"Becoming American": Exploring Exposure to the US and Health Among Latina/os

by

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Dedication

This dissertation is dedicated to the formidable forces in my life: my grandparents, Jesus and Olga. Grandma and Grandpa, you carried me through this dissertation. I thought of you constantly as I worked on this labor of love. I imagined the journey that you embarked on and the blood, sweat, and tears that you shed in paving a path for me in this country. Grandpa, I could you feel your hugs and the rough palms of your hands on my shoulders as I sat at my desk. I feel your presence every day and I miss you. Grandma, you were the first storyteller in my life who inspired me to write and tell stories of my own. You taught me about who I am and where I came from. I love you both.

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List of Acronyms/Abbreviations

BMI	body mass index
CVD	cardiovascular disease
CVH	cardiovascular health
DAPA	Deferred Action for Parents of Americans
DACA	Deferred Action for Childhood Arrivals
DBP	diastolic blood pressure
HCHS/SOL	Hispanic Community Health Study/ Study of Latinos
HPA	hypothalamic–pituitary–adrenal axis
LDL	low-density lipoprotein cholesterol
NH	non-Hispanic
NHANES	National Health and Nutrition Examination Survey
NHIS	National Health Interview Survey
RQ	research question
SBP	systolic blood pressure
SES	socioeconomic status
SNS	sympathetic nervous system
WC	waist circumference
WHR	waist-hip ratio

Abstract

Increasingly the field of public health and scholarship on racial/ethnic health inequities has shifted upstream by developing frameworks and research that elaborate how race and racialized societies impact health. However this upstream view of race has been missing in the preponderance of research on the health of Latina/os in the United States, and scholars studying Latino health inequities have largely ignored structural racism factors that shape Latinos' lives and their health. This dissertation aims to addresses this gap by interrogating the Latino Health Paradox, a research finding that suggests that the health of Latina/os declines with more time in the US and across generations. Paper 1 reviews literature on the Latino health paradox and builds an interdisciplinary conceptual model to outline how structural racism, the perpetuation of deeply embedded systems of racial inequities, may shape these health patterns among generations of Latinos. Paper 2 employs data from the Mexican Family and Life Survey (MxFLS) to investigate differences in cardiovascular health among Mexico-US migrants and non-migrants, and specifically explores how exposure to the US shapes cardiovascular health. Finally, Paper 3 conceptualizes how immigration policy contributes to the racialization and stigmatization of Latinos in the US, the psychosocial "surround" Latinos navigate as result, and the implications of these processes for health. The paper then taps into Twitter data collected after the passage of immigration policies in the US to explore the psychosocial and material benefits and constraints of these policies on Latino lives and health.

Chapter 1 Introduction

The tide may be shifting on the study of racial/ethnic health inequities in the United States. In the 1990s, various public health institutions began new concerted efforts to reduce and eliminate health inequities across racial/ethnic lines in the United States. To be sure, researchers and policymakers had focused on race and health prior to the 90s, however this period ignited a national focus that shaped the landscape of public health for years to come. For example, the Office of Minority Health was officially created within the Department of Health and Human Services in 1990 and the Office of Research on Minority Health (ORMH) at NIH in 1993. Congress commissioned the landmark Institute of Medicine report "Unequal Treatment" which assessed the nature of healthcare inequities by race/ethnicity (A. Nelson, 2002). Meanwhile Healthy People 2000, developed by the Department of Health and Human Services, listed the elimination of health disparities, including those by race and ethnicity, as one of its central goals (US Department of Health and Human Services & National Center for Health Statistics, 1993).

Dominated by a biomedical framework, however, the majority of research on race and health that emerged in the 1990s pointed to individual behavior, genetics, and healthcare as major contributors, obscuring the landscape of research and stalemating progress on racial/ethnic health inequities. Alternatively, many public health scholars proposed a "fundamental causes" approach in arguing that racial inequities in health instead reflected the embodiment of the racialized ideologies and structural inequities that dominated the lives of people of color in the US (Geronimus & Thompson, 2004). In recent years, the field has increasingly shifted upstream

by developing frameworks that elaborate how racialized societies and race impact health and applying these perspectives to novel empirical research (Bailey et al., 2017; Gee & Ford, 2011; Hicken, Kravitz-Wirtz, Durkee, & Jackson, 2018a).

And yet, this upstream view of race has been missing in the preponderance of research on the health of Latina/os[1] in the United States. A vast body of ethnographic and sociological work points to the ways in which racial animus has framed Latinos as un-American, criminal, illegal, and "other" (Almaguer, 1994; José A. Cobas & Feagin, 2008; Molina, 2014; Portes & Rumbaut, 2006; Telles & Ortiz, 2008). These forms of cultural racism have then shaped institutional inequities in education, labor, housing, and other sectors, interpersonal experiences of discrimination, and the psychosocial toll of navigating a world in which you are constantly told "You don't belong here"(Molina, 2016).

Despite the evidence of historically-rooted oppression experienced in the daily lives of US and immigrant Latinos, scholars studying Latino health inequities have largely ignored the structural factors that shape Latinos' lives and their health (Echeverría et al., 2013; Viruell-Fuentes, Miranda, & Abdulrahim, 2012; Zambrana & Carter-Pokras, 2010). Several studies have documented what is termed the "Latino health paradox" in which US-born Latinos have worse health profiles in comparison to their foreign- born coethnics, and greater time in the US is associated with poorer health among immigrants (Acevedo-Garcia & Bates, 2008). The majority of studies that seek to unpack the heterogeneity in health outcomes across Latino subgroups often rely on individual-level explanations for variations in health such as differences in physical

[1] Throughout this dissertation, I use the terms Latina/o and Latino interchangeably. I refer to the terms Hispanic/Non-Hispanic when used by an author or article. I recognize the term Latinx has become increasingly adopted to express gender-neutral and inclusive language. While I use this term in my day-to-day life, I remit to Latina/o given the current conventions of the field and popular usage within Latinx communities.

activity, nutrition, and other proximate health factors (Abraído-Lanza, Chao, & Flórez, 2005; Abraido-Lanza, Dohrenwend, Ng-Mak, & Turner, 1999; Palloni & Arias, 2004). Further, a myriad of studies attempt to capture the acculturation or assimilation practices of migrant and US born Latinos that shape health, without considering the dynamic interplay of structure, culture, and behavior (L. M. Hunt, Schneider, & Comer, 2004; Isasi, Ayala, et al., 2015; Kagawa Singer, 2012; Riosmena, Everett, Rogers, & Dennis, 2015; Zambrana & Carter-Pokras, 2010). As a result, policies and interventions designed with an overreliance on these proximate determinants of health miss the mark and fail to truly understand and address Latino health inequities.

In this dissertation, however, I aim to build on research that points to an alternative explanation for the deterioration of Latino health across generations and time in the US. This body of work argues that Latino migrants and their US born coethnics are racialized bodies in a socially, economically, and racially stratified society in the US (Viruell-Fuentes et al., 2012). As such declines in Latino health across time and generations is the result of the physical embodiment of lifelong and repeated stress-exposures from contending with this environment, the restricted access to social and economic resources, the deterioration of social support and autonomous coping resources, and the perpetuation of deeply embedded systems of racial and socioeconomic inequities (Domínguez & Watkins, 2003; Geronimus & Thompson, 2004; James, 1993; Kaestner, Pearson, Keene, & Geronimus, 2009; Pearson, 2008; Viruell-Fuentes, 2007). In order to better develop research, interventions, and policies towards maintaining and improving Latinos' health, we must continue to draw on and develop these new paradigms that outline the multilevel pathways by which racial ideologies and social structures shape individual life chances, experiences, behavior, and health.

Latina/os also represent a unique case with which to approach the study of race and health in the United States. The 58 million Latinos in the US encompass a population with diverse[2] and varied backgrounds which shape their experiences in the US (A. Flores, 2017a). Mexican and Mexican Americans account for 63 percent of Latinos, the largest country-of-origin subgroup, however migration from Mexico has declined recently. Puerto Ricans, meanwhile, make up the second-largest share of Latinos with 5.3 million in the US, 3.4 million on the island, and increasing rates of migration to the mainland. Finally, over the last 10 years, migration from Central America has boomed and Central Americans now make up 10 percent of the Latina/o population, largely from El Salvador, Honduras, and Guatemala. Importantly, despite strong roots in migration, since the 1960s the share of US-born Latina/os has exceeded the foreign born population (A. Flores, 2017b). While the foreign-born population increased from 1970-2000s, to a high of 40 percent of all Latinos, the proportion of immigrants has since declined. This demographics shift puts into sharp focus the importance of the experiences and health of the US-born in shaping overall trends among Latinos. Finally, while Texas, California, and Florida dominate the share of the US Latina/o population, since the 1990s Latino have dispersed to newer regions including the South and Northeast (Stepler & Lopez, 2016).

Interrogating race, through the lens of the Latina/o experience in the US therefore provides us with unique opportunities within which to explore how race matters for health. While the US operates with a consistent white-black racial hierarchy in the backdrop, racialization processes, the ways in which race is made and the meanings assigned to racial

[2] Throughout this dissertation, I fall into the common trap of largely characterizing Latinos as a monolithic and homogenous group with a singular experience. However my goal in this work is to present a framework that captures how race shapes all Latina/os in the US and I attempt to highlight, when I can, how unique experiences by citizenship, country-of-heritage, migration status, gender, and place of residence add dimensions to this framework.

categories, are ever-changing and continually in flux in the US (Bonilla-Silva, 1997; Omi & Winant, 1994). Across historical periods, sociopolitical contexts, and contexts of residence, Latina/os and their families negotiate the implications of these racialization processes with divergent outcomes depending on their circumstances. Some Latinos and their families have been part of US society since the 1800s, while new waves of migration have created new generations of Latinos who faced different types of social and political reception in the US. Furthermore, some Latinos are the products of colonization while others embarked on legal or undocumented migration and distinct pathways in the US. Finally some Latinos are deeply-embedded in ethnic communities but face limited socioeconomic mobility, while others are traversing educational and labor ladders (and barriers) in attempts to forge an emerging Latino middleclass (José A. Cobas & Feagin, 2008; Vallejo, 2012). These diverse migration and intergenerational pathways allow us to explore how race is experienced (and learned) in the US, transmitted across generations, and the social, political, and economic circumstances that intersect to shape individual experiences and health.

In addition to these potential conceptual and scholarly contributions, advancing research on Latino health inequities is central to the field's broader goal of reducing racial/ethnic health inequities and improving our nation's health. Latinos constitute a diverse and growing segment of the US population. From 2000 to 2010 Latinos were the main driver of population growth in the US. Currently Latinos make up nearly 18 percent of the US population, the second-largest racial or ethnic group behind whites, and are projected to reach 30 percent of the population by 2050 (A. Flores, 2017b). While migration of foreign-born Latinos has partially contributed to this demographic growth, in fact, the children of immigrants and 3rd-and later generations compromise the fastest growing segment of the Latino population. Thirty-five percent of all

Latinos are under the age of 18, and Latino youth compromise a quarter of all children in the US (Foxen, 2013). Latinos increasingly shape communities across the US, influence our social institutions, and impact economic and political processes (Saenz, 2012). So too, Latino health inequities will shape the landscape of racial/ethnic health inequities in the US and overall population health indicators.

This dissertation draws on qualitative and quantitative research approaches to illuminate the ways in which the experience of race and racism matter for the lives and health of Latina/os in the United States. Through this work I interrogate structural racism in the US and how both its direct and subtle manifestations take their toll on racialized groups. I take the case of Latina/os in the US and explicate the ways in which structural racism may uniquely shape their lives and health. The empirical chapters of this dissertation then explore these arguments and conceptualizations further and propose new avenues to explore the role of structural racism on Latino health. As such, this dissertation is comprised of five chapters.

Chapter 2 provides a critical literature review of the health of Latinos across time and generations in the US and presents an emerging conceptual model, "Becoming American", which outlines how structural racism shapes the lives of Latinos and may contribute to these health patterns. This conceptual model draws on literature from public health and the social sciences to detail the permutations of structural racism in society and how racism may become embodied by Latina/os to shape their health. Importantly, this discussion elaborates the role of cultural racism in shaping and rationalizing both institutional and interpersonal racism.

Chapter 3 uses data from the Mexican Family Life Study to explore the health dynamics that shape migration to the US among Mexicans. In addition, I analyze whether migration to the US and time spent in the US shapes cardiovascular health and health-behaviors by comparing

Mexican who migrated to the US to those who did not migrate. This analysis provides an indirect test of "Becoming American" because it first tests the hypothesis that exposure to the US is associated with negative health, net of difference in health behaviors or health selection factors.

Chapter 4 explores how immigration policy contributes to the racialization and stigmatization of Latinos in the US, the psychosocial "surround" Latinos navigate, and the implications of the processes for health. This paper then tests this framework through a qualitative analysis of Twitter data after the passage of two immigration policy case studies. This analysis traces the ways in which Twitter users discuss the role of immigration policy in shaping and denying their both psychosocial and material benefits as members of the body politic. In addition, I draw on extant literature to conjecture how these emerging themes of these may relate to health. Collectively, these papers explore structural racism and Latino health from multiple angles and point to new ways to conceptualize why and how race matters for health. In Chapter 5, I conclude with broad and overarching findings from these papers and future research directions.

Chapter 2 "Becoming American" Conceptual Model

Considerable progress has been achieved in research on the effects of racial inequities on the health of racial/ethnic minorities. Multiple forms of racism, including interpersonal experiences of discrimination and population-level markers of racial bias, have been linked to increased morbidity and mortality across the lifecourse. The mechanisms underlying these associations have yet to be fully elucidated; however, scholars theorize that racism (1) shapes racial minorities' inequitable experiences of social and economic disadvantages (Williams & Mohammed, 2009); (2) exposure to explicit and implicit racialized messages of othering (Essed, 1991; C. J. P. Harrell et al., 2011); and (3) contributes to the breakdown of cultural and social supports that racial minorities rely on for their physical and psychological wellbeing (Geronimus, 2000; James, 1994; Keene, Padilla, & Geronimus, 2010; Pearson, 2008; Viruell-Fuentes, 2011).

Racism operates through complex physiological, psychological, and behavioral pathways to exact a toll on health, and in particular chronic and cardiovascular disease. Social, economic, and cultural marginalization over the lifecourse as a result of racism is theorized to over-activate stress response systems in the body, leading to declines in health (Geronimus, 1992; McEwen, 1998). Furthermore, marginalized individuals have been shown to engage in risk behaviors, such as smoking, poor diets, and limited exercise, often as forms of coping (Dallman et al., 2003; Isasi, Parrinello, et al., 2015; Jackson, Knight, & Rafferty, 2010; W. D. Lopez, Konrath, & Seng, 2011; Ornelas et al., 2015; Vásquez et al., 2016). Finally, structured inequities in access to health

care and social resources limit racial/ethnic minorities' ability to manage health conditions once they emerge, leading to complex comorbidities, reduced quality of life, and mortality (Buchmueller, Levinson, Levy, & Wolfe, 2016).

Despite these advances, scholars across disciplines have called for the integration of structural racism frameworks in studying links between racial inequities and health (Bailey et al., 2017; Gee & Ford, 2011; Geronimus, 2000; Viruell-Fuentes et al., 2012). Structural racism refers to the historical and ongoing reproduction of "racist ideologies [that] lead to controlling images, discourses of hegemonic whiteness, and racialized identities, which in turn lead to racist practices on the micro- and macrolevel" (T. Golash-Boza, 2016). A growing body of literature has outlined the mechanisms by which structural racism exerts its pernicious tentacles to shape society, ideology, institutions, and policies across time and historical periods (Bonilla-Silva, 1997; Essed, 1991; Ford & Airhihenbuwa, 2010; Gee, Walsemann, & Brondolo, 2012; Omi & Winant, 1994; Phelan & Link, 2015). To date, however, research in public health has only tapped into a limited number of these pathways and mechanisms. This gap is largely because structural racism, by definition, operates across socioecological levels, time, and generations, which present challenges for our existing theoretical frameworks and methodological approaches.

To address these challenges, researchers have engaged in novel research strategies and utilized innovative data to untangle the effects of structural racism on health and wellbeing. These strategies include (1) proxying markers of systematic racial discrimination using population surveys, social media, public policies, and socio-contextual variables (Gee, 2002; Lukachko, Hatzenbuehler, & Keyes, 2014); (2) conceptualizing and operationalizing how structural racism changes across historical moments (Miranda, Schulz, Israel, & Gonzalez, 2011; J. Rodriguez, Bound, & Geronimus, 2013); and (3) using intergenerational and longitudinal data

to measure the enduring effects of structural inequities on health (Brody et al., 2014; Colen, Geronimus, Bound, & James, 2006) . Nevertheless, this area of research is still in its infancy and a major challenge within the field is to continue theorizing and studying the complex role that race and structural racism play in shaping health. By turning our gaze upstream and studying how deeply embedded racial inequities shape health, the scholarship on structural racism offers a promising avenue towards making inroads on health inequities among racial/ethnic minorities.

Furthermore, applying a structural racism lens for studying health among Latinos provides another opportunity to propel this field of research forward. Latinos comprise 17 percent of the US population and represent the nation's largest racial/ethnic minority group (US Census Bureau, 2016). While there is an expansive body of research on Latino health, the majority of this work focuses on proximate risk factors and interventions. Moreover, the excessive focus on the so-called "Latino/Hispanic paradox", a research finding that demonstrates that recently arrived foreign born Latino have better health profiles compared to Non-Hispanic Whites, has resulted in research largely concentrating on cultural, behavioral, or genetic factors that may protect Latino health (Viruell-Fuentes et al., 2012).

