), and contact with immigration police contributes to social isolation and feeling unsafe (Theodore and Habans 2016). In their ethnographies, both Goffman (2014) and Stuart (2017) describe instances where the police break down informal social support systems. Goffman (2014) explains how police use loved ones as tools to gain information on men under investigation, thus turning key social supports to dangerous liabilities and damaging these ties. Similarly, Stuart (2017) describes how police broke up an informal support group of weightlifters, threatening arrest if they continue to meet together. Since existing research suggests police surveillance may harm social relationships, I predict:

H2.1: Individuals with more police stops will be more likely to be socially isolated than individuals with fewer police stops.

Social supports are vital to good health. Both objective and perceived social support are vital to one's health, contributing both to one's resilience to illness and ability to recover from poor health (Thoits 2011). This relationship between social support and health is widespread, impacting numerous physical and mental health outcomes (Fiori and Jager 2012; Seeman et al. 2001; Thoits 2010, 2011; Uchino 2006, 2009), with loneliness being a particularly powerful predictor of poor health (Segrin and Passalacqua 2010). If police surveillance negatively impacts social relationships, and social isolation contributes to poor health outcomes, isolation may explain some of the relationship between police contact and poor health outcomes. This would suggest:

H2.2: The relationship between frequent police stops and health outcomes are attenuated by social isolation.

If this attenuation is observed, it would support the argument that social isolation is a mechanism by which policing is related with negative health outcomes. Frequent police contact may contribute to distrust of relationships (Goffman 2014) and contribute to the creation of “climates of fear” (Shedd 2012) and “communities of exile” (Stuart 2017). If this is a learned disposition, its ramifications of health may increase over time. Thus:

H2.3: Social isolation will attenuate more of the relationship between police stops and health later in life.

Gender and Race Variation

The literature suggests the relationship between police contact and health may vary by gender. Men and women can manifest stress differently (Aneshensel, Rutter, and Lachenbruch 1991; Longest and Thoits 2012), and may process and interpret police encounters differently. According to research, men are more likely to react to contact by trying to anticipate and avoid future criminal justice contact (Pearlin and Bierman 2013), while the less frequent exposure experienced among girls has translated to girls experiencing increased stigma from stops, resulting in worse outcomes (Turney 2020). In contrast, community-level analyses predicting depression have found greater effects among men than women, (A. A. Sewell et al. 2016), but individual-level analyses have found that girls experience greater levels of depression following encounters with the police compared to boys (Turney 2020). This would suggest that:

H3.1: The relationships between police stops and system avoidance and police stops and health are more pronounced among young women than young men.

Research suggests these relationships may also vary by race and ethnicity. The less common experience of police stops among whites may result in greater stigma, while the

compounding of stressors and disadvantage among people of color may result in worse outcomes (Turney 2020). The literature tends to find that Blacks experience the most negative effects of aggressive policing (Baćak and Nowotny 2020; McFarland, Taylor, McFarland, et al. 2018; McFarland et al. 2019; Sewell and Jefferson 2016; Turney 2020). Unequal exposure, unequal severity of stops, and the cumulative effects of dehumanizing experiences and history of unfair treatment of people of color (Kahn et al. 2016; Rios 2011; Slocum and Wiley 2018) may also translate to increased susceptibility to the negative effects of police stops. This suggests:

H3.2: The relationships between police stops and system avoidance, and police stops and health are more pronounced among people of color than among whites.

Method

Data

I draw data from Waves 1 - 4 of the National Longitudinal Study of Adolescent to Adult Health (Harris et al. 2009). Data collection included a stratified random sample from 80 high schools and feeder schools across the United States during the 1994-1995 school year. The collection strategy oversampled Black adolescents from well-educated families, as well as Chinese, Cuban, and Puerto Rican adolescents. Wave 2 was collected in 1996, Wave 3 from 2001-2002 when respondents were on average 22 years old, and Wave 4 was collected about seven years later in 2008-2009. The independent variable, number of police stops, was only available in Wave 3. Therefore, each model is cross-sectional, measuring outcomes at Wave 3 and Wave 4 using the independent variable from Wave 3. I draw covariates from Waves 1-4. In Wave 1, 20,745 respondents are included in the study, in Wave 2, 14,738 respondents, in Wave 3, 15,197 respondents, and in Wave 4 there are 15,701 respondents. I use the longitudinal

weights for Waves 1, 3, and 4 created by the data curators of the National Longitudinal Study of Adolescent to Adult Health. I remove individuals not included in this weighting structure, resulting in a sample of 12,288. I drop cases with missing data (about 2%), resulting in an analytic sample of 12,016 who have complete cases for all four waves. The dependent variables of interest, self-rated health and depression are available at each of the four waves. However, frequency of police stops are only available at Wave 3, making longitudinal analyses such as fixed effects unsuitable. To address this, I use cross-sectional analyses to estimate short-term relationships at Wave 3 and estimate long-term effects seven years later at Wave 4, using a lagged dependent variable in each model. The system avoidance variable is available in both Waves 3 and 4, but no suitable measure of social isolation is present in both Waves 3 and 4, so I use different measures at each wave. I describe this decision in further detail below. This project is approved by the University of Massachusetts Amherst Institutional Review Board (Protocol #1968 in Kuali).

Measures

Police Stops

Frequency of police stops is my independent variable of interest. Participants responded to the prompt “How many times have you been stopped or detained by the police for questioning about your activities”, with five possible responses: never; 1 time; 2-3 times; 4-5 times; 6 or more. Due to a relatively low number of people in the 6+ category, it is collapsed this with the 4-5 category, resulting in a 4+ category. I use three dichotomous measures, indicating whether the respondent was 1) stopped once; 2) stopped 2-3 times; or 3) 4+ times. The

reference category is people who were never stopped by the police. About 9% of the sample experienced 1 police stop, 7% experienced 2-3 stops, and 4% experienced 4+ stops.

System Avoidance

System avoidance is based on the research of Sarah Brayne (2014), but I focus specifically on medical system avoidance. This is measured as whether the respondent did not go to the hospital or clinic when they thought they needed treatment within the last year. At Waves 3 and 4, about 24% of this sample report not having gone to the doctor when they should have. Note that this is a self-report item, meaning it is the respondent's own evaluation of not going when they should have; this may vary from actual need and is likely a conservative measure, but indicates a reluctance from going to the doctor when they believe they should go.

Table 2. Add Health Sample Characteristics (n=12,116)

	Mean	SD	Min	Max
<i>Criminal Justice Contact (W3)</i>				
1 Stop*	0.09	0.28	0	1
2-3 Stops*	0.07	0.25	0	1
4+ Stops*	0.04	0.19	0	1
<i>Health System Avoidance</i>				
System Avoidance (W3)*	0.24	0.42	0	1
System Avoidance (W4)*	0.24	0.43	0	1
<i>Social Isolation</i>				
Time with Friends (W3)*	0.08	0.27	0	1
Feelings of Loneliness (W4)*	0.29	0.45	0	1
<i>Health Outcomes</i>				
General Health (W3)				

Excellent*	0.33	0.47	0	1
Moderate*	0.41	0.49	0	1
Worse*	0.27	0.44	0	1
General Health (W4)				
Excellent*	0.19	0.49	0	1
Moderate*	0.39	0.48	0	1
Good or worse*	0.42	0.49	0	1
Depression (W3)	0.84	0.45	.25	3.11
Depression (W4)	0.71	0.47	.1	4
<i>Control Variables</i>				
Male (W1)*	0.45	0.50	0	1
White (W1)*	0.56	0.50	0	1
Black (W1)*	0.21	0.41	0	1
Hispanic (W1)*	0.16	0.36	0	1
Asian (W1)*	0.06	0.24	0	1
Other (W1)*	0.02	0.13	0	1
Age (W3)	21.95	1.76	18	27
Parental Education (W1)	13.00	2.69	0	18
Foreign Born (W1)*	0.07	0.26	0	1
Respondent Education (W3)	5.74	2.20	1	13
Delinquency (W3)	0.08	0.21	0	3
Health Insurance (W3)*	0.77	0.42	0	1

* indicates a dichotomous variable. Mean indicates % of occurrence.

Social Isolation

Social Isolation at Wave 3 is measured as how many times during the past week the respondent spent just hanging out or talking with their friends. Individuals who reported spending no time with friends are coded as socially isolated. About 8% of the respondents meet this definition of social isolation. In Table 4 and later in this chapter, I refer to this measure as “Time with Friends.”

This same item is not available at Wave 4, but this wave has an important subjective measure not available at Wave 3. In Wave 4, respondents answered the prompt “How often do you feel isolated from others”. The item was initially measured as a 4-point Likert scale ranging from 0 “never” to 3 “often”, with few respondents (5%) answering the maximum value. To make this variable comparable to system avoidance, I recode it into a dichotomous variable, with 0 indicating they “never” or “rarely” feel isolated from others, and 1 indicating they “sometimes” or “often” feel isolated from others. With this construction, about 29% of the sample are considered socially isolated. In Table 4 and later in this paper, I refer to this measure as “Feelings of Loneliness.”

Health Outcomes

General Health: General health is measured at each wave with a self-rating of health on a 5-point Likert scale ranging from “Excellent” to “Poor.” At Wave 3, over 70% of the sample reported their health as “Excellent” or “Very good”, with relatively few respondents reporting their health as “Good” or worse. Because of the small number of people rating their health worse than “good”, I combined the three lowest ratings of health: “fair” and “poor” and “good”. Going forward, this category is referred to as worse health. Given that “Very Good” was the most common, and middle, response, this category is referred to as “moderate” henceforth. For consistency, the Wave 4 variable was coded with the same pattern. I combine participants who report “Excellent” or “Very Good” health into a category I henceforth refer to as “Excellent” health.

Depression: Depression is measured using items from the Center for Epidemiological Studies Depression Scale (CES-D). The CES-D is a short self-report questionnaire measuring

depressive symptoms in a general population (Radloff 1977). Each item is measured on a 4-point Likert scale, including questions such as “You were sad” or “You could not shake off the blues, even with help from your family and friends”, each measured with a 7-day recall period. Wave 3 has a longer version of this scale, including 19 items, while Wave 4 has a more abbreviated scale using 10 items. Although this means these measures are slightly different, I include the additional items in Wave 3 to ensure the scale would be as reliable as possible. The Wave 4 depression scale has an alpha of 0.84, and the Wave 3 measure has an alpha of 0.87. Unlike the general health measure described above, this variable cannot be directly compared across the two time points, as they include different items from the CES-D.

Control Variables

All models adjust for sex, race, age, parental education, respondent education, income, nativity, health insurance, and the respective measure of previous health. Age is measured at Wave 3 and ranged from 18 to 27, with a mean of about 22. Sex is measured as whether the respondent identifies as male or female. Race is measured as a series of dichotomous variables, measuring whether they are non-Hispanic Black, Hispanic, non-Hispanic Asian/Pacific Islander, or non-Hispanic Other, with non-Hispanic white as the reference group. The majority (55%) of this sample is white, 21% are Black, 16% are Hispanic, 6% are Asian, and 2% are Other.

Parental education is measured using the parental questionnaire from the Wave 1 in-home interview. Nativity indicates whether the individual was born within the United States, with a relatively few (7%) being born outside the country. Notably, the majority (77%) have health insurance.

When predicting general health and depression, their respective Wave 1 variable is adjusted for. Similarly, when predicting system avoidance at Waves 3 and 4, system avoidance at Wave 1 is adjusted for. Delinquency is measured as the number of delinquent actions committed during the past year. These items include stealing things over \$50, damaged property, stole something from a house or building, used or threatened to use a weapon to get something, sold illicit drugs, stole something worth less than \$50, or took part in a gang fight.

Statistical Analyses

All models are cross-sectional using lagged dependent variables, examining outcomes at Waves 3 and 4, adjusting for outcomes in prior waves. I use cross-sectional analyses because police stops are measured only in Wave 3, making a fixed effects approach impossible. Thus, Wave 3 models estimate acute relationships, and Wave 4 models long-term associations. This limits my ability to test causal relationships but allows for the testing of associations across multiple waves. I first estimate the associations among police stops and the proposed mechanisms: system avoidance and social isolation, to test their potential roles as mechanisms. If they are predicted by police stops and help explain the relationship between police stops and health outcomes, this would provide evidence of their role as mechanisms. Second, I estimate associations among police stops and health outcomes at Wave 3, testing how much of this association is explained by the proposed mechanisms. Third, I estimated the association between police contact and health at Wave 3 and Wave 4, testing how much of this relationship is explained by the proposed mechanisms at the respective wave. This allowed for testing of whether the mediating role of system avoidance and social isolation varied over time.

I use different regression techniques based on the distribution of the dependent variables. When predicting system avoidance and social isolation, I use logistic regressions because both are measured as dichotomous variables. Self-rated general health is measured as an ordinal measure, so I first attempted an ordinal logistic regression, but the proportional odds assumption was violated. Therefore, I use a generalized ordinal logistic regression to ensure unbiased estimates. In models estimating depression, I use a negative binomial regression because depression was highly skewed to the right. I use an adjusted Wald test to examine whether the introduction of the mediators causes a statistically significant change in the relationship between police stops and health outcomes. I also use an adjusted Wald test to explore whether the difference in coefficients between 1 and 2-3 police stops is statistically significant, and if the difference between 2-3 police stops and 4+ police stops is statistically significant. All models estimating general health or depression adjust for health at Wave 1. All analyses were weighted using the longitudinal Wave 1-4 weights created by the providers of the restricted use National Longitudinal Study of Adolescent to Adult Health data.

Results

System Avoidance & Social Isolation

First, I test Hypothesis 1.1, that police stops are associated with a greater likelihood of medical system avoidance. The data strongly support Hypothesis 1.1. As Table 3 below indicates, at Wave 3, experiencing stops by the police is associated with a higher likelihood of medical system avoidance, with the magnitude of this relationship increasing as the number of stops increase. Individuals who experienced only 1 stop were 30% more likely to avoid going to the doctor when they needed to. Respondents with 2-3 stops were 43% more likely, and people

with 4+ stops were 74% more likely than people with no stops to avoid going to the doctors when they needed to. When estimating the association between police stops and medical system avoidance seven years later at Wave 4, the association is much weaker, save those with 2-3 stops. When adjusting for system avoidance at the previous wave, those with 2-3 stops were still 40% more likely than those with no stops to avoid getting medical treatment when they needed it. Prior to adjusting for Wave 3 system avoidance, those with 1 stop were 23% more likely to exhibit system avoidance at Wave 4, but this association becomes nonsignificant when adjusting for Wave 3 system avoidance. This suggests long-term system avoidance may be driven by the adoption of system avoidance in adolescence. The socialization pattern of those with 2-3 stops is different, however. They share some of this indirect pathway mediated by system avoidance earlier in life, but this indirect pathway does not explain all of this relationship. Instead, the distrust of information-gathering institutions may grow larger during this seven-year period. This may be driven by unobserved factors such as police stops increasing as they grew older, further criminal justice contact, worsening life conditions, or other factors. Overall, results suggest that greater police contact is associated with a higher likelihood of system avoidance.

Table 3: Predicting System Avoidance and Social Isolation

	System Avoidance (W3)		Time with Friends (W3)	
	Odds Ratio	SE	Odds Ratio	SE
<i>Wave 3 Mechanisms</i>				
1 Police Stop	1.30*	(0.14)	0.90	(0.17)
2-3 Police Stops	1.43**	(0.18)	0.66	(0.14)
4+ Police Stops	1.74***	(0.33)	1.24	(0.30)
	System Avoidance (W4)		Feel Isolated (W4)	

<i>Wave 4 Mechanisms</i>	Odds Ratio	SE	Odds Ratio	SE
1 Police Stop	1.19	(0.13)	1.09	(0.11)
2-3 Police Stops	<i>1.40**</i>	(0.18)	<i>1.36**</i>	(0.15)
4+ Police Stops	<i>1.09</i>	(0.20)	<i>1.41*</i>	(0.21)

* p< 0.05; ** p<0.01; *** p<0.001; Coefficients are presented in odds ratios; For 2-3 Police Stops, italics represent a significant (p<0.05) variation from 1 police stop; For 4+ police stops, italics represent a significant (p<0.05) variation from 2-3 police stops; Control variables and covariates are not shown in these models.

Hypothesis 2.1, that police stops are associated with social isolation, received partial support, depending on the measure of isolation used. Note that police stops were associated with the Wave 4 measure of loneliness, but not the Wave 3 measure of time with friends. Individuals with 2-3 stops were 35% more likely to feel isolated, and those with 4+ were 41% more likely to feel isolated. While we must be cautious in comparing these results due to them being measured in different waves, these results suggest that different types of social isolation may be differentially associated with police stops. While time spent with friends did not vary following police contact, police stops are associated with more feelings of loneliness. This may be an important area of investigation for future studies. Additionally, as shown below, data suggest the wave 4 measure is a better predictor of health outcomes compared to the wave 3 measure.

Wave 3 Health Outcomes

Self-rated general health is estimated using generalized ordinal logistic regression, allowing for the estimation of the likelihood of being in each category of self-rated health. Model 1 here refers to the fully adjusted model before adding the proposed mediators, and Model 2 introduces the proposed mediators: social isolation and system avoidance. Note that all models include a lagged dependent variable, adjusting for health and depression at Wave 1.

When estimating general health, Model 1 suggests that people with more stops have worse health, being less likely to report having excellent health, and more likely to report having worse rated health. Respondents with 2-3 stops were 8.47% less likely to report having excellent health, and 5.96% more likely to have health rated worse compared to people with no stops. People with 4+ police stops were 9.12% less likely to report having excellent health, and 6.43% more likely to report having health rated worse. Results predicting moderate health were nonsignificant.

Results support Hypotheses 1.2, that system avoidance may serve as a mediator between police stops and health outcomes. Notably, Hypothesis 2.2 is not supported in Wave 3; this measure of social isolation is not associated with excellent or poor health. Social isolation is associated with being less likely to report moderate health, but since this measure is not associated with police stops, results suggest it is not a mechanism. The magnitude of the association between 2-3 police stops decreases from being 8.47% less likely to report excellent health to being 7.35% less likely to report excellent health. Similarly, among those with 4+ stops, the association decreases from 9.12% to 7.48%, the mechanisms explaining 1.64 of this relationship. Adjusted Wald tests suggest these changes in the coefficient are statistically significant. System avoidance is also a strong predictor; those who were avoidant being 12.62% less likely to report excellent health, and it explained some of the relationship between police stops and health outcomes. Together with the results of Hypothesis 1.1, this suggests that system avoidance is a mechanism, explaining some of the relationship between police stops and self-reported health.

Similarly, system avoidance appears to be a mediator when predicting worse health. People who were isolated were 6.24% more likely to report worse health, and people who did not go to the doctor when they needed to were 12.33% more likely to report worse health.

Among those with 2-3 stops, the effect size decreased from 5.96% to 5.03% with the inclusion of system avoidance and social isolation in the model. More drastically, the relationship between 4+ stops and worse health decreased from being 6.43% more likely to report poor health to nonsignificant when introducing the proposed mechanisms.

Table 4: Wave 3 Acute Health Outcomes

	Model 1		Model 2	
	Coef.	SE	Coef.	SE
<i>Excellent Self-Rated General Health</i>				
1 Police Stop	-0.74	(2.14)	-0.08	(2.14)
2-3 Police Stops	-8.47***	(2.72)	-7.35**	(2.71)
4+ Police Stops	-9.12**	(3.28)	-7.48*	(3.31)
Social Isolation	--	--	0.77	(2.58)
System Avoidance	--	--	-12.62***	(1.33)
<i>Moderate Self-Rated General Health</i>				
1 Police Stop	-2.59	(2.30)	-2.73	(2.32)
2-3 Police Stops	2.51	(2.68)	2.32	(2.69)
4+ Police Stops	2.68	(3.23)	3.26	(3.28)
Social Isolation	--	--	-7.02**	(2.41)
System Avoidance	--	--	-0.29	(1.44)
<i>Worse General Health</i>				
1 Police Stop	3.33	(1.82)	2.81	(1.90)
2-3 Police Stops	5.96**	(1.87)	5.03**	(1.88)
4+ Police Stops	6.43*	(2.50)	4.23	(2.49)
Social Isolation	--	--	6.24**	(2.13)
System Avoidance	--	--	12.33***	(1.06)
<i>Depression</i>				
1 Police Stop	0.05*	(0.02)	0.05*	(0.02)
2-3 Police Stops	0.05*	(0.02)	0.04	(0.02)
4+ Police Stops	0.03*	(0.02)	0.02	(0.03)

Social Isolation	--	--	0.05*	(0.03)
System Avoidance	--	--	0.17***	(0.01)

* p< 0.05; ** p<0.01; *** p<0.001; All models include a lagged dependent variable; For 2-3 Police Stops and 4+ Police stops, italics represents a significant (<0.05) variation from 1 police stop; Control variables and covariates are not shown in these models; Model 1 represents fully adjusted model excluding proposed mediators; Model 2 adds the proposed mediators; Results for the generalized ordinal logistic regressions are displayed in predicted probabilities; Depression is predicted using negative binomial regressions.

The association between police stops and depression was statistically significant for each level of police stops, but the majority of this is explained by the mechanisms. Among individuals with 2-3 or 4+ stops, the relationship between police stops and depression became statistically nonsignificant when adjusting for the mechanisms. However, the association between police stops and depression remained unchanged for those who were stopped only once.

Wave 4 Outcomes

When predicting Wave 4 outcomes, the associations between police stops and health outcomes are more inconsistent. Remember that police stops are measured at Wave 3, seven years prior to Wave 4. Even after 7 years, respondents with 2-3 are 5.38% less likely to have excellent health. Moreover, this association becomes nonsignificant when adjusting for system avoidance and social isolation. Both feelings of loneliness and system avoidance were associated with a lower likelihood of reporting excellent health.

Having been stopped once by the police is associated with a slightly higher likelihood of reporting moderate health, and this relationship is largely unaffected by the mediators.

Respondents with 2-3 stops are 6.26% more likely to report poor health, this relationship lowering to 4.90% when adjusting for feelings of loneliness and system avoidance.

Compared to the acute models, more of this relationship is explained by feelings of isolation and medical system avoidance; the effects of all levels of police stops became nonsignificant when adjusting for feelings of isolation and medical system avoidance. Some of this may also be explained by the superior measure of isolation available in Wave 4. People with 2-3 stops were 6.26% more likely to have worse health, this effect lowering to 4.90% after adjusting for feelings of loneliness and medical system avoidance. Strangely, the 4+ group did not have a statistically significant association with health outcomes, though the associations were approaching significance in Model 2 for the excellent and worse health categories. This may be driven by the lower number of people in the 4+ category, thus making it more difficult to observe relationships. Note that, even though the relationships are not statistically significant, directionality suggests it is related with generally worse health. Overall, findings suggest that system avoidance and feelings of loneliness are mechanisms, explaining some of the relationship between police stops and self-rated health.