However, related to the Latino health paradox is the finding that the health of longer-stay migrants and the US-born declines across time and generations. In light of these findings, some scholars suggest that complex racial inequities and structural racism experienced by Latinos across the lifecourse and generations may play a role in shaping these declines in health (Cacari Stone, Viruell-Fuentes, & Acevedo-Garcia, 2007; Henry-Sanchez & Geronimus, 2013; Viruell-Fuentes et al., 2012). Incorporating a structural racism framework when studying Latinos' health provides an important opportunity to acknowledge the complex historical, social, and political factors that shape Latinos lives and health. Moreover, this research would also advance the

theoretical and empirical literature on the role of racism in perpetuating cardiovascular health inequities beyond the Black-White binary of race.

This review synthesizes the emerging research on structural racism health among ethnic and racial minorities in the United States and points to new directions for research on Latino health. First, I outline the mechanisms by which stress leads to chronic disease, cardiovascular disease, and other health outcomes and how racism has been conceptualized as a potential stressor. Next, I review the literature on Latino health and highlight how this existing research fails to meaningfully incorporate the theoretical and empirical research on race and racism for Latino health. I then summarize key research connecting structural racism and health. In doing so, I show how public scholars have conceptualized and operationalized the complex nature of racism for health research. Drawing on these frameworks, I outline a conceptual model that links processes associated with structural racism to health outcomes among Latinos across times and generations. In this discussion, I provide an overview of structural racism and discuss how racism and racialization processes influence Latino lives in the US. Finally, I conclude by proposing new areas of research that provide avenues to test this conceptual model, and advance research on cardiovascular health among Latinos by using a structural racism framework.

Stress and Links to Health

Acute and chronic stressors across the lifecourse have also been linked to chronic and cardiovascular disease and many health risk factors, largely due to the physiological effects of repeated or persistent stress (Black & Garbutt, 2002; Bunker et al., 2003; Chida & Hamer, 2008). In response to a stressor, the body's goal is to react via fight or flight by diverting energy and resources to the heart and muscles and shutting off other unessential bodily functions (Sapolsky, 2004). To accomplish this, the body activates the sympathetic nervous system (SNS) to release

norepinephrine and epinephrine and triggers the hypothalamic–pituitary–adrenal (HPA) axis to release glucocorticoids (cortisol in humans)[3]. In addition, the SNS also causes the veins in our body to constrict, increasing blood pressure and making the heart pump with more force. The released glucocorticoid, norepinephrine, and epinephrine hormones also trigger the breakdown of triglycerides in fat cells, protein in non-exercising muscles, and glycogen in other body cells. In addition, the glucorcorticoids also disrupts any insulin in the bloodstream from storing these energy sources back into their storage cells. As a result, the blood stream is flooded with glucose, fatty acids, and amino acids that are used to fuel the muscles in the body and respond to the stressor. The body's physiological response to stress is well adapted to react to short-term acute stressors, but research has shown that these processes can be detrimental for health when stress is prolonged.

In the face of repeated acute stressors or chronic stress, turning on/off the stress response system or continuously activating the stress response can have pernicious consequences for health. Increased blood pressure because of the stress response can lead to chronic hypertension. Blood veins that are responsible for regulating blood flow become hardened and rigid over time, in order to withstand the increasing blood pressure, which leads to even more pressure. In the heart, blood returning at a higher force can cause the muscles in the left ventricle to thicken, causing a lopsided heart and potentially irregular heartbeat. Meanwhile, the body expends a significant amount of energy in secreting proteins, sugar, and triglycerides, and then releasing insulin to re-store molecules that remain in the bloodstream. These processes can damage insulin-secreting cells in the pancreas or create insulin-resistance, leading to diabetes.

[3] In this process, the hypothalamus first releases corticotropin releasing hormone (CRH) which activates the release of ACTH from the pituitary gland, which eventually causes the adrenal gland to release glucocorticoids.

Throughout the body, arteries and veins can also become damaged due to increased blood pressure. As a result, immune cells begin to clump in these areas, along with the fatty acids, amino acids, and glucose that are excreted from the cells for energy, creating a build-up of atherosclerotic plaque in the damaged veins and arteries. Disruptions in the heart can cause heart failure, while clogged circulatory systems (thrombosis) or traveling plaque (embolus) can obstruct blood flow leading to heart attack or stroke. Due to this cascade of potentially harmful mechanisms, "the stress response [then] can become more damaging than the stressor itself" (Sapolsky, 2004, p. 13).

Furthermore, emerging research suggests that activation and deactivation of the stress response system can also become dysregulated due to chronic, early life, and intergenerational stressors. Researchers, for example, have documented that repeatedly turning on the stress response makes it more challenging for the body to later turn off the secretion of stress hormones after a stressor has occurred, which in turn is linked to accelerated aging (Tsigos & Chrousos, 2002). In another stream of work, scholars suggest that early life experiences of stress and adversity may predispose individuals to mount a greater inflammatory response to future stressors in adulthood (G. E. Miller et al., 2009). In addition, research in epigenetics also proposes that early life and in-utero conditions may confer a proinflammatory epigenetic signature and heighten the stress responses over the lifecourse (Kuzawa & Sweet, 2009; G. E. Miller et al., 2009).

In addition to these physiological processes, scholars are now beginning to unpack the ways in which stressors may predispose individuals to engage in poor health behaviors that impact morbidity and mortality. Psychological distress, for example, has been linked to cigarette smoking and failed attempts to quit smoking (Castañeda et al., 2016; Dube et al., 2009).

Furthermore, spikes in cortisol were associated with increased food and sugar consumption in lab studies (Epel, Lapidus, McEwen, & Brownell, 2001), while in population studies higher levels of stress were associated with binge eating and drive to eat (Groesz et al., 2012). Stress hormones have also been shown to activate neural pathways related to cognitive decline, depression, and anxiety, which are also related to cardiovascular disease. Finally, the growing body of literature on stress and sleep demonstrates that the activation of the HPA axis during chronic stress plays a role in disrupting sleep cycles, while disrupted sleep has been shown to be associated with numerous pathways that lead to cardiovascular disease (Grandner, Sands-Lincoln, Pak, & Garland, 2013; Van Reeth et al., 2000).

Both laboratory studies with animal and human subjects as well as population-based studies have been used to explicate the role of stress reactivity on health. Lab studies with animal models have allowed researchers to more finely measure the mechanisms of the stress response system, as well as modify stress exposures in experimental settings (Leong, Ng, & Jaarin, 2015). Population studies provide the real-world connections to detail the range of stressors that affect health. In prospective studies, relatively common life stressors such as marital conflict (Eaker, Sullivan, Kelly-Hayes, D'Agostino, & Benjamin, 2007; Orth-Gomér et al., 2000), workplace strain (Backé, Seidler, Latza, Rossnagel, & Schumann, 2012), and caregiving burden (Känel et al., 2012; S. Lee, Colditz, Berkman, & Kawachi, 2003) have been linked to elevated stress biomarkers, CVD prevalence, and CVD-related mortality.

Furthermore, several scholars have explored how living in inequitable societies may also shape risk for stress-induced conditions, arguing that individuals who perceive having a low status within a social hierarchy may face low-grade chronic stress (Marmot, 2004). For example, Diez-Roux et al and Franzini et al found that living in regions with higher income inequality was

associated with cardiovascular disease risk factors and years of life loss to heart disease, although stress response dysregulation was not measured in these studies (Diez-Roux, Link, & Northridge, 2000; Franzini & Spears, 2003). Research on the lifecourse effects of early life poverty, trauma, and adverse environments has also contributed to the body of knowledge on how stressors across the lifecourse can have enduring effects on cardiovascular health (Lynch & Smith, 2005). Finally, a wide body of research also implicates racial discrimination and marginalization as an important stressor that shapes racial inequities in chronic and cardiovascular disease (Nazroo, 2003). Largely, however, these advancements have not been implemented in research on Latinos, which continues to focus on cultural and behavioral factors that shape health.

Health Research Among Latinos

Since the 1980s, researchers have documented that across a number of health indicators foreign-born Latinos have better health outcomes and lower mortality in comparison to non-Latino whites and some racial/ethnic minority groups, despite their relatively lower socioeconomic status and riskier health profiles (Acevedo-Garcia & Bates, 2008; K. J. Hunt et al., 2003, 2003; K S Markides & Coreil, 1986). Later research has demonstrated that US born Latinos exhibit worse health in comparison to the foreign born, and that the health profiles of Latinos immigrants decline with more years in the US (Acevedo-Garcia, Soobader, & Berkman, 2007; Kyriakos S. Markides & Eschbach, 2005; Ruiz, Steffen, & Smith, 2013; Urquia, O'Campo, & Heaman, 2012). This health phenomenon has been coined "the Latino health paradox," because migrants often arrive with low education, income, and access to health resources; however, these disadvantages do not result in poor health as the leading public health models would suggest. Further, scholars would expect that as Latinos across generations increase

their socioeconomic status and footing within the US their health would improve, but instead we encounter the opposite.

This broader Latino health paradox also occurs for many chronic conditions (Cortes-Bergoderi et al., 2013). In comparison to foreign born Latinos, US born Latinos are at greater risk of CVD (Dominguez et al., 2015). In addition, several studies have found that among the foreign born, greater duration in the US is associated with increasing prevalence of cardiovascular disease and associated risk factors (Daviglus, Pirzada, & Talavera, 2014). Coronary heart disease and stroke prevalence is also higher among the US born as compared to the foreign born, and greatest among the second and third generation Latinos as compared to the first generation (Daviglus et al., 2012). Furthermore, risk factors for CVD including hypertension and diabetes have been shown to significantly reduce Latinos' quality of life and contribute to national health care expenditures (Centers for Disease Control Foundation, 2015; Martinelli et al., 2008). Importantly, Latinos overall have lower cardiovascular disease morbidity and mortality in comparison to NH-whites, and African Americans, although again this appears to be driven by the health advantage of the foreign born (Balfour et al., 2016).

The health paradox is most consistent among the Mexican-origin population, although recent studies have provided new data to uncover intergroup heterogeneity in health trends. The majority of studies have sampled Mexican origin Latinos or, due to sample size limitations, aggregated Latinos across countries of origin (Schoenthaler, 2017). In an analysis of mortality data from 2002-2013, however, Rodriguez et al disaggregated by country of origin and found that Mexican men and women had lower CVD mortality compared to the NH White counterparts; however, Puerto Ricans and Cubans had comparable rates to NH Whites (F. Rodriguez et al., 2017). Similarly, the HCHS/SOL found that overall age-adjusted hypertension

prevalence rates are higher in Dominican, Puerto Rican, and Cuban adults compared to Mexicans and South Americans.

Recognizing that country-of-origin and generational status differences in health may reflect unique sociopolitical and contextual circumstances, researchers have increasingly shifted to studying how different social contexts faced by Latino subgroups affect health. For example, Rodriguez and colleagues sampled older Hispanics in the US and in Puerto Rico, finding that those on the island had less controlled blood pressure and worse blood lipid profiles than those on the mainland and NH Whites, but lower levels of cardiovascular disease (C. J. Rodriguez et al., 2017) In the US, context of residence has also been shown to matter for CVD health among Latinos. In their analysis of Puerto Rican and Mexican health in Chicago, Lee and Ferraro found that living in segregated ethnic-communities was deleterious to health for Puerto Ricans, protective for second generation Mexicans, and had no effects on the health of 1st generation Mexicans (M.-A. Lee & Ferraro, 2007). Protective or null effects of ethnically segregated communities has similarly been documented in other studies (Eschbach, Ostir, Patel, Markides, & Goodwin, 2004; Kershaw, Osypuk, Do, Chavez, & Roux, 2014; Merkin et al., 2009).

Meanwhile, exposures to potentially stressful policy environments may also be deleterious for the health of Latinos. For example, recent studies have found that residing in anti-immigrant climates is associated with less physical activity and increased obesity (Philbin et al., 2016) as well as worse physical and mental health (Vargas, Sanchez, & Juárez, 2017) among both US and foreign-born Latinos. Further studies on allostatic load, a marker of physiological wear and tear due to cumulative exposure to the stress response, show that US-born Latinos as well as longer-stay foreign-born Latinos have higher allostatic load scores and stressors (de Castro, Voss, Ruppin, Dominguez, & Seixas, 2010; Kaestner et al., 2009; Peek et al., 2010;

Salazar et al., 2016). Collectively these studies bring into focus how the social, political, and economic environment faced by Latinos in the US may be harmful to health, the resources that Latinos leverage to buffer these environments, and how intersectionality frameworks can be used to explore the diverse experiences of Latino subgroups (Viruell-Fuentes et al., 2012). However, as I discuss next, the leading explanations for the declines in health among Latinos fail to adopt this more nuanced approach.

Explanations for the Latino Health Paradox.

The vast heterogeneity in health outcomes among Latinos across countries of origin, nativity, generational status, language use, and socioeconomic status underscore the importance of considering how these intersecting dimensions reflect the historical and structural factors that shape power and privilege, access to health resources, and exposure to health-promoting and harming experiences (Acevedo-Garcia, Sanchez-Vaznaugh, Viruell-Fuentes, & Almeida, 2012; Geronimus, 2000) . To date, however, the three major hypotheses that have dominated the literature, the healthy migrant, return-migration, and the acculturation/assimilation hypotheses, frame declines in health across time in the US as the result of individual behaviors or data artifacts. Below, I discuss the theoretical strengths and limitations of these arguments and review the empirical literature that evaluates these hypotheses.

Healthy Migrant Hypothesis.

The healthy migrant hypothesis suggests that Latino immigrants to the US represent the healthiest segment of their sending countries' population. Migrants may be healthier than those in the general population for several reasons. First, those who decide to migrate or are chosen by their families to migrate may represent the "heartiest" individuals, those who have the physical capacity and economic means to migrate as well as intrinsic personal characteristics that are

related to health (e.g. determination, self-esteem, motivation)(Jasso, Massey, Rosenzweig, & Smith, 2004). In addition, individuals who migrate may be subject to health screenings by immigration authorities, which would exclude unhealthy individuals. Finally, some suggest that many sending countries in Latin American have overall better health behaviors than the. As a result, proponents of the healthy migrant hypothesis argue that comparing the health outcomes of the foreign-born to the US-born is not appropriate because migrants, due to these self-selection, immigration screenings, or sending-country factors, are healthier at the outset. However, these arguments may not hold up, as migration flows from Latin American have largely been driven by low-skilled labor migrants, family reunification, and political conflict. Nor are there health screening for undocumented immigrants, Puerto Ricans, and many temporary migrants, and rejection of immigrant visas due to health factors is relatively low (Wasem, 2010). Therefore, health selection may not be a significant factor in considering the health of Latino migrant groups.

Empirical data to support the argument for healthy migrant selection among Latino migrants are mixed. In several analysis, researchers tracked the migration patterns of young-adult Mexicans and found that physical health was only slightly related to migration, mental health was not associated with migration, and that living in a state where migration was common was the strongest predictor (Nobles, Rubalcava, & Teruel, 2013; L. N. Rubalcava, Teruel, Thomas, & Goldman, 2008). In another study, Bostean linked data from Mexico and the US and found that there was no significant difference between Mexican non-migrants and migrants in terms of chronic conditions, but non-migrants were less likely to have activity limitations (Bostean, 2013). Few studies, however, have expanded samples to Central, South, and Caribbean Latinos, with some exceptions. In their analysis of National Immigrant Survey data, Akresh and Frank

again found that Mexican migrants were not positively selected for health, but that Central and South American migrants were less likely to display negative health selection (Akresh & Frank, 2008). Meanwhile, Abraido-Lanza consistently found mortality advantages among foreign-born Latinos as compared to US and foreign-born Whites, suggesting that health selection is not a plausible factor for better health among Latino migrants (Abraido-Lanza et al., 1999). Using Current Population Survey data Hamilton compared immigrants to both US-born in-state movers and all US-born adults and found that Hispanic immigrants overall had a health advantage over in-state movers and US-born adults (T. G. Hamilton, 2015). Finally, in one of the most comprehensive studies, Ro and colleagues compiled data from 19 sending countries and US CPS data to compare the health of non-migrants and migrants (Ro, Fleischer, & Blebu, 2016). From their analysis, Mexican, Guatemalan, and Ecuadoran migrants displayed the lowest levels of health selection, Dominicans and Puerto Ricans fell in the middle, while Colombian and Argentinian migrants had the highest levels of positive health selection. Further, levels of health selection still did not account for the immigrant health advantage over US-born whites (Ro et al., 2016) .

Return-Migration/Salmon Bias:

Next, the return-migration or salmon bias hypothesis proposes that less healthy migrants in the US return to their country of origin if their health deteriorates, and that this selective out-migration underestimates the true morbidity and mortality of immigrants in the US (Abraido-Lanza et al., 1999; Pablos-Méndez, 1994; Turra & Elo, 2008). The return-migration hypothesis draws on anecdotal evidence that showed that some migrants who became extremely ill in the US would return to Latin America to be cared for by their kin, seek medical care, and, in some cases, die. As a result, statistics on the health and mortality of Latino migrants might not include

these sick or deceased individuals, and therefore the data on Latino migrants would appear artificially healthy. One major limitation of the return-migration hypothesis, however, is that while historically many Latino migrants engaged in circular migration, increasing border security and immigration enforcement has restricted binational migration flows, particularly among the undocumented (Massey, Durand, & Malone, 2003).

The return-migrant hypothesis is arguably one of the more difficult of the three hypotheses to test; however, studies that have attempted to measure return-migration and health have again provided mixed evidence. In one of the first analyses, Abraido-Lanza compared the mortality profiles of Cuban, Puerto Rican, and other Latino subgroups and found that all Latino groups demonstrated a significant mortality advantage compared to Non-Latino Whites (Abraido-Lanza et al., 1999). Since Puerto Rican mortality was included in the national mortality data and Cubans were unlikely to return to Cuba due to political reasons, the author argued return-migration was unlikely to be an explanation for the health advantage among these and other Latino subgroups. Similarly, Turra and Elo used Social Security data to compare mortality among elderly foreign-born Hispanics who resided in the US and those outside the US and found that indeed elderly foreign-born Hispanics outside of the US had higher mortality; however, the authors were doubtful that the magnitude of the difference could explain the Hispanic advantage (Turra & Elo, 2008). However, Arenas and colleagues found that among Mexican migrants, those who self-reported improvements in their health after migration were less likely to return to Mexico; however, there was no difference in return migrants among those who self-reported declines in health and those with no changes in health (Arenas, Goldman, Pebley, & Teruel, 2015). Furthermore those who rated their health worse than peers of their same age and sex were significantly more likely to return to Mexico. However, in a comprehensive analysis of CPS

data, van Hook and colleagues found that among the foreign-born social and economic integration was a stronger predictor of emigration relative to health, although health was particularly relevant for older immigrants (Van Hook & Zhang, 2011). When they explored effects among Mexican immigrants compared to non-Mexican immigrants, poor health was no longer a predictor of emigration among Mexican immigrants.

Acculturation/Assimilation Hypothesis

Finally, the acculturation/assimilation hypothesis argues that recent immigrants arrive in the US with positive health behaviors, strong social support networks, and cultural values that promote health. These practices decline as immigrants "acculturate" and adopt unhealthy behaviors associated with living in the US, such as sedentary lifestyles and poor diets, resulting in worse health (Abraído-Lanza et al., 2005; Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005). This hypothesis is analogous to the health selection hypothesis in proposing that migrants arrive to the US with better health. Of the three hypotheses, the acculturation hypothesis is arguably the most often referenced and researched in the public health literature, and largely draws on early sociological and psychological theories of immigrant adaptation in the US. Furthermore, the acculturation hypothesis also fits conveniently into common explanations for why Americans in general are so unhealthy compared to other high-income countries- namely worse health behaviors and poorer built environments (Avendano & Kawachi, 2014). There are many challenges to this hypothesis, however, including arguments that globalization has already propelled shifts to unhealthy behaviors within Latin America (Martínez, 2013), shifts in health behavior may be reflective of contextual constraints and barriers, and that adaptation to the US is a more heterogeneous and nuanced process (Lopez-Class, Castro, & Ramirez, 2011).

There is mixed evidence to support this argument that Latinos with less exposure to the US engage in optimal health behaviors. In an analysis of HCHS/SOL data, for example, there was substantial variation in cardiovascular health behaviors across countries of origin and gender (González et al., 2012). Mexican, Central American, and Dominican Latinas were significantly more likely to engage in positive health behaviors compared to Puerto Rican and Cuban women, and South American women had the highest level of engagement in positive health behaviors. No analogous differences among Latino men were found although the men tended to have significantly worse CVH behaviors compared to women. Importantly, the authors found no differences in CVH behaviors across nativity status, years in the US, and language use preferences, for all country-of-heritage groups.

Other studies have found that foreign-born Latinos and those with less exposure to the US had better health behaviors; however, the net difference was minimal and unlikely to have significant effects on health. For example, in a review of diet among Latinos, foreign-born Latinos had fruit and vegetable intake that was only 0.96-1.25 servings higher than the US born (Pérez-Escamilla & Putnik, 2007). Studies of physical activity meanwhile have shown the opposite effect, where being US born, spending more time in the US, and more English language use is associated with higher levels of physical activity (Afable-Munsuz & Brindis, 2006; Jurkowski, Mosquera, & Ramos, 2010; Merchant et al., 2015; Palta et al., 2015). Importantly, both smoking (particularly among women) and alcohol use increase among the US born and foreign born with more time in the US (Marcus & Crane, 1985; Pérez-Escamilla & Putnik, 2007). Furthermore, Fenelon used linked health-mortality data and found that that smoking attributable mortality explained the mortality advantage of US born Mexicans and foreign-born

Mexican compared to NH Whites; however, smoking and mortality were not meaningful for Latinos of other national origins (Fenelon, 2013).

Pursuing other lines of inquiry, other scholars have argued that instead of (or in addition to) health behaviors, recently arrived Latinos embrace cultural and social values and behaviors that assure their health, including familialism, community support, and religious observance (Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009) . Over time, these behaviors may wear away as individuals adopt to US values that are more individualistic. However, it is essential to underscore that Latinos represent diverse subgroups with wide variations in values, customs, and behaviors related to cultural factors. For example, in a Pew study Latinos overall shared similar levels of religious commitment as Americans overall (Funk & Martinez, 2014). In addition, across generations the foreign born were more likely to identify a religious affiliation compared to the US born and 2nd/3rd generations; however, there were no differences in religious commitment across generations (Funk & Martinez, 2014). Finally, Mexican, Salvadoran, and Dominican respondents had the highest rates of religious affiliation, while 20 and 26 percent of Puerto Ricans and Cubans respectively identified no religious affiliations.

Similarly, many studies have explicated the role of familialism among Latinos, the strong attachment to nuclear and extended families, and commitment to the provision of support to family support. Villarreal highlights the distinction between attitudinal and behavioral familalism noting that across generations attitudes towards familialism remain high but behaviors may decline (Villarreal, Blozis, & Widaman, 2005). Further using data from the NSFH, Sarkisian measured features of family integration and found that compared to White respondents, Mexican and Puerto Rican respondents were more likely to live with and nearby extended family and provide financial help, and Mexicans were more likely to offer instrumental

help (Sarkisian, Gerena, & Gerstel, 2006). However, socioeconomic status, features of one's nuclear family, and familialism played distinct roles in mediating these relationships. For example, Latinos were more likely to cohabit if they were low SES, but more likely to provide financial support if they had higher SES. Enactment of these familial values, then, are more reflective of socioeconomic circumstances rather than shifts in underlying belief and values systems across generations and time in the US.

Analogous to the familialism argument, researchers also suggest that recent Latino migrants often develop and rely on strong social support networks, which may decline over time in the US. Viruell-Fuentes, however, studied social networks and support among Latinos in Chicago and found that the US-born and longer-stay migrant had larger networks and social resources compared to recent immigrants (Viruell-Fuentes, Morenoff, Williams, & House, 2013). Furthermore, US born Latinos oftentimes become the social navigators and resource brokers for their communities and families. In qualitative work, Latina women as well as middle-class Latinos have described the significant responsibility, extra work, and burden that are associated with taking on this role in their families and communities (Vallejo, 2012; Viruell-Fuentes, 2011). In addition, the literature on transnationalism also demonstrates that Latino migrants often engage in significant ties to their countries of origin that enable them to maintain social networks across time and space (Desipio & Pantoja, 2008; Schiller, Basch, & Blanc, 1995; Vertovec & Vertovec, 2009; Villa-Torres et al., 2017). As demonstrated by this literature, social networks and support systems among US-born and immigrant Latinos are more nuanced and complex than initially conceptualized. Social support and networks are therefore not a feature exclusive to recent Latino migrants , and growing avenues of globalization often enable migrants to maintain relationships and connections across borders.

Instead of using time in the US or nativity status as a marker of acculturation, researchers have also developed acculturation scales to better measure Latinos' adaptation to US norms and values and have applied these measures in studies on health (Center for Subtance Abuse Treatment, 2014). These scales were first implemented to replace crude markers of acculturation, such as years in the US and generational status for more theoretically meaningful measures. The first generation of measures largely used language as a marker of acculturation, which has faced significant critique (Lopez-Class et al., 2011; Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987). Later adaptations have added measures and sub-domains, still these often capture surface-level elements of culture, rely on unidimensional factors, and continue to heavily load on language use items in factor-analysis. While assimilation and acculturation arguments have garnered widespread popularity and research in the public health literature on Latino health, the reviewed literature demonstrate that arguments of the effects of acculturation on health often lack theoretical and empirical rigor. Surveying the origins of acculturation and assimilation frameworks in the social sciences points to potential avenues for reviving this concept.

Origins of Acculturation and Assimilation Frameworks.

Social scientists first developed acculturation frameworks largely for domestic and international anthropology research to explain the patterns of incorporation and adaptation when distinct cultural groups met. Acculturation was originally conceptualized as a multidimensional and bidirectional process "when groups of individuals having different cultures come into continuous first-hand contact, with +subsequent changes in the original culture patterns of either or both groups" (Redfield, Linton, & Herskovits, 1936). The acculturation processes could eventually result in acceptance/assimilation, adaption, or reaction, outcomes that largely depended on the type and context of contact between these groups.

Later, classic assimilation models were applied in sociological research on newly-arrived Southern and Eastern European migrants in the US. This body of work suggested that migrants would follow a straight-line convergence with the host society's core group, which in the US was defined as "middle-class cultural patterns of, largely, white Protestant, Anglo-Saxon origins" (Gordon, 1964, p. 72), beginning with language, dress, cultural behaviors, and eventually neighborhood, education, and economic integration (Massey and Denton 1985). Alba and Nee advance this argument adding that rather than unilateral absorption into a monolithic American melting pot, ethnic groups instead cross boundaries while bringing attributes to expand the definition of American (e.g. cuisine, habits)(Alba & Nee, 2009). So too, Gans reconceptualized straight-line assimilation as more of a bumpy process where later immigrant generations eventually become "Americanized" despite initial sociopolitical and economic barriers (Gans, 1992).

A number of scholars, however, have contested classical assimilation models and proposed new frameworks that contend with the ethnic diversity, structural constraints, and context of entry of newer migrant groups. For example, scholars in psychology proposed the process of enculturation where both migrants and the members of ethnic groups, "adapt to the cultural beliefs values, behaviors, and languages of their heritage cultures and develop an understanding and sense of belonging to their ethnic group" (N. A. Gonzales, Fabrett, & Knight, 2009). Sam and Berry drew on these concepts to develop their model of strategies for cultural adaptation where individuals could fall into one of four categories: assimilation (adopts the receiving culture and discards the heritage culture), separation (rejects the receiving culture and retains the heritage culture), integration (adopts the receiving culture and retains the heritage culture), and marginalization (rejects both the heritage and receiving cultures) (Sam & Berry,

2010). However, Sam and Berry's model was developed from a psychological perspective and largely neglects the socio-contextual factors that may shape diverse adaptation processes and outcomes.

In a seminal departure when new waves of migrants began to arrive in the US after changes in immigration policy, sociologists Portes, Rumbaut, and Zhou used ethnographic and quantitative work with 1st and 2nd generation children to develop their segmented assimilation model which incorporates the context of reception factors, human capital, and parent/family structures that may shape the adaptation of the children of immigrants (Portes & Rumbaut, 2006). The segmented assimilation model contended with several facets of immigration post-1965 including the changing composition of migrant groups as well as new socioeconomic and political structures of the US. Specifically, new migrant groups from Latin American, Asia, and Africa, and the Carribbean, were racial and ethnically diverse but also included both high/low-skilled and high/low-SES migrants. Furthermore, the post-industrial economy shifted the socioeconomic prospects of new migrant groups, while continued waves of migration facilitated the creation of large ethnic enclaves and the ability for new migrant groups to retain strong connections to their cultures and country of origin. Proponents of segmented assimilation directly incorporate the notion that migrants become enmeshed into an inequitable and stratified society in the US that is shaped by race, class, and gender. Given these distinct factors, then, immigrants and their children could follow three paths including assimilation, selective-acculturation, or downward mobility. Notably the segmented assimilation model has received various critiques for its lack of specificity, reliance on empirical data from adolescents who have not completed their life-course trajectories, and pessimistic outlook on the future of migrants.

Despite these advancements in the social science literature on theories of assimilation and acculturation, debate abounds with respect to the applicability of these theories to public health. Most public health literature falls short of incorporating sociological frameworks on immigrant integration in two respects. First, the majority of these arguments largely draw on classical assimilation models in assuming that Latino migrants adopt standard American health behaviors. Second, when researchers incorporate segmented assimilation frameworks into their research, few researchers acknowledge the structural and societal factors that shape the diverse outcomes among migrants and later generations. Another missing link is that while sociologists have provided these new frameworks to explain the socioeconomic mobility of newer migrants groups and later generations, health outcomes emerge due to unique mechanisms and perhaps do not track with SES. While many argue that social and economic mobility is associated with better health, the case of Latino immigrants and later US-born generations whose health declines with increasing mobility challenges these arguments. Instead, scholars are pointing to new evidence to argue that gains in a mobility for racial/ethnic minorities and other marginalized groups come at a cost to health and wellbeing, due to the significant structural and social constraints that these groups need to overcome.

Importantly, many recent studies have embraced these new facets of immigrant acculturation and integration frameworks by demonstrating links between contextual barriers, stressors, and social constraints and the emergence of noxious health behaviors among Latinos. In this vein, acculturation is conceptualized not as a shedding of cultural values and behaviors but instead a complex process in which Latinos contend with their racialized status, structural constraints, and exposure to stressors. For example, Ornelas and colleagues found the perceived barriers to opportunity including legal status and language were associated with binge drinking

among Latino immigrants men (Ornelas et al., 2015). Similarly, in a longitudinal study of recent Latino migrants, higher immigration stress as (measured through a series of items related to financial, marital, occupational, and parenting stressors attributed to immigration) was negatively associated with family cohesion (Dillon, Rosa, & Ibañez, 2013). Finally, in their study on health behaviors among Latinos in Boston, Allen et al found that acculturation was associated with poorer diet and smoking, and further that this relationship was mediated by material hardship (J. D. Allen et al., 2014). This work points to the complex dynamics of behavior change among US and foreign-born Latinos, illuminating the role of social contextual factors in shaping health outcomes, rather than solely individual behaviors.

Considering the meaning of race and the role of racism on Latino Health.

The theoretical and empirical limitations of the leading hypotheses for the Latino health paradox as well as the gaps in popular acculturation frameworks have prompted calls for new approaches to studying health disparities within the Latino community. A wide body of research demonstrates that contending with racism and unique race-related stressors across the lifecourse also contributes to chronic and cardiovascular disease for racial/ethnic minorities in the US. This field of research emerged and developed with the growing recognition that racial disparities in health were not adequately explained by genetic or behavioral factors. As a result, this gap prompted researchers to more critically conceptualize the social and cultural construction of race and ethnicity, and outline the mechanism by which race and racism impact health. Dressler and colleagues outlined five bodies of research on racial disparities and health, including the racial-genetic model, health behavior model, socioeconomic model, psychosocial stress model, and structural constructivist model (Dressler, Oths, & Gravlee, 2005). The latter three models explicitly attend to racial stratification and racism (with important distinctions) and point to

promising directions for understanding the declines in health among Latinos in the US. I will now review these bodies of literature and evaluate existing studies that adopt these models to advance research on Latino health.

The socioeconomic status model of racial disparities.

The SES model draws on the wide evidence of disparities in wealth, income, education, and occupational status between many racial/ethnic minority groups and Whites to argue that SES disparities confound and largely "explain away" racial/ethnic health disparities (Adler & Newman, 2002). This approach is further supported by a large body of research that demonstrates links between socioeconomic status and health behaviors, morbidity, and mortality. However, other research demonstrates that a racial gap in health still exists even after accounting for SES, and in some cases exacerbates racial disparities (Geronimus, Bound, Keene, & Hicken, 2007; D R Williams, 1999). Furthermore some studies suggest that that the SES gradient in health is not as consistent for Blacks and Latinos in comparison to NH Whites (Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010; Pearson, 2008).

Links between SES, race, and health are further complicated in research on Latinos due to the added dimension of immigration. In many Latin American countries, the relationship between SES and health is mixed and less consistent than patterns in the US as many countries are undergoing an epidemiological transition. For example in a study of SES and health among older adults in Costa Rica, increased SES was associated with greater mortality, metabolic syndrome, and diabetes (Rosero-Bixby & Dow, 2009). Similarly, using MHAS data Smith and Goldman found no evidence of SES gradients in rural areas of Mexico while in urban areas higher SES was associated with higher self-rated health and fewer functional limitations, but higher levels of obesity, smoking, and alcohol use (Smith & Goldman, 2007).

Few studies, however, have assessed the interaction between foreign-born status and SES on health among Latinos. In one notable exception, Acevedo-Garcia found that among Latinas: (1) foreign born status conferred a protective effect against low birthweight (LBW); (2) the effect was strongest for women with less than 12 years of education; (3) there was no relationship between education and LBW among foreign born women; and (4) the gradient between education and LBW among US born women was negative, but weaker than that for NH White women (Acevedo-Garcia, Soobader, & Berkman, 2005). In a follow-up analysis where Latinos were disaggregated by country-of-origin (Mexico, Central/South American, Cuba, Puerto Rico), the protective effect of foreign-born status was found for only Mexicans and Central/South Americans with less than 12 years of education (Acevedo-Garcia et al., 2007). Analogously in an analysis of child BMI and parent's education and income, the negative gradient between BMI and parent's education was weak among both US and foreign born Latino parents; however, the relationship between income and BMI was null for foreign born and negative for US born parents (Balistreri & Van Hook, 2009). Weak SES gradients among Latinos, and particularly those who are Mexican and less educated, has been documented in several other analyses (Buttenheim, Goldman, Pebley, Wong, & Chung, 2010; Goldman, Kimbro, Turra, & Pebley, 2006; Turra & Goldman, 2007).

Thus, among Latinos, advantages in SES may not guarantee health advantages as they do for Whites in the US (Pearson, 2008). Further, SES does not operate in the same ways for all Latino subgroups. For Mexicans, and in some cases Central Americans, lower SES is in fact protective of health while among South Americans, Puerto Ricans, Cubans, and Dominicans SES largely shows a traditionally positive relationship with health. Collectively, these findings point to the need to better understand how education, income, wealth, occupational status and other

diverse facets of SES shape the lived experiences of Latino groups across countries of origin and generational status. Furthermore, since immigration may confer gains in income, education, and wealth but declines in occupational prestige and social status, it is unclear how these dynamics of socioeconomic mobility shape health among migrants. Lifecourse models of SES which consider the dynamic interplay of SES markers across time (and borders) could be one avenue by which to explore the role of SES on Latino's health (Colen, 2011; Elder, Johnson, & Crosnoe, 2003; Gee et al., 2012; Riosmena et al., 2015). Still however, the extant research shows that the SES model does not fully explain the declines in health among Latinos in the US.