Table 5: Wave 4 Long-Term Health Outcome Models

	Model 1		Model 2	
	Coef.	SE	Coef.	SE
<i>Excellent Self-Rated General Health</i>				
1 Police Stop	-2.78	(1.73)	-2.24	(1.71)
2-3 Police Stops	-5.38*	(2.23)	-4.38	(2.25)
4+ Police Stops	-4.25	(2.79)	-3.80	(2.78)
Feelings of Loneliness	--	--	-2.72*	(1.14)
System Avoidance	--	--	-9.05***	(1.24)
<i>Moderate Self-Rated General Health</i>				
1 Police Stop	3.63*	(1.80)	3.65*	(1.80)
2-3 Police Stops	-0.52	(2.44)	-0.52	(2.44)
4+ Police Stops	0.80	(3.41)	1.30	(3.41)
Feelings of Loneliness	--	--	-2.86*	(1.26)

System Avoidance	--	--	-5.06***	(1.33)
<i>Worse General Health</i>				
1 Police Stop	-0.85	(1.97)	-1.40	(1.97)
2-3 Police Stops	6.26**	(2.31)	4.90*	(2.31)
4+ Police Stops	3.44	(3.02)	2.50	(3.02)
Feelings of Loneliness	--	--	5.58***	(1.34)
System Avoidance	--	--	14.11***	(1.32)
<hr/>				
<i>Depression</i>	Coef.	SE	Coef.	SE
1 Police Stop	1.04	(0.02)	1.02	(0.02)
2-3 Police Stops	1.07*	(0.02)	1.02	(0.02)
4+ Police Stops	1.07*	(0.03)	1.05	(0.03)
Feelings of Loneliness	--	--	1.58***	(0.03)
System Avoidance	--	--	1.21***	(0.02)

* p< 0.05; ** p<0.01; *** p<0.001; All models include a lagged dependent variable; For 2-3 Police Stops and 4+ Police stops, italics represents a significant (<0.05) variation from 1 police stop; Control variables and covariates are not shown in these models; Model 1 represents fully adjusted model excluding proposed mediators; Model 2 adds the proposed mediators; Results for the generalized ordinal logistic regressions are displayed in predicted probabilities; Depression is predicted using negative binomial regressions; Note that police stops is from Wave 3, about 7 years prior to the outcomes.

Although the magnitude of associations predicting excellent health were larger in Wave 3 than Wave 4, this may be in part because fewer people rated themselves as having excellent health in this wave. The same people who are driving this relationship with moderate health in Wave 4 may be the same who caused the larger magnitude effect observed with excellent health in Wave 3.

Police stops are also related with depression at Wave 4, with some of this relationship being explained by the proposed mechanisms. Respondents with 2-3 or 4+ stops at Wave 3 also reported higher levels of depression at Wave 4, and this is reduced by the introduction of

feelings of loneliness and system avoidance, to the point the association becomes nonsignificant.

Variation by Race and Gender

Moderation based on gender is present, but racial variance is not observed in these data. Overall, the relationship between police stops and health outcomes are stronger among women than men. In Model 1, among those with 2-3 stops, women are 29.30% less likely to report having excellent health, while men are 2.23% less likely. Women with 4+ stops are 32.87% less likely to report having excellent health, while men are 5.77% less likely. However, women with 2-3 stops are about 21% more likely to report having moderate health, while the effect among men is nonsignificant. When predicting worse health, men and women did not statistically differ. This suggests that experiencing multiple police stops is associated with many women moving from excellent to moderate health. Much of this relationship is explained by system avoidance, the gender difference becoming much smaller when including it the model. An exception to this is when predicting worse health among those with 4+ stops, when women are still almost 18% more likely to report worse health than men. More can be seen in Figure 4 below. Overall, women appear to be largely driving many of the effects observed within this paper.

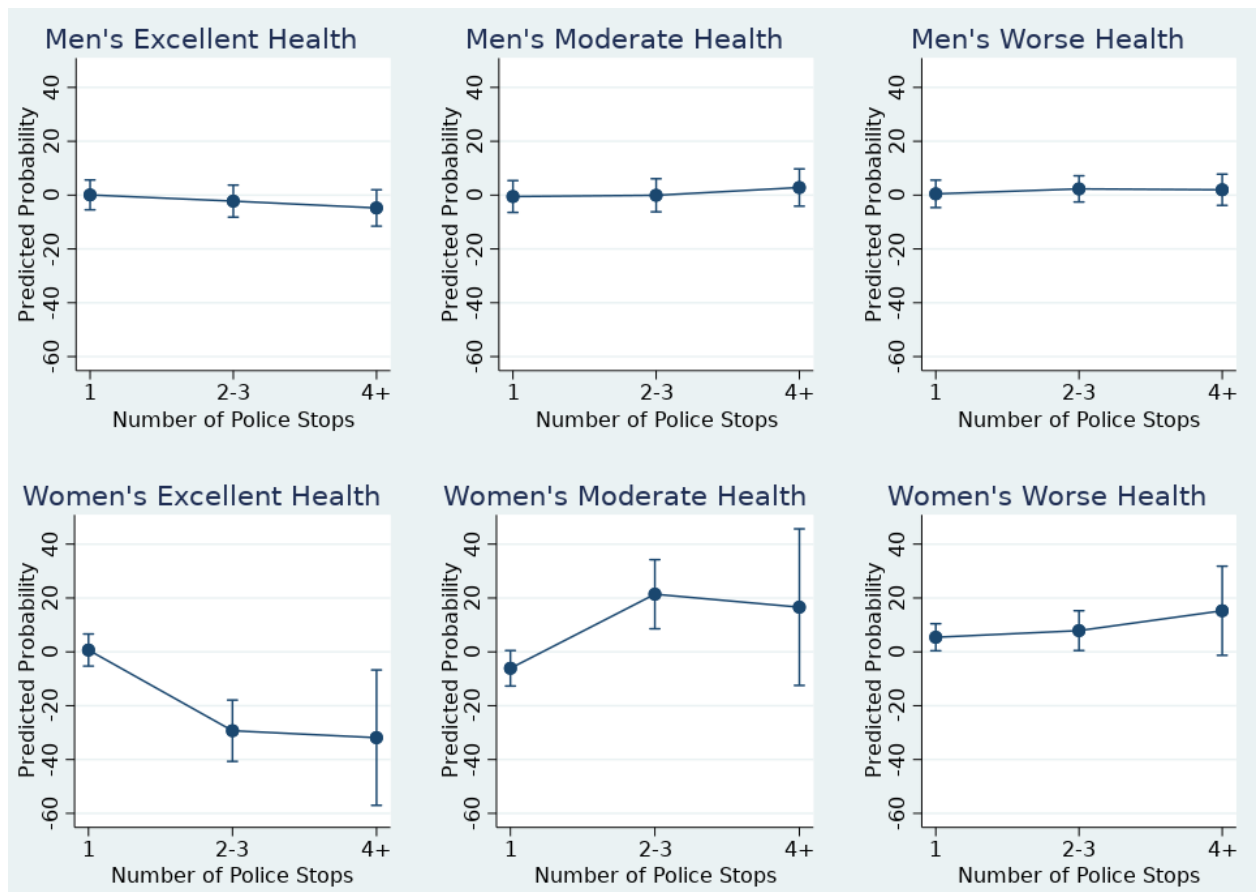


Figure 4. Predicted Probabilities on Health by Gender

The relationship between police stops and medical system avoidance also varies by gender. Figure 5 below depicts a predicted probability plot comparing system avoidance across gender. Women with 4+ stops are also much more likely to report system avoidance than men with 4+ stops, women being 280% more likely to report system avoidance, and men being 167% more likely to report system avoidance. Thus, system avoidance may explain more of the relationship between police contact and health outcomes among women than men. Notably, although the effect size is larger among women, the standard error is much smaller among men, suggesting the relationship is smaller but more consistent among men. However, this may be driven by the smaller number of women with multiple police stops.

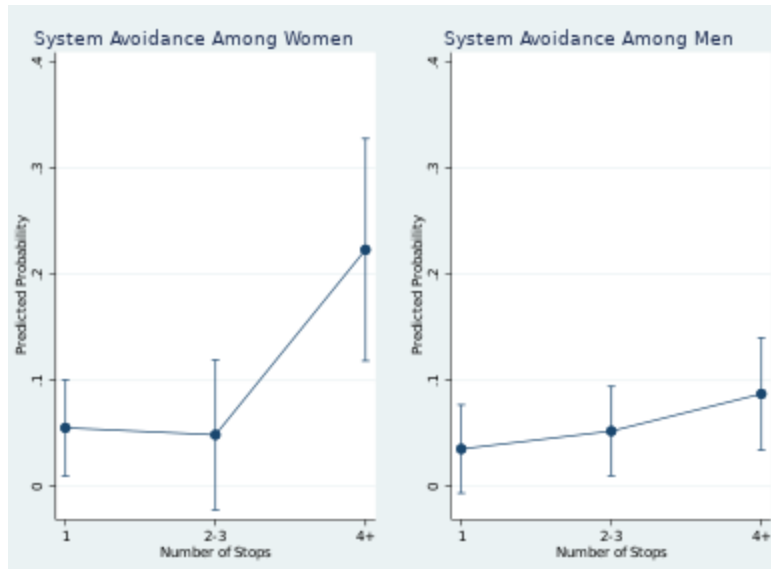


Figure 5. System Avoidance Across Gender

Discussion

Current policing tactics are a public health risk, even when there is no physical violence. Mass incarceration is a major driver of social stratification (Wakefield and Uggen 2010), with police serving as an obstacle for poor communities of color, rather than a service (Young and Petersila 2016). Policing has widespread negative effects on health (Geller et al. 2014; Legewie 2019; Sewell 2017; Turney 2020). Stress is a well-documented driver of these deleterious effects on health, evidenced by biomarker (Boen 2020; McFarland, Taylor, McFarland, et al. 2018) and self-reported distress (Jackson et al. 2019; A. A. Sewell et al. 2016), but socialization is also an important mechanism driving this relationship. In this paper, I identify two important socialization mechanisms driving the relationship between police contact and poor health: medical system avoidance and feelings of loneliness.

Results suggest being stopped by the police results in avoiding medical systems, and that this contributes to worsening health. Results from Hypothesis 1.1 suggests that people with

more police stops are more likely to avoid going to the doctor when they need to, and Hypothesis 1.2 provides evidence that this explains some of the relationship between police stops and health outcomes. This comports with and extends the work of Brayne (2014), that encounters with the criminal justice system contributes to system avoidance. I provide evidence that the likelihood of system avoidance increases with frequency of police stops. This is particularly important because system avoidance would hinder the effectiveness of universal healthcare or other healthcare reforms.

Hypothesis 1.3 also suggests the role of system avoidance persists through the life course, suggesting it may have long-term behavioral ramifications, impacting physical and mental health through the life course. Researchers investigating the deleterious effects of police encounters should investigate how police shape interactions with formal health systems and the accessibility of societal resources. Additionally, results suggest that system avoidance is a mechanism which explains some of the relationship between police stops and health outcomes. Future researchers should pay more attention to socialization mechanisms by which mass incarceration contributes to health disparities, including system avoidance.

The role of social isolation varies depending on how it is measured. Hypothesis 2.1, that police stops are associated with social isolation is supported when measuring feelings of loneliness, but not time spent with friends. Similarly, Hypothesis 2.2, that social isolation explains some of the relationship between police stops and health outcomes is supported by these data when observing feelings of loneliness, but not time spent with friends. This comports with previous literature which suggests police contact can harm social well-being (Bačák and Apel 2019), but similar to Brayne (2104), findings also suggest there are some forms of social supports which may not be affected. The feelings of loneliness may be a symptom of deeper feelings of marginalization and isolation from society. In the same way they are isolated from

formal medical systems, people under police surveillance may feel like they are not a full member of society, embodying a second-class citizenship. Future research could expand upon this using a design which allows for a more direct comparison of different forms of social support. Moreover, it may be important to understand how different sources of marginalization may shape different forms of social support.

Hypothesis 2.3, that social isolation would have more explanatory power predicting long-term outcomes is supported by these analyses, but this may be due to the way it is measured, feelings of loneliness being a more suitable measure than time spent with friends. These feelings of loneliness may also be an important driver of the enhanced stress response and bodily wear observed among people under police surveillance (Boen 2020; McFarland, Taylor, McFarland, et al. 2018; Sewell 2017). Moreover, this isolation resulting from police interactions may contribute to the reproduction of inequality and legal hegemony noted in prior research (Silbey 2005; Silbey et al. 2018; Young and Billings 2020) by creating “communities of exile” (Stuart 2017) and making resistance more difficult. These feelings of isolation may also contribute to the legal cynicism noted in previous research (Geller and Fagan 2019). To understand the widespread social impacts of police contact, both health and legal scholars should seek to better understand how police contact undermines feelings of connectedness and belonging.

Hypothesis 3.1 provides new evidence that system avoidance may be particularly common among women who experience police stops. This comports with previous literature, which has suggested police contact may have greater social impact on girls than boys (Turney 2020). Additionally, extant literature suggests stress differentially impacts women compared to men (Aneshensel et al. 1991; Longest and Thoits 2012), but this paper also adds that women also may exhibit different socialization patterns following police contact. The unequal influences

of police contact are becoming increasingly important as the incarceration of women continues rising. Although Hypothesis 3.2, that people of color experience worse outcomes following contact, was not supported, this does not mean that police stops or these pathways do not contribute to racial health disparities. It is due to differential exposure, not differential effects, that police stops contribute to racial health disparities. Future research should continue exploring who is most affected by police encounters, and how this interacts with other forms of social marginalization.

There are two major limitations of this study. First, the use of cross-sectional data limits the ability to discuss causality. Although I attempt to analyze these data the best that I can, fixed effects approaches would provide far greater evidence of causality. Although I use lagged dependent variables when applicable, a fixed effects approach would better adjust for time-invariant unobserved factors. Second, as discussed above, caution is needed when comparing the measures of social support since they are not available in the same wave. Additionally, comparing more forms of support may also be an important step for future research. This paper provides evidence that socialization is a pathway by which police stops contribute to deleterious health outcomes, but future work is needed to more fully understand the diverse pathways by which mass incarceration contributes to health disparities.

Conclusion

This chapter finds that frequent police stops serve as a public health risk, creating a second-class citizenship which isolates individuals from formal healthcare systems and increases feelings of isolation, thereby contributing to worsening health outcomes. Repeated police contact may be particularly deleterious for women, but much of this is explained by medical system avoidance. Arrest and incarceration are not necessary to contribute to these negative

outcomes, suggesting every level of criminal justice contact must be considered when discussing criminal justice reform. Future research should further examine the role of isolation from institutions and social isolation in driving the widespread negative effects of aggressive police encounters and explore how to mitigate these effects.

CHAPTER 4: STIGMA AND STRESS: EFFECTS OF POLICE CONTACT ON PARENTAL STRESS AND HEALTH

Introduction

Contact with the criminal justice system has been linked with numerous deleterious health outcomes (Kirk and Wakefield 2018; Pettit and Gutierrez 2018; Sewell 2017; A. A. Sewell et al. 2016; Wildeman 2012). Extensive research has examined impacts of arrests and incarceration (Blankenship et al. 2018; Foster and Hagan 2017; Massoglia and Pridemore 2015; Wakefield and Wildeman 2014; Wildeman 2012), and recent research has begun investigating the deleterious health outcomes of the most routine forms of criminal justice contacts: police stops (Geller et al. 2014; Legewie and Fagan 2018; A. A. Sewell et al. 2016). However, relatively little is known about the mechanisms by which police contacts shape health outcomes. Among potential mechanisms, theoretical work argues family stress may be an important mechanism connecting aggressive police surveillance and health outcomes (W. Sewell et al. 2016), but to the best of the author's knowledge, this has not been empirically explored. Building on this theoretical work, in this paper I explore how stigma and stress from police stops impacts adolescent health via family stress and parental mental health.

The family stress model describes how outside stressors such as poverty impact the family unit (Conger et al. 2002; Conger and Elder 1994). These outside stressors contribute to emotional distress of caregivers and influences the parent-child relationship, and these are indirect pathways which shape child health. In this paper, I draw on previous work conceptualizing modern policing as a source of family stress (W. Sewell et al. 2016) to empirically test how family stress mediates the relationship between adolescent police contact and health outcomes. The core argument is that policing is an environmental stressor which is

associated with greater levels of parental stress and parental emotional distress and creates distance between parents and their children. This increased parental stress and emotional distress, and increased distance between parents and their children is in turn associated with worse child outcomes. Specifically, I measure family stress as parental stress, and increased emotional distance in the parent-child relationships for primary and secondary caregivers, and I also measure parental anxiety. For child outcomes, I measure general health, sleep problems, anxiety, and depression. I first measure whether stop stigma and stress are associated with parental stress, then test whether parental stress explains some of the relationship between health outcomes and stop stigma and stress.

Results suggest family stress may be among the mechanisms by which police contact impacts some health outcomes of children and families. Stress from police stops are associated with increased levels of parental stress, greater emotional distance from primary caregivers, and higher parental anxiety. Similarly, stigma from stops is associated with increased distance from primary caregivers, and parental anxiety. Parental stress, emotional distance, and parental mental health explained some, but not all, of the negative health outcomes of stop stigma and stress. The data suggest that family stress is among the pathways by which modern policing shapes health disparities.

Background

Contact with the criminal justice system has widespread and lasting effects on health and life trajectories (Boen 2020; Lee et al. 2014; Pettit and Western 2004; Schnittker and John 2007; Wildeman and Wang 2017). Negative impacts include behavioral (Legewie and Fagan 2018; Toro, Lloyd, et al. 2019), psychological (Baćak and Nowotny 2018; Linsley et al. 2007; A. A.

Sewell et al. 2016), and physical health outcomes (Boen 2020; McFarland, Taylor, McFarland, et al. 2018; Sewell 2017). Mass incarceration impacts many institutions in our society, including families (Wakefield, Lee, and Wildeman 2016). Our criminal justice system dissects family units, isolating parents from their children long before a trial occurs. After charges are levied and if one is convicted, repressive penalties are placed on individuals, affecting not only themselves, but also their families, disproportionately impacting the poor and people of color (Alexander 2010; Wakefield et al. 2016; Wakefield and Uggen 2010). A wealth of research explores the negative impacts of parental incarceration (Foster and Hagan 2017; Wakefield and Wildeman 2014), including the legal and social stigmas of incarceration on individuals and their families (Western and Wildeman 2009). However, these negative effects are not isolated to incarceration; research suggests that police stops, the most mundane form of contact with the criminal justice system, creates a second-class citizenship (Tyler et al. 2013; Young and Petersila 2016).

Police stops are the most common form of contact with the criminal justice system, having an important role in socialization. An estimated 31 million Americans are stopped by the police each year (Langton and Durose 2015). The widespread negative impacts of New York City's Stop and Frisk policies have been well-documented (Sewell and Jefferson 2016; A. A. Sewell et al. 2016), despite only 1% of these stops resulting in arrest (Shedd 2012). Following police stops, adolescents can experience greater levels of stigmatization and post-traumatic stress (Jackson et al. 2019). Despite well-documented evidence that Stop and Frisk is ineffective and has drastic racial disparities (Gelman, Fagan, and Kiss 2007; Kramer et al. 2017; Shedd 2012), many of the practices have proven resilient, taking new forms. There are still many proponents of Stop and Frisk and similar approaches; several notable politicians continue to tout Stop and Frisk as successful, despite the vast wealth of evidence to the contrary. Policing

practices have consistent patterns of racial disparities in likelihood of being stopped, invasiveness of stops, use of force, and severity of force (Kramer et al. 2017). People of color and the poor are continually shown to disproportionately bear the burden of invasive policing tactics (Gilman et al. 2018; Owusu-Bempah 2017; Pettit and Gutierrez 2018; Shedd 2012), making it an important factor in socialization of people of color and the poor.

Black adolescents in particular are the most likely to experience invasive police contact (Kramer et al. 2017). Police contact is associated with worse mental and physical health outcomes, thus making it a potential contributor to racial health disparities (McLeod et al. 2020; Sewell 2017; A. A. Sewell et al. 2016). That adolescents are overwhelmingly targeted is particularly important because adolescence is a key period of social development (Schneider 2016). Adolescence is a period of identity formation which disproportionately impacts health through the life course (Halfon and Hochstein 2002; Harris et al. 2009; Simons et al. 2019). The disproportionate likelihood of exposure during adolescence and the key developmental role of adolescence makes it a particularly important life stage to examine. Social connections in particular are vital during this developmental period (Schneider 2016), with the family being a particularly source of social connections (Shor, Roelfs, and Yogev 2013). Therefore, adolescence is a vital life stage to consider when examining the social ramifications of police encounters and how they contribute to racial health disparities.

Contagious Stress

Social connections are a vital buffer against deleterious physical and mental health outcomes, contributing to better health across the life course (Thoits 1982, 2010, 2011). Both perceived and actual support received are vital protectors of health (Berkman L 1995; Holt-

Lunstad, Smith, and Layton 2010; Thoits 2011), contributing to better outcomes across a diverse number of disease profiles. Research suggests social support can buffer the negative effects of chronic stress on physical and mental health (Cassel 1976; Thoits 1995, 2011; Uchino 2006), these relationships aiding individuals in dealing with adversity (Feeney and Collins 2015), and preventing negative health behaviors (Hawkey, Thisted, and Cacioppo 2009). Moreover, social support is related to more positive “biological profiles” across a number of immune and inflammatory responses (Uchino 2006). However, while social ties can be a vital source of this support, they can also serve as a source of stress, conflict, and strain (Rook 1990; Thoits 2011). The contagious nature of stressors is well-documented (Barr et al. 2018b; Pearlin, Aneshensel, and Leblanc 1997; Turney 2019), suggesting stressful events of a focal individual can spread via social connections.

Research applying the family stress model continually suggests that parental stress impacts child outcomes, and that this holds true across race and varying family structures (Conger et al. 2002; Conger and Conger 2002; R. D. Conger, Conger, and Martin 2010; Conger and Elder 1994; K. J. Conger, Rueter, and Conger 2010; Cui, Donnellan, and Conger 2007; Masarik and Conger 2017; Yoder and Hoyt 2005). The family stress model suggests the relationship between parental stressors and child development largely operates through shaping behaviors and mental states of the parents, which leads to worse child outcomes (Conger et al. 2002; Conger and Elder 1994). For example, the stresses associated with poverty may consume the parents’ emotional resources, resulting in distance from their children. The core of the family stress model is that the lack of resources, shapes child health. This lack of resources can be a lack of environmental, social, legal, or neighborhood resources (W. Sewell et al. 2016). Families are closely linked social units (Dornbusch 1989) in which stress and its negative effects may impact all members of the family unit.