The psychosocial stress model.

The psychosocial stress model of racial health disparities borrows from broader models of stress, coping, and health to theorize the role of interpersonal racial insults and institutional racial inequities as stressors on health. The Transactional model of stress and coping was originally applied and elaborated in research on racism and health. Stress and Coping argues that stressors are external or internal demands that upset balance and can affect psychological or physiological wellbeing (Lazarus & Folkman, 1984). An individual first evaluates and assigns meaning to a stressor (primary appraisal) and then activates a coping response using available resources and options (secondary appraisal). Stressors can active coping responses that could be either deleterious or beneficial for psychological and physical health (R. Clark, Anderson, Clark, & Williams, 1999).

Perceived racism and discrimination measures dominated the early generation of this body of research with studies documenting associations between reports of overt racial insults and various health outcomes including high blood pressure, mental health, low birth weight, and self-rated health (Paradies, 2006). In addition, researchers have demonstrated how racial signals,

which on the surface seem benign, can actually be taxing for health. For example researchers found that Black Americans who reported preparing for and anticipating racial insults, or vigilance, also had higher blood pressure (Hicken, Lee, Morenoff, House, & Williams, 2013). Furthermore, in their work on stereotype threats, Steele and colleagues found that subtle cues within daily environments can activate negative stereotypes about one's racial/ethnic group, which taxes working memory and increases blood pressure (Blascovich, Spencer, Quinn, & Steele, 2001; C. M. Steele & Aronson, 1995). Finally, in work on racial microaggressions, researchers have documented that slight racial insults are also noxious for health, and perhaps even more powerful that experiences of overt racism (Lepore et al., 2006; Merritt, Bennett, Williams, Edwards, & Sollers, 2006; Sue et al., 2007).

Studies on Latinos and levels of perceived discrimination are mixed and complicated by immigration status, country of origin, and other factors. Analysis of data from the NLAAS, for example, showed that being younger, male, and obtaining some college education or being a college graduate were all independently associated with reports of everyday discrimination (Pérez, Fortuna, & Alegria, 2008). In addition, Cubans had significantly lower reports of discrimination as compared to Mexicans, as well as those with a stronger ethnic identity, and foreign-born individuals who arrived in the US after the age of 7. Similar results were documented in an analysis of ethnic discrimination in the SOL/HCHS dataset, which also found that reported discrimination was higher in Chicago as compared to the Bronx, Miami, and San Diego, and further that being in a region where your country-of-origin community was relatively small (e.g. Puerto Ricans in San Diego) was also associated with greater discrimination (Arellano-Morales et al., 2015).

Collectively, these studies suggest that those with greater exposure to the US by either being US born or spending more years in the US become more acutely aware of discrimination. The experiences of Latinos intersect with other meaningful axes of stratification including gender, education, and age to shape their discrimination experiences. Latino men and Latinos with exposure to college education, for example, have been shown to more likely experience situations where they are targets for discrimination (José A. Cobas & Feagin, 2008). Finally Latinos' experiences of discrimination may also be shaped by social context, including how one's migrant group was received (e.g. welcome reception by early Cuban migrants) and the extent to which one lives in a coethnic community.

Several analyses have demonstrated clear links between experiences of interpersonal discrimination and various physical and mental health outcomes among diverse Latino samples. In a study of Mexican and other Latino immigrants in New Hampshire, individuals who reported that racial discrimination impeded their goals, felt anger due to the treatment they received due to their race, and experienced poorer healthcare due to their race reported lower mental health scores (Gee, Ryan, Laflamme, & Holt, 2006). Furthermore, the effect of discrimination on mental health was stronger for longer-stay immigrants as compared to more recent arrivals. In a follow-up analysis, discrimination in this sample was also associated with worse physical health and systolic blood pressure (Ryan, Gee, & Laflamme, 2006). While these studies did not explore the pathways between discrimination and health, Flores and colleagues found that perceived stress mediated the relationship between discrimination and health, but discrimination was still an independent and significant predictor of depression and poorer physical health (E. Flores et al., 2008).

In another vein of studies, researchers have used innovative proxies of population-level and institutional markers of racial discrimination and linked these racial biases to individual health. This research fills an important gap since individuals are often unable to identify the institutional sources of racism and racial inequities that shape their lives. For example, housing and residential discrimination have been measured using segregation indexes, mortgage loan and foreclosure records, and rental application and eviction data to document racial disparities in housing access and associations to poorer health (Gee, 2002; Mendez, Hogan, & Culhane, 2011). In another example, researchers have used markers of racial prejudice from the General Social Survey (GSS) and web-searches to explore associations between area-level prejudice and adverse birth outcomes, mortality, and blood pressure (Chae et al., 2018; Lukachko et al., 2014; Morey, Gee, Muennig, & Hatzenbuehler, 2018). Finally, in research specifically focused on Latina/os, state-level immigration policy records and federal immigration enforcement data have been linked to worse health outcomes and lower healthcare utilization (Almeida, Biello, Pedraza, Wintner, & Viruell-Fuentes, 2016; Hatzenbuehler et al., 2017; Philbin et al., 2016; Rhodes et al., 2014). As noted by Krieger, however, these studies provide an indirect link between racism and health, and rarely have the capacity to measure direct mechanisms (Krieger, 2003).

Despite the contributions of research on interpersonal experiences of racism and new approaches for capturing

institutional racism, this work is not without its limitations. Several scholars note the weakness of subjective measures of discrimination and racism, arguing that these measures only scrape the surface of race-related stressors (Chae, Nuru-Jeter, Lincoln, & Francis, 2011; Lewis, Cogburn, & Williams, 2015). Many of the leading scales for measuring experiences of racial discrimination rely on self-report of blatant acts of discrimination; however, ethnographic

research suggests that racial insults are often more nuanced and complex (J. Feagin, 2013; Nuru-Jeter et al., 2009; Viruell-Fuentes, 2011). As a result, the rates of reports of racial discrimination across studies is generally low and often have weak associations to health. Furthermore, the effects of racial discrimination can accumulate across time to affect health; however, existing approaches largely do not consider lifecourse experiences of racial discrimination (Colen, 2011). Emerging research also suggests that while individual experiences of racism are powerful, perceptions of group-level discrimination and racism, vicarious experiences of racism, and the transmission of racial trauma across generations are also salient factors that are understudied with respect to health (S. P. Harrell, 2000; Heard-Garris, Cale, Camaj, Hamati, & Dominguez, 2017). While the research on institutional markers of racial inequity has enhanced individual-level measures of racial discrimination, these approaches still do not capture the totality of racism's toll on one's lived experience across social institutions. Finally, both approaches to measuring individual-level and institutional racism research often aggregate racial/ethnic groups atheoretically and lack details on individuals' lives and experiences, which undeniably shape experiences of racism.

The structural constructivist model.

As elaborated by Dressler, the social constructivist model integrates how race reflects both the intersection of cultural and structural constructions and how "that intersection leaves its mark on the human body."(Dressler, 2001, p. 457). In this approach, cultural construction represents the shared meanings and significance that individuals apply to the social phenomena that we call race. Structural construction refers to how individuals are situated within and constrained by various social structures as a result of race. This framing advances the conceptualization of race as dynamic and ever-evolving due to shifting social and political

factors. As such, unpacking the implications of race for health requires a careful analysis of how race is constructed and operates across historical moments and sociopolitical contexts, and the ways in which racialization processes ascribe social meanings to seemingly benign phenotypical and cultural traits (cultural construction). Scholars must then explore how these racial meanings and categorization processes shape stratification and inequity across various aspects of social life, and the implications of these stratification processes for health. In applying this framework to health, both the social construction of race and the social, psychological, and economic consequences of race-making can have positive, negative, or neutral implications for health.

By conceptualizing what race means for Latina/os, how Latina/os have been historically and contemporaneously racialized, and the implications of these racialization processes for the lived experience of Latina/o communities across sociopolitical contexts, the structural constructivist model has the potential to advance research on Latina/o health inequities(Dressler, 2001; Gonzalez-Barrera & Lopez, 2013). This perspective is sorely needed since the preponderance of research on Latina/o does not consider the dynamic meaning of race, and in particular how diverse health outcomes among Latina/os may, in part, reflect unique exposures to racialization processes and their consequences (Viruell-Fuentes et al., 2012).

Importantly, a growing body of critical scholarship in Latino health has drawn on this approach. For example, Miranda et al found that among a sample of Mexican-origin individuals, immigration to the US during a negative immigration context in comparison to a positive or neutral immigration context was associated with depressive symptoms later in life (Miranda et al., 2011). Variations in restrictive immigration policies were theorized to capture diverse exposures to the racialized structure in the US and thus differentially impact the mental health of US and foreign-born Latinos. So too, Vargas and colleagues probed the effect of socially-

assigned race on self-rated health finding that Latinos who were Mexican, US-born, or US citizens and reported that they were typed as Hispanic/Latino had worse self-reported health as compared to those who were typed as white (Vargas, Sanchez, & Kinlock, 2015). This study illuminates the racialization experiences that are heightened for Latinos of Mexican-descent, and further how the advantages of being American-born and a US-citizen largely hinge on one's actual experience of race. Collectively, this burgeoning literature points to new ways to conceptualize and frame processes of structural racism at both the institutional and individual level, and underscores that the implications of race and racism for Latino health fluctuates across social, political, and historical contexts.

Conceptual Model: How "Becoming American" Affects the Health of Latinos

Given the limitations and gaps of current research on Latinos and health, I now bring together social science and public health literature to develop a conceptual model that outlines the ways in which race and racialization processes occur for Latinos. I then outline the implications of these processes for the experiences of Latinos across diverse sociopolitical and demographic backgrounds and their health (Figure 2.1).

A System of Race and Racism.

The model is undergirded by the notion that structural racism has served as a foundation for social stratification in the United States and shapes the lived experiences of Latinos (as well as other groups of people who have been classified as white and non-white). Structural racism frameworks underscore the notion that racial power and oppression are woven into our nation's institutions, policies, and social fabric, trickling down to our everyday interactions and life experiences (Jones, 2000). Racism, then, is theorized as more than individually held beliefs or random acts of discrimination, but rather a dominant system that explicitly and implicitly

maintains the maintenance of power, resources, and privilege to individuals who are typed as white over people of color (J. Feagin, 2013). These processes mutually reinforce each other across time and space and contribute to the social, political, economic, and cultural context that Latinos, and indeed all people in the US, have to negotiate and contend with throughout their lives.

In addition, the mechanisms by which structural racism maintains *white supremacy* change across sociopolitical and historical contexts and racialized groups under a "cloak of invisibility" (Bonilla-Silva, 2001). While colonization and slavery operated as early manifestations of structural racism, contemporary forms of structural racism are shrouded under ordinary and everyday processes that ensure that dominant groups maintain power. As argued by critical race theory and scholars, structural racism has always been ubiquitous in the US and difficult to unveil. In addition, structural racism is often (but not always) maintained through passive rather than active actions. Therefore, due to the pervasive and passive nature of structural racism, links between structural racism and racial health inequities are often difficult to "prove". Understanding the links to health then requires a close examination of how structural racism "happens" and unfolds over time.

Cultural Racism.

Cultural racism refers to the shared system of meaning and understanding that overtly and covertly attributes value and normality to Whiteness and devalues, stereotypes, and labels non-white groups as other, different, and/or invisible. Feagin and colleagues refers to this concept as the "white racial frame", an ideology, worldview, or lens that colors nearly all facets of society including the media, institutions, social interactions, and even smells and emotions (J. Feagin, 2013). For example, in the white racial frame "symbolic racial capital" ensures that

whites way of life, families and networks are normalized, privileged, and not interpreted as threatening. As a result, the white racial frame legitimizes a strong sense of entitlement and "fairness" along with the minimization of the past and current legacies of racism and marginalization. While cultural racism is an amorphous phenomenon, Hicken and colleagues have drawn on social science theory to outline four processes that link cultural racism to structural racism: racialization, stigmatization, standardization, and evaluation (Hicken et al., 2018a).

Racialization and stigmatization are part of the broader social process of identification which attempts to categorize and define social groups (Michèle Lamont, 2012). In this schema, racialization refers to the process of attaching social meaning to groups of people based on phenotypic or social attributes, and the creation of racial groups as a result (e.g. race-making) (Fanon, 2001; Miles, 1989; Omi & Winant, 1994). In the US racial context, racialization has largely operated to define who is "white" and who is not white. Omi and Winant, for example, describe racial formation as a process in which racial categories are created, transformed, and destroyed across socio-historical moments and outline racial projects that link policies and practices as examples of these shifts (e.g. Affirmative Action, immigration policy).

Stigmatization then shapes the meanings that are assigned to racial groups, and the devaluation of certain racial groups through the creation and maintenance of stereotypes (Goffman, 1963; Hatzenbuehler, Phelan, & Link, 2013; Link & Phelan, 2001). Historian Natalia Molina, for example, has traced the use of racial scripts through popular discourse, media, and policies to demonstrate how the negative framing of African-Americans and Indigenous groups has been used and recycled across time and space to shape the racialization of Latinos, Asians, and other racial/ethnic groups (Molina, 2014). As a result, stigma and stereotypes are at the heart

of cultural racism processes whereby groups that are racialized as non-white are categorized and labeled as socially, politically, and culturally inferior (Chae et al., 2018; Geronimus, 2013; Link & Phelan, 2001).

Meanwhile, standardization and evaluation encompass processes that rationalize the extension of value and merit through specified rules and norms. At face value, these meritocracies appear neutral and objective but instead creates and perpetuates inequalities (Michèle Lamont, 2012). As elaborated by Timmermans and Eptein, standards in modern society act as a form of social regulation through the creation of norms and conventions. Oftentimes, these norms are implicitly enforced through shared social understanding (Timmermans Jr & Epstein, 2010). In her work on racial inequities in health, for example, Geronimus argues that US society maintains cultural beliefs and racial ideologies such as developmentalism, economism, and the American Creed (Geronimus, 2000; Geronimus et al., 2016). These standards are often established and maintained by dominant groups (e.g. Whites), passively adopted by marginalized groups, and all groups are evaluated and judged against these standards. In the evaluation phase, social and economic value is granted to groups and individuals who adhere to these social standards, although the odds are often stacked against those who are unable to. For racial ethnic groups, Whiteness then confers advantages not only in terms of material benefits and resources, but also "on the psychic benefits of having their values honored in public discourse and institutional structures and timetables"(Geronimus, 2000, p. 254).

As a result of these processes, individuals who are constructed as "white" in the US navigate their lives with "differential economic, political, social, and even psychological rewards" because they do not contend with dehumanizing stereotypes or the burden of achieving unrealistic social and cultural standards (Bonilla-Silva, 1997). As a corollary, groups of people

who are considered non-white (e.g. Black and Native American) are categorized as separate races and considered innately inferior to those who were defined as white (Almaguer, 1994; Omi & Winant, 1994). Historically, the first racialized groups of people were colonized Native Americans and enslaved African Americans. Subsequently, as new groups of people came to the US or became part of the US, these groups have become enmeshed into the existing racial hierarchy, some becoming white, some becoming non-white, and others falling into gray areas in between (Brodkin, 1998; Molina, 2014; Omi & Winant, 1994). Indeed one of the central components of the white racial frame and cultural racism is the notion that for groups that are labeled or designated as "white" their whiteness and the benefits thereof become largely invisible and taken for granted, whereas for people of color race becomes permanently salient, not only for that individual but for society at large (J. Feagin, 2013).

Importantly, many scholars argue that the categorization of white/nonwhite remains problematic because various groups that have been formally classified as white, continue to face unique experiences of oppression and marginalization. The case of Latinos is similarly complex. While Latinos might be considered people of color or non-white, within certain subgroups race and skin color are differentially salient. For example, Afro-Latinos face unique exposures to racism because they may be more readily typed as a person of color. Lighter-skinned Latinos or those who pass as White may not face these same experiences, but they continue to be impacted by the cultural and institutional racism that face Latinos overall. To address these limitation, intersectionality theory considers the heterogeneity of experiences within racial groups and several scholars have explored deviations between self-identified versus socially-imposed racial identities (Crenshaw, 1997; Viruell-Fuentes et al., 2012). Yet, while racial categories are fluid and porous and there is diverse inter-group heterogeneity within defined ethno-racial groups,

structural racism processes continue to operate amidst the ever-pervasive backdrop of "whiteness" and cultural racism.

How Cultural Racism Has Happened for Latinos.

So too, Latinos have been incorporated into the US racial hierarchy and have navigated the social, political, economic, and psychosocial consequences of cultural racism processes (Acuna, 1972; Almaguer, 1994; Rumbaut, 2009). Notably, the racial categorization and exclusion of Latinos has often operated in a grey-space and scholars argues that in order to understand race and the racialization of Latinos we need to read between the lines in reviewing history and policies. For example, while many Mexicans and Puerto-Ricans were granted citizenship upon their incorporation into the US, they experienced (and continue to experience) unequal citizenship. Moreover, while many Latinos were categorized as "white" historically or can pass as white in the present day, popular stereotypes and ideologies constructed and continue to construct Latinos as non-white, foreign, and other. By turning to various historical moments and the unique experiences of Latinos, we can begin to unpack the ways in which cultural racism's tools have been recycled to shape the popular imagination of Latinos.

The first major influx of Latinos in the US was not a result of migration but due instead to the US-Mexico War and the annexation of over half of Mexico's territory to the US in 1848. As a result, an estimated 70,000-100,000 Mexicans living in the Southwest became forcibly incorporated into the US and were conferred American citizenship- nearly 20 years before the passage of the 14th Amendment[4]. Leading up to the US-Mexico War, Manifest Destiney fueled American's motivation to expand westward including into the Southwest. With this philosophy

[4] Notably, Mexicans could also choose to "return" to Mexico or retain their Mexican citizenship.

American statesman and leaders argued that Americans were granted a God-given duty to expand democracy, capitalism, and Puritan values. Interwoven was the assumed moral and racial superiority of Anglo-Saxons and Puritans over Native Americans and Hispanics. As demonstrated by policy discussions, popular media, and personals correspondence, US politicians and the public constructed Mexicans as inferior, "an idle thriftless people", drew parallels between Mexican and Native American groups, and shaped notions that Mexicans were biologically and culturally unfit to govern themselves (Gutiérrez, 1995). Due to these constructions, although Mexicans and Mexican-Americans were formally granted citizenship after the US-Mexico war, they were relegated to second-class citizenship and often faced political disenfranchisement, loss of land rights, physical violence, and limited access to labor, education, and economic opportunities (Almaguer, 1994).

In a similar fashion, the US would later engage in imperialism throughout Latin American and the Caribbean citing the need to modernize and civilize these nations and peoples (Gutiérrez, 2006). US international policies including the Monroe Doctrine, Roosevelt Corollary, and the Big Brother policy declared Western independence from European encroachment and established cooperation between the US and Latina America. These policy developments were first to support many countries' independence efforts but later became a strategy to exert US military and economic interests throughout the Americas. Throughout the late 19th century and 20th century, the US would repeatedly engage in economic, political, and military interventions throughout Latin America. For example, Honduras was under military occupation through the early 1900s in an effort to protect the growing banana industry and prevent political coups. Following the Cuban Revolution in 1959, the US would back some of the region's most extreme leaders including Rafael Trujillo in the Dominican Republic and Augusto Pinochet in Chile, and

support conflicts throughout the region including the Salvadoran civil war and the Contra rebels in Nicaragua in efforts to prevent the spread of Communism.

These developments in the early to mid 1900s created a political and economic landscape in Latin American that would fuel migration for decades. Although Latin American migrants have always been part of the history of the US, many migration scholars associate the post-1960s as the period in which the US experienced the most rapid and significant migration from Latin America. After the 1960 and 70s, globalization, structural adjustment policies, and economic restructuring produced global and national conditions that propelled migrants from Latino America to service and low-wage sectors in the US. Instability and poverty in many Latin American countries provided the push, while labor and economic opportunities in the US provided the pull (Massey et al., 2003).

Mexicans comprised the majority of these economic migrants due to the geographic proximity of the US and high economic instability in Mexico (Acevedo & Espenshade, 1992). For many Central Americans, internal conflicts in the 1980-90s and in the last 15 years, due in part to economic and political instability and drug violence has also fueled migration (N. Hamilton & Chinchilla, 1991). South Americans migrated in smaller numbers due to geographic barriers and more stable economic and social conditions, however many who faced aggressive dictatorships and internal conflicts also migrated (e.g. Chile and Colombia). Puerto Ricans as US-citizens have historically engaged in circular migration from the island for economic opportunities, wherein the most economically and socially disadvantaged have often been forced to remain on the island. Finally, Cubans have experienced a similarly tumultuous past where many middle and upper-class individual were (relatively) warmly received after the Cuban

Revolution of 1959, while later groups from the Mariel boatlift following Cuba's economic decline in 1980 were viewed negatively.

Despite the diverse immigration experiences of various groups from Latin America, scholars have argued that Latino migrants and their children have largely been homogenized into a monolithic racial/ethnic group in the US (Oboler, 1997) (racialization). Throughout these demographic shifts and immigration waves, popular tropes about Mexicans were adapted from stereotypes about Native American and African groups and later applied to other Latinos from diverse countries of origin (stigmatization). The framing of Mexicans was mired with racial scripts that linked them to stereotypes of indolence and laziness, beliefs that Mexicans were uncivilized and backwards, and evoked fears of miscegenation (Almaguer, 1994; Molina, 2014; Sandrino-Glasser, 1998). Depending on their context of arrival and the sociopolitical conditions of the period, other immigrant groups from Latin America similarly negotiated these stereotypes and labels to varying extents.

As the Latino immigrant population has grown, so too have national concerns about the looming "Latino Threat," beliefs that Spanish speaking, uneducated, and poor immigrants and their children are taking over the US (Chavez, 2013; Huntington, 2004). These ideologies create the perception of Latino as not-quite-American, which in the US racial hierarchy equals "not-white." US-born children of Latino migrants as well as the foreign-born who gain citizenship often contend with popular notions that they are foreigners and not-quite-American, which dilutes the power of their citizenship and membership in the US. These processes of "othering" serve to ostracize and marginalize certain Latino immigrant communities from "American" society and also set into motion a process of racialization that shapes the incorporation of future generations of Latino children (C. Nelson & Tienda, 1985).

Cultural racism for Latinos is constantly renegotiated, redefined, and reapplied to meet the needs of legitimizing a racially stratified society. Early manifestations of cultural racism included the framing of Mexicans and Mexican-Americans as lazy and unintelligent (Almaguer, 1994). As migration increased from Latin American, public health concerns and public charge arguments framed Latino migrants and their children as health and social burdens (Molina, 2011; Suarez-Orozco, 1996). As I elaborate below, in the current sociopolitical climate, under the auspices of national security and the War on Drugs, the lines between immigration and criminality have been clearly linked and disproportionately target Latinos as criminal (A. Armenta, 2017)

Institutional and Interpersonal Racism.

Institutional and interpersonal racism are the machines that partly do the work of structural racism in shaping the material conditions and psychosocial experiences of Latinos and other people of color. In this conceptualization, anti-immigrant and anti-Latino ideologies, the vehicles of cultural racism, translate into institutional and interpersonal forms of racism and discrimination. Institutional racism refers to the ways in which cultural racism has been embedded into our social systems and organizations resulting in systematic racial inequalities in the education, legal, housing, financial, and healthcare systems. Laws and policies, historically, were used to ascribe differential access to these resources and opportunities to White and nonwhite groups; prominent examples include Jim Crow laws, residential redlining policies and housing covenants, and restrictive college and university admissions policies. Now, however, both the standardization and evaluation features of cultural racism help justify systemic inequities across racial lines in these institutional and public domains (J. Feagin, 2013). Despite the passage of civil rights and antidiscrimination legislation, the legacies of these ideologies and

policies continue to permeate the lives of racial minorities, although often in more subtle ways. Meanwhile, interpersonal racism refers to experience of prejudice and discrimination directed towards individuals due to their race or ethnicity (V. R. Clark, 2001; S. P. Harrell, 2000). As previously discussed, scholarship on interpersonal racism has expanded from early measures of perceived unfair treatment due to include more nuanced experiences of racial bias such nonverbal and verbal cues, vicarious racism, and microaggressions (S. P. Harrell, 2000)

While it is beyond the scope of this review to outline all of the ways institutional and interpersonal racism play out across all facets of life for Latinos, I point to one key and emerging arena in which interpersonal and institutional racism interact in complex ways to shape Latinos' lives today, the crimmigration system.

Since the 1980s, the US has witnessed the growing intersection of federal immigration policy and state, local, and federal criminal justice systems resulting in the development of the crimmigration system. Three key features of this system include an expanded scope of crimes that are deemed deportable offenses, the creation of immigration related felony offenses, and extreme measures to incarcerate and remove immigrants (J. Stumpf, 2006). Prior to this period the criminal justice system and immigration system largely operated independently. Now however, low-level and non-violent criminal convictions often trigger immigration arrests, detainment, and deportation. Moreover, immigration-related crimes (such as entering the US without documentation or reentering the US after a prior removal) were previously considered civil offenses, but the federal government has expanded definitions of "aggravated felony" charges to categorize these crimes as felony level offenses. Finally, immigration enforcement now operates from the "ground-up" in which local police, state agencies, and public and private immigration prisons work in tandem to enforce federal immigration policies (A. Armenta, 2017).

Scholars argue that the crimmigration system is part of a larger effort to reduce and restrict immigration, whereby both undocumented/unauthorized immigrants as well as non-citizen immigrants[5] (e.g. visa and green card holders) are increasingly targeted for criminalization, detainment, and deportation.

The ingenuity of the crimmigration system however, and indeed one of its main features, is that its creation and maintenance is rationalized under the auspices of law-and-order, national security, and upholding clearly defined policies, rather than racial intent on the part of the institutions (e.g. judicial system) and actors (e.g. local police) that enforce it (e.g. standardization). The racial inequities, however, are stark and evident. For example, Latinos make up the largest racial/ethnic group in the federal prison system where most are convicted of either immigration or drug-related crimes[6]; in addition, nearly half of all federal arrests are immigration-related[7] offenses (Federal Bureau of Prisons, 2018; Motivans, 2017). Furthermore in 2016, immigrants from Mexico, Guatemala, El Salvador, and Honduras made up 86 percent of all individuals in ICE detention and 94 percent of ICE removals (Baker, 2017). Increasingly, the Department of Homeland Security relies on collaboration with local and state police and governments for immigration enforcement. In these sectors, local police have been shown to rely on race and gender to largely surveil and target Latino men (T. Golash-Boza & Hondagneu-Sotelo, 2013).

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[5] That noncitizen but authorized immigrants are increasingly targeted for deportation is a relatively recent but alarming phenomenon. Both permanent residents who commit low-level criminal offenses have faced deportation. In addition, individuals with special asylum visas or temporary protected status have lost their visas which in essence turns authorized immigrants to unauthorized immigrants.

[6] While Latinos are less likely to sell drugs and equally likely to consume drugs as Non-Hispanic Whites, there are more likely to be convicted of a federal drug offense. In addition, Latinos make up 77% of those convicted of an offense related to marijuana and 62% of those convicted for a cocaine offense. The majority of felony convictions are among the US-born.

[7] Immigration-related "crimes" such as entering the US without documentation or smuggling others into their US, are largely non-violent

Scholars have argued that Latinos are disproportionately targeted and impacted by the crimmigration system, and as such this system has become a primary mechanism that racializes Latinos in the US (Provine & Doty, 2011). Important to note is the pervasive effects that crimmigration has on both immigrants as well as the US-born. Using CPS data, researchers found that 16.7 million people in the US live with at least one unauthorized family member in their household; over half of these individuals are US-citizens or naturalized citizens and 43 percent are children (Mathema, 2017). Crimmigration policies and their ripple effects, therefore, affect a wide swath of the Latino community due to the preponderance of these mixed-status families. For example, in a recent Pew report, 47 percent of Latinos reported worrying that a friend or family member would be deported (Pew Research Center, 2017a).

And indeed, the consequences of both worrying about or actually experiencing an immigration detainment and deportation can be catastrophic. In one study, families who had a parent deported experienced a 70 percent decrease in their economic income due to the loss of their primary breadwinner (Capps et al., 2016). Housing foreclosure rates among Hispanics were also higher in counties with agreements between local police and ICE, called 287(g) policies, suggesting that heightened policing may be linked to housing foreclosures due to more deportations (Rugh & Hall, 2016). Researchers also estimated that if a mass deportation program, as proposed by the current administration, was implemented, millions of families would be plunged into deep poverty (Warren & Kerwin, 2017). Since immigration largely targets young Latino men, deportations also increase the number of single female-led households (T. Golash-Boza & Hondagneu-Sotelo, 2013). Finally children in mixed-status families report worse physical and psychological health (Vargas & Ybarra, 2017), while those who have experienced an immigration raid or family member's deportation demonstrated signs of PTSD (Rojas-Flores,

Clements, Hwang Koo, & London, 2017) and internalizing and externalizing symptoms(Chaudry et al., 2010).

Finally, as the crimmigration system has developed and unfolded over decades, the criminalization of Latino immigrants in the US has also contributed to experiences of racial bias in day-to-day life. With increasing detentions and deportations and the uptick in immigrants being detained for low-level crimes, immigration and criminality has become synonymous in the American psyche and reinforced notions that immigrants are less-than-human (Menjívar & Abrego, 2012). Moreover, Latinos collectively have become conflated with undocumented immigrants and by extension, associated with being less-American and outsiders (Ana, 2002; Chavez, 2013). Moreover race, gender, and class intersect to shape the experience of individuals who are targeted and typed as both Latino and undocumented. As a result, Latinos increasingly confront both blatant and subtle reminders of their assumed criminality, being a perpetual foreigner, and second-class citizenship status as they navigate social spaces and institutions. For example, in one qualitative study, Latinos reported that they were scrutinized regularly in stores and on their college campuses (criminality), had various instances in which their citizenship was questioned, or that individuals assumed they were undocumented (perpetual foreigner) (Rivera, Forquer, & Rangel, 2010). Similarly, Donato and Rodriguez analyzed police traffic stop reports before and after the implementation of local immigration policing policies (287(g)) in a southern county and found an increase in pretextual stops that relied on officer discretion (e.g. license plate attached with only one screw) and the use of symbolic language that signaled the noncitizenship and undocumented status of suspects (Donato & Rodríguez, 2014).

In the same way the crimmigration and criminal justice system shapes Latinos experiences from the cradle to the grave, inequities in other social sectors and institutions are

pervasive. Across the Pre-K to college educational pipeline, Latinos lag behind other racial/ethnic groups in access to education opportunities, school quality, and educational attainment despite the strong educational aspirations among both Latinos students and parents. Research has also shown that Latinos were disproportionately referred to risky loans resulting in more housing foreclosures (Rugh, 2015), overrepresented in lower-paying occupations net of demographic and labor factors (Queneau, 2005), and less likely to access healthcare and health insurance. As a consequence, Latinos overall face barriers in social and economic areas, including occupational opportunities, educational attainment, wealth creation, and access to quality housing and neighborhoods (Bailey et al., 2017; Geronimus & Thompson, 2004; David R. Williams & Jackson, 2005). Meanwhile those who do attain a semblance of the American dream, navigate substantial tolls and barriers in achieving social and economic mobility, and contend with racialized sentiments that dilute the returns of their mobility (Vallejo, 2012). Importantly, cultural racism fuels and legitimizes these institutional inequities.

Becoming American.

Amidst the backdrop of cultural and structural racism processes, the lives of millions of Latinos play out day-to-day. People go to work, send their kids to school, pay their bills, and envision dreams for their future. In what ways then, does cultural and structural racism shape the everyday lives of Latinos, transmit experiences across generations, and unfold across time to shape health? In so many words: how does "Becoming American" impact Latinos' health? I outline three processes below that might begin to answer these questions and advance work on structural racism and Latino health: Dreams Deferred; Membership Denied; Culture Eroded. As demonstrated in the model, these processes overlap and work in tandem to shape the psychosocial and material experiences of Latinos. Moreover, I aim to delineate how pervasive

features of the aforementioned structural and cultural "surround" shape the lived experiences of Latinos (Geronimus et al., 2016).

Dreams Deferred.

"For being a foreigner, Ashima is beginning to realize, is a sort of lifelong pregnancy
— a perpetual wait, a constant burden, a continuous feeling out of sorts"
—Jhumpa Lahiri, The Namesake, 2004

The "American Dream" is a salient feature of the American narrative and a central experience of many immigrant groups in the US. As defined by James Truslow Adams, the American Dream refers to "a dream of a social order in which each man and each woman shall be able to attain to the fullest stature of which they are innately capable, and be recognized by others for what they are, regardless of the fortuitous circumstances of birth or position" (Adams, 1931, pp. 404–405). In Adams' conceptualization, the Dream not only referred to the opportunity to aspire to materials and wealth, but also the capacity for individuals to live with dignity and full personhood irrespective of their background. For example, Adams recounts the story of an immigrant laborer who sat to talk in Adams' study after a day of work who remarked that in his homeland, "I could never sit and talk like this. There is a difference there between social grades which cannot be got over. I would not talk to you there as man to man." Instead, the promise of the American Dream, involves the idea that all individuals can aspire to climb the ladder of opportunity and will be welcome on the rungs that they traverse.

Across the US, both immigrants and US-born Latinos are moreis likely to embody and believe in the American Dream compared to any other racial-ethnic group. In a 2015 poll conducted by The Atlantic/Aspen Institute, 55 percent of Latinos believed they were living the American Dream while 28 percent believed they could in the future (The Atlantic/Aspen

Institute, 2015). In addition, 59 percent believed the American Dream is attainable for all Americans and lagged only behind African Americans in believing that the American Dream is achievable as long as you work for it (70 versus 74 percent). Similar findings have been replicated in other research and polls (Cohen-Marks & Stout, 2011; M. H. Lopez, Morin, & Krogstad, 2016; Pew Research Center, 2017b).

Despite this optimism, ethnographic and quantitative research among Latinos often highlights the economic, social, and political barriers that Latinos navigate in achieving success in the US. For example, in the same poll Latinos were also the most likely to report that the obstacles to achieving the American Dream were more severe now more than ever (76 percent). In explaining this disparity, scholars point to the dual frame of reference adopted by many immigrant groups, including Latinos, in which struggles and challenges are normalized as part of the cost of aspiration and achievement in the US (Gibson & Ogbu, 1991; Portes & Rumbaut, 2006; Telles & Ortiz, 2008). In rationalizing this frame, immigrants reflect on their life in their countries of origin (or what the life would have been) in relation their lives in the US, view their current circumstances as temporary, and justify experiences of exclusion as a consequence of being a newcomer. However, researchers have found that with more time in the US and across generations this dual frame of reference shifts or erodes, as individuals come to the realization that inequity is more permanent and institutional (Gelatt, 2013; Viruell-Fuentes, 2011).