Although research applying the family stress model typically focuses on the role of economic disadvantage (Conger et al. 2002; Conger and Elder 1994; K. J. Conger et al. 2010), recent theoretical arguments suggest family stress may be a key mechanism through which police hyper-surveillance contributes to racial health disparities (W. Sewell et al. 2016). The primary assertion of the family stress model is that the psychological impacts of societal stressors shape child outcomes. These stressors shape parenting tactics and parental stress, spilling over into child outcomes (Conger et al., 2010; Donnellan et al., 2013). The same logic could be applied to examine how the stigmas and stresses of policing may spread through a family. Previous research links criminal justice contact (typically in the form of incarceration) with deleterious health and developmental outcomes for family members (Turney 2014, 2017, 2019; Turney and Lanuza 2017; Western 2018). Parental incarceration has been linked with poorer mental health (Wakefield and Wildeman 2014), infant mortality (Wildeman 2012), homelessness (Wakefield and Wildeman 2014), unmet care needs of children (Foster and Hagan 2017), attention deficit disorder, developmental delays, and behavioral problems (Turney 2014), and worsening externalizing behaviors and cognitive skills (Turney 2017). In a similar vein, recent research suggests that adolescent police contact can shape parental health (Turney 2019). By impacting parental stress and health outcomes, police contact can shape outcomes of entire families, not just those directly exposed to contact. If contact with the criminal justice system shapes not just individuals but their entire families, it should be expected that police contact would be related with greater family stress. This would suggest:

H1.1: Parents whose adolescents experience greater amounts of *stigma* from police stops have greater levels of parental stress than adolescents with less or no *stigma* from police stops.

H1.1: Parents whose adolescents experience greater amounts of *stress* from police stops have greater levels of parental stress than adolescents with less or no *stress* from police stress.

In this paper, I aim to test how family stress may be a mechanism explaining some of the relationship between police stops and deleterious health outcomes. I specifically examine how parental stress explains the respective relationships between stop stigma and stop stress and four health outcomes. Family Stress approaches assert that stress experienced by parents shapes the parent-child relationship, and that this affects a wide variety of child outcomes (Conger et al. 2002; Conger and Elder 1994; K. J. Conger et al. 2010). If, as previous researchers have suggested, family stress is a mechanism by which police contact impacts health, we would expect:

H2.1: The relationship between stop *stigma* and health outcomes will be attenuated when adjusting for parental stress.

H2.2: The relationship between stop *stress* and health outcomes will be attenuated when adjusting for parental stress.

If both H1.1 and H2.2 are supported, this would suggest that family stress is a mechanism by which adolescent stigma from police stops shapes child outcomes. Likewise, if both H1.2 and H2.2 are supported by the data, this would suggest that family stress is a mechanism by which adolescent stress impacts child health.

Methods

Data

This research project used the Fragile Families and Child Wellbeing Study (FFCWS). Recruitment drew from mothers with children born in urban hospitals between 1998 and 2000. The majority of these children being born to unmarried parents, oversampling Black and Hispanic families. Each wave was collected via phone interviews. I use data from the focal

adolescent, their parents, and teachers during the following years of the child's life: birth (Wave 1, collected 1998-2000), year 3 (Wave 3, collected 2001-2003), year 9 (Wave 5, collected 2007-2010), and year 15 (Wave 6, collected 2014-2015). Since factors of the police contact and the outcomes are only measured at Wave 6, panel-based fixed effects models are impossible. Thus, all models are cross-sectional, limiting inferences of causality. To best reduce the impacts of this limitation, I use lagged dependent variables when possible. In later sections I go into more detail on when lagged dependent variables are used.

Most waves include interviews with the biological mother and father, and/or the child's primary caregiver, and waves 5 and 6 include an interview with the focal child. After removing respondents who are not present in all waves, about 8% of the cases had missing covariate data. I use impute missing cases using multiple imputation with five iterations, using STATA SE 14's imputation procedure.³ Missing values are imputed based on variables with no missingness⁴ using multivariate normal regression, which has been shown to be suitable even when the assumption of normality has been violated (Demirtas, Freels, and Yucel 2008; Lee and Carlin 2010).

Measures

Adolescent Health Outcomes

³ Analyses suggested that missingness on family stress would have changed the distribution of the variable, so casewise deletion would have resulted in biased estimates.

⁴ Variables used to impute missing values include parental depression, whether respondent's mother was born outside the United States, race, gender, age, parental education, parental intelligence, self-reported good health (Wave 5), and parental stress (Waves 5 & 6).

I measure relationships for four health outcomes: self-rated good health, self-rated sleep problems, anxiety, and depression. Each outcome is measured at Wave 6. Self-rated good health is measured using a 5-point Likert scale, measuring how respondents rated their own health, ranging from Excellent to Poor. Due to few individuals reporting the lower health rankings, I use a dichotomous measure, indicating whether or not the respondent had “Excellent” or “Very Good health”. From here on, this “Excellent” to “Very Good Health” category is referred to as “Good Health”, and the remaining categories are referred to as “Worse Health”. This same measure is present in Wave 5, allowing for the use of a lagged dependent variable. When predicting self-rated health, I use a lagged dependent variable coded in the same manner as the Wave 6 measure. Reporting having a sleep problem is measured as a self-rated dichotomous measure, indicating whether or not the respondent reported having sleep problems.

Anxiety is measured using 6 items from the Brief Symptom Inventory 18 (Derogatis and Savitz 2000). Items include having spells of terror or panic, feeling fearful, feeling nervous or shaky inside, feeling restless and can’t be still, getting suddenly scared for no reason, and feeling tense or keyed up. Each is measured on a Likert scale ranging from 0 (not at all) to 4 (extremely).

Depression is measured using items from the Center for Epidemiologic Studies Depression Scale (Radloff 1977). The five items used in this study are useful for cross-cultural comparisons (Perreira et al. 2005). These five items include the respondent not being able to shake the blues even with the help from family and friends, feeling sad, [not] feeling happy, feeling life is not worth it, and feeling depressed. Responses varied from 1 (strongly agree) to 4 (strongly disagree).

Distance from Primary and Secondary Caregivers, Stress, and Health Measurements

Adolescents' feelings of distance from caregivers is measured independently for the primary caregiver and secondary caregiver. The original items measured the adolescent's reported closeness to their parent, and the amount they talk and exchange ideas. These items are reverse coded to measure emotional distance. Parental stress of the primary caregiver is measured using the Parent Stress Inventory (Abidin 1988), a validated measure of parental stress. Items include how much the primary caregiver agrees with the following statements: "being a parent is harder than I thought it would be"; "I feel trapped by my responsibilities as a parent"; "taking care of children is more work than pleasure"; "I feel tired/worn out/exhausted from raising a family". Responses to each item range from 1 (strongly agree) to 4 (strongly disagree). The wave 6 measure had an alpha of 0.68, and the wave 5 measure had an alpha of 0.66, indicating good reliability.⁵

Parental anxiety and depression are also measured. Parental anxiety and depression are measured using items from the Composite International Diagnostic Interview- Short Form (CIDI-SF) (Kessler et al. 1998). Each of these are measured as dichotomous measures, indicating whether they fit the diagnostic criteria for anxiety or depression.

Stigma and Stress from Police Stops

Stigma and stress from police stops are each measured using independent scales created from items asking about adolescents' interaction(s) with police. Stigma from the stop is measured using 11 items, including Friends treat you with (less) respect since stopped; "People

⁵ Note that FFCWS also has items on how parents deal with conflict, but this scale had low reliability (alpha=0.57), so it was not used in these analyses.

have avoided you since you were stopped”; “People have used the incident to hurt your feelings since you were stopped”; “(you) avoid people because they might look down on you since being stopped”; “People are more uncomfortable around you since being stopped”; “(you) sometimes hide incident with police from your friends and family”; “Think it’s good to keep past incident with police secret”; “Would advise friend stopped by police to not tell others it”; “Wait until you know someone well to tell about incident with police”; and “Less likely to apply for job if employer knew about incident with police”. This resulted in a scale with an alpha of 0.79, indicating very good reliability.

Stress from the stop examines symptoms of PTSD following the stop. This scale is measured using nine items: “Other life events cause you to think about experience with the police”; “You think about having been stopped even when you do not mean to”; “You try not to think about this incident”; “Pictures of this incident sometimes pop into your mind”; “Remembering experience brings back feelings of being stopped (by the police)”; “Your feelings about this incident are kind of numb”; “You try to remove the time you were stopped from your memory”; “You try not to talk about the time you were stopped”; and “Reminders of the time you were stopped cause physical reactions”. The items in this scale result in an alpha of 0.75, indicating a high degree of reliability.

Controls

Additional controls include race, sex, age, household income, parental education, whether respondent’s family receives public aid, poverty percentage, whether either parent is born outside the United States, neighborhood efficacy, primary and secondary caregiver intelligence, and child impulsiveness rated by the primary caregiver. Race is measured using a

series of dichotomous measures indicating whether the respondent is Black, Hispanic, and other, with white being the reference category. Whether or not either parent is born outside the United States is measured using a dichotomous variable. Household income is measured as a continuous measure, based on the report of the respondent's primary caregiver. Parental education is measured using two dichotomous indicators, measuring whether or not either parent completed high school, and whether either parent completed college. Whether or not respondent's family received public aid is measured dichotomously, and poverty percentage is measured as the percentage of the family's income compared to the poverty line. Neighborhood efficacy is measured using Sampson's scale from the Project on Human Development in Chicago Neighborhoods: Community Involvement and Collective Efficacy (Sampson, Raudenbush, and Earls 1997). Parental intelligence is measured at Wave 3 using the Weschler Adult Intelligence Scale – Revised (Wechsler 1981). Primary caregiver-rated impulsiveness is the child's impulsiveness as rated by the primary caregiver, measured at Wave 3 using the Child Behavior Checklist (Achenbach 1992). The impulsivity measure is reported by the adolescent at wave 6 using an abbreviated version of Dickman's impulsivity scale (Dickman 1990). Delinquency is measured at wave 5 using a list of adolescent-reported delinquent behaviors, including graffiti, property damage, shoplifting, getting into a fight, stealing, and other similar items.

Statistical Analyses

I use different regression techniques based on the distribution of the dependent variable. When predicting dichotomous outcomes such as parental anxiety, parental depression, adolescent good health, and adolescent sleep problems, logistic regressions are used. Emotional distance from primary caregivers and adolescent anxiety are highly skewed, so negative binomial regressions are used. Due to a semi-normal distribution, emotional distance from their

secondary caregivers, parental stress, and depression are estimated using ordinary least squares regressions.

I first estimate the relationship between stop stress/stigma and the proposed mechanisms: parental stress, emotional distance from caregivers, parental anxiety, and parental depression. I then estimate the relationship between stress/stigma and the outcomes, testing whether the inclusion of the proposed mechanisms attenuates the relationship between stop stress/stigma and health outcomes. My argument that these my proposed mechanisms are indeed mechanisms will be supported if both: 1) stop stress/stigma predicts the proposed mechanisms; and 2) the proposed mechanisms attenuate the relationship between stop stress/stigma and health outcomes.

Results

Table 6 below shows the descriptive statistics of the variables included in the models. The average adolescent is 15.48 years old, ranging from 14 to 18. Nearly 60% of the sample received public aid, indicating this is a largely poor sample. This sample has a greater proportion of Black and Hispanic families than the overall U.S. population, with 48% and 23% of Black and Hispanic respondents respectively. Less than 20% of the sample are white. Overall, this is a relatively healthy sample, with 71% reporting good health, but almost one fourth reported having sleep problems. Children reported being much closer to their primary caregiver (typically their mother) than their secondary caregivers (usually their fathers). Police contact is common among the adolescents in this sample; over 1/4th of the sample reported police contact.

Figure 6 below depicts the difference in the stigma and stress reported by Black, Latinx, and white respondents who are stopped by the police. Each distribution suggests whites overall

experienced less stigma and stress from police stops compared to Black and Latinx respondents. Nearly 50% of white adolescents who are stopped experienced very little to no stigma from their stop, while Black and Hispanic adolescents are much less likely to experience such low stigma. Likewise, white adolescents are much less likely to report the highest levels of stigma, especially compared to Black adolescents. When reporting stress experienced from stops, Black adolescents had approximately a normal distribution, while whites are more skewed to the right, being much less likely to report the highest levels of stress. The distribution among Hispanic adolescents who are stopped is more normally distributed than among whites, but more skewed, similar to among Black adolescents. Overall, Black adolescents experienced the most stressful and stigmatizing encounters with the police, and Hispanic adolescents experienced more stigmatizing and stressful police encounters than white adolescents. This is particularly important because, as this paper will explore below, the stress and stigma resulting from police encounters are associated with worse health outcomes. Therefore, unequal exposure to stigma and stress may contribute to health disparities.

Table 6. Fragile Families Sample Characteristics (n=2,796)

Variable	Mean	Std. Dev.	Min	Max
<i>Police Stop Scales</i>				
Stress from Police Stop	.109	.23	0	1
Stigma from Police Stop	.067	.156	0	1
<i>Parental Stress & Health</i>				
Distance from PCG	1.815	1.838	0	6
Distance from SCG	3.366	2.326	0	6
Parental Stress	1.049	.692	0	3
Parental Anxiety Diagnosis*	.054	.226	0	1
Parental Depression Diagnosis*	.25	.433	0	1
<i>Adolescent Health Outcomes</i>				
Excellent/Very Good Health*	.713	.453	0	1
Sleep Problems*	.245	.43	0	1
Adolescent Anxiety	1.804	.653	1	4
Adolescent Depression	10.144	2.323	5	20
<i>Demographics</i>				
Black*	.48	.5	0	1
Hispanic*	.231	.422	0	1
Other*	.093	.29	0	1
Parent Foreign-Born*	.158	.365	0	1
Male*	.504	.5	0	1
Adolescent's Age	15.48	.686	14	18
Household Income	60085.293	60634.693	0	600000
High School Education*	.844	.363	0	1
College Education*	.257	.437	0	1
Receives Public Aid*	.584	.493	0	1
Poverty Percentage	3.221	1.37	1	5
Neighborhood Efficacy	1.852	.678	1	4
<i>Individual Factors</i>				
PCG Intelligence	6.829	2.647	0	14
SCG Intelligence	5.515	3.487	0	15
PCG-Rated Impulsiveness	2.985	.608	1	4

* Indicates a dichotomous variable, mean is equal to the percentage of the sample in this category.

Police Stops and Parental Stress

Table 7 below displays the findings regarding how the stigma and stress from police stops impact parental outcomes, including parental stress, emotional distance from caregivers, and parental anxiety and depression. Note that parental stress and parental anxiety use lagged dependent variables from Waves 5 and 3 respectively. The Wave 3 parental anxiety measure is used as the lagged dependent variable because there is no suitable measure in Wave 5. Table 7 shows only the fully adjusted models; fully adjusted models adjust for race, nation of birth, sex, age, income, education, whether their family receives public aid, poverty percentage, neighborhood efficacy, parental intelligence, maternal impulsiveness, adolescent delinquency, adolescent impulsiveness, and for parental stress and parental anxiety, a lagged dependent variable. Parental depression and emotional distance from caregivers do not include lagged dependent variables because a suitable measurement at a prior wave is not available.

Overall, stress and stigma shared largely similar patterns. Stigma and stress from police stops are both associated with greater levels of parental stress and distance from primary and secondary caregivers, providing support for hypotheses 1.1 and 1.2. Stop stigma also consistently had associations of greater magnitude, but also with greater variability as indicated by a larger standard error. See Table 7 below for more details. However, stop stigma and stop stress differed in their associations with parental health. Stop stigma is associated with a 143% increased likelihood of a parent being diagnosed

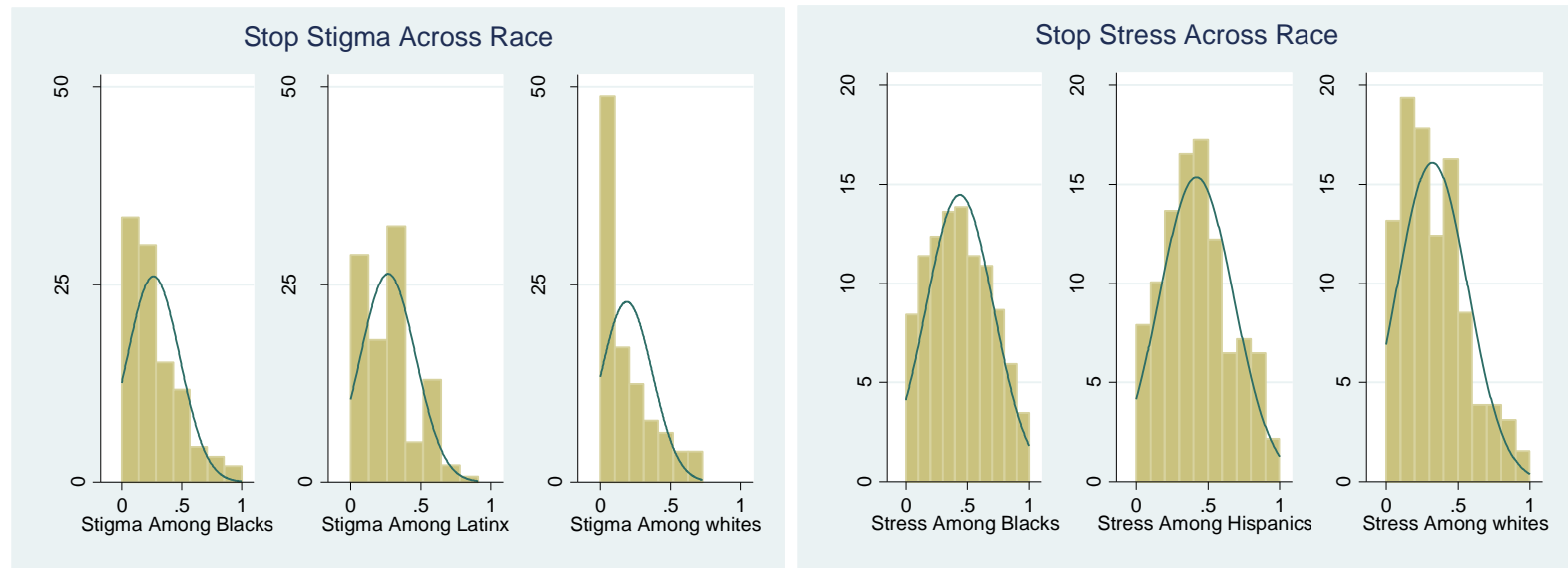


Figure 6. Stop Stigma and Stress Across Race

with anxiety, while stop stress is not associated with an increased likelihood of parental anxiety.

Police Stops, Health, and Mediation by Parental Stress

Table 8 below shows the relationships between stop stigma and stop stress and four health outcomes. When estimating sleep problems, anxiety, and depression, Model 4 is the fully adjusted model except for measures of family stress, and Model 5 adds these measures. When estimating the outcomes for self-rated good health, Model 5 is the fully adjusted model including a lagged dependent variable, and Model 6 adds the measures of family stress. The stigma and stress from police stops are both

Table 7. Stigma and Stress from Police Stops and Parental Outcomes

	Parental Stress	Distance from PCG	Distance from SCG	Parental Anxiety	Parental Depression
Stop Stigma	0.32*** (0.08)	0.42*** (0.08)	0.54* (0.27)	2.43* (0.98)	1.49 (0.41)
Stop Stress	0.24*** (0.06)	0.35*** (0.05)	0.45* (0.19)	1.72 (0.48)	1.25 (0.24)

* p<0.05; ** p<0.01; *** p<0.001; Standard Errors displayed in parentheses; PCG refers to Primary Caregiver; SCG refers to Secondary Caregiver; Table omits control models and shows only main effects from stress and stigma models; Models adjust for race, sex, age, whether the respondent's mother was foreign-born, household income, parental education, whether their family receives public aid, the percentage of the neighborhood below the poverty line, neighborhood efficacy, parental intelligence, and mother-rated child impulsiveness; Results for parental stress and distance from SCG are presented in OLS coefficients; Results for distance from PCG are presented as negative binomial coefficients; Results for parental anxiety and parental depression are presented in odds ratios.

associated with each of our deleterious health outcomes: self-rated good health, self-rated sleep problems, anxiety, and depression.

As shown in Table 8 below, hypothesis 2.1 and 2.2 are supported; the relationship between stop stigma and stress and health is partially explained by measures of family stress. However, the family stress measures which served as mediators varied by outcome. For self-reported good health and adolescent anxiety, distance from primary and secondary caregivers appeared to be mediators. The data also suggest parental stress and distance from primary and secondary caregivers may serve

as mediators between stop stigma/stress and adolescent depression. Finally, parental stress and distance from secondary caregivers appear to partially mediate the relationship between stop stigma/stress and self-reported sleep problems. Note that although parental depression is associated with a decreased likelihood of self-reported good health and an increased likelihood of sleep problems, since it is not associated with stop stigma/stress in Table 7, the data suggest they are not mediating this relationship. Overall, hypotheses 2.1 and 2.2 are largely supported by these data.

When estimating self-rated health, in Model 5, respondents with high levels of stigma are 42% less likely to report having good health, but this association became nonsignificant when adjusting for family stress. Prior to adjusting for family stress, high levels of stress from police stops is associated with being 48% less likely to report having good health. In Model 6, when family stress is adjusted for, high levels of stress is associated with being 39% less likely to report having good health. In both of these cases, the mechanisms which drove this change appear to be distance from primary and secondary caregivers. In both the stop stigma and stop stress models, a unit increase of distance from primary caregivers is associated with being 10% less likely to report having good health, and secondary caregivers is associated with being 8% less likely to report good health per unit increase in this scale. In both cases, parental depression is associated with the adolescent being 19% less likely to report good health, but since stop stress and stigma are not associated with parental depression, this is not a case of mediation.

When estimating the relationship of stop stress/stigma with anxiety and depression, similar patterns occurred. High levels of stop stigma is associated with a 0.33 unit increase in the anxiety scale in Model 4, but this decreased to 0.29 when introducing

Table 8. Health Outcomes of Stigma from Police Stops and Parental Factors

	Good Health		Sleep Problems		Anxiety		Depression	
	M5	M6	M4	M5	M4	M5	M4	M5
Stigma from Police Stop	0.58*	0.70	3.09***	2.66***	0.33***	0.29***	2.20***	1.90***
	(0.16)	(0.19)	(0.83)	(0.73)	(0.09)	(0.09)	(0.28)	(0.28)
Distance from PCG		0.90***		1.01		0.02***		0.14***
		(0.02)		(0.03)		(0.01)		(0.02)
Distance from SCG		0.92***		1.05*		0.01*		0.09***
		(0.02)		(0.02)		(0.01)		(0.02)
Parental Stress		1.01		1.33***		0.04		0.32***
		(0.07)		(0.09)		(0.02)		(0.07)
Parental Anxiety		1.05		1.30		0.02		-0.21
		(0.20)		(0.25)		(0.06)		(0.20)
Parental Depression		0.81*		1.42***		0.01		-0.03
		(0.08)		(0.14)		(0.03)		(0.10)
	Good Health		Sleep Problems		Anxiety		Depression	
	M5	M6	M4	M5	M4	M5	M4	M5
Stress from Police Stop	0.52***	0.61**	1.82**	1.61*	0.24***	0.21***	1.41***	1.17***
	(0.10)	(0.11)	(0.34)	(0.31)	(0.06)	(0.06)	(0.19)	(0.19)
Distance from PCG		0.90***		1.02		0.02*		0.13***

	(0.02)	(0.03)	(0.01)	(0.02)
Distance from SCG	0.92***	1.05*	0.01*	0.09***
	(0.02)	(0.02)	(0.01)	(0.02)
Parental Stress	1.02	1.33***	0.04	0.32***
	(0.07)	(0.09)	(0.02)	(0.07)
Parental Anxiety	1.07	1.30	0.02	-0.21
	(0.21)	(0.25)	(0.06)	(0.20)
Parental Depression	0.81*	1.42***	0.01	-0.02
	(0.08)	(0.14)	(0.03)	(0.10)

* p<0.05; ** p<0.01; *** p<0.001; Standard errors are displayed in parentheses; When predicting Good Health and Sleep Problems, coefficients are reported in Odds Ratios. For Good Health, Model 5 is identical to Model 4 for each of the other variables, but includes a lagged dependent variable. The subsequent Model 5 (Model 6 for Good Health) introduces Family Stress measures; Models adjust for race, sex, age, whether the respondent's mother was foreign-born, household income, parental education, whether their family receives public aid, the percentage of the neighborhood below the poverty line, neighborhood efficacy, parental intelligence, and mother-rated child impulsiveness.

the family stress measures. Both distance from primary caregivers (0.02) and distance from secondary caregivers (0.01) are associated with adolescent anxiety and appear to explain some of the relationship between stop stigma and adolescent anxiety. Similarly, prior to the inclusion of the family stress measures, high levels of stop stress is associated with a 0.24 unit increase of adolescent anxiety, which decreased to a 0.21 unit increase when introducing family stress measures. Again, this relationship is largely driven by distance from primary caregivers (0.02) and secondary caregivers (0.01). High levels of stop stigma is associated with a 2.20 unit increase in

the depression scale, which decreased to 1.90 when introducing family stress measures.

However, in addition to the distance from primary caregivers (0.14) and secondary caregivers (0.09), parental stress (0.32) is also associated with adolescent depression, suggesting each of these serve as mediators. Likewise, high levels of stop stress is associated with increased adolescent depression (1.41), which decreased when including family stress measures (1.17). Similarly, distance from primary caregivers (0.13) and secondary caregivers (0.09) and parental stress (0.32) are associated with depression and explained the change in the association between stop stress and adolescent depression. Overall, this supports the proposition that distance from primary and secondary caregivers are mediators between stop stigma/stress and adolescent anxiety, while distance from caregivers and parental stress mediate the relationship between stop stigma/stress and adolescent depression.

When estimating the relationship between stop stigma/stress and sleep problems, data suggest that parental stress and distance from secondary caregivers may be important mediators. In Model 4, high levels of stop stress is associated with a 209% increased likelihood of reporting a sleep problem, this lowering to 166% increased likelihood when adjusting for family stress measures. Parental stress is associated with a 33% increased likelihood, while distance from secondary caregivers is associated with a 5% increased likelihood. Similarly, in Model 4, stop stress is associated with an 82% increased likelihood of reporting sleep problems, which decreased to a 61% increased likelihood when including family stress measures in Model 5. Again, family stress (33%) and distance from secondary caregivers (5%) are both associated with increased likelihood of reporting sleep problems. In both cases, parental depression is associated with a 42% increased likelihood of sleep problems, but since stop stigma and stress are not associated with parental depression, data do not support it as a mediator.

Variation by Race and Gender

Interaction terms were used to explore how these relationships may be moderated by race and gender. Overall, relatively little of the outcomes varied by race or gender, with two exceptions. First, Black children did not experience a higher likelihood of sleep problems due to stop stigma, while white children did. Note that this is an outlier among the pattern, and the association is only significant at the $p < 0.05$ level among white children. Second, when predicting distance from the primary caregiver, the effect is much larger among girls than boys. High levels of stop stigma is associated with an 0.82 increase of the PCG distance scale, while this association is only 0.20 among boys. Likewise, high levels of stop stress is associated with an 0.58 increase in the PCG distance scale, while this association is 0.19 among boys. Thus, evidence suggests that the association between stop stress/stigma and distance from primary caregivers is larger among girls than boys. When considering the role of stigma and stress in the maintenance of racial health disparities, it is not necessary that Black children experience a larger effect than white children. Rather, results suggest that it is differential exposure by race which contributes to health disparities, not unequal effects. In other words, stop stigma and stress impact racial health disparity because Black and Brown children experience more stigmatizing and stressful stops than white children.

Discussion

This research is in line with previous work which has shown the widespread negative impacts of current approaches to policing (Boen 2020; Lee et al. 2014; Pettit and Western 2004; Schnittker and John 2007; Wildeman and Wang 2017). Previous research theorized that family stress may be a mechanism connecting discriminatory policing and racial health disparities (W. Sewell et al. 2016), and this study provides new empirical evidence this, with adolescent stress

from stops contributing to an increase in parental stress and emotional distance from their primary caregiver. The data also suggest that stigma and stress from police stops are associated with worse adolescent health outcomes. This is particularly important because adolescence is a key period of social development, having a disproportionate impact on health through the life course (Halfon and Hochstein 2002; Harris et al. 2009; Simons et al. 2019). Thus, the socialization effects of police contact during adolescence may have particularly salient effects on health through the life course and may contribute to racial health disparities later in life.

Although the relationships among these variables for the most part did not vary by race or gender, results still support that stigma and stress from police encounters contribute to racial health via unequal exposure. The data comport with previous research, that Black and Hispanic adolescents experienced more stressful and stigmatizing encounters with the police (Alang et al. 2017; A. A. Sewell et al. 2016). This project did not find any evidence of stigma or stress impacting Black or Hispanic adolescents differently than whites, but unequal exposure is what drives racial health disparities. There is some evidence, however, that the relationship between stop stigma/stress and emotional distance from caregivers is stronger among girls than boys.

Stress and stigma resulting from adolescent police encounters with the police are associated with higher levels of parental stress and distance from primary and secondary caregivers, supporting Hypothesis 1.1 and 1.2. Parental incarceration has been linked with less parental involvement in their children's education (Anna R Haskins and Jacobsen 2017), and indeed much of the literature focuses on how parental contact with the criminal justice system impacts children, but this paper extends this to provide evidence that adolescent police contact may be related to changes in the family unit. Stress is contagious (Barr et al. 2018b; Pearlin et al. 1997; Turney 2019), and this provides additional evidence that the stigma and stresses of police encounters may influence family relationships. This is important because it provides evidence

that police stops may influence not only the 31 million Americans stopped by the police each year (Langton and Durose 2015), but their families as well, further proliferating the negative effects of our current policing tactics.

Family stress explains some of the relationship between stigma and stress and adolescent health outcomes. Although most previous research focuses on how poverty impacts child health via family stress (Conger et al. 2002; Conger and Elder 1994), this study empirically extends sources of family stress to include stigmatizing and stressful encounters with the police. Regardless of race, adolescents with stigmatizing and stressful police encounters experienced greater distance from their caregivers, and their parents experienced higher levels of stress. Moreover, family stress explained some of the relationship between stop stigma/stress and health outcomes, suggesting family stress may be a mechanism by which stigmatizing and stressful police encounters impact health.

This study also has several limitations. First, the cross-sectional design makes evaluations of causal claims impossible. Although lagged dependent variables are used for some of the outcomes, this does not provide as strong evidence as a fixed effects model. When the next wave of these data are released, future researchers can estimate models which better approximate causality. Second, this paper focuses on how child exposure to police is associated with the parent-child relationship but does not observe how parental exposure to police may explain this relationship. A paper which simultaneously estimates both can gain much more detailed information on how police contact is related to family stress. Finally, future research should identify more granular measurements of family stress. This paper conceptualizes parental stress largely as aggravation and has measurements for emotional distance from primary and secondary caregivers, but there could be much more granular and specific measurements for how the family dynamic can be influenced by outside stressors. Finally, this

paper used a normative definition of family shaped around the nuclear family. However, close friends and other non-normative family members may also be vectors by which the negative effects of stress are spread, as well as vital sources of social support.

Conclusion

Current police tactics are a public health risk which impact not only the individual who encounter the police, but their families as well. Results suggest stigma and stress from police stops contributed to increased family stress and negative health outcomes. Family stress appears to be among the mechanisms explaining some of the relationship between stress and stigma from police stops and anxiety and sleep problems, though more mechanisms are needed to fully understand how current policing tactics contribute to racial health disparities.

**CHAPTER 5: ASSOCIATIONS BETWEEN CRIMINAL JUSTICE-BASED POLICE/COURT
DISCRIMINATION, BIOLOGICAL AGING, DISEASE ACTIVITY, AND PSYCHOLOGICAL DISTRESS:
THE BLACK WOMEN’S EXPERIENCES LIVING WITH LUPUS (BEWELL) STUDY**

Background

Chronic stress contributes to racial/ethnic inequities in morbidity and mortality. In addition to heightened general stress, qualitatively unique racism-related stressors, including experiences of racial discrimination, are considered to be key drivers of these health inequities (Clark et al. 1999; Phelan and Link 2015; Williams and Collins 2001; Williams and Mohammed 2013). Among the societal domains in which racism operates, those occurring in criminal justice contexts, such as in policing and the court system, are among the most well-described and unjust. Over-policing and use of force are particular concerns in Black communities (Crutchfield et al. 2012; Kramer et al. 2017; Warren et al. 2006), which been found to lead to disenfranchisement as well as worse health outcomes, (Kirk and Wakefield 2018; Pettit and Gutierrez 2018; Sewell 2017; Wildeman 2012). Discriminatory policing practices, such as stop-and-frisk and heightened surveillance of Black communities, may impact health via stress-mediated pathways (Sewell 2017). However, relatively little research has examined racial discrimination in policing explicitly in relation to biomarkers that have been found to reflect the embodiment of stress.

People’s experiences with the police impact mental health, including depression (Baćak and Nowotny 2018; Toro, Lloyd, et al. 2019), psychological distress (A. A. Sewell et al. 2016), and anxiety (Geller et al. 2014, 2017), as well as physical health outcomes such as high blood pressure, obesity, asthma, and general health (Sewell and Jefferson 2016), and suicide (Linsley et al. 2007). Criminal justice practices are a form of structural violence, and a part of a larger

regime of racial oppression intentionally designed to subvert and dehumanize Black Americans (Khenti 2014; Owusu-Bempah 2017; Sabo et al. 2014). Racism contributes to racial health inequities through overt as well as subtle channels (Phelan and Link 2015; Williams and Collins 2001). One mechanism believed to link racist policing practices and health is chronic elevated physiologic and psychological stress, resulting from heightened vigilance.

Systemic racism in the criminal justice system manifests in over policing, increased surveillance, and use of force in Black communities (Crutchfield et al. 2012; Kramer et al. 2017; Pierson et al. 2020; Warren et al. 2006). Pervasive police presence is not a service, but rather hinders success (Young and Petersila 2016), creates “climates of fear” (Shedd 2012), “communities of exile” (Stuart 2017), and increases feelings of threat (Billies 2015). Members of highly surveilled communities report feeling second-class citizenship, isolation, and lack of access to legal protection (Brayne 2014; Goffman 2014; Stuart 2017; Wacquant 2001; Young and Petersila 2016). Policing is an important component of the social environment and contributes to chronic stress and subsequent health inequities.

Contact with the criminal justice system has far-reaching negative consequences which disproportionate harm Black and Brown communities. Racial disparities exist in police contact (Kramer and Remster 2018; Kramer et al. 2017; Warren et al. 2006), decision to charge and plea bargains (Davis 2007), and harshness of sentencing (Yang 2015). In addition to the formal sentences of prison time, collateral consequences undermine individual’s connections to society (Kirk and Wakefield 2018). Invisible sentences include lower likelihood of employment (Apel and Sweeten 2010; Western and Pettit 2005), increased likelihood of homelessness and housing insecurity (Cain 2003; Harding, Morenoff, and Herbert 2013; Herbert, Morenoff, and Harding 2015), losing the ability to vote (Demleitner 2000), and are temporarily or permanently barred from certain forms of employment (Finzen 2005). These collateral consequences contribute to

and serve as additional ways the criminal justice system exerts its power to enforce racial stratification in the United States. Notably, even police contact has collateral consequences.

The negative impact of racist policing extends beyond the immediate target, to others connected to them, including families (Turney 2019) and communities (Legewie 2019; Sewell 2017; Sewell and Jefferson 2016; A. A. Sewell et al. 2016). Police exposure contributes to escalating deviance (Toro, Lloyd, et al. 2019; Wiley and Esbensen 2016) and worse educational performance for Black youth (Legewie and Fagan 2018). Discrimination by the police is a highly distressing event and can undermine feelings of citizenship. Although evidence suggests community-level police surveillance may affect men more than women (A. A. Sewell et al. 2016), other research suggests that women may experience worse mental health following police contact (A. A. Sewell et al. 2016; Toro, Thomas, et al. 2019; Turney 2019). The majority of research examining biological consequences of policing have focused on men (McFarland, Taylor, McFarland, et al. 2018). There is a paucity of research examining Black women's experiences of discrimination in criminal justice contexts in relation to biomarkers susceptible to stress.

Telomere Length

Telomere length is an indicator of cell aging, and has been linked to multiple disease outcomes (López-Otín et al. 2013; Révész et al. 2016). Telomeres are nucleoproteins which cap and protect the ends of human chromosomes; they shorten over time through the natural process of cell replication, but can undergo accelerated shortening in the presence of biological conditions such as chronic inflammation and oxidative stress (Blackburn 1991, 2005; Cawthon et al. 2003; Houben et al. 2008). Critically short telomeres result in protein misfolding, endoplasmic

reticulum stress, and other malfunctions associated with chromosomal instability, including cell death (Armanios and Blackburn 2012; Cawthon et al. 2003; Raynaud et al. 2008), and has been linked to several aging diseases (Armanios and Blackburn 2012; Benetos et al. 2013; Cawthon et al. 2003), including cardiovascular diseases (Epel et al. 2006; Fitzpatrick et al. 2006; Haycock et al. 2014), chronic inflammatory diseases (Houben et al. 2008), and a higher general risk of mortality (Cawthon et al. 2003; Fitzpatrick et al. 2011; Needham et al. 2015).

Research suggests that the social context can influence telomere attrition. Shortened telomeres have been connected with chronic stressors such as experiences of discrimination (Chae et al. 2014), poverty (Chae et al. 2014; Geronimus et al. 2015; Zhu et al. 2011), social disadvantage (Mitchell et al. 2014), adverse childhood experiences (Chen et al. 2014; Küffer et al. 2016), anxiety (Shalev et al. 2014), neighborhood disorder (Massey et al. 2018; Theall et al. 2013), post-traumatic stress (Küffer et al. 2016), and perceived life stress (Epel et al. 2004). Research suggests that Black and Hispanic adults in America have a faster rate of telomere shortening than their white counterparts, likely driven by experiences of racism (Diez Roux et al. 2009).

Despite increasing evidence that chronic stress is a key mechanism linking aggressive policing to health, little research has examined evidence of this relationship at the cellular level. Epigenomic research suggests that certain social determinants of health can get “under the skin” (Cole 2013; Hertzman and Boyce 2010). Contact with the criminal justice system has been linked with increased levels of C-reactive protein (Boen 2020), and unfair treatment by police is associated with shorter telomeres among men (McFarland, Taylor, McFarland, et al. 2018). However, the small extant literature on police discrimination and biological aging has focused exclusively on men (McFarland, Taylor, Hill, et al. 2018), and nothing is known about if and how police discrimination contributes to accelerated cell aging among Black women. This relationship

may be particularly important to examine in light of research suggested more severe consequences of police contact for women compared to men (Turney 2020).

Systemic Lupus Erythematosus

Research on systemic lupus erythematosus (SLE) suggests the same biological processes, including telomere attrition, occur in the general population and those with SLE, but that the timing is accelerated among those with SLE (Honda et al. 2001; van den Hoogen et al. 2015; Montoya-Ortiz 2013). SLE is an autoimmune disorder characterized by chronic inflammation, increased oxidative stress, and tissue damage (Karlson et al. 2003; Perl 2013). SLE disproportionately impacts Black women (Lim et al. 2014). In addition, among patients with SLE, Black women have higher mortality rates, dying on average 13 years earlier than white women (Lim et al. 2019), and are more likely to be diagnosed earlier in life (Somers et al. 2014). Racial discrimination may be an important driver of this racial disparity. Research suggests that various facets of racism contribute to worse SLE outcomes (Chae et al. 2015), including greater disease activity (Chae et al. 2019; Martz et al. 2019a) and irreversible organ damage (Chae et al. 2019).

Several notable features of SLE make it an important disease in which to study the impact of racism on health. SLE is an understudied disease characterized by major racial inequities in prevalence and progression. For this reason, research on the causes of health inequities experienced by Black women with SLE is imperative. Additionally, SLE severity is susceptible to stress, which studies consistently find engages inflammatory pathways and is the main mechanism in most accounts of racial health inequalities. Accordingly, the potential health impact of psychosocial stressors, such as discrimination, may be amplified or manifest in a shorter time frame in the context of this disease (Honda et al. 2001; van den Hoogen et al. 2015;

Montoya-Ortiz 2013). Thus, SLE offers a unique opportunity to examine biosocial pathways through which racism contributes to racial inequities in health. Although, there are multiple pathways through which racism enters the experiences of African Americans (and other groups) we focus on racialized contact with the criminal justice system. Formally, we hypothesize that Black women with SLE who experience police/court discrimination have shorter telomeres (H1), more disease activity (H2), and greater psychological distress (H3) than those who do not experience police/court discrimination.

Methods

Data

These hypotheses were tested using data from the Black Women's Experiences Living with Lupus (BeWELL) study (Chae et al. 2019). Respondents were recruited from Georgians Organized Against Lupus (GOAL), which largely drew participants from the Georgia Lupus Registry (Drenkard et al. 2013). BeWELL includes a total of 438 adult Black Women with SLE who live in the Atlanta, Georgia metropolitan area. Respondent age ranged from 18-79. During the course of the study, 39 participants were lost to attrition including 19 who passed away. After excluding those lost to attrition, about 6% of the sample were dropped due to missingness at any wave, resulting in an analytic sample of 375. Data were collected in 5 waves, including 3 primary and 2 interim waves. The three primary waves were each measured approximately one year apart, and included all measures, including biomarker and survey responses. Interim waves were measured approximately half-way between waves 1 and 2, and waves 2 and 3 (6-months after the prior wave). Data collection for BeWELL was approved by the Institutional Review Board of Emory University. The current analyses were determined to be exempt from human subjects review by the University of Massachusetts Amherst Institutional Review Board.

Measures

Primary Dependent Variable: Leukocyte Telomere Length (LTL) was measured at each of the three primary waves, each about one year apart. LTL was collected via dried blood spots, and was measured as the relative telomere to single copy gene (T/S) ratio. Due to the relatively short time period of the study, we calculated the mean T/S ratio across the three waves and used this as our primary dependent variable of interest.

Secondary Dependent Variables: Psychological distress was measured at each of the primary waves using the six-item version of Kessler et al.'s (2002) non-specific psychological distress scale (K6). This scale was originally developed to be part of the US National Health Interview Survey (NHIS), and has been used extensively in health research (Ojeda and Bergstresser 2008; Operario, Adler, and Williams 2004; Read and Gorman 2006; A. A. Sewell et al. 2016), including in a national psychiatric epidemiology study of Black Americans (National Survey of American Life). Respondents were asked how much they felt the following ways during the past 30 days: Nervous; Hopeless; Restless or fidgety; so depressed that nothing could cheer you up; that everything was an effort; and worthless. Each response was measured on a Likert scale, ranging from 1 (all of the time) to 5 (none of the time). These values were reverse coded so that higher values indicated greater distress and combined into a single continuous scale.

Disease activity in the past three months was measured at each wave using the SLE Activity Questionnaire (SLAQ) (Karlson et al. 2003). The SLAQ is a validated, and frequently used patient-reported measure which includes 24 items related to disease activity. Items include fatigue, joint swelling, fever, and other symptoms of SLE (Karlson et al., 2003; Bachen et al.,

2009; Chae et al., 2019; Hersh et al., 2008; Hunter et al., 2020; Julian et al., 2009; Martz et al., 2019b; Nery et al., 2007). The measure is scored continuously, with greater scores reflecting greater disease activity.

Independent Variable: Police/court discrimination was our primary independent variable of interest. This item was taken from the Experiences of Discrimination measure (Krieger et al. 2005), which was administered at each of the five waves. Respondents were asked if they “experienced discrimination, been prevented from doing something, or been hassled or made to feel inferior due to their RACE, ETHNICITY, or COLOR”, followed by a number of places or situations where they may have experienced discrimination. We focused on the indicator which measured experiencing discrimination “from the police or courts.” The baseline wave asked how many times they had been discriminated against in their entire life; following waves asked about experiences of discrimination in the past 6 months. We transformed these variables into dichotomous measures, indicating whether or not they experienced any discrimination for police/courts within the recall period.

Control Variables: Models adjust for years since diagnosis, age, household income, , education, labor force status (part time vs. retired or unable to work, with full time as the reference category), marital status (married or marriage-like relationship vs. divorced, with single as the reference category), emotional support, instrumental support, and adverse childhood experiences. Education was measured using two dummy variables, indicating whether the respondent completed high school, and whether they completed college. Labor force status was also measured using dummy variables indicating whether the respondent was working part time or was unable to work, with working full time as the reference category. Emotional and Instrumental support are measured using the PROMIS social support scales (Hahn et al. 2014), which measured specific forms of social support.