Connecting these psychosocial processes to health, a wide body of research demonstrates that belief in the hard-work ethos and aspirations for the American Dream at any cost can be taxing for health. These health consequences are particularly dire for groups in which hard work will never be enough. For example, research on John Henryism and goal-striving stress among Black Americans shows that individuals who expend incredible efforts to negotiate psychosocial

stressors or to achieve their goals pay the cost in both their physical and mental health (James, 1994; Parker & Kleiner, 1966; Sellers, Neighbors, Zhang, & Jackson, 2012). Another stream of research also demonstrates the physiological costs of striving and achieving success for racial/ethnic minorities. Colen and colleagues analyzed trajectories of SES and health among White, Black, and Hispanic youth in the NLSY and found that upwardly mobile Black and Latino individuals were more likely to experience discrimination, which partially explained Black/White but not Hispanic/White disparities in health (Colen, Ramey, Cooksey, & Williams, 2018). Similarly, researchers have also developed the notion of skin-deep resilience and demonstrated that Black youth who achieve outward indications of success also face worse health (Brody et al., 2013; G. E. Miller, Yu, Chen, & Brody, 2015).

The American Dream for racial/ethnic minorities and marginalized groups may therefore represents a constant Dream Deferred. The costs of both (1) striving for the dream and not achieving it *and* (2) striving for the dream and achieving it, can be physically and psychologically harmful. An understudied component of this research is how Latino immigrants come to understand the realities of the American Dream for their lives, how this frame is transmitted to future generations, and the implications of embodying these frames for their health. In a study of suicidality using the NLAAS, Brown and colleagues found that the relationship between time in the US and suicidality was strongest for Latino immigrants, as compared to Afro-Caribbean and Asian immigrants, and argued that deflated expectations may contribute to their findings (Brown, Cohen, & Mezuk, 2015). However, few studies have explored hard-work ethos, John Henryism, and goal-striving stress to health of Latino groups explicitly. Furthermore, within Latinos, various groups have immigrated to the US with different

sets of expectations, constraints, and institutional resources; therefore future work could illuminate how these factors shape goals and health in the US.

Membership Denied.

In 2014, Supreme Court Justice Sonya Sotomayor wrote a dissent of the court's ruling in Schuette v. BAMN, a case that upheld the constitutionality of Proposal 2 in Michigan, a law that banned the use of affirmative action in public employment, education, and contracting. In her dissent, Sotomayor wrote about the salience of race writing,

> "The enduring hope is that race should not matter; the reality is that too often it does… Race matters.
>
> And race matters for reasons that really are only skin deep, that cannot be discussed any other way, and that cannot be wished away. Race matters to a young man's view of society when he spends his teenage years, watching others tense up as he passes, no matter the neighborhood where he grew up. Race matters to a young woman's sense of self when she states her hometown, and then is pressed, "No, where are you really from?", regardless of how many generations her family has been in the country. Race matters to a young person addressed by a stranger in a foreign language, which he does not understand because only English was spoken at home.
>
> Race matters because of the slights, the snickers, the silent judgments that reinforce that most crippling of thoughts: *"I do not belong here."* [emphasis added]
>
> —Schuette v BAMN, 134 S. Ct at 1676 (Sotomayor, J., dissenting).

Sotomayor's dissent highlights how a central feature of negotiating race in the US includes the constant barrage of messages of difference that are received both explicitly and implicitly by racialized groups of people, and the psychological gymnastics they undertake to understand their place in US society. The racialization and stigmatization processes of cultural racism work to create, maintain, and legitimize racial boundaries and transmit these messages of difference. While scholars of race have long demonstrated that one of the major features of being

a racialized body in the US is contending with being "othered" (Du Bois, 1903; Viruell-Fuentes, 2007), it has been argued that this feature of the "surround" has been understudied with respect to health (Geronimus, 2013).

Across social science disciplines, including psychology, sociology, and political science, belonging, membership, and mattering are key facets of social life that individuals seek in achieving a whole life. While these concepts encompass interrelated constructs, they each tap into unique dimensions. The defining attributes of belonging include the experience of being valued, needed, or important with respect to other people or groups, and fitting with other people or groups through shared or complementary characteristics (Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992). Belonging can be considered an internal affect or more broadly fitting in with socially ascribed groups or systems. Similarly, membership refers to successfully building and being part of a community; membership involves personal investment to a group (McMillan & Chavis, 1986). In addition, membership inherently involves boundary-making and the imposition of rules and norms to ascribe membership. Mattering, meanwhile, involves the external validation that one is significant to the world and people around them (Rosenberg & McCullough, 1981). A person feels they matter if they receive the attention of others (awareness), are the object of others' interest or concern (importance), and are needed by others (reliance)(Elliott, Kao, & Grant, 2004). Mattering alludes to the creation and cultivation of a sense of purpose. Collectively, belonging, membership, and mattering are argued to contribute to a sense of agency and control in life.

Research on belonging, membership, and mattering is limited in two major respects. First, because these concepts were developed primarily from a psychological lens, the sociological conceptualization of these constructs is scant (Yuval-Davis, 2006). However, they

are undeniably shaped by the cultural and social environment that formulates and facilitates the transmission of social norms. Second, work connecting these concepts to race/ethnicity and health is limited. The majority of research on the significance of belonging and mattering for health has long been dominated by research in mental health and young people (K.-A. Allen & Kern, 2017). An important body of work has considered the significance of belonging and personal social connections for life expectancy and chronic disease; however, belonging has largely been conceptualized as individual social relationships rather than a societal process in this work (Berkman & Syme, 1979; Tay, Tan, Diener, & Gonzalez, 2013). An important gap in this work, therefore, is linking the implications of racialization process to sociological belonging, membership, and mattering and tracing the health effects of the "dirty work of boundary maintenance" with respect to race/ethnicity (Crowley, 1999).

Societies and institutions, however, can implement approaches to minimize marginalization and othering, and instead extend membership and mattering. A growing stream of research has explored how these processes might be linked to health. Lamont and Hall's study of successful societies, for example, argues that social inequities create health inequities due to the "wear and tear of daily life" faced by marginalized members of society (Michele Lamont & Hall, 2009). They further argue that "societies that recognize a wide range of people as full members of the community deserving of recognition and support…provide more extensive buffers than societies that stigmatize those who are different". These buffers, then, can provide a shield to withstand the tolls of class and race (Hall & Lamont, 2009). So too, social psychologist Claude Steele and colleagues have demonstrated how schools and workplaces can send markers of belonging and mattering and transmit identity safety to ameliorate the effects of stereotype

threat on health and performance (Aronson, Cohen, & McColskey, 2009; Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008; Claude M. Steele, 2011).

These lines of research are akin to Geronimus' weathering hypothesis which outlines that the physiological tolls of being a racialized body in the US is due, in part, to the roll that cultural and structural racism plays in undermining one's sense of self. Collectively this literature then argues that race shapes health above and beyond access to resources, money, and materials; race changes the meaning and frames within which one approaches their life and how one understands their worth to the world (Pearson, 2008). Race involves the psychosocial experience of being othered and by extension being denied membership and mattering; this conceptualization points to new ways in which race matters for health (powell & Menendian, 2016).

Belonging and membership for Latinos in the US has been a contested space across sociohistorical periods. For generations various Latinos groups were denied full membership in society despite acquiring citizenship, long-term residence in the US, and other forms of participation in society (e.g. homeownership, military service, etc.) (Molina, 2011). At the same time, within co-ethnic communities and certain regions, Latinos have retained distinct community networks that have enabled them to craft distinct spaces of belonging. At a more national level, Latinos and others have historically been involved in grassroots efforts to demand political power, immigrant rights, and labor rights. These efforts have worked to contest the boundaries of exclusion in an effort to argue for membership and inclusion (Hagan, 2006). To date, however, a limited body of research has considered how notions of membership and belonging matter for Latino health from a population-health level, and further how sub-groups within the Latino population come to understand their sense of belonging and mattering in the

US. To expand this research, scholarship on how membership and mattering is created and negotiated for Latinos within society at large, but also within the specific contexts (e.g. schools, public spaces, and workplaces) and geographic areas of the US is warranted (Dovidio, Gluszek, John, Ditlmann, & Lagunes, 2010; J. R. Feagin & Cobas, 2013; Valenzuela, 1999). Detailing these processes would then enable researchers to explore how membership and mattering across Latinos' lives might be linked to health outcomes.

Finally, considering how membership and mattering is denied to Latinos in the US, provides an important connection between structural racism and the deterioration of health among Latinos across time and generations. This aspect of structural racism is a particularly ripe area for exploration because it points to the potential mechanisms by which (1) Latinos experience health declines despite gains in socioeconomic mobility, and (2) Latinos who do not directly experience racism are still affected by this pervasive feature of structural racism. While Latinos may make inroads in terms of social and economic mobility, Membership Denied argues that the psychosocial toll of not-being-quite-American can still be taxing for health. Furthermore these processes may be particularly noxious for 2nd and 3rd generations in the US who perceive a sense of exclusion across their lifetime and strive for full membership in the US (Telles & Ortiz, 2008).

Culture Eroded.

"Like all people, we perceive the version of reality that our culture communicates. Like others having or living in more than one culture, we get multiple, often opposing messages. The coming together of two self-consistent but habitually incomparable frames of reference causes un choque, a cultural collision."

—Gloria Anzaldua, Borderlands: La Frontera, 1987

The final psychosocial process that connects structural racism to the health of Latinos in the US refers to Cultural Erosion, the process by which racialized groups of people lose cultural

structures and practices that they have developed to withstand racial inequities in the US. A wide body of work highlights the ways in which racialized groups of people experience both "repression and sites of resistance" and adopt mechanisms to adapt to the tolls of a racialized contexts (Hooks, 1990). As posited by Geronimus, weathering in the context of health refers to both experiencing the storm of marginalizing stressors, but also developing collective strategies to withstand the storm (Geronimus, 2000). For example, Sherman James proposed that the birth outcomes advantage among Mexican and Mexican American women in the US may be due to the adherence to a traditional Mexican cultural orientation, and several empirical studies have explored these ideas further (Campos, Schetter, Walsh, & Schenker, 2007; James, 1993). Similarly, Lee and Ferraro found that living in a highly-segregated neighborhood was protective for the health of second and later generation Mexican Americans, suggesting that features of the segregated neighborhoods act as a shield against processes of racism (M.-A. Lee & Ferraro, 2007). Geronimus, James, and others refer to these adaptive familial, social, and cultural arrangements as alternative cultural frameworks that work to provide marginalized groups with both a lens and strategies to withstand structural inequities and undermining racialized messages.

Meaningfully[8] exploring Latinos' alternative cultural frameworks and the ways in which Latino individuals, families, and communities create and maintain these structural supports is a ripe but understudied area of inquiry. The dominant conceptualizations of culture with respect to Latino health have largely been monolithic, static, and crude (Viruell-Fuentes et al., 2012). For example, scholars continue to measure constructs such as machismo and familialism, which

[8] I write meaningfully because several studies have atheoretically and ahistorically attempted to capture features of Mexican or Latino culture that are protective or risky for health- such as language, food, family values. However, I argue these analyses are not structural in nature and take a risk factor approach, focusing on individual, rather than exploring these factors as part of a large structural system and network

emerged in research during the 1970s and 1980s but have largely remain updated or refreshed to meet contemporary conditions. Instead, a growing body of research is pointing to processes that Latinos have developed in order to negotiate new forms of structural racism, which may shape health. For example, an emerging body of literature points to transnationalism and extended social ties as an emerging mechanism utilized by Latino migrants in building communities in established and emerging destinations (Villa-Torres et al., 2017). So too, a wide body of scholarship in sociology points to segmented assimilation pathways and how retaining bicultural frameworks help ensure the social and economic mobility for 2nd and 3rd generation youth (Portes & Rumbaut, 2006). While some public health researchers have adopted these frameworks to explore biculturalism and health, this work is still new and would benefit from a more nuanced conceptualization of cultural processes (Dressler & Santos, 2000; Finch, Nelson, Perez, & Do, 2007; Ro, 2014)

Moreover, a wide body of literature both in sociology and public health, have demonstrated links between the loss of alternative cultural frameworks and health and social costs (Geronimus & Thompson, 2004). Shifts in health-assuring cultural frameworks and practices may emerge due to both individual and structural level processes. At the individual level, cultural and structural racism prompt or force, Latinos and other racial/ethnic groups to adopt "whiteness" as the key to economic, social, and psychological mobility. For example, Tafoya used Census data to show that Latinos who categorize themselves as "white" versus "some other race" were more likely to have higher incomes, more education, and argued that whiteness is akin to a sense of belonging and acceptance (Tafoya, 2004). Similarly, political scientists have shown that later generation Latinos as well as those who adapt to the US through language and higher SES are more likely to espouse anti-immigrant and anti-Latino sentiments.

However, in a racialized world, Pearson and other argues that even achievements in class, education, and social standing can't buy one whiteness in terms of health (Pearson, 2008). Instead, declines in health among Latinos across generations may be due, in part, to Cultural Erosion: the loss of non-mainstream frameworks and practices that assure health and wellness while assuring one's racial identity. What these practices and lenses are, how they develop and are transmitted or eroded among Latino subgroups, however, has been underexplored in the literature.

Lifecourse Sociopolitical Context.

As demonstrated in the conceptual model, the consequences of "Becoming American" accumulate across time and generations (see arrows in figure) wherein the health costs of "Becoming American" intensify for Latino immigrants with more time in the U and US-born Latinos. Specifically the processes of Becoming American contribute to cumulative life stressors and shape the individual level health pathways that lead to adverse health, including chronic and cardiovascular disease.

Importantly, as highlighted previously, Latinos are a diverse group of individuals from a variety of countries of origin, heritage, and migration histories. Therefore, the processes of "Becoming American", hinge on the circumstances by which one or one's family came to be in the US and the social and environmental context one inhabits throughout their lives. For example, it can be argued that both mainland and island Puerto Ricans carry the trauma of colonization in ways that South Americans might not. Attending to these distinctions and intergroup heterogeneity points to complex processes that nuance the experiences of "Becoming American.".

Exploring Becoming American from New Directions

Inequities in Latina/o health have puzzled researchers for decades and prompted a burgeoning literature on the factors and mechanisms that shape the health of Latinos in the US. Progress in this area, however, has reached a stalemate with the preponderance of literature focusing on behavioral or individual drivers of health. Instead, I argue that advancing research on Latino health requires theoretical and empirical approaches that consider health in the context of racialization processes and structural racism in the US. The conceptual model that undergirds this dissertation, "Becoming American", is a first step at detailing how processes of structural and cultural racism may shape declines in the health of Latinos across time and generations in the US. In this model, cultural racism refers to the social processes that lead to the creation of racial groups, dehumanizing racial stereotypes, and the ideologies that normalize the unequal treatment of racialized people in the US. Furthermore, the three emerging concepts in the model, Dreams Deferred, Membership Denied, and Culture Eroded, refer to distinct psychosocial pathways by which cultural and structural racism shapes Latinos' experiences in the US that can be taxing for health. The subsequent empirical chapters of this dissertation aim to test components of the Becoming American conceptual model through distinct angles.

"Becoming American" assumes that the health of Latinos declines with more time in the US and between the 1st and 2nd generation. As discussed previously however, the validity of this health phenomena has been contested in the literature, particularly due to arguments about the health selection of migrants. Therefore Chapter 3 uses data from Mexican adults to explore if health shapes decisions to migrate to the US. In my analysis I hypothesize that health selection **is not** be a salient factor for future migration to the US; a confirmation of this hypothesis would lend support to the argument that health among Latinos does indeed worsen in the US. Building

on this foundation, the analysis in Chapter 3 tests this question directly by comparing the cardiovascular health profiles of US-Mexico return migrants and nonmigrants. This analysis builds evidence for Becoming American by exploring if exposure to the US is indeed deleterious for health and also testing if health behaviors underlie these changes.

The questions posed and answered by Chapter 3 then help set the stage for Chapter 4. In this chapter I return to the social context in the United States that shapes Latinos' health as posed by "Becoming Amercian". Specifically I consider the ways in which cultural and structural racism currently operate through immigration policies to impact the health of Latinos. In this chapter, I elaborate on how cultural racism create and perpetuate stigmas and stereotypes about Latino immigrants and shapes the psychosocial context that Latino immigrants and their US-born coethnics navigate. Then, I qualitatively analyze Twitter data after the passage of major immigration policies in the US to unpack the ways in which Twitter users who are affected directly or indirectly by these policies discuss these psychosocial mechanisms. The conceptual arguments and the data in this chapter help to support and build on three processes in the Becoming American model, Dreams Deferred, Culture Eroded and Membership Denied.