Analytic Approach

Conditional quantile regression was used to examine associations between police/court discrimination and LTL. These models allow us to estimate nonlinear relationships between our independent and dependent variables. While OLS regressions are estimated using the mean value of the dependent variable, quantile regression defaults to the median. Separately estimating models using various specific percentiles of the dependent variable allows for exploration of how the association between police/court discrimination and telomere length may vary according to different levels of telomere length. We use the 10th, 25th, 50th, 75th, and 90th percentiles. These models are estimated using the telomere length value of each percentile after adjusting for all independent variables. Because of differences in how the police/court discrimination question was asked in Wave 1, LTL models include wave 2 and 3 measures as independent variables. To adjust for disease factors, Model 1 adjusts for age, organ damage, disease activity, and years since diagnosis. Model 2 added controls for socioeconomic status, measured as education, employment status, and household income. Next, we added controls for social support; Model 3 added marital status, and model 4 added emotional and instrumental support. Model 5 adjusted for adverse childhood experiences. Each of these models includes dichotomous measures of police/court discrimination at Waves 2 and 3.

In models that estimate associations between discrimination and psychological distress, a negative binomial regression was used because of a right skewed dependent variable distribution. The normal distribution of disease activity allows for the use of an OLS regression. When examining associations with the secondary dependent variables, we tested for associations at baseline, Wave 2, and Wave 3. The baseline (Wave 1) models used the measure indicating whether the respondent had ever experienced discrimination by the police or in the

courts, while following models measured for those experiences within the past 6 months prior to Wave 2 and Wave 3. The Wave 2 and 3 models use a lagged dependent variable, adjusting for the respective outcome at Wave 1. Model 1 included only police/court discrimination. Subsequent models adjusted for sociodemographic characteristics in block groups. Model 2 adjusted for age, organ damage, disease activity, and years since diagnosis. Model 3 adjusted for socioeconomic status, measured as education, employment status, and household income. To adjust for social support, Model 4 added marital status, and Model 5 added emotional and institutional support. Model 6 adjusted for adverse childhood experiences. Each of these models includes the dichotomous measure of discrimination for both Waves 2 and 3.

Results

Sample characteristics are shown in Table 9. Mean respondent age was 46.7, and the average years since diagnosis was 15.8 years. About 64% had only a high school education, and 29% completed college. About 12% were working part time, and 58% were retired or unable to work. The average household income was \$36,832.69, about 52% were married or in a marriage-like relationship, and 22% were divorced.

Table 9: BeWELL Sample Description (n=375)

	Mean	S.D.	Min	Max
<i>Dependent Variables</i>				
Mean LTL (W1-3)	1.39	0.27	0.83	2.66
Psychological Distress (W1)	12.03	5.43	6.00	30.00
Psychological Distress (W2)	12.47	5.79	6.00	30.00
Psychological Distress (W3)	11.65	5.44	6.00	30.00
Disease Activity (W1)	15.18	8.11	0.00	36.00
Disease Activity (W2)	13.92	7.81	0.00	41.00
Disease Activity (W3)	13.39	7.72	0.00	38.00
<i>Independent Variables</i>				

Police/Court Discrimination* (W1)	0.35	0.48	0.00	1.00
Police/Court Discrimination* (W2)	0.07	0.25	0.00	1.00
Police/Court Discrimination* (W3)	0.07	0.27	0.00	1.00
<i>Control Variables</i>				
Organ Damage (W1)	2.42	2.50	0.00	15.00
Organ Damage (W2)	2.78	2.59	0.00	17.00
Organ Damage (W3)	3.08	2.77	0.00	17.00
Age (W1)	46.72	12.03	20.95	80.17
Years Since Diagnosis (W1)	15.81	10.23	0.22	54.83
High School Educated* (W1)	0.93	0.26	0.00	1.00
College Educated* (W1)	0.29	0.45	0.00	1.00
Working Part Time* (W1)	0.12	0.33	9.00	1.00
Unable to Work* (W1)	0.58	0.49	9.00	1.00
Household Income (W1)	37,832.69	28,916.51	30,00.00	127,010.00
Married* (W1)	0.52	0.50	0.00	1.00
Divorced* (W1)	0.22	0.42	0.00	1.00
Emotional Support (W1)	52.21	0.29	25.80	62.00
Instrumental Support (W1)	53.45	9.59	29.40	63.30
Adverse Childhood Experiences	1.89	1.56	0.00	4.00

*Indicates a dichotomous variable, mean indicates % of population in the respective category
Results from conditional quantile regressions examining associations between

police/court discrimination and LTL are shown in Table 10. For many levels of LTL, we do not observe a statistically significant association. However, among those with average (50th percentile) LTL, greater police/court discrimination at Wave 2 was associated with the average LTL across Waves 1-3. This association was statistically significant across all of the models except the baseline model. Police/court discrimination was also associated with accelerated biological aging among those with longer than average (25th percentile) LTL, but this association was only significant when adjusting for ACEs in Model 5. Although there was a positive association between police/court discrimination and LTL among those with the longest telomeres (10th percentile), adjusting for SES caused this association to become non-significant. Thus, we observed a statistically significant association for those who, all else equal, had average telomere length. It is important to note that this finding was robust to an alternate specification of the mean LTL to include just waves 2 and 3 (omitting wave 1). However, combining Waves 2

and 3 responses of police/court discrimination into a single indicator did not reveal statistically significant associations.

Next, negative binomial regressions were used to examine the relationship between police/court discrimination and psychological distress. Across each of the models, police/court discrimination was associated with higher levels of psychological distress. For models measured at Wave 1, having experienced police/court discrimination was associated with increased psychological distress. When estimating associations with psychological distress in Waves 2 and 3, police/court discrimination at Wave 2 was associated with increased psychological distress. Wave 3 discrimination over the past 6 months was not associated with psychological distress, while discrimination at Wave 2 still was associated with more psychological distress. Overall, there was strong support that police/court discrimination was associated with higher levels of psychological distress.

Table 10: Associations Between Police/Court Discrimination and Mean Leukocyte Telomere Length (W1-3)

	Model 1		Model 2		Model 3	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<i>10th Percentile</i>						
Prior 6m discrimination (W2)	-0.10	(0.11)	-0.10	(0.09)	-0.10	(0.10)
Prior 6m discrimination (W3)	0.08*	(0.04)	0.05	(0.05)	0.05	(0.07)
<i>25th Percentile</i>						
Prior 6m discrimination (W2)	-0.06	(0.06)	-0.06	(0.08)	-0.07	(0.04)
Prior 6m discrimination (W3)	0.06	(0.05)	0.09	(0.08)	0.08	(0.07)
<i>50th Percentile</i>						
Prior 6m discrimination (W2)	-0.16	(0.09)	-0.18*	(0.07)	-0.17**	(0.07)
Prior 6m discrimination (W3)	0.05	(0.05)	0.04	(0.07)	0.06	(0.05)
<i>75th Percentile</i>						
Prior 6m discrimination (W2)	-0.06	(0.10)	-0.10	(0.07)	-0.08	(0.07)
Prior 6m discrimination (W3)	0.04	(0.07)	0.03	(0.07)	0.03	(0.06)
<i>90th Percentile</i>						
Prior 6m discrimination (W2)	0.06	(0.12)	-0.03	(0.10)	0.02	(0.13)
Prior 6m discrimination (W3)	-0.06	(0.09)	-0.03	(0.06)	-0.05	(0.06)

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; Model 1 adjusts for age, organ damage, disease activity, and years since diagnosis; Model 2 adds socioeconomic status; Model 3 adds marital status.

Results from OLS regression models examining the relationship between police/court discrimination and disease activity were less consistent than those for psychological distress. Across the baseline and W2 lagged dependent variable models, discrimination was strongly associated with disease activity. Across each of the baseline models, discrimination was associated with greater levels of disease activity. Even when adjusting for ACEs, there remained a statistically significant relationship. In the Wave 2 lagged DV model, there was a weaker association that became nonsignificant when controlling for ACEs (Model 6). However, when estimating disease activity at Wave 3, none of the associations were statistically significant.

Discussion

Modern criminal justice practices reflect structural racialized violence (Khenti 2014; Owusu-Bempah 2017; Sabo et al. 2014), and contribute to racial health inequities (Phelan and Link 2015; W. Sewell et al. 2016; A. A. Sewell et al. 2016; Williams and Collins 2001). Aggressive and discriminatory policing has been linked with increased

Table 11: Primary Associations Between Police/Court Discrimination and Psychological Distress (a) and Disease Activity (b)

	Coef.	S.E.
(a) Psychological Distress		
<i>Baseline Models</i>		
Ever experienced P/C discrimination (W1)	0.12**	(0.04)
<i>W2 Lagged Dependent Variable</i>		
Prior 6m discrimination (W2)	0.14*	(0.06)
<i>W3 Lagged Dependent Variable</i>		
Prior 6m discrimination (W2)	0.14*	(0.06)
Prior 6m discrimination (W3)	0.01	(0.09)
(b) Disease Activity		
<i>Baseline Models</i>		
Ever experienced P/C discrimination (W1)	2.35***	(0.69)
<i>W2 Lagged Dependent Variable</i>		
Prior 6m discrimination (W2)	1.98*	(1.00)
<i>W3 Lagged Dependent Variable</i>		
Prior 6m discrimination (W2)	1.31	(1.01)
Prior 6m discrimination (W3)	-0.2	(0.91)

*p<0.05; **p<0.01; ***p<0.001; Model 1 includes only Police/Court Discrimination; Model 2 adjusts for age, organ damage, disease activity, and years since diagnosis; Model 3 adds socioeconomic status; Model 4 adds marital status; Model 5 adds emotional and instrumental support; Model 6 adds adverse childhood experiences.

psychosocial distress (A. A. Sewell et al. 2016), infant mortality (Legewie 2019), worse mental health (Geller et al. 2014), diabetes, obesity, poorer health in general (Sewell 2017), and more. This paper builds upon prior research by examining links between discrimination via contact with police and courts and its links with accelerated biological aging, psychological distress, and disease activity among among Black women with SLE.

We found some evidence that police/court discrimination is associated with shorter LTL among Black women who, all else equal, had average LTL. Our findings are consistent with prior research linking criminal justice contact and discrimination with biological indicators of health risk (Boen 2020; McFarland, Taylor, McFarland, et al. 2018). This research has focused on health associations among men (McFarland, Taylor, McFarland, et al. 2018) and young adults (Boen 2020). We expand this research to adult Black women managing a chronic disease. The present study identifies a novel relationship between a specific criminal justice-related source of discrimination and accelerated biological aging in this population. We found evidence of a nonlinear relationship, and in particular, significant associations among those with average or slightly longer than average LTL. Those with longer telomeres may have additional resources which buffer the negative influences of stress. At the same time, those with shorter telomeres may be experiencing a blunting effect, where additional stressors may have a reduced relationship with attrition. This has been observed in previous research (Balzan et al. 2018), when the cortisol response was found to be blunted among those in very highly stressful environments. Thus, among respondents with average or somewhat shorter than average telomeres, there may be the strongest association between stress and telomere attrition.

Hypothesis 2, that police/court discrimination would be associated with higher levels of psychological distress was strongly supported. Previous research has found evidence of PTSD (Geller et al., 2014), anxiety (Geller et al., 2017), social stigma (Jackson et al., 2019) among adult

men and children. Our findings on Black women with SLE echo these findings. In accordance with prior research, both baseline cross-sectional and lagged dependent variable models suggest that this form of discrimination contributes to increased psychological distress (Devolder et al. 2017). Notably, Sewell and colleagues (2016) had previously found that community-level police surveillance was associated with increased psychological distress among men but not women; we found evidence that at the individual-level, Black women's direct experiences of police/court discrimination is associated with psychological distress.

We found some support for our third hypothesis, that SLE disease activity would be related to police/court discrimination. SLE is an autoimmune disorder that has been found to be sensitive to psychosocial stress. Experiences of discrimination in criminal justice contexts may increase SLE activity via stress-mediated channels (Chae et al. 2019). When examining associations at baseline, prior lifetime police/court discrimination was significantly associated with disease activity. Likewise, when examining increase in disease activity over the first year of the study, police/court discrimination in the past 6 months was one of the most strongly associated independent variables, until adverse childhood experiences was introduced to the model. When examining SLE disease activity in the third wave the relationship was not significant. This difference between Waves 2 and 3 may be explained by the political climate between these two waves, Wave 2 having been collected closer to the contentious 2016 Presidential election; however, further exploration may provide additional insight. Moreover, the relationship between discrimination and SLE disease activity may be spurious, driven by the historical context. Overall, we find some evidence that police/court discrimination contributes to increased SLE activity. This is particularly important because it suggests that police and court discrimination may increase the severity of pre-existing chronic conditions. Stressors associated with the management of a chronic condition may be magnified by other general as well as

racism-related stressors, including those associated with contact with the criminal justice system. Future research could further explore how experiences of racism within criminal justice contexts shapes the experiences of those with chronic illness in different ways from the general population.

This study has several limitations. The independent variable of interest is a coarse measurement. The current measurement does not differentiate between those who were discriminated against by the police from those who were discriminated against in the courts. Additional information about encounters with the police may also be useful for a further exploration of how police/court discrimination impacts health. Data collection over a longer period of time could also allow for longitudinal methods which can better approximate causality, such as fixed effects approaches.

Conclusion

Discriminatory criminal justice practices are a health hazard, influencing the biological system of Black Americans. In this paper, we found evidence that discrimination by police and courts is associated with both psychological and biological health outcomes for Black women with SLE. Discrimination from police and courts was associated with accelerated biological aging, disease activity, and psychological distress. The criminal justice system continues to enforce racial stratification and health inequalities. It is vital that we recognize how systemic racism contributes to racial health inequalities. Eliminating racial discrimination and racial inequalities throughout the criminal justice system is vital to the goal of eliminating racial health inequalities.

CHAPTER 6: CONCLUSION

This dissertation shows how policing is related to health disparities. The relationship between police contact and poor health outcomes is well-documented (Baćak and Nowotny 2020; McFarland et al. 2019; Sewell and Jefferson 2016; A. A. Sewell et al. 2016), but relatively little is known about what drives this relationship. In this dissertation, I examined specific mechanisms connecting police contact and a variety of health outcomes. In Figure 1 I provided a brief overview of the relationships observed in this dissertation. Three socialization mechanisms were identified: System avoidance and social isolation were examined in Chapter 3, and family stress is explored in Chapter 4. In Chapter 5, I explored biological mechanisms, observing a relationship between police discrimination and telomere length, a measure of accelerated biological aging. This focus on mechanisms extends the existing literature by exploring why police contact is associated with various health outcomes. This focus on mechanisms also helps understand the role of police contact within the fundamental cause framework.

Policing as a Fundamental Cause

In Chapter 2, I argued that police contact is a fundamental cause of health disparities. As a fundamental cause, policing shapes health through numerous pathways. Chapters 3 and 4 examined socialization pathways, while Chapter 5 focused on a biological mechanism. Chapter 3 discussed two important pathways: System Avoidance and Social Isolation. In Chapter 4, I provided evidence for another socialization pathway: Family Stress. In Chapter 5, I found that police discrimination is associated with accelerated biological aging, psychological distress, and disease activity among Black women with Lupus. Together, these chapters satisfy the first requirement to be a fundamental cause, that they: work through multiple mechanisms to influence numerous health outcomes for a large group of people. Together, these empirical

chapters support Chapter 2's argument that policing is a fundamental cause of health disparities.

The specific mechanisms explored in Chapters 3 and 4 also satisfy the second requirement of a fundamental cause: influencing access to resources that are used to avoid disease risk factors or treat illness. In Chapter 3 I found that police contact is associated with system avoidance. System avoidance is the avoidance of information-gathering institutions, which include education, employment, and formal healthcare institutions (Brayne 2014). Most directly, the avoidance of healthcare institutions isolates a major resource to treat illness, but system avoidance also influences socioeconomic status, through limited educational and employment opportunities. Additionally, Chapters 3 and 4 suggest police contact is associated with the loss of multiple forms of support. This is particularly important because social support is a key health resource (Thoits 2010). In Chapter 3, police contact was associated with feelings of loneliness, is associated with a higher risk of mortality and worse health (Coyle and Dugan 2012; Holt-Lunstad et al. 2015; Segrin and Passalacqua 2010). In Chapter 4, I found that stigma and stress resulting from police stops were associated with greater family stress and less closeness to parents. Families are a key source of support, and the loss of this was associated with worse health outcomes. Overall, the findings satisfied the second requirement of a fundamental cause.

The third requirement of a fundamental cause is possibly the most difficult requirement to satisfy: the fundamental cause must impact health across time and place. With other fundamental causes this is easier to provide strong evidence for, but with limited data on police contact and health, testing this relationship is very difficult. Additionally, it must be noted that policing in the United States looks drastically different from policing in similar countries, making cross-cultural examinations difficult. However, the preceding chapters did provide evidence that

this requirement may be satisfied. Chapters 3, 4, and 5 each used different datasets, collected on three different samples across two decades. In Chapter 3, I used the National Longitudinal Study of Adolescent to Adult Health, a nationwide school-based sample. In this chapter, I primarily used data collected from 2001-2003, and 2008-2009, when respondents were young adults. In Chapter 4 I used data from the Fragile Families and Child Wellbeing Study, a study which primarily recruited children born to single mothers, primarily focusing on data collected from 2014-2015, when the focal respondents were adolescents. Finally, in Chapter 5 I used data from the Black Women's Experiences Living with Lupus (BeWELL) study (Chae et al. 2019). As the name suggests, these data were collected from adult Black women with Lupus. This dataset was collected in three waves from 2015-2018, and recruited solely from the Atlanta, Georgia metropolitan area. Each of these datasets focused on different samples and were collected across two decades, yet each of them supported that police contact was associated with worse health outcomes, providing support for the third requirement of a fundamental cause. However, it is unknown if there is support for this across other nations or how long lasting this relationship has been. Thus, these chapters provide some support for the third requirement, but future research should further explore whether the third requirement is supported by cross-cultural examination and if this relationship persists. Overall, results from this dissertation suggest that police contact may be a fundamental cause of health inequality.

Implications

If policing is a fundamental cause of health disparities, this influences the way we should try to address it. I did not focus on specific mechanisms in order to remedy these specific pathways. Rather, I examine specific mechanisms in order to situate police contact as a fundamental cause. The fundamental cause framework suggests that if we were to remove

specific mechanisms, new mechanisms would soon take their place. In other words, we cannot resolve health disparities by focusing on individual mechanisms, but rather by addressing the underlying social causes. In this case, the social marginalization and second-class citizenship created by policing is what must be addressed. Therefore, we must drastically reform policing if we wish to move toward health equity.

It is well-documented that policing creates a second-class citizenship (Epp et al. 2014; Goffman 2014; Shedd 2012; Stewart 2017; Wacquant 2001; Young and Petersila 2016). Much like socioeconomic status (Link and Phelan 1995), systemic racism (Phelan and Link 2015), segregation (Williams and Collins 2001) and stigma (Hatzenbuehler et al. 2013), policing shapes various health outcomes through numerous pathways. Instead of focusing our attention on the mechanisms, we must address the underlying cause. Therefore, we must end the policing system which creates a second-class citizenship. This is vital because even if we were to create a universal healthcare system, these benefits would be off limits to the many of the most vulnerable in our society.

Thus, to address this issue of health disparities, we must apply solutions put forth by legal scholars. To address the issue of health inequality, we must encourage full citizenship for all, especially those frequently under police surveillance (Young and Petersila 2016). As pointed out by existing literature (Brayne 2014; Goffman 2014), and Chapter 3 of this dissertation, current approaches to policing isolate individuals from key health resources. Some scholars have suggested information decoupling as a way to grant people under surveillance access to formal healthcare and employment systems (Young and Petersila 2016). This may be particularly useful

in reducing system avoidance, and reducing the second-class citizenship associated with police surveillance.⁶

Our current policing model is highly adversarial (Hough 2013), and focusing on improving procedural justice is an important step in ameliorating the second-class citizenship created by policing (Bradford, Murphy, and Jackson 2014). Having a transparent and fair justice system which is on procedural justice and has less of a focus on punishment could go a long way in relieving the health disparities caused by police. A change from an adversarial model of policing to one focused on procedural justice would incur no additional costs (Hough 2013), yet could ensure fuller citizenship to those who are currently over-surveilled.⁷ In our current political climate this move away from the “tough on crime” rhetoric may be seen as risky, but this approach could yield drastic results. This would help reduce the social marginalization identified in this dissertation, and reduce the social isolation and family stress experienced by people who experience frequent and aggressive police contact.

Many current reform approaches are focused on shallow changes which alone will not address the underlying issues of modern policing. Changing hiring patterns are a current reform which many precincts are enacting, but this must be paired with an organizational shift which dismantles the underlying racial regime. Research suggests that the socialization of officers requires “buying in” to police culture -and its accompanying racialized perspectives- in order to fit in (Johnson 2006). This racial regime must be addressed in conjunction with efforts to have a more representative police force. Additionally, while many call for enacting “community

⁶ For a fuller exploration of information decoupling, see Young & Petersila, 2016.

⁷ For a fuller explanation of the adversarial and procedural justice approaches to policing, see Hough, 2013.

policing”, research has linked some forms of these policies with greater levels of police violence (Preito-Hodge and Tomaskovic-Devey 2020).

As Wacquant’s (2000) peculiar institutions warn us, racism can easily take new forms. Small reforms frequently fail to address racial inequality because racism can take a new form. In many ways, this reflects Phelan and Link’s (1995) fundamental cause approach, where they argue that we must address the bedrock of disparities, not individual manifestations; because unless the fundamental cause is addressed, new mechanisms arise to maintain inequality. We must not simply create system which seem equal, but we must create a system in which everyone’s full citizenship is ensured.

Limitations

This dissertation has multiple theoretical and empirical limitations. Although I find strong evidence for the first two requirements of fundamental cause theory, the evidence for the third requirement is limited. I did find a pattern of policing being associated with worse health outcomes across each of the datasets, but each of these were collected within the United States, and were only in two different decades. To have a stronger argument for the third requirement, we would need to have evidence that this relationship exists in more contexts, and across more years. This limitation is largely caused by the lack of data; as more time passes, more data become available and this will be able to be explored further.

The claims for causality are also limited due to the available data. Fixed effects approaches were unsuitable for Chapters 3 and 4 because police contact is only available in one wave of these datasets. The new waves of Fragile Families data (used in Chapter 4) will become available a couple years after the writing of this dissertation and will allow for a better exploration of many of these questions using a superior fixed effects approach. Additionally,

while Chapters 3 and 4 were collected across the United States, data from Chapter 5 were collected on a specific sample: adult Black women with Lupus living in the Atlanta, Georgia metropolitan area. However, the specific sample was also a strength of this study, allowing for better knowledge regarding a highly marginalized group of people who do not receive enough attention in the literature. Each of the empirical chapters had individual limitations which I went into further detail in their respective chapters.