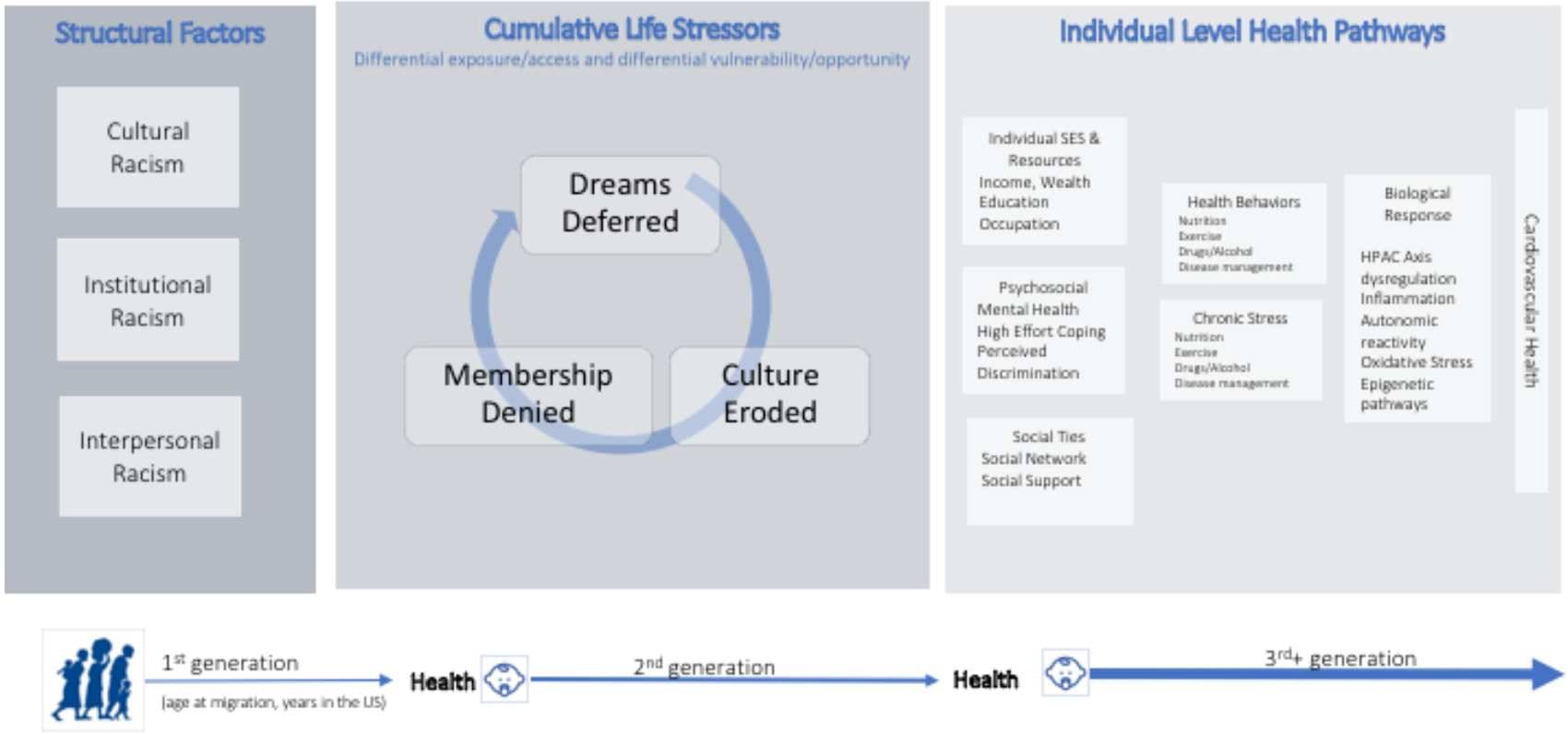


Figure 2.1 “Becoming American” Conceptual Model

Chapter 3 Exposure to the US and the Cardiovascular Health of Mexico-US Migrants

A consistent body of research demonstrates that among Latina/os, migration and generational status plays an influential role in shaping cardiovascular disease related health behaviors and health outcomes. First-generation Latina/o immigrants have generally better CVD outcomes and lower levels of CVD risk factors in comparison to second and third generation Latina/os who are US-born (Acevedo-Garcia & Bates, 2008). These findings, often referred to as the Immigrant or Latino health paradox, have been widely documented for Latina/os in both nationally-representative and regional data, and most consistently among those of Mexican descent (Kyriakos S. Markides & Eschbach, 2005). The first studies on the paradox documented an immigrant health advantage in all-cause mortality and birth-outcomes, but now this phenomena has been found among a variety of disease-specific health outcomes, morbidity, and mortality including cardiovascular disease (Ruiz et al., 2013). Moreover, the health paradox has perplexed researchers because the social and economic vulnerabilities faced by immigrants in the US, would instead have predicted their poorer health as compared to the US born.

Explanations for the differential health outcomes among immigrant and non-immigrant Latinos are many and varied. In general these explanations fall into two categories: data artifact hypotheses or health behavior hypotheses. In the data artifact category, the health selection hypothesis argues that the healthiest immigrants make the decision to migrate, and that CVD related health behaviors and risk factors are better in sending countries compared to the US (Akresh & Frank, 2008). In addition, the return migration or salmon bias hypotheses proposes

that immigrants who become sick or unhealthy in the US might return to their country of origin for medical care or family care (Abraido-Lanza et al., 1999). Based on these explanations, research that compares the health outcomes of immigrants and the US-born may be misspecified due to its failure to account for these potential in-migration and out-migration processes.

Meanwhile, among the health behavior hypotheses, it is argued that immigrants engage in better CVD related behaviors such as physical activity and healthier eating due to a variety of social and cultural factors (Kennedy, Kidd, McDonald, & Biddle, 2015). Furthermore, once in the US, immigrants may be part of positive social networks and cultural practices that promote their health (healthy immigrant hypothesis) (Jasso et al., 2004). Drawing on scholarship from sociology and psychology, health researchers suggest that the US-born and longer-stay migrants acculturate or assimilate to US norms and behaviors (Lara et al., 2005). Therefore, in comparing recent migrants to longer-term migrants or the US born, scholars suggest that the US-born as well as migrants with more time in the US engage in individual-level health behaviors that erode their health, such as smoking or sedentary activity, or shed the social and cultural practices that assure immigrant health, such as family ties and spirituality (acculturation/assimilation hypothesis).

The preponderance of research to test these potential explanations has largely involved the use of cross-sectional data in the US to compare health outcomes and risk factors between the US and foreign-born. For example, researchers have used nationally-representative surveys such as the NHIS (Antecol & Bedard, 2006; Zsembik & Fennell, 2005) and NHANES (Crimmins, Kim, Alley, Karlamangla, & Seeman, 2007), and area-level surveys such as the San Antonio Heart Study and Sacramento Area Latino Study on Aging (Espinoza Sara E., Jung Inkyung, & Hazuda Helen, 2013; González, Tarraf, & Haan, 2011) to document the health advantage of

immigrants compared to the US-born. In another vein, cross-sectional data has also been used to compare health among immigrants with varying years in the US or who arrived in the US at different age points (Angel, Angel, Díaz Venegas, & Bonazzo, 2010; Colon-Lopez, Haan, Aiello, & Ghosh, 2009; Derby et al., 2010). With this approach, researchers attempt to disaggregate immigrants to better capture how migration shapes health selection and behaviors that might be related to health outcomes and how these factors change with time in the US.

In another vein, an emerging body of literature uses binational cross-sectional or longitudinal data to compare migrants to their compatriots who did not migrate (Lu, 2008; Ro & Fleischer, 2014; L. N. Rubalcava et al., 2008). Binational data through the use of linked datasets from both sending and receiving countries enable researchers to explore potential differences in health selection, behaviors, and outcomes with more appropriate comparison groups. With significant data collection hurdles, longitudinal data also enable researchers to gain access to information about individuals pre/post migration, explore health at baseline, and compare health trajectories between nonmigrants and migrants.

While these existing explanations and methodological approaches shed light on the drivers of the Latino health paradox, gaps in the research still remain. With some notable exceptions, the majority of research that has explored the health paradox hypotheses used data that was collected in the 1980s or 1990s and contemporary migration flows and health patterns are distinct from these earlier migration periods. While some recent datasets do include Latino immigrants and the US born, few include an important comparison group- non-migrants from Latin America. In addition, it is likely that the health paradox hypotheses operate in tandem to shape health outcomes, yet few studies have comprehensively tested multiple hypotheses in the same analysis.

Therefore, chapter 3 aims to contribute to this body of literature and address some of these gaps by using two waves of data from the Mexican Family and Life Survey to compare cardiovascular health, risk factors, and health-related behaviors between (1) Mexico-US migrants and nonmigrants and (2) Mexico-US return migrants and nonmigrants, and test the healthy immigrant and return migration hypotheses. The Mexican Life Family and Life Survey (MxFLS) is a longitudinal, multi-thematic survey representative of individuals and households in Mexico(L. Rubalcava & Teruel, 2006). The baseline survey, collected in 2002, consisted of a sample of 19,764 individuals from 150 communities in Mexico. The second wave (MxFLS-2; 2005-2006) relocated and reinterviewed the original respondents including those who emigrated to the US; re-contact rates for MxFLS-2 reached 90%. While health data from wave 2 on Mexico-US migrants has not yet been released, migration status at wave 2 is available and is used to classify Mexico-US migrants and nonmigrants. Furthermore, respondents were asked to provide a detailed migration history and this information is leveraged to classify US-Mexico return migrants and nonmigrants.

The MxFLS is also among the most recent studies that measures health and migration in the Mexican population. Understanding the health trajectories of Mexico-US migrants is essential for understanding broader processes within Latino health data. The Mexico-US migration flow represents one of the largest global migration flows, and Mexican migrants account for the largest immigrant origin group in the US[9]. Furthermore, Mexican migrants comprise 35% of the Mexican-origin population in the US and 20% of the overall Latino population (Gonzalez-Barrera & Lopez, 2013; US Census Bureau, 2013). This analysis therefore

[9] As of 2013, however, China and India surpassed Mexico in the number of immigrants sent per year

elucidates some of the potential mechanisms and drivers of Latino health in the US and provides an important examination of the Latina/o health paradox using data on Mexicans.

Research Questions & Hypotheses

Research Question 1: Mexico-US Migration.

Do (1) cardiovascular disease related health behaviors and (2) cardiovascular health profiles predict future US migration among Mexican adults?

Hypothesis 1a: CVD health behaviors do not predict future US-migration among Mexican adults

Hypothesis 1b: CVD health profiles do not predict future US-migration among Mexican adults

Research Question 2: Return Migration.

Do US-Mexico return migrants have significant differences in (1) CVD-related health behaviors and (2) CVD health profiles in comparison to non-migrants?

Hypothesis 2a: Return migrants will have worse CVD-related health behaviors in comparison to non-migrants

Hypothesis 2b: Return migrants will have worse CVD health profiles in comparison to n on-migrants, net of CVD-related behaviors.

Hypothesis 2c: Return migrants with more time in the US will have worse (1) CVD-related health behaviors and (2) CVD health profiles in comparison to return migrants who spent less time in the US and non-migrants

Methods

Data.

I use data from two waves (2002; 2005) of the Mexican Family Life Survey (MxFLS), a longitudinal, nationally representative sample of households in Mexico (L. Rubalcava & Teruel,

2006). The MxFLS used a multi-stage probability sample of the Mexican population. Primary sampling units were selected under criterions of national, urban-rural and regional representation on pre-established demographic and economic variables. The baseline survey in 2002 collected data on 35,000 individuals across 8,440 households in 150 communities throughout the country. . The second wave in 2005-2006 successfully recontacted almost 90% of the original household sample, including those who migrated within Mexico or emigrated to the US. However, the full sample of these data are not yet publicly available which limited my ability to compare trajectories of health and social characteristic among migrants and nonmigrants. Nevertheless, the data include an indicator to identify Mexico-US migrants in wave 2 (i.e. individuals who were living in Mexico during Wave 1 but moved to the US in Wave 2). I use this indicator to identify non-migrants and future migrants at baseline and compare their health.

The MxFLS collected socio-economic, demographic and health information on individuals and households. Participants also completed an in-home physical health assessment conducted by a trained health worker. I limit my analysis to individuals, ages 16 or older (n=19,048) because these individuals were surveyed on their migration history, health behaviors, and sociodemographics. This research was classified as exempt by the University of Michigan Institutional Review Board (HUM0011332).

Measures.

Table 3.1 provides an overview of the measures used for the analysis.

CVD Risk Factors and CVD.

Cardiovascular disease encompasses a range of conditions related to the buildup of plaque in the circulatory system leading to acute coronary syndrome, angina, arrhythmia, cardiomyopathy, coronary heart disease, heart failure, inflammatory heart disease, ischaemic

heart disease, deep vein thrombosis, peripheral artery disease, and stroke (Mozaffarian et al., 2015). Risk factors for CVD include overweight diabetes, and high cholesterol while CVD prevalence includes individuals with hypertension, heart disease (angina, heart attack), and stroke (Heidenreich et al., 2011). MxFLS measures a range of CVD risk factors as well as overall prevalence.

Abdominal Obesity: Measures of excess abdominal visceral adipose tissue, while associated with obesity and BMI, are suggested to be better predictors of CVD risk as they may "capture metabolic abnormalities, including decreased glucose tolerance, reduced insulin sensitivity, and adverse lipid profiles" (World Health Organization, 2008). Adiposity is generally measured using waist-circumference or waist-hip ratio and risk is determined using sex-specific cutoffs. I computed a continuous measure of waist-hip ratio using waist and hip circumference measures. I also computed dichotomous measure of elevated waist-circumference and elevated waist-hip ratio using WHO cutoff guidelines (WC >102 cm (M); >88 cm (W); WHR ≥0.90 cm (M); ≥0.85 cm (W)). For the analysis, I interchanged and compared results using elevated WHC and WHR.

Obesity: I computed a continuous measure of using height and weight measures BMI (weight/height^2 * 703), as well as clinical cutoffs for underweight (<18.4), normal (18.5-25), overweight (25.1-29.9), and obese categories (>30). I created two dichotomous variables which included only those who were categorized as obese compared to all other categories, and the second variable with obesity and overweight compared to normal and underweight.

Blood Pressure: Blood pressure is considered a structural marker of arterial vulnerability and high blood pressure is an indicator of potential cardiovascular disease. I used continuous measures of systolic (SBP) and diastolic (DBP) to create clinical measures of normal blood

pressure (<120/80), prehypertension (120-139/80-89), and hypertension (>140/90)[10]. In addition, I created two dichotomous measures of high blood pressure, one which included both individuals with clinical hypertension as well as those who reported that they were currently taking medication for hypertension and the second with only those that had a clinical measure of hypertension based on their SBP and DBP measurements.

Diabetes: Individuals self-reported if they had a history of diabetes. This measure was used to compute a dichotomous variable of diabetic status.

Cardiovascular Disease: Individual self-reported if they had a history of heart disease, heart attack, cholesterol/arteriosclerosis, or stroke. I computed a dichotomous measure of cardiovascular disease status based on positive responses to any of these items.

CVD Health-Related Behaviors.

Cardiovascular disease health-related behaviors are defined as the following:

Current Smoker: I created a dichotomous variable for smoking status, smoker (1) or nonsmoker (0), based on a series of questions about smoking history and quantity of smoking. Nonsmokers were individuals who reported that they had never smoked in their life. Individuals who reported that they had smoked previously, but currently reported zero cigarettes in the past month were also categorized as nonsmokers. Smokers were classified as individuals who reported smoking on average 1 or more cigarettes in the past month.

Physical Exercise: I created both continuous and dichotomous measures of physical activity. The continuous measure consisted of the total minutes of physical activity that respondent engaged in during an average week. This measures was also used to create a binary variable to indicate

[10] In 2018, the US updated their blood pressure guidelines however Mexico still ascribes to the previous standards (Instituto Mexicano del Seguro Social, 2017)

whether the individual met the criteria for the recommended amount of weekly physical activity in Mexico and the US (>150 min/week) (Pérez-Escamilla, 2016).

Migration Indicators.

Mexico-US Migrants: MxFLS identified individuals who migrated to the US in 2005 (although no other health or socioeconomic information about these migrants is currently available). Using this variable, I classified individuals as Mexico-US migrants (1) or nonmigrants (0).

Mexico-US Desired Migrants: The MxFLS asked respondents a series of migration questions including their desire for future migration. Using these questions I created a category of "desired migrants" based on individuals who: indicated in Wave 1 that they had a desire to emigrate from Mexico, chose the US as their destination, but had remained Mexico in Wave 2. As a non-migrant group with a desire to migrate, these individuals may be a better group to compare to Mexico-US migrants. Both groups may have endogenous characteristics that shape both migration and health (e.g. determination, self-confidence) that individuals with no desire to migrate do not share.

US-Mexico Return Migrant: MxFLS asks individuals to provide a roster of places they have lived since age 16; this migration roster enables me to determine if an individual ever lived in the US and their length of time in the US. Using these variables, I created an indicator of return migrants which included individuals who had reported living in the US for a period of 12 months or longer, but lived in Mexico in Wave 1. In addition, I computed the length of time spent in the US as a continuous variable measured in months (non-return migrants were given a value of 0).

Controls.

Finally, I include various controls within my models to account for variables that are associated with migration and the health outcomes of interest, but not central to my RQs.

Controls included age, sex, education, marital status, and health insurance. I used data on highest level of education completed to create a categorical measure indicating whether the individual completed college, high school, secondary/elementary school, or no education . Marital status was a dichotomous measure of unmarried (0) or married (1). Married included co-habiting couples and unmarried included widows. Health insurance was a dichotomous measure (yes/no) based on whether the individual indicated that they had public or private health insurance in the past year.

Table 3.1 Study Measures, MxFLS, Wave I

Measures	Variables
CVD Risk Factors	Waist circumference[1] & Elevated waist circumference[2] Waist-hip ratio[1] & Elevated waist-hip ratio[1] BMI[1] & Overweight/Obesity[2 & 3] Systolic & Diastolic Blood Pressure[1] & Hypertension [2 & 3] Diabetes Status[2]
CVD	Self-reported CVD (history of stroke, heart attack, or arteriosclerosis)[2]
CVD Behaviors	Smoking[2] Weekly Physical Activity (hours)[1 &] Recommended Level of Physical Activity[2]
Migration Indicators	Mexico-US Migrant (migrant and non-migrant) Mexico-US Desired Migrant (migrant and desired migrant) US-Mexico Return Migrant (return migrant and non-migrant) Time in the US (months)
Covariates	Age[1] Sex[2] Education[3] Marital Status[2] Health Insurance[2] Traditional Migration State[2]

[1]continuous variable [2] dichotomous variable [3]categorical variable

Statistical Analysis.