Conclusion

Policing is a public health risk. In its current form, policing contributes to racial health inequalities. In this dissertation, I have provided evidence that policing is a fundamental cause of health disparities, operating by creating a second-class citizenship. I identify specific social and biological mechanisms which explain some of the relationship between policing and health, including system avoidance, loneliness, family stress, accelerated biological aging, psychological distress, and increased Lupus disease activity. If we wish to ameliorate health disparities, we must confront the ways policing contributes to social marginalization.

APPENDIX

FULL MODEL TABLES

Appendix Table 1: Medical System Avoidance Wave 3 Full Models

	Model 1	Model 2	Model 3	Model 4
1 Stop	1.38** (0.14)	1.36** (0.13)	1.30** (0.13)	1.30* (0.14)
2-3 Stops	1.61*** (0.15)	1.45*** (0.15)	1.37** (0.14)	1.43** (0.17)
4+ Stops	2.24*** (0.27)	1.93*** (0.27)	1.81*** (0.27)	1.74*** (0.27)
Male		0.84** (0.05)	0.81*** (0.05)	0.94 (0.07)
Black		0.98 (0.08)	0.97 (0.08)	1.02 (0.10)
Hispanic		1.21 (0.15)	1.19 (0.15)	1.14 (0.15)
Asian		1.02 (0.15)	1.07 (0.17)	1.13 (0.21)
Other		1.29 (0.27)	1.36 (0.29)	1.68* (0.36)
Parental Education		0.98 (0.01)	1.00 (0.01)	1.02 (0.01)
Foreign Born		1.20 (0.14)	1.19 (0.15)	1.25 (0.19)
Age		1.03* (0.02)	1.03 (0.02)	1.03 (0.02)
Delinquency		2.22*** (0.33)	2.07*** (0.32)	2.19*** (0.37)
Health Insurance			0.43*** (0.03)	0.43*** (0.04)
Parental Education (missingness dummy)			1.14 (0.20)	1.30 (0.30)
System Avoidance (W1)				1.31*** (0.07)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 2: Social Isolation Wave 3 Full Models

	Model 1	Model 2	Model 3
1 Stop	0.86 (0.17)	0.90 (0.18)	0.93 (0.21)
2-3 Stops	0.63* (0.15)	0.66 (0.16)	0.67 (0.18)
4+ Stops	1.18 (0.29)	1.24 (0.31)	1.21 (0.36)
Male		1.69*** (0.19)	1.50** (0.20)
Black		1.38* (0.18)	1.37* (0.20)
Hispanic		1.50** (0.21)	1.44* (0.23)
Asian		0.77 (0.23)	0.78 (0.25)
Other		1.22 (0.48)	1.52 (0.63)
Foreign Born		1.25 (0.25)	1.19 (0.30)
Delinquency		0.36* (0.15)	0.29* (0.15)
Parental Education		0.90*** (0.02)	0.89*** (0.02)
Age		1.09** (0.03)	1.09* (0.04)
Health Insurance		0.99 (0.12)	1.04 (0.12)
Parental Education (missingness dummy)		1.79** (0.39)	2.45*** (0.64)
System Avoidance (W2)			1.00 (0.13)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 3: Police Stops and Self-Rated General Health

Good Health	Model 1	Model 2	Model 3	Model 4
1 Stop	0.00 (0.02)	-0.02 (0.02)	-0.01 (0.02)	0.00 (0.02)
2-3 Stops	-0.07* (0.03)	-0.09** (0.03)	-0.07* (0.03)	-0.06* (0.03)
4+ Stops	-0.07* (0.03)	-0.12** (0.03)	-0.06 (0.03)	0.05 (0.03)
Male		0.09*** (0.01)	0.08*** (0.01)	0.08*** (0.01)
Black		0.04** (0.01)	0.05** (0.01)	0.05** (0.01)
Hispanic		0.01 (0.02)	0.05* (0.02)	0.05** (0.02)
Asian		-0.08* (0.03)	-0.07* (0.03)	-0.07* (0.03)
Other		0.06 (0.05)	0.07 (0.04)	0.07 (0.04)
Foreign Born		0.05 (0.03)	0.05 (0.03)	0.01** 0.00
Age		0.00 0.00	0.00 0.00	0.01 0.00
Health Insurance			0.06*** (0.01)	0.04** (0.01)
Parental Education			0.01** (0.00)	0.01*** (0.01)
Parental Education (missingness dummy)			-0.06 (0.04)	-0.06 (0.04)
Good Health (W1)			0.21*** (0.01)	0.21*** (0.01)
Delinquency			-0.10** (0.04)	-0.08* (0.04)
Isolate (W3)				0.01 (0.03)
System Avoidance (W3)				-0.12*** (0.01)
Moderate Health	Model 1	Model 2	Model 3	Model 4
1 Stop	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
2-3 Stops	0.02 (0.03)	0.03 (0.03)	-0.03 (0.03)	0.03 (0.03)
4+ Stops	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
Male		-0.02 (0.01)	-0.02 (0.01)	-0.01 (0.01)
Black		-0.08*** (0.01)	-0.08*** (0.01)	-0.08*** (0.01)

Hispanic	-0.06**	-0.06**	-0.05**
	(0.02)	(0.02)	(0.02)
Asian	-0.01	-0.01	-0.01
	(0.03)	(0.03)	(0.03)
Other	-0.11*	-0.10*	-0.10*
	(0.05)	(0.05)	(0.05)
Foreign Born	0.00	-0.00	-0.01
	(0.03)	(0.03)	(0.03)
Age	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Health Insurance		0.01	0.01
		(0.01)	(0.02)
Parental Education		0.00	0.00
		(0.00)	(0.00)
Parental Education (missingness dummy)		0.01	-0.00
		(0.03)	(0.03)
Good Health (W1)		-0.01	-0.01
		(0.01)	(0.01)
Delinquency		-0.00	-0.00
		(0.03)	0.00
Isolate (W3)			-0.07***
			(0.02)
System Avoidance (W3)			0.00
			(0.01)

Poor Health	Model 1	Model 2	Model 3	Model 4
1 Stop	0.03	0.04*	0.03	0.02
	(0.02)	(0.02)	(0.02)	(0.02)
2-3 Stops	0.05*	0.07**	0.04*	0.03
	(0.02)	(0.02)	(0.02)	(0.02)
4+ Stops	0.05	0.08**	0.04	0.02
	(0.03)	(0.03)	(0.03)	(0.03)
Male		-0.08***	-0.07***	-0.06***
		(0.01)	(0.01)	(0.01)
Black		0.04**	0.03*	0.03*
		(0.01)	(0.02)	(0.01)
Hispanic		0.05**	0.01	0.00
		(0.02)	(0.02)	(0.02)
Asian		0.09**	0.08*	0.08*
		(0.03)	(0.03)	(0.03)
Other		0.05	0.03	0.02
		(0.04)	(0.04)	(0.04)
Foreign Born		-0.05*	-0.05*	-0.06*
		(0.02)	(0.02)	(0.02)
Age		-0.00	-0.01	-0.01
		0.00	0.00	0.00
Health Insurance			-0.07***	-0.05***
			(0.01)	(0.01)

Parental Education	-0.01***	-0.01***
	0.00	0.00
Parental Education (missingness dummy)	0.07**	0.07**
	(0.03)	(0.02)
Good Health (W1)	-0.20***	-0.19***
	(0.01)	(0.01)
Delinquency	0.10***	0.09**
	(0.03)	(0.02)
Isolate (W3)		0.07**
		(0.02)
System Avoidance (W3)		-0.12***
		(0.01)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; This table presents exponentiated coefficients, the table displays predicted probabilities; Standard errors in parentheses

Appendix Table 4: Depression Wave 3 Full Models

	Model 1	Model 2	Model 3
1 Stop	1.05* (0.02)	1.06* (0.02)	1.05* (0.02)
2-3 Stops	1.06* (0.03)	1.05* (0.03)	1.04 (0.02)
4+ Stops	1.07* (0.03)	1.03 (0.03)	1.02 (0.03)
Male		0.92*** (0.01)	0.92*** (0.01)
Black		1.07*** (0.02)	1.07*** (0.02)
Hispanic		1.07*** (0.02)	1.06** (0.02)
Asian		1.10** (0.03)	1.10*** (0.03)
Other		1.04 (0.06)	1.03 (0.06)
Foreign Born		1.01 (0.03)	1.01 (0.03)
Parental Education		0.99*** (0.00)	0.99*** (0.00)
Age		0.99*** (0.00)	0.99*** (0.00)
Health Insurance		0.94*** (0.01)	0.97* (0.01)
Delinquency		1.19*** (0.04)	1.16*** (0.04)
Parental Education (missingness dummy)		1.05 (0.04)	1.05 (0.04)
Depression (W1)		1.40*** (0.02)	1.37*** (0.02)
Isolate (W3)			1.06* (0.03)
System Avoidance (W3)			1.19*** (0.02)
Inalpha	0.00 (.)	0.00 (.)	0.00 (.)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 5: Gender Moderation Wave 3 Full Models

	System Avoidance	Social Isolation	Depression
1 Stop	1.39* (0.19)	0.71 (0.26)	1.05 (0.04)
2-3 Stops	1.34 (0.29)	0.48 (0.25)	1.13*** (0.04)
3-4 Stops	3.80*** (1.20)	0.24 (0.23)	1.03 (0.06)
Male * 1 Stop	0.89 (0.15)	1.39 (0.61)	1.00 (0.04)
Male * 2-3 Stops	1.02 (0.26)	1.46 (0.83)	0.90* (0.04)
Male * 4+ Stops	0.44* (0.16)	5.51 (5.24)	1.00 (0.06)
Male	0.83** (0.06)	1.62*** (0.20)	0.93*** (0.01)
Black	0.98 (0.09)	1.37* (0.18)	1.07*** (0.02)
Hispanic	1.18 (0.15)	1.50** (0.21)	1.07*** (0.02)
Asian	1.07 (0.17)	0.77 (0.23)	1.10*** (0.03)
Other	1.36 (0.29)	1.21 (0.48)	1.04 (0.06)
Parental Education	1.00 (0.01)	0.90*** (0.02)	0.99*** (0.00)
Foreign Born	1.19 (0.15)	1.25 (0.25)	1.01 (0.03)
Age	1.03 (0.02)	1.09** (0.03)	0.99*** (0.00)
Health Insurance	0.43** (0.03)	0.99 (0.12)	0.94*** (0.01)
Parental Education (missingness dummy)	1.14 (0.20)	1.80** (0.40)	1.05 (0.04)
Delinquency	2.08*** (0.32)	0.36* (0.15)	1.19*** (0.04)
Depression (W1)			1.40*** (0.02)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 6: Race Moderation Wave 3 Full Models

	System Avoidance	Social Isolation	Depression
1 Stop	1.05 (0.18)	1.30 (0.38)	1.10* (0.04)
2-3 Stops	0.97 (0.16)	0.77 (0.27)	1.06 (0.05)
3-4 Stops	0.86 (0.23)	1.38 (0.45)	1.05 (0.06)
White * 1 Stop	1.36 (0.27)	0.53 (0.19)	0.95 (0.04)
White * 2-3 Stops	1.67* (0.35)	0.75 (0.36)	0.98 (0.06)
White * 4+ Stops	2.81** (0.89)	0.84 (0.36)	0.98 (0.06)
Male	0.82** (0.05)	1.67*** (0.19)	0.92*** (0.01)
Black	1.10 (0.10)	1.28 (0.18)	1.07** (0.02)
Hispanic	1.35* (0.17)	1.38* (0.21)	1.06** (0.02)
Asian	1.22 (0.20)	0.71 (0.21)	1.09** (0.03)
Other	1.56* (0.33)	1.12 (0.45)	1.03 (0.06)
Parental Education	1.00 (0.01)	0.90*** (0.02)	0.99*** (0.00)
Foreign Born	1.15 (0.14)	1.26 (0.25)	1.01 (0.03)
Age	1.03 (0.02)	1.09** (0.03)	0.99*** (0.00)
Health Insurance	0.43*** (0.03)	1.00 (0.12)	0.94*** (0.01)
Parental Education (missingness dummy)	1.14 (0.20)	1.79** (0.39)	1.05 (0.04)
Delinquency	2.05*** (0.32)	0.37* (0.15)	1.19*** (0.04)
Depression (W1)			1.40*** (0.02)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 7: Medical avoidance Wave 4 Full Models

	Model 1	Model 2	Model 3	Model 4
1 Stop	1.30** (0.12)	1.27* (0.12)	1.23* (0.12)	1.19 (0.12)
2-3 Stops	1.62*** (0.17)	1.50*** (0.16)	1.46*** (0.16)	1.40** (0.15)
4+ Stops	1.48* (0.22)	1.27 (0.20)	1.21 (0.19)	1.09 (0.17)
Male		0.97 (0.06)	0.96 (0.06)	0.99 (0.07)
Black		1.12 (0.08)	1.11 (0.08)	1.12 (0.08)
Hispanic		0.85 (0.09)	0.83 (0.09)	0.81 (0.09)
Asian		0.83 (0.11)	0.85 (0.11)	0.84 (0.12)
Other		0.83 (0.20)	0.85 (0.20)	0.81 (0.19)
Parental Education		0.95*** (0.01)	0.96** (0.01)	0.96** (0.01)
Foreign Born		1.10 (0.15)	1.10 (0.16)	1.08 (0.16)
Age		0.98 (0.02)	0.97 (0.02)	0.97 (0.02)
Delinquency		1.66*** (0.24)	1.59** (0.24)	1.42* (0.21)
Health Insurance			0.62*** (0.03)	0.71*** (0.04)
Parental Education (missingness dummy)			1.70** (0.27)	1.68** (0.28)
System Avoidance (W3)				2.30*** (0.17)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 8: Social Isolation Wave 4 Full Models

	Model 1	Model 2	Model 3
1 Stop	1.08 (0.12)	1.11 (0.13)	1.09 (0.13)
2-3 Stops	1.37*** (0.12)	1.37*** (0.13)	1.36** (0.13)
3-4 Stops	1.46** (0.20)	1.46** (0.21)	1.41* (0.20)
Male		0.86* (0.05)	0.85** (0.05)
Black		1.20* (0.11)	1.18 (0.10)
Hispanic		1.00 (0.09)	0.97 (0.09)
Asian		1.13 (0.18)	1.15 (0.18)
Other		1.09 (0.22)	1.10 (0.23)
Foreign Born		0.91 (0.13)	0.90 (0.13)
Age		1.03 (0.02)	1.02 (0.02)
Delinquency		1.27 (0.17)	1.24 (0.18)
Parental Education			1.00 (0.01)
Health Insurance			0.75*** (0.05)
Parental Education (missingness dummy)			1.61*** (0.21)
R^2			
BIC	.	.	.

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 9: Police Stops and Self-Rated General Health

Excellent Health	Model 1	Model 2	Model 3	Model 4
1 Stop	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.02 (0.02)
2-3 Stops	-0.04 (0.02)	-0.05* (0.02)	-0.05* (0.02)	-0.04 (0.02)
4+ Stops	-0.04 (0.03)	-0.06* (0.03)	-0.04 (0.03)	-0.04 (0.03)
Male		0.05*** (0.01)	0.04*** (0.01)	0.04*** (0.01)
Black		-0.00 (0.01)	0.01 (0.01)	0.00 (0.01)
Hispanic		-0.05** (0.02)	-0.01 (0.02)	-0.02 (0.02)
Asian		-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)
Other		-0.01 (0.04)	0.01 (0.04)	0.00 (0.04)
Foreign Born		0.06** (0.02)	0.07*** (0.02)	0.07*** (0.02)
Age		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Delinquency		0.00 (0.02)	-0.00 (0.03)	0.01 (0.03)
Health Insurance			0.04** (0.01)	0.03* (0.01)
Parental Education			0.01*** (0.00)	0.01*** (0.00)
Parental Education (missingness dummy)			-0.06 (0.03)	-0.08* (0.03)
Good Health (W1)			0.12*** (0.01)	0.11*** (0.01)
Isolate (W3)				-0.03* (0.01)
System Avoidance (W3)				-0.09*** (0.01)
Moderate Health	Model 1	Model 2	Model 3	Model 4
1 Stop	0.04 (0.02)	0.03 (0.02)	0.04* (0.02)	0.04* (0.02)
2-3 Stops	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
4+ Stops	0.00	0.00	0.01	0.01

	(0.03)	(0.03)	(0.03)	(0.03)
Male	-0.01	-0.01	(0.02)	
	(0.01)	(0.01)	(0.01)	
Black	-0.10***	-0.09***	-0.09***	
	(0.02)	(0.02)	(0.02)	
Hispanic	-0.08**	-0.05*	-0.05*	
	(0.02)	(0.02)	(0.02)	
Asian	-0.12***	-0.12***	-0.12***	
	(0.03)	(0.03)	(0.03)	
Other	-0.01	0.00	0.00	
	(0.05)	(0.05)	(0.05)	
Foreign Born	0.07*	0.07*	0.07*	
	(0.03)	(0.03)	(0.03)	
Age	-0.01	-0.00	-0.00	
	(0.00)	0.00	0.00	
Delinquency	0.00	-0.00	0.00	
	(0.03)	(0.03)	(0.03)	
Health Insurance		0.05**	0.04**	
		(0.01)	(0.01)	
Parental Education		0.01***	0.01***	
		0.00	0.00	
Parental Education (missingness dummy)		0.01	0.04	
		(0.04)	(0.03)	
Good Health (W1)		0.06***	0.05***	
		(0.01)	(0.01)	
Isolate (W3)			-0.03*	
			(0.01)	
System Avoidance (W3)			-0.05***	
			(0.01)	

Poor Health	Model 1	Model 2	Model 3	Model 4
1 Stop	-0.01	0.00	-0.01	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)
2-3 Stops	0.05*	0.07**	0.06**	0.05*
	(0.03)	(0.02)	(0.02)	(0.02)
4+ Stops	0.04	0.06	0.03	0.03
	(0.03)	(0.03)	(0.03)	(0.03)
Male		-0.04**	-0.02*	-0.02
		(0.01)	(0.01)	(0.01)
Black		0.10***	0.09***	0.09***
		(0.02)	(0.02)	(0.01)
Hispanic		0.13***	0.07*	0.07**
		(0.02)	(0.04)	(0.03)

Asian	0.16*** (0.04)	0.16*** (0.04)	0.16*** (0.04)
Other	0.01 (0.05)	-0.01 (0.05)	-0.01 (0.05)
Foreign Born	-0.13*** (0.03)	-0.14*** (0.03)	-0.14*** (0.03)
Age	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)
Delinquency	-0.00 (0.03)	0.01 (0.03)	-0.01 (0.03)
Health Insurance		-0.09*** (0.01)	-0.07*** (0.01)
Parental Education		-0.02*** (0.00)	-0.02*** (0.00)
Parental Education (missingness dummy)		0.05 (0.03)	0.04 (0.03)
Good Health (W1)		-0.18*** (0.01)	-0.17*** (0.01)
Isolate (W3)			0.06*** (0.01)
System Avoidance (W3)			(0.14*** (0.01)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; This table presents exponentiated coefficients, the table displays predicted probabilities; Standard errors in parentheses

Appendix Table 10: Depression Wave 4 Full Models

	Model 1	Model 2	Model 3
1 Stop	1.07* (0.03)	1.04 (0.03)	1.02 (0.02)
2-3 Stops	1.11*** (0.03)	1.07* (0.03)	1.02 (0.03)
4+ Stops	1.19*** (0.04)	1.07* (0.04)	1.05 (0.03)
Male	0.86*** (0.01)	0.93*** (0.02)	0.92*** (0.01)
Black	1.18*** (0.03)	1.12*** (0.03)	1.10*** (0.02)
Hispanic	1.11*** (0.03)	1.02 (0.03)	1.03 (0.03)
Asian	1.10* (0.05)	1.08* (0.04)	1.08 (0.04)
Other	1.04 (0.06)	1.02 (0.05)	1.02 (0.05)
Foreign Born	0.99 (0.04)	0.96 (0.04)	0.97 (0.03)
Parental Education		0.98*** (0.00)	0.98*** (0.00)
Age		1.00 (0.01)	1.00 (0.00)
Health Insurance		0.91*** (0.02)	0.95*** (0.01)
Delinquency		1.11* (0.05)	1.08* (0.04)
Parental Education (missingness dummy)		1.15*** (0.05)	1.08 (0.04)
Depression (W1)		1.46*** (0.02)	1.31*** (0.02)
Isolate (W3)			1.58*** (0.02)
System Avoidance (W3)			1.21*** (0.02)
Inalpha	0.00 (.)	0.00 (.)	0.00 (.)

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 11: Stigma from Police Stop and Parental Stress

	Model 1	Model 2	Model 3	Model 4
Stop Stigma	0.44*** (0.04)	0.33*** (0.04)	0.32*** (0.04)	0.29*** (0.04)
Black		-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Hispanic		-0.04 (0.02)	-0.04* (0.02)	-0.04 (0.02)
Other		0.02 (0.03)	0.01 (0.03)	0.00 (0.03)
Parent Foreign-Born		0.02 (0.02)	0.01 (0.02)	0.02 (0.02)
Male		0.05*** (0.01)	0.05*** (0.01)	0.03** (0.01)
Adolescent's Age		-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Household Income		0.00** (0.00)	0.00*** (0.00)	0.00*** (0.00)
High School Education		-0.10*** (0.02)	-0.08*** (0.02)	-0.08*** (0.02)
College Education		0.04* (0.02)	0.06*** (0.02)	0.06*** (0.02)
Receives Public Aid		0.08*** (0.02)	0.06*** (0.02)	0.06*** (0.02)
Poverty Percentage		-0.08*** (0.01)	-0.07*** (0.01)	-0.07*** (0.01)
Neighborhood Efficacy			0.14*** (0.01)	0.14*** (0.01)
PCG Intelligence			-0.00 (0.00)	-0.00 (0.00)
SCG Intelligence			0.01*** (0.00)	0.01** (0.00)
Impulsiveness			-0.15*** (0.01)	-0.15*** (0.01)
Delinquency				0.02*** (0.00)
Constant	1.04*** (0.01)	1.37*** (0.15)	1.62*** (0.16)	1.57*** (0.16)
R^2	0.010	0.040	0.078	0.080
BIC	23551.63	23299.81	22871.99	22724.67

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 12: Stress from Police Stop and Parental Stress

	Model 1	Model 2	Model 3	Model 4
Stop Stress	0.32*** (0.03)	0.24*** (0.03)	0.24*** (0.03)	0.22*** (0.03)
Black		-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Hispanic		-0.04 (0.02)	-0.04* (0.02)	-0.04 (0.02)
Other		0.02 (0.03)	0.01 (0.03)	0.01 (0.03)
Parent Foreign-Born		0.02 (0.02)	0.01 (0.02)	0.02 (0.02)
Male		0.05*** (0.01)	0.05*** (0.01)	0.03* (0.01)
Adolescent's Age		-0.01 (0.01)	-0.02 (0.01)	-0.01 (0.01)
Household Income		0.00** (0.00)	0.00*** (0.00)	0.00*** (0.00)
High School Education		-0.10*** (0.02)	-0.09*** (0.02)	-0.08*** (0.02)
College Education		0.04** (0.02)	0.06*** (0.02)	0.06*** (0.02)
Receives Public Aid		0.07*** (0.02)	0.06*** (0.02)	0.06*** (0.02)
Poverty Percentage		-0.08*** (0.01)	-0.07*** (0.01)	-0.07*** (0.01)
Neighborhood Efficacy			0.14*** (0.01)	0.14*** (0.01)
PCG Intelligence			-0.00 (0.00)	-0.00 (0.00)
SCG Intelligence			0.01*** (0.00)	0.01*** (0.00)
Impulsiveness			-0.15*** (0.01)	-0.15*** (0.01)
Delinquency				0.02*** (0.00)
Constant	1.03*** (0.01)	1.41*** (0.15)	1.66*** (0.16)	1.61*** (0.16)
R^2	0.011	0.041	0.079	0.081
BIC	23538.43	23291.07	22859.97	22715.26

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 13: Stigma from Police Stop and Distance from Primary Caregiver

	Model 1	Model 2	Model 3	Model 4
Stop Stigma	0.55*** (0.06)	0.62*** (0.06)	0.61*** (0.06)	0.58*** (0.06)
Black		-0.03 (0.03)	-0.04 (0.03)	-0.05 (0.03)
Hispanic		-0.04 (0.03)	-0.05 (0.03)	-0.04 (0.03)
Other		-0.08* (0.04)	-0.09* (0.04)	-0.10* (0.04)
Parent Foreign-Born		-0.16*** (0.03)	-0.17*** (0.03)	-0.16*** (0.03)
Male		-0.14*** (0.02)	-0.13*** (0.02)	-0.15*** (0.02)
Adolescent's Age		-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Household Income		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
High School Education		-0.05 (0.03)	-0.04 (0.03)	-0.04 (0.03)
College Education		0.15*** (0.02)	0.16*** (0.02)	0.17*** (0.03)
Receives Public Aid		0.06* (0.02)	0.05* (0.02)	0.05* (0.02)
Poverty Percentage		-0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Neighborhood Efficacy			0.06*** (0.02)	0.05*** (0.02)
PCG Intelligence			-0.00 (0.00)	-0.01 (0.00)
SCG Intelligence			0.00 (0.00)	0.00 (0.00)
PCG-Rated			-0.04** (0.02)	-0.04** (0.02)
Delinquency				0.02*** (0.01)
Constant	0.57*** (0.01)	0.73** (0.23)	0.81*** (0.24)	0.75** (0.24)
Inalpha Constant	-0.60*** (0.03)	-0.63*** (0.03)	-0.64*** (0.03)	-0.64*** (0.03)
R^2				
BIC	40619.11	40557.70	40543.55	40298.26

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 14: Stress from Police Stop and Distance from Primary Caregiver

	Model 1	Model 2	Model 3	Model 4
Stop Stress	0.45***	0.50***	0.50***	0.48***

	(0.04)	(0.04)	(0.04)	(0.04)
Black		-0.03	-0.04	-0.05
		(0.03)	(0.03)	(0.03)
Hispanic		-0.04	-0.05	-0.04
		(0.03)	(0.03)	(0.03)
Other		-0.07	-0.08*	-0.09*
		(0.04)	(0.04)	(0.04)
Parent Foreign-Born		-0.16***	-0.17***	-0.16***
		(0.03)	(0.03)	(0.03)
Male		-0.14***	-0.14***	-0.15***
		(0.02)	(0.02)	(0.02)
Adolescent's Age		-0.01	-0.01	-0.01
		(0.01)	(0.01)	(0.01)
Household Income		0.00	0.00	0.00
		(0.00)	(0.00)	(0.00)
High School Education		-0.06	-0.05	-0.04
		(0.03)	(0.03)	(0.03)
College Education		0.16***	0.17***	0.17***
		(0.02)	(0.02)	(0.02)
Receives Public Aid		0.05*	0.04	0.04
		(0.02)	(0.02)	(0.02)
Poverty Percentage		-0.00	0.00	0.00
		(0.01)	(0.01)	(0.01)
Neighborhood Efficacy			0.06***	0.05***
			(0.01)	(0.02)
PCG Intelligence			-0.01	-0.01
			(0.00)	(0.00)
SCG Intelligence			0.00	0.00
			(0.00)	(0.00)
Impulsiveness			-0.05**	-0.05**
			(0.02)	(0.02)
Delinquency				0.02***
				(0.01)
Constant	0.55***	0.78***	0.87***	0.81***
	(0.01)	(0.23)	(0.24)	(0.24)
Inalpha				
Constant	-0.61***	-0.64***	-0.65***	-0.65***
	(0.03)	(0.03)	(0.03)	(0.03)
R^2				
BIC	40585.95	40521.48	40505.60	40263.55

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 15: Stigma from Police Stop and Distance from Secondary Caregiver

	Model 1	Model 2	Model 3	Model 4
Stop Stress	0.76*** (0.14)	0.52*** (0.14)	0.54*** (0.14)	0.45*** (0.14)
Black		0.21*** (0.06)	0.07 (0.06)	0.04 (0.06)
Hispanic		0.09 (0.07)	-0.05 (0.07)	-0.03 (0.07)
Other		0.39*** (0.08)	0.28*** (0.08)	0.27** (0.08)
Parent Foreign-Born		-0.13* (0.07)	-0.24*** (0.07)	-0.21** (0.07)
Male		-0.46*** (0.04)	-0.45*** (0.04)	-0.51*** (0.04)
Adolescent's Age		0.01 (0.03)	-0.03 (0.03)	-0.02 (0.03)
Household Income		-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
High School Education		0.15* (0.06)	0.19** (0.06)	0.20** (0.06)
College Education		0.11 (0.05)	0.14** (0.05)	0.14** (0.05)
Receives Public Aid		0.43*** (0.05)	0.38*** (0.05)	0.36*** (0.05)
Poverty Percentage		-0.17*** (0.02)	-0.16*** (0.02)	-0.16*** (0.02)
Neighborhood Efficacy			0.10** (0.03)	0.09** (0.03)
PCG Intelligence			0.03** (0.01)	0.03** (0.01)
SCG Intelligence			-0.11*** (0.01)	-0.11*** (0.01)
Impulsiveness			-0.05 (0.04)	-0.05 (0.04)
Delinquency				0.08*** (0.01)
Constant	3.33*** (0.02)	3.64*** (0.50)	4.60*** (0.51)	4.46*** (0.52)
R^2	0.003	0.071	0.098	0.101
BIC	50542.92	49827.38	49501.65	49198.61

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 16: Stress from Police Stop and Distance from Secondary Caregiver

	Model 1	Model 2	Model 3	Model 4
Stop Stress	0.65*** (0.10)	0.45*** (0.10)	0.45*** (0.09)	0.37*** (0.09)
Black		0.21*** (0.06)	0.07 (0.06)	0.04 (0.06)
Hispanic		0.09 (0.07)	-0.05 (0.07)	-0.03 (0.07)
Other		0.40*** (0.08)	0.28*** (0.08)	0.27** (0.08)
Parent Foreign-Born		-0.13* (0.07)	-0.24*** (0.07)	-0.21** (0.07)
Male		-0.46*** (0.04)	-0.46*** (0.04)	-0.51*** (0.04)
Adolescent's Age		0.00 (0.03)	-0.03 (0.03)	-0.03 (0.03)
Household Income		-0.00*** (0.00)	-0.00*** (0.00)	-0.00*** (0.00)
High School Education		0.15* (0.06)	0.18** (0.06)	0.20** (0.06)
College Education		0.11* (0.05)	0.15** (0.05)	0.15** (0.05)
Receives Public Aid		0.42*** (0.05)	0.37*** (0.05)	0.35*** (0.05)
Poverty Percentage		-0.17*** (0.02)	-0.16*** (0.02)	-0.16*** (0.02)
Neighborhood Efficacy			0.10** (0.03)	0.09** (0.03)
PCG Intelligence			0.03** (0.01)	0.03** (0.01)
SCG Intelligence			-0.11*** (0.01)	-0.11*** (0.01)
Impulsiveness			-0.05 (0.04)	-0.05 (0.04)
Delinquency				0.08*** (0.01)
Constant	3.31*** (0.02)	3.72*** (0.50)	4.68*** (0.51)	4.53*** (0.52)
R^2	0.004	0.072	0.098	0.102
BIC	50525.30	49817.11	49492.58	49192.23

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 17: Stigma from Police Stop and Parental Anxiety

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stigma	3.74*** (0.71)	2.31*** (0.47)	2.31*** (0.47)	2.30*** (0.47)	2.44*** (0.51)
Black		0.47*** (0.05)	0.50*** (0.05)	0.49*** (0.05)	0.50*** (0.05)
Hispanic		0.67*** (0.08)	0.70** (0.09)	0.70** (0.09)	0.68** (0.09)
Other		0.70* (0.10)	0.71* (0.11)	0.72* (0.11)	0.70* (0.10)
Parent Foreign-Born		0.78 (0.10)	0.82 (0.10)	0.82 (0.11)	0.84 (0.11)
Male		1.21* (0.09)	1.21* (0.09)	1.19* (0.09)	1.15 (0.09)
Adolescent's Age		1.18** (0.06)	1.17** (0.06)	1.17** (0.06)	1.18** (0.06)
Household Income		1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
High School Education		1.10 (0.11)	1.10 (0.11)	1.10 (0.11)	1.07 (0.11)
College Education		0.60*** (0.07)	0.61*** (0.07)	0.60*** (0.07)	0.60*** (0.07)
Receives Public Aid		2.09*** (0.22)	2.02*** (0.22)	2.01*** (0.22)	1.95*** (0.21)
Poverty Percentage		0.76*** (0.04)	0.76*** (0.04)	0.76*** (0.04)	0.76*** (0.04)
Neighborhood Efficacy			1.20** (0.07)	1.20** (0.07)	1.18** (0.06)
PCG Intelligence			1.05*** (0.02)	1.05*** (0.02)	1.05** (0.02)
SCG Intelligence			1.01 (0.01)	1.01 (0.01)	1.00 (0.01)
Impulsiveness			0.69*** (0.04)	0.69*** (0.04)	0.75*** (0.05)
Delinquency				1.02 (0.02)	1.02 (0.02)
Parental Anxiety (W3)					3.07*** (0.37)
R^2					
BIC	5644.06	5417.97	5391.16	5383.15	5318.40

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 18: Stress from Police Stop and Parental Anxiety

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stress	2.66*** (0.36)	1.80*** (0.26)	1.78*** (0.26)	1.78*** (0.26)	1.77*** (0.26)
Black		0.47*** (0.05)	0.49*** (0.05)	0.49*** (0.05)	0.50*** (0.05)
Hispanic		0.67*** (0.08)	0.70** (0.09)	0.70** (0.09)	0.68** (0.09)
Other		0.71* (0.10)	0.73* (0.11)	0.73* (0.11)	0.71* (0.11)
Parent Foreign-Born		0.79 (0.10)	0.82 (0.11)	0.82 (0.11)	0.83 (0.11)
Male		1.21* (0.09)	1.20* (0.09)	1.19* (0.09)	1.16 (0.09)
Adolescent's Age		1.17** (0.06)	1.16** (0.06)	1.16** (0.06)	1.18** (0.06)
Household Income		1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
High School Education		1.09 (0.11)	1.09 (0.11)	1.09 (0.11)	1.06 (0.11)
College Education		0.60*** (0.07)	0.61*** (0.07)	0.61*** (0.07)	0.60*** (0.07)
Receives Public Aid		2.08*** (0.22)	2.01*** (0.22)	2.00*** (0.22)	1.94*** (0.21)
Poverty Percentage		0.76*** (0.04)	0.76*** (0.04)	0.76*** (0.04)	0.76*** (0.04)
Neighborhood Efficacy			1.19** (0.06)	1.19** (0.07)	1.18** (0.06)
PCG Intelligence			1.05** (0.02)	1.05** (0.02)	1.05** (0.02)
SCG Intelligence			1.01 (0.01)	1.01 (0.01)	1.00 (0.01)
Impulsiveness			0.69*** (0.04)	0.69*** (0.04)	0.75*** (0.05)
Delinquency				1.01 (0.02)	1.02 (0.02)
Parental Anxiety (W3)					3.01*** (0.36)
R^2					
BIC	5639.09	5417.87	5391.64	5383.50	5321.07

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 19: Stigma from Police Stop and Parental Depression

	Model 1	Model 2	Model 3	Model 4
Stop Stigma	1.98*** (0.26)	1.50** (0.20)	1.49** (0.21)	1.43* (0.20)
Black		0.72*** (0.05)	0.79*** (0.05)	0.78*** (0.05)
Hispanic		0.79** (0.06)	0.87 (0.07)	0.88 (0.07)
Other		0.82* (0.07)	0.88 (0.08)	0.88 (0.08)
Parent Foreign-Born		0.66*** (0.05)	0.72*** (0.05)	0.73*** (0.05)
Male		1.00 (0.05)	1.00 (0.05)	0.97 (0.05)
Adolescent's Age		1.00 (0.03)	1.01 (0.03)	1.02 (0.03)
Household Income		1.00 (0.00)	1.00* (0.00)	1.00* (0.00)
High School Education		0.90 (0.06)	0.86* (0.06)	0.86* (0.06)
College Education		0.92 (0.05)	0.92 (0.05)	0.92 (0.05)
Receives Public Aid		1.68*** (0.09)	1.69*** (0.09)	1.69*** (0.10)
Poverty Percentage		0.91*** (0.02)	0.91*** (0.02)	0.91*** (0.02)
Neighborhood Efficacy			1.19*** (0.04)	1.19*** (0.04)
PCG Intelligence			1.04*** (0.01)	1.04*** (0.01)
SCG Intelligence			1.06*** (0.01)	1.06*** (0.01)
Impulsiveness			0.81*** (0.03)	0.81*** (0.03)
Delinquency				1.05*** (0.01)
<i>R</i> ²				
<i>BIC</i>	12700.97	12459.30	12331.46	12235.57

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 20: Stress from Police Stop and Parental Depression

	Model 1	Model 2	Model 3	Model 4
Stop Stress	1.56*** (0.14)	1.23* (0.12)	1.23* (0.12)	1.19 (0.11)
Black		0.72*** (0.05)	0.79*** (0.05)	0.78*** (0.05)
Hispanic		0.79** (0.06)	0.87 (0.07)	0.88 (0.07)
Other		0.82* (0.07)	0.89 (0.08)	0.88 (0.08)
Parent Foreign-Born		0.66*** (0.05)	0.72*** (0.05)	0.73*** (0.05)
Male		1.01 (0.05)	1.00 (0.05)	0.98 (0.05)
Adolescent's Age		1.00 (0.03)	1.01 (0.03)	1.02 (0.03)
Household Income		1.00 (0.00)	1.00* (0.00)	1.00* (0.00)
High School Education		0.89 (0.06)	0.86* (0.06)	0.86* (0.06)
College Education		0.92 (0.05)	0.92 (0.05)	0.92 (0.05)
Receives Public Aid		1.67*** (0.09)	1.69*** (0.09)	1.69*** (0.10)
Poverty Percentage		0.91*** (0.02)	0.91*** (0.02)	0.91*** (0.02)
Neighborhood Efficacy			1.19*** (0.04)	1.19*** (0.04)
PCG Intelligence			1.04*** (0.01)	1.04*** (0.01)
SCG Intelligence			1.06*** (0.01)	1.06*** (0.01)
Impulsiveness			0.81*** (0.03)	0.81*** (0.03)
Delinquency				1.05*** (0.01)
<i>R</i> ²				
<i>BIC</i>	12703.57	12462.87	12334.76	12238.63

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 21: Stigma from Police Stop and Excellent/Very Good Health

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Stop Stigma	0.68** (0.09)	0.59*** (0.08)	0.59*** (0.08)	0.61*** (0.08)	0.59*** (0.08)	0.70* (0.10)
Black		0.99 (0.06)	0.98 (0.06)	0.99 (0.06)	1.01 (0.06)	1.00 (0.06)
Hispanic		1.03 (0.07)	1.03 (0.08)	1.01 (0.07)	1.04 (0.08)	1.02 (0.08)
Other		1.17 (0.10)	1.17 (0.10)	1.17 (0.10)	1.20* (0.11)	1.19 (0.11)
Parent Foreign-Born		0.98 (0.06)	0.97 (0.07)	0.97 (0.07)	0.99 (0.07)	0.93 (0.06)
Male		1.82*** (0.08)	1.82*** (0.08)	1.88*** (0.08)	1.91*** (0.09)	1.79*** (0.08)
Adolescent's Age		0.82*** (0.02)	0.83*** (0.03)	0.82*** (0.03)	0.83*** (0.03)	0.82*** (0.03)
Household Income		1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
High School Education		1.11 (0.07)	1.11 (0.07)	1.10 (0.07)	1.10 (0.07)	1.10 (0.07)
College Education		1.01 (0.06)	1.01 (0.06)	1.02 (0.06)	1.02 (0.06)	1.06 (0.06)
Receives Public Aid		0.96 (0.05)	0.97 (0.05)	0.97 (0.05)	0.97 (0.05)	1.03 (0.06)
Poverty Percentage		1.10*** (0.03)	1.10*** (0.03)	1.10*** (0.03)	1.09*** (0.03)	1.07** (0.03)
Neighborhood Efficacy			1.00 (0.03)	0.99 (0.03)	1.00 (0.03)	1.02 (0.03)
PCG Intelligence			0.99 (0.01)	0.99 (0.01)	0.99 (0.01)	0.99 (0.01)
SCG Intelligence			1.01 (0.01)	1.01 (0.01)	1.01 (0.01)	1.00 (0.01)
Impulsiveness			1.09* (0.04)	1.09* (0.04)	1.08* (0.04)	1.06 (0.04)
Delinquency				0.96** (0.01)	0.97** (0.01)	0.98 (0.01)
Good Health (W5)					1.47*** (0.08)	1.44*** (0.08)
Distance from PCG						0.90*** (0.01)
Distance from SCG						0.92*** (0.01)
Parental Stress						1.02 (0.03)
Parental Anxiety						1.02 (0.10)
Parental Depression						0.82*** (0.04)

R^2						
BIC	13386.66	13127.74	13145.14	13071.91	13037.77	12816.51

Exponentiated coefficients; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 22: Stress from Police Stop and Excellent/Very Good Health

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Stop Stress	0.60*** (0.05)	0.55*** (0.05)	0.55*** (0.05)	0.56*** (0.05)	0.54*** (0.05)	0.62*** (0.06)
Black		0.99 (0.06)	0.99 (0.06)	1.00 (0.06)	1.02 (0.07)	1.01 (0.07)
Hispanic		1.03 (0.07)	1.03 (0.08)	1.01 (0.07)	1.04 (0.08)	1.02 (0.08)
Other		1.17 (0.10)	1.17 (0.10)	1.17 (0.10)	1.20* (0.11)	1.19 (0.11)
Parent Foreign-Born		0.97 (0.06)	0.97 (0.07)	0.97 (0.07)	0.99 (0.07)	0.92 (0.06)
Male		1.86*** (0.08)	1.87*** (0.08)	1.92*** (0.09)	1.95*** (0.09)	1.82*** (0.08)
Adolescent's Age		0.83*** (0.03)	0.83*** (0.03)	0.83*** (0.03)	0.84*** (0.03)	0.83*** (0.03)
Household Income		1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
High School Education		1.11 (0.07)	1.12 (0.07)	1.10 (0.07)	1.10 (0.07)	1.11 (0.07)
College Education		1.01 (0.06)	1.00 (0.06)	1.01 (0.06)	1.01 (0.06)	1.06 (0.06)
Receives Public Aid		0.97 (0.05)	0.98 (0.05)	0.99 (0.05)	0.99 (0.05)	1.04 (0.06)
Poverty Percentage		1.10*** (0.03)	1.10*** (0.03)	1.10*** (0.03)	1.09** (0.03)	1.07** (0.03)
Neighborhood Efficacy			1.00 (0.03)	0.99 (0.03)	1.00 (0.03)	1.02 (0.03)
PCG Intelligence			0.99 (0.01)	0.99 (0.01)	0.99 (0.01)	0.99 (0.01)
SCG Intelligence			1.01 (0.01)	1.01 (0.01)	1.01 (0.01)	1.00 (0.01)
Impulsiveness			1.09* (0.04)	1.09* (0.04)	1.08* (0.04)	1.06 (0.04)
Delinquency				0.97** (0.01)	0.97* (0.01)	0.98 (0.01)
Good Health (W5)					1.48*** (0.08)	1.45*** (0.08)
Distance from PCG						0.90*** (0.01)
Distance from SCG						0.92*** (0.01)
Parental Stress						1.02 (0.03)
Parental Anxiety						1.03 (0.10)

Parental Depression						0.81 ^{***} (0.04)
R^2						
BIC	13363.63	13101.19	13118.82	13047.67	13012.05	12798.55
Exponentiated coefficients; Standard errors in parentheses						
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$						

Appendix Table 23: Stigma from Police Stop and Sleep Problems

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stress	3.37*** (0.43)	3.14*** (0.42)	3.13*** (0.42)	3.06*** (0.41)	2.62*** (0.36)
Black		0.48*** (0.03)	0.50*** (0.03)	0.49*** (0.03)	0.51*** (0.03)
Hispanic		0.94 (0.07)	0.97 (0.07)	0.98 (0.07)	1.02 (0.07)
Other		0.93 (0.08)	0.95 (0.08)	0.94 (0.08)	0.96 (0.08)
Parent Foreign-Born		0.78*** (0.05)	0.81** (0.06)	0.82** (0.06)	0.84* (0.06)
Male		1.00 (0.05)	0.99 (0.05)	0.98 (0.05)	1.00 (0.05)
Adolescent's Age		1.07* (0.03)	1.07* (0.03)	1.06 (0.03)	1.06 (0.03)
Household Income		1.00** (0.00)	1.00* (0.00)	1.00* (0.00)	1.00** (0.00)
High School Education		0.95 (0.06)	0.94 (0.06)	0.94 (0.06)	0.96 (0.06)
College Education		0.93 (0.05)	0.94 (0.05)	0.93 (0.05)	0.93 (0.06)
Receives Public Aid		1.40*** (0.08)	1.38*** (0.08)	1.37*** (0.08)	1.28*** (0.07)
Poverty Percentage		0.95 (0.02)	0.95 (0.02)	0.95 (0.03)	0.99 (0.03)
Neighborhood Efficacy			1.05 (0.04)	1.05 (0.04)	0.99 (0.03)
PCG Intelligence			1.03** (0.01)	1.03** (0.01)	1.03** (0.01)
SCG Intelligence			1.01 (0.01)	1.01 (0.01)	1.01 (0.01)
Impulsiveness			0.78*** (0.03)	0.78*** (0.03)	0.83*** (0.03)
Delinquency				1.02 (0.01)	1.01 (0.01)
Distance from PCG					1.01 (0.01)
Distance from SCG					1.05*** (0.01)
Parental Stress					1.33*** (0.05)
Parental Anxiety					1.35** (0.12)
Parental Depression					1.41*** (0.07)
<i>R</i> ²					
<i>BIC</i>	12528.86	12329.65	12305.72	12232.97	12009.71