Descriptive Statistics and Bivariate Relationships

The analysis was completed using Stata 15. Categorical variables were dummy coded for the analysis. Descriptive statistics and frequencies of the study variable were generated to assess the quality of the data and proportion of missing cases. Any cases that were missing data on the independent, dependent, or control variables were dropped from the analysis. The final dataset for the analysis included n= 14,744 cases.

I computed descriptive statistics to obtain demographic characteristics among the entire sample and compare non-migrants, migrants, desired migrants, and return migrants at Wave 1. Pearson's chi-square tests (categorical variables) and students' t-tests (continuous) were used to explore significant differences in demographic and health characteristics among these groups.

Multivariate OLS and Logistic Regression Models

Multivariate regression models were used to examine the relationship between health at baseline and migration (RQ1) and return migration and health at baseline (RQ2).

For RQ1, I test whether health at wave 1 is associated with Mexico-US migration at wave 2. In these models, Mexico-US migration is the dependent variable while health variables at baseline are the independent variables. In addition, I complete a sub-analysis of RQ1 by restricting my sample to Mexico-US migrants (1) and desired migrants (0). The model is specified as follows:

$$\ln(\text{migration}/1\text{-migration}) = \beta_0 + \beta_1(\text{health vars}) + \ldots \beta_k(\text{controls})$$

For RQ2, I test whether return-migration from the US is associated with each of the health variables at wave 1. In these models, now health at baseline is the dependent variable and

both US-Mexico return migration and times in the US are independent variables (in separate models). The models are specified as follows using BMI and obesity as a models.

$$\text{OLS: } Y_{BMI} = \beta_0 + \beta_1(\text{return migrant}) + \ldots \beta_k(\text{controls}) + e_i$$

$$\text{Logistic: } \ln(\text{obesity}/1\text{-obesity}) = \beta_0 + \beta_1 \text{months in US}) + \ldots \beta_k(\text{controls})$$

To compare models and determine the appropriate covariates to include in final models, I used likelihood-ratio tests to compare nested and full models and examined standard errors and p-values. I also tested for multicollinearity by computing correlation coefficients and conducted post-estimation tests of the regression models using variance inflation factors

Mixed Effects Models

Data in the MxFLS are clustered on two levels, respondents are nested within families/households and families/households are grouped within states. Failure to account for clustering in the data may lead to misleading inferences. Therefore to account for nesting in the data, I also estimated a series of mixed effects models with fixed-effect and random-effects. First, I estimated a two-level model that included fixed effects for the relationship between the dependent variable and the level-1 independent variables (e.g. age, gender, etc) and a random-intercept for family. Then I estimated a three-level model that included fixed effects for the relationship between the dependent variable and the level 1- independent variables, a random-intercept for family at level-2, and a random intercept for state at level-3. I compared the results of the mixed effects models that account for nesting to the OLS and logistic regression models.

Results

Descriptive Statistics

The final analytic sample consisted of 14,744 cases. Table 3.2 presents descriptive statistics of the overall sample. There was a larger proportion of women (56 percent) than men (44 percent). The mean age was 40 years old (sd=16.62) and ranged from 15 to 107. The majority of individuals were married (70 percent). In addition, about one-fifth of the sample had achieved at least a high school education in Mexico and slightly over half of individuals reported that they had worked in the past month. Slightly less than half reported that they had any form of health insurance.

In terms of health characteristics, over 60 percent of the sample was classified as overweight or obese (63.96 percent), which was consistent with national estimates (Barquera et al., 2009). Over a quarter had elevated waist-hip ratio (28 percent) and waist circumference (26 percent). Based on anthropometric measures of systolic and diastolic blood pressure, 36 percent were classified as having hypertension/high blood pressure; when high blood pressure included those who reported taking medicine for hypertension that percentage nearly doubled to 63 percent. Based on self-report data, approximately 6 percent and 3 percent reported that they had been diagnosed with diabetes and cardiovascular disease, respectively. Finally 13 percent reported being a current smoker, and 13 percent also reported levels of physical activity that classified them as meeting the recommended weekly level of physical activity.

Migrant Groups Descriptive Statistics and Bivariate Analysis

Tables 3.3-3.5 provide breakdowns of the various migrant groups used in the analysis and compare their sociodemographic and health characteristics. Categorical variables were compared

using chi-square tests and continuous variables using t-tests. A p-value level of 0.01 was set as the level of significance.

There were a total of 321 Mexico-US migrants and 14,423 nonmigrants in the sample (Table 3.3). Mexico-US migrants were respondents who lived in Mexico during Wave 1 of the study in 2009, then were living in the US during Wave 2 in 2012. As compared to non-migrants, migrants were more likely to be younger, male, unmarried, and uninsured. In addition, migrants had lower levels of obesity, elevated waist-hip ratio and waist circumference, and self-reported diabetes. Finally, Mexico-US migrants were also more likely to have previously resided in the US, and spent more time in the US compared to non-migrants who had also previously resided in the US.

Table 3.4 further subdivides the non-migrant group to compare Mexico-US desired migrants and Mexico-US migrants. Desired migrants were those individuals who in Wave 1 had said they wanted to migrate to the US, but remained in Mexico in Wave 2. In general, desired migrants and migrants had similar sociodemographic and health characteristics. However, desired migrants were more likely to have completed high school and have health insurance. Finally, 276 individuals in the sample were Mexico-US return migrants which was defined as individuals who had previously migrated to the US for a period of at least 12 months. Return migrants had a much larger proportion of men, 71 percent versus 44 percent, and were more likely to be currently working and uninsured. Return migrants also had lower levels of elevated waist-hip ratio compared to non-return migrants but otherwise were comparable health-wise.

Research Question 1

RQ1 tests whether health at wave 1 is associated with migration to the US at wave 2

using a series of logistic regression models (Table 3.6). I first entered and selected the appropriate covariates in the model before testing for association with health. The best fitting model included covariates for age, sex, education, insurance status, and traditional migration state. In this base model, being younger and male, having less education and no health insurance, and living in a traditional migration state were all independent and significant predictors of future migration to the US. Model 2, Table 3.5 shows that most of the health indicators, including obesity status, high blood pressure, self-reported diabetes, self-reported CVD, smoking, and physical activity, were not significantly associated with future migration status. Elevated WHC, however, was associated with migration; those who had an elevated waist circumference were less likely to migrate to the US (OR=0.67, 95%CI 0.46-0.98). To rule out multicollinearity or variable specification issues, I tested these models with continuous versions of these variables if available (e.g. continuous measure of BMI vs categorical measure of obesity) and I entered each of the health indicators individually with only the covariates.

In Table 3.7 I further explore health at baseline and migration by restricting the sample to include Mexico-US migrants (1) and desired migrants (0), which resulted in a sample of n=607 cases. Recall that desired migrants are individuals who reported wanting to move to the US in wave 1 but had not migrated by wave 2. In these models, age, education, and insurance status were the only independent predictors of migration; those who were younger, did not complete college, and were uninsured were more likely to migrate among desired migrants and Mexico-US migrants. In Model 2 in the Table 3.7, I add health variables into the model and again health factors were not significantly associated with migration. I also tested each of these health variables in isolation in the model and used alternate specifications of the variables for robustness checks.

Research Question 2

For RQ2 I test whether ever migrating the US and further amount of time spent in the US before Wave I is associated with health during Wave I. In these models, each of the health indicators was modeled as the dependent variable. In cases where indicators could be defined as continuous or categorical (e.g. BMI and obesity/overweight), I ran both OLS regression and logistic regression models. While point estimates varied, the substantive results for most of the outcomes did not differ. Therefore I present and discuss the outcomes of the logistic regression models. I also tested if associations between return migration or time in the US and health could be explained by differences in smoking and physical activity behaviors, by entering these variables in the model both before and after the return migration and time variables. Tables 3.8-3.14 present the base model with covariates and full models that included migration variables for each of the health indicators.

I first tested whether return migration and time in the US were associated with physical activity (Table 3.8) and smoking (Table 3.9). In both models, neither being a return migrant nor amount of time spent in the US were significantly associated with either physical activity or smoking. For physical activity, age, sex, education, insurance status, and traditional migration state were significant covariates, while only sex, employment status, education and insurance status were associated with smoking.

Next I tested associations between return migration and time in the US and CVD risk factors of obesity status, elevated WHC, high blood pressure, and diabetes (Tables 3.10-3.13). Across the models for high blood pressure and diabetes, there were no significant differences between return migrants and non-migrants. Nor was time in the US significantly associated with the probability of high blood pressure or self-reported diabetes. However, for both

obesity/overweight status and elevated WHC, both return migration and time in the US were significant independent variables in the models. Return migrants had a 45% increased odds of having an elevated WHC compared to nonmigrants (OR=1.452, 95% CI 1.079-1.953) and each additional year spent in the U.S. increased the odds of adiposity by 3% (OR=1.003, 95% CI 1.00-1.007). Similarly return migrants were more likely to be overweight and obsese as compared to nonmigrants (OR=1.381, 95% CI 1.056-1.806), and time in the US also increased the probability of being overweight (OR=1.005, 95% CI 1.001-1.009). The inclusion of physical activity or smoking behaviors in the models did not significantly alter these findings

Finally, I tested return migration and time in the US on self-reported cardiovascular disease (Table 3.14). In these models, return migration was not significantly associated with cardiovascular disease, however time in the U.S. was associated with an increased odds of reporting heart disease, stroke, or atherosclerosis (OR=1.005, 95% CI 1.001-1.009). Again, the inclusion of smoking or physical activity did not add any explanatory power to the models or change the effects of time spent in the U.S on cardiovascular disease.

Mixed Effects Models

I next ran a series of mixed effects models that allowed me to account for the clustering of respondents in both families and states. Across these models the likelihood ratio test demonstrated that the mixed effects model offered a better fit to the model than the OLS and logistic regression models. However, in general the results from the models did not change the substantive findings of the simpler models. Therefore the tables in Appendices C-F present the results of the mixed effects models for a sample of the health variables.

Important to note however is that the mixed effects models allowed me to calculate the intraclass correlation (ICC) and determine the proportion of variability in the dependent variable

that is attributable to the family-level and state-level clustering. In the mixed effects model that modeled the relationship between Mexico-US migration and health at baseline, 75 percent of the variation in migration was attributable to state of residence while 44 percent was attributable to the family level. In comparison, the mixed effects models that tested the relationship between US-Mexico return migration and time in the US had much lower ICCs for family-level and state-level variation in the health outcomes of interest. For example, the family level ICC ranged from 4-9% of the variation while the state level ICC ranged from 7-20%.

Discussion

This analysis drew on a large and multi-thematic dataset of adults in Mexico to gain a better understanding of health factors that may shape migration to the United States, and further to explore how US migration might shape health among Mexican migrants once they return to their country of origin. In general, I found that a variety of health behaviors, cardiovascular health risk factors, and cardiovascular disease are not associated with future migration to the US. Instead, more traditional factors such as age, gender, and education were consistently associated with migration. In addition, having health insurance also reduced the odds of migration. This finding may be due, in part, to the types of employment sectors that provide health insurance to Mexican residents (private business and government employees) and the employment and economic opportunities these individuals had in Mexico compared to uninsured individuals outside of these sectors. Elevated waist circumference was negatively associated with migration to the US, although related measures obesity, BMI, and elevated waist-hip-ratio were not.

The results of the analysis in the entire sample was comparable to the sub-analysis that included only migrants and desired migrants. Desired migrants, those who said they want to migrate to the US eventually, may have been a more appropriate comparison group than non-

migrants, because they perhaps share personality or motivation factors similar to those who ultimately migrate. Health, though, may have played a stronger role in why these individuals ultimately did not migrate to the U.S. This hypothesis however did not bear out in the data where none of the health variables distinguished desired migrants from actual migrants. Based on these findings, it is unlikely that health selection were significant contributors to respondents' decision to migrate to the US between the waves of the MxFLS.

While I found that migrants and nonmigrants had similar health profiles before migration, health outcomes among return migrants revealed a different and mixed story depending on the health indicator in question. Return migrants, those who had ever spent a year or longer in the US, were more likely to be obese/overweight and have an elevated waist circumference. As compared to other return migrants and non-migrants who had not migrated to the US, return migrants who had lived in the US for more time also had an higher probability for obesity, elevated waist circumference, and self-reported cardiovascular disease.

In summary I found that the health of Mexico-US migrants' was on par with their compatriots who do not migrate, but the health of US-Mexico return migrants was worse on some indicators. These results have multiple potential explanations. Differences in health behaviors in the US relative to the US, or the assimilation hypothesis, could partially explain the health differentials between return migrants and nonmigrants. That is, US-Mexico return migrants could have adopted worse health behaviors in the US that drive these differences. While I controlled for physical activity and smoking as potential health behaviors, other factors such as diet which were not measured in the study could have played a role in these findings. So too, return migrants could have uniquely returned to Mexico *because* they were sick or unhealthy and so these findings could support this salmon bias hypothesis. However, scholars conjecture

that return migration due to health is largely because of serious illness such as cancer or disability, rather than the health indicators that were significant in the analysis- obesity and waist circumference.

Alternatively, a growing body of research suggests that the worse health of Mexican migrants in the US compared to those in Mexico may be reflective of the unique social environment and migration experiences they endure in the US. In this line of inquiry, the stressors of migration as well as the process of being a marginalized and racialized immigrant in the US could contribute to deleterious health outcomes that are associated with stress response dysregulation, such as obesity and waist hip circumference. Indeed the finding that more time in the U.S. was associated with worse health points to the potential of this exposure hypothesis. Age at migration and age at return migration would likely shed further light on these findings. Sample size limitations and variable availability restricted my ability to test these age explanations and the exposure hypothesis further. However the longitudinal waves of the MxFLS study continues to track return migrants, who have now reached over 1000 cases, and is conducting a qualitative study about return migrants' decision to return to Mexico which could clarify this potential pathway.

In addition, living in a traditional migration state played an important role across models that predicted both migration and health outcomes. Traditional migration states such as Zacatecas, Michoacán, Oaxaca, and Sinaloa, have historically sent the most migrants to the US in comparison to other regions in Mexico. It is likely that this indicator is capturing socio-contextual factors, such as regional poverty, violence, or employment opportunities, that shape migration and health but were not well measured by the other covariates in the models. The mixed effects also supported this finding where a high proportion of the variation in US-Mexico

migration was explained by the respondent's state of residence. Future work in this area would benefit from adding state-level predictors into the model to clarify the role of this state and regional context for migration and health

However I interpret my findings and their contributions, while also noting some important limitations of this analysis and data. Although the MxFLS provides survey weights to adjust for item-nonresponse, the survey design features, and national demographics of Mexico, the weights provided in the data were complex and it was unclear how to implement the MxFLS weighting system to my regression models[11]. Therefore the results of this analysis is not representative of the entire population of Mexico and its migrant population. Further, survey method researchers have found that failure to account for sampling weights can potentially lead to biased estimates and standard errors; fully specified models, however, are suggested to suffer less from these issues. In building the model, I attempted to use diagnostic procedures to ensure a strong fit to the models in light of these potential issues (Korn & Graubard, 2011; West, Sakshaug, & Aurelien, 2016).

In addition, while the structure of the MxFLS allowed me to include a number of multifaceted variables in the models, the data itself has some notable limitations. First, while many of the health measures where collected by a health professional, nearly a quarter of the sample was dropped from the analysis dues to missing health measures. It is unclear why so many cases where missing this health information, and cases with missing data did differ from the analytical sample (Appendix A). Therefore, multiple imputation or other missing data techniques may be a useful next step in this analysis. In addition, measures of physical activity,

[11] I consulted resources at CSCAR, ISR, and the PIs of the study for assistance. Consultants at CSCAR were also unsure how to handle the weighting scheme and repeated attempts for clarification from the study PIs went unanswered

smoking, diabetes, and cardiovascular disease were all based on self-report, although these measures were often correlated or associated with the clinical measures (Appendix B).

Although migration flows from Mexico to the US have been receding as of late, Mexican migrants in the US and return migrants in Mexico represent a significant demographic in both countries. The current literature is mixed on how health might shape individual's propensity to migrant, how the US shapes migrant's health, and the various mechanisms that influence these processes. This analysis contributes to this literature by leveraging data from the MxFLS and providing novel approaches to explore these questions. The findings from the analysis demonstrate that health selection is not a salient determining factor for future migration among Mexican adults, however upon returning to Mexico adults with exposure to the US far worse in some health measures. These findings suggest that researchers would be well include to further explore and examine the unique social and health environments faced but Mexican migrants to the US and the implications of this context for their health.

Table 3.2 Descriptive Statistics, MxFLS, Wave 1, n=14,744

Variable	N	Mean (sd)	%
Age		40.57(16.62)	
Male	6,527		44.27
Married	10,264		69.61
High School Education	2,966		20.12
Currently Working	7,966		54.03
Health Insurance	6,691		45.38
Relatives in the US	5133		36.35
Mexico-US Migrants	321		2.18
Mexico-US Desired Migrants	299		2.35
US-Mexico Return Migrants	276		1.87
Overweight/Obese	9301		63.96
Elevated Waist-Hip Ratio	4155		28.18
Elevated Waist-Circumference	3893		26.4
High Blood Pressure	5368		36.41
Self-Reported Diabetes	863		5.85
Self-Reported CVD	482		3.27
Current Smoker	2007		13.61
Recc Physical Activity	2046		13.88

Table 3.3 Descriptive Statistics & Bivariate Analysis, Nonmigrants v Migrants, MxFLS, Wave 1, n=14,744

Variable	Non-Migrants (n=14,423)			Migrants (n=321)		
	N	Mean (sd)	%	N	Mean (sd)	%
Age**		40(.14)			29(.64)	
Male*	6,359		44.09	168		52.34
Married**	10,093		69.98	171		53.27
High School Education	2,901		20.11	65		20.25
Currently Working	7,780		53.94	186		57.94
Health Insurance