Exponentiated coefficients; Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 24: Anxiety and Stop Stress Full Models

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stigma	0.32*** (0.04)	0.34*** (0.04)	0.33*** (0.04)	0.32*** (0.04)	0.28*** (0.04)
Black		-0.05* (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)
Hispanic		0.01 (0.02)	0.00 (0.02)	0.01 (0.02)	0.01 (0.02)
Other		0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
Parent Foreign-Born		-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)
Male		-0.07*** (0.01)	-0.07*** (0.01)	-0.08*** (0.01)	-0.06*** (0.01)
Adolescent's Age		-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Household Income		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
High School Education		-0.01 (0.02)	-0.01 (0.02)	-0.00 (0.02)	-0.00 (0.02)
College Education		0.00 (0.02)	0.01 (0.02)	0.01 (0.02)	-0.00 (0.02)
Receives Public Aid		0.07*** (0.02)	0.07*** (0.02)	0.07*** (0.02)	0.06** (0.02)
Poverty Percentage		-0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Neighborhood Efficacy			0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
PCG Intelligence			-0.01 (0.00)	-0.01 (0.00)	-0.01 (0.00)
SCG Intelligence			0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Impulsiveness			-0.02 (0.01)	-0.02 (0.01)	-0.01 (0.01)
Delinquency				0.01** (0.00)	0.01* (0.00)
Distance from PCG					0.02*** (0.00)
Distance from SCG					0.01*** (0.00)
Parental Stress					0.04*** (0.01)
Parental Anxiety					0.02 (0.03)
Parental Depression					0.01 (0.02)
Constant	0.57*** (0.01)	0.65*** (0.16)	0.74*** (0.17)	0.73*** (0.17)	0.56** (0.17)

Inalpha					
Constant	-31.14	-31.14	-31.14	-31.13	-60.63
R^2					
BIC	30115.89	30138.99	30145.83	29967.83	29763.06

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 25: Stress from Police Stop and Anxiety

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stress	0.23*** (0.03)	0.25*** (0.03)	0.24*** (0.03)	0.23*** (0.03)	0.20*** (0.03)
Black		-0.05* (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)
Hispanic		0.01 (0.02)	0.00 (0.02)	0.01 (0.02)	0.01 (0.02)
Other		0.02 (0.03)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
Parent Foreign-Born		-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)
Male		-0.07*** (0.01)	-0.07*** (0.01)	-0.08*** (0.01)	-0.06*** (0.01)
Adolescent's Age		-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.01)
Household Income		0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
High School Education		-0.02 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.00 (0.02)
College Education		0.00 (0.02)	0.01 (0.02)	0.01 (0.02)	-0.00 (0.02)
Receives Public Aid		0.07*** (0.02)	0.07*** (0.02)	0.06*** (0.02)	0.05** (0.02)
Poverty Percentage		-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Neighborhood Efficacy			0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
PCG Intelligence			-0.01 (0.00)	-0.01 (0.00)	-0.01* (0.00)
SCG Intelligence			0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Impulsiveness			-0.02 (0.01)	-0.02 (0.01)	-0.01 (0.01)
Delinquency				0.01** (0.00)	0.01* (0.00)
Distance from PCG					0.02*** (0.00)
Distance from SCG					0.01*** (0.00)
Parental Stress					0.04*** (0.01)
Parental Anxiety					0.02 (0.03)
Parental Depression					0.01 (0.02)
Constant	0.57***	0.69***	0.78***	0.76***	0.59***

	(0.01)	(0.16)	(0.17)	(0.17)	(0.18)
Inalpha					
Constant	-31.14	-31.14	-31.14	-31.13	-60.64
R^2					
<i>BIC</i>	30109.55	30132.68	30138.93	29962.07	29760.25

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 26: Stigma from Police Stop and Depression

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stigma	2.28*** (0.14)	2.27*** (0.14)	2.24*** (0.14)	2.12*** (0.14)	1.85*** (0.14)
Black		-0.17** (0.06)	-0.21*** (0.06)	-0.25*** (0.06)	-0.24*** (0.06)
Hispanic		0.04 (0.07)	-0.01 (0.07)	0.01 (0.07)	0.05 (0.07)
Other		0.19* (0.09)	0.17 (0.09)	0.14 (0.09)	0.15 (0.09)
Parent Foreign-Born		-0.03 (0.07)	-0.08 (0.07)	-0.04 (0.07)	0.01 (0.07)
Male		-0.42*** (0.04)	-0.42*** (0.04)	-0.49*** (0.04)	-0.41*** (0.04)
Adolescent's Age		0.02 (0.03)	0.01 (0.03)	0.01 (0.03)	0.02 (0.03)
Household Income		-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
High School Education		-0.20** (0.06)	-0.14* (0.07)	-0.12 (0.07)	-0.11 (0.06)
College Education		-0.04 (0.05)	-0.01 (0.05)	-0.01 (0.05)	-0.08 (0.05)
Receives Public Aid		0.35*** (0.05)	0.33*** (0.05)	0.31*** (0.05)	0.27*** (0.05)
Poverty Percentage		-0.11*** (0.02)	-0.10*** (0.02)	-0.10*** (0.02)	-0.07** (0.02)
Neighborhood Efficacy			0.07* (0.03)	0.07* (0.03)	0.01 (0.03)
PCG Intelligence			-0.05*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)
SCG Intelligence			0.01 (0.01)	0.01 (0.01)	0.01* (0.01)
Impulsiveness			-0.12** (0.04)	-0.12** (0.04)	-0.06 (0.04)
Delinquency				0.11*** (0.01)	0.09*** (0.01)
Distance from PCG					0.13*** (0.01)
Distance from SCG					0.09*** (0.01)
Parental Stress					0.31*** (0.03)
Parental Anxiety					-0.15 (0.10)
Parental Depression					-0.05 (0.05)
Constant	10.02*** (0.02)	10.29*** (0.50)	10.95*** (0.53)	10.80*** (0.53)	9.61*** (0.52)

R^2	0.024	0.053	0.057	0.063	0.092
BIC	50115.70	49852.88	49802.97	49476.35	48872.64

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 27: Stress from Police Stop and Depression

	Model 1	Model 2	Model 3	Model 4	Model 5
Stop Stress	1.46*** (0.09)	1.44*** (0.10)	1.43*** (0.10)	1.33*** (0.10)	1.12*** (0.10)
Black		-0.17** (0.06)	-0.21*** (0.06)	-0.25*** (0.06)	-0.23*** (0.06)
Hispanic		0.05 (0.07)	-0.00 (0.07)	0.02 (0.07)	0.05 (0.07)
Other		0.22** (0.09)	0.19* (0.09)	0.17* (0.09)	0.18* (0.09)
Parent Foreign-Born		-0.03 (0.07)	-0.08 (0.07)	-0.05 (0.07)	0.00 (0.07)
Male		-0.42*** (0.04)	-0.41*** (0.04)	-0.48*** (0.04)	-0.40*** (0.04)
Adolescent's Age		0.01 (0.03)	-0.00 (0.03)	0.00 (0.03)	0.02 (0.03)
Household Income		-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
High School Education		-0.22*** (0.06)	-0.16* (0.07)	-0.14* (0.07)	-0.12 (0.06)
College Education		-0.03 (0.05)	-0.00 (0.05)	-0.00 (0.05)	-0.08 (0.05)
Receives Public Aid		0.34*** (0.05)	0.32*** (0.05)	0.30*** (0.05)	0.26*** (0.05)
Poverty Percentage		-0.12*** (0.02)	-0.11*** (0.02)	-0.10*** (0.02)	-0.07** (0.02)
Neighborhood Efficacy			0.07* (0.03)	0.07* (0.03)	0.01 (0.03)
PCG Intelligence			-0.05*** (0.01)	-0.05*** (0.01)	-0.05*** (0.01)
SCG Intelligence			0.01 (0.01)	0.01 (0.01)	0.01* (0.01)
Impulsiveness			-0.13*** (0.04)	-0.12*** (0.04)	-0.06 (0.04)
Delinquency				0.10*** (0.01)	0.09*** (0.01)
Distance from PCG					0.13*** (0.01)
Distance from SCG					0.09*** (0.01)
Parental Stress					0.32*** (0.03)
Parental Anxiety					-0.16 (0.10)
Parental Depression					-0.04 (0.05)
Constant	10.01*** (0.02)	10.46*** (0.50)	11.15*** (0.53)	10.99*** (0.53)	9.76*** (0.53)

R^2	0.021	0.049	0.054	0.060	0.089
BIC	50149.68	49891.06	49837.25	49512.65	48912.36

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix 28: Telomere Length Full Models (n=375)

	Model 1		Model 2		Model 3	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
10th Quantile						
Prior 6m discrimination (W2)	-0.10	(0.12)	-0.10	(0.08)	-0.09	(0.10)
Prior 6m discrimination (W3)	0.08	(0.10)	0.05	(0.07)	0.04	(0.07)
Respondent Age	-0.01**	(0.00)	-0.00**	(0.00)	-0.00**	(0.00)
Organ Damage	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)
Disease Activity	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Years Since Diagnosis	-0.00*	(0.00)	-0.00*	(0.00)	-0.00*	(0.00)
High School Educated			0.07	(0.06)	0.06	(0.04)
College Educated			0.04	(0.03)	0.03	(0.04)
Working Part Time			0.00	(0.04)	0.01	(0.04)
Unable to work			-0.05	(0.04)	-0.05	(0.04)
Percent Poverty			0.00	(0.00)	0.00	(0.00)
Married					-0.03	(0.03)
Divorced/Widowed					-0.00	(0.01)
Constant	1.43***	(0.11)	1.32***	(0.09)	1.34***	(0.11)
25th Quantile						
Prior 6m discrimination (W2)	-0.06	(0.07)	-0.09*	(0.04)	-0.09	(0.06)
Prior 6m discrimination (W3)	0.06	(0.05)	0.08	(0.07)	0.11	(0.08)
Respondent Age	-0.00*	(0.00)	-0.00*	(0.00)	-0.00*	(0.00)
Organ Damage	-0.00	(0.01)	-0.00	(0.01)	0.00	(0.01)
Disease Activity	-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Years Since Diagnosis	-0.00	(0.00)	-0.00	(0.00)	-0.00**	(0.00)
High School Educated			0.06	(0.10)	0.02	(0.12)
College Educated			-0.00	(0.04)	0.03	(0.04)
Working Part Time			0.01	(0.05)	-0.05	(0.06)
Unable to work			-0.03	(0.04)	-0.06	(0.04)
Percent Poverty			0.00	(0.00)	0.00	(0.00)
Married					-0.06	(0.04)
Divorced/Widowed					-0.03	(0.02)
Constant	1.54***	(0.09)	1.49***	(0.12)	1.48***	(0.15)
50th Quantile						
Prior 6m discrimination (W2)	-0.16	(0.10)	-0.16*	(0.07)	-0.19	(0.10)
Prior 6m discrimination (W3)	0.05	(0.05)	0.03	(0.07)	0.03	(0.07)
Respondent Age	-0.01***	(0.00)	-0.01***	(0.00)	-0.01***	(0.00)
Organ Damage	-0.00	(0.00)	-0.00	(0.01)	-0.01	(0.01)
Disease Activity	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Years Since Diagnosis	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
High School Educated			-0.04	(0.09)	-0.03	(0.08)
College Educated			0.04	(0.03)	0.05	(0.03)

Working Part Time			0.04	(0.05)	0.00	(0.05)
Unable to work			0.03	(0.03)	0.02	(0.04)
Percent Poverty			-0.00	(0.00)	0.00	(0.00)
Married					-0.04	(0.03)
Divorced/Widowed					-0.03	(0.02)
Constant	1.71***	(0.08)	1.73***	(0.10)	1.72***	(0.13)
75th Quantile						
Prior 6m discrimination (W2)	-0.06	(0.14)	-0.09	(0.09)	-0.07	(0.09)
Prior 6m discrimination (W3)	0.04	(0.07)	0.05	(0.08)	0.03	(0.08)
Respondent Age	-0.01***	(0.00)	-0.01***	(0.00)	-0.01***	(0.00)
Organ Damage	0.01	(0.01)	0.01	(0.01)	0.00	(0.01)
Disease Activity	-0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Years Since Diagnosis	0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
High School Educated			-0.00	(0.05)	0.03	(0.04)
College Educated			0.07	(0.05)	0.06	(0.04)
Working Part Time			0.06	(0.08)	0.07	(0.08)
Unable to work			0.08*	(0.04)	0.09	(0.05)
Percent Poverty			0.00	(0.00)	0.00	(0.00)
Married					-0.06	(0.05)
Divorced/Widowed					-0.02	(0.02)
Constant	1.95***	(0.10)	1.89***	(0.08)	1.92***	(0.13)
90th Quantile						
Prior 6m discrimination (W2)	0.06	(0.14)	-0.03	(0.13)	-0.06	(0.10)
Prior 6m discrimination (W3)	-0.06	(0.08)	-0.04	(0.09)	-0.03	(0.06)
Respondent Age	-0.02***	(0.00)	-0.02***	(0.00)	-0.02***	(0.00)
Organ Damage	0.00	(0.01)	-0.00	(0.01)	0.00	(0.01)
Disease Activity	-0.00	(0.00)	0.00	(0.00)	-0.00	(0.00)
Years Since Diagnosis	0.01	(0.00)	0.00	(0.00)	0.00	(0.00)
High School Educated			0.10	(0.13)	0.06	(0.07)
College Educated			0.00	(0.05)	0.02	(0.05)
Working Part Time			0.12	(0.07)	0.19*	(0.08)
Unable to work			0.10	(0.07)	0.11	(0.07)
Percent Poverty			-0.00	(0.00)	0.00	(0.00)
Married					-0.13*	(0.06)
Divorced/Widowed					-0.05	(0.03)
Constant	2.35***	(0.07)	2.23***	(0.18)	2.29***	(0.14)

Appendix Table 29: Wave 1 Disease Activity Full Models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Prior discrimination	2.14*	(0.99)	1.76*	(0.69)	2.27**	(0.82)	2.12**	(0.73)
Age			-0.01	(0.04)	-0.01	(0.04)	-0.02	(0.03)
Organ Damage			1.13***	(0.18)	0.97***	(0.16)	0.98***	(0.13)
Years Since Diagnosis			-0.08	(0.05)	-0.07	(0.05)	-0.07	(0.04)
High School Educated					-1.42	(1.83)	-1.16	(1.62)
College Educated					-2.22*	(1.13)	-1.96	(1.04)
Working Part Time					-0.35	(1.21)	-0.49	(1.27)
Unable to work					2.18**	(0.83)	2.34*	(0.99)
Percent Poverty					-0.01***	(0.00)	-0.01***	(0.00)
Married							1.85	(1.00)
Divorced/Widowed							0.53	(0.99)
Constant	14.42***	(0.51)	13.49***	(1.79)	16.51***	(2.36)	15.56***	(2.34)
Observations	375		375		375		375	
BIC	2638.56		2610.90		2572.16		2579.07	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 30: Disease Activity Wave 2 Full Models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Prior 6m discrimination (W2)	1.63*	(0.78)	1.60*	(0.73)	1.65*	(0.83)	1.50*	(0.71)
Disease Activity (w1)	0.78***	(0.03)	0.76***	(0.03)	0.76***	(0.03)	0.75***	(0.04)
Respondent Age			-0.03	(0.02)	-0.02	(0.02)	-0.02	(0.02)
Organ Damage			0.12	(0.11)	0.14	(0.13)	0.14	(0.14)
Years Since Diagnosis			-0.01	(0.02)	-0.01	(0.03)	-0.01	(0.03)
High School Educated					-0.40	(1.13)	-0.22	(1.06)
College Educated					0.00	(0.60)	0.07	(0.56)
Working Part Time					-0.30	(0.85)	-0.16	(0.77)
Unable to work					-0.46	(0.61)	-0.44	(0.66)
Percent Poverty					-0.00	(0.00)	-0.00	(0.00)
Married							0.77	(0.50)
Divorced/Widowed							0.53	(0.29)
Constant	2.02***	(0.46)	3.23**	(1.11)	4.05*	(1.71)	3.24	(1.71)
Observations	375		375		375		375	
<i>BIC</i>	2214.63		2229.22		2257.44		2264.98	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 31: Disease Activity Wave 3 Full Models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Prior 6m discrimination (W2)	1.91	(1.09)	2.11*	(0.99)	2.19	(1.31)	2.10	(1.10)
Prior 6m discrimination (W3)	-0.49	(0.89)	-0.50	(0.97)	-0.47	(1.00)	-0.37	(0.87)
Disease Activity (w1)	0.75***	(0.02)	0.70***	(0.03)	0.70***	(0.04)	0.70***	(0.04)
Respondent Age			0.02	(0.03)	0.02	(0.03)	0.02	(0.03)
Organ Damage			0.36**	(0.12)	0.38**	(0.13)	0.38***	(0.10)
Years Since Diagnosis			-0.04	(0.03)	-0.04	(0.03)	-0.04	(0.03)
High School Educated					-2.34**	(0.82)	-2.30**	(0.88)
College Educated					0.24	(0.62)	0.26	(0.72)
Working Part Time					0.15	(0.87)	0.17	(0.88)
Unable to work					-0.26	(0.61)	-0.23	(0.60)
Percent Poverty					0.00	(0.00)	0.00	(0.00)
Married							0.19	(0.65)
Divorced/Widowed							0.31	(0.45)
Constant	1.98***	(0.39)	1.32	(1.24)	3.66*	(1.66)	3.37*	(1.44)
Observations	375		375		375		375	
BIC	2251.57		2255.10		2278.76		2289.39	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 32: Psychological Distress Wave 1 Ful Models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Prior Discrimination	0.14**	(0.05)	0.10*	(0.04)	0.11**	(0.04)	0.12**	(0.04)
Respondent Age			-0.00*	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Organ Damage			0.00	(0.01)	0.01	(0.01)	0.01	(0.01)
Disease Activity			0.02***	(0.00)	0.02***	(0.00)	0.02***	(0.00)
Years Since Diagnosis			-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
High School Educated					-0.22***	(0.06)	-0.22***	(0.04)
College Educated					-0.06	(0.05)	-0.06	(0.06)
Working Part Time					-0.03	(0.08)	-0.02	(0.07)
Unable to work					-0.03	(0.07)	-0.03	(0.06)
Poverty Percentage					-0.00	(0.00)	-0.00	(0.00)
Married							-0.03	(0.05)
Divorced/Widowed							-0.04	(0.06)
Constant	2.44***	(0.04)	2.29***	(0.11)	2.59***	(0.13)	2.59***	(0.10)
Inalpha								
Constant	-2.32***	(0.11)	-2.74***	(0.18)	-2.84***	(0.25)	-2.84***	(0.26)
Observations	375		375		375		375	
BIC	2263.21		2204.13		2218.58		2229.96	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 33: Psychological Distress Wave 2 Full Models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Prior 6m discrimination (W2)	0.12*	(0.06)	0.08	(0.06)	0.11	(0.06)	0.11	(0.07)
Psychological Distress (w1)	0.04***	(0.00)	0.03***	(0.00)	0.03***	(0.01)	0.03***	(0.00)
Respondent Age			0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
Organ Damage			-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Disease Activity			0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)
Years Since Diagnosis			-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
High School Educated					-0.02	(0.06)	-0.03	(0.06)
College Educated					-0.02	(0.05)	-0.02	(0.06)
Working Part Time					-0.01	(0.09)	-0.01	(0.06)
Unable to work					0.07	(0.06)	0.06	(0.05)
Poverty Percentage					-0.00	(0.00)	-0.00	(0.00)
Married							-0.02	(0.06)
Divorced/Widowed							0.01	(0.02)
Constant	2.07***	(0.06)	1.98***	(0.11)	2.03***	(0.12)	2.04***	(0.13)
Inalpha								
Constant	-2.53***	(0.18)	-2.70***	(0.21)	-2.72***	(0.26)	-2.73***	(0.26)
Observations	375		375		375		375	
BIC	2241.18		2235.92		2262.03		2273.34	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix Table 34: Psychological Distress Wave 3 Full Models

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Prior 6m discrimination (W2)	0.13*	(0.05)	0.09	(0.06)	0.14*	(0.06)	0.14*	(0.06)
Prior 6m discrimination (W2)	0.04	(0.09)	0.01	(0.08)	0.02	(0.08)	0.01	(0.07)
Psychological Distress (W1)	0.04***	(0.00)	0.03***	(0.01)	0.03***	(0.00)	0.03***	(0.01)
Respondent Age			-0.00	(0.00)	-0.00	(0.00)	-0.00	(0.00)
Organ Damage			-0.01	(0.01)	-0.01	(0.01)	-0.01	(0.01)
Disease Activity			0.01***	(0.00)	0.01***	(0.00)	0.01***	(0.00)
Years Since Diagnosis			-0.00	(0.00)	0.00	(0.00)	0.00	(0.00)
High School Educated					-0.06	(0.06)	-0.06	(0.05)
High School Educated					-0.09	(0.05)	-0.09	(0.06)
Working Part Time					0.05	(0.06)	0.05	(0.07)
Unable to work					0.09*	(0.04)	0.09	(0.05)
Poverty Percentage					-0.00	(0.00)	-0.00	(0.00)
Married							-0.02	(0.04)
Divorced/Widowed							0.00	(0.04)
Constant	1.93***	(0.06)	2.01***	(0.11)	2.13***	(0.14)	2.15***	(0.16)
Inalpha								
Constant	-2.76***	(0.23)	-2.94***	(0.34)	-3.02***	(0.28)	-3.02***	(0.32)
Observations	375		375		375		375	
BIC	2166.31		2164.97		2181.65		2193.10	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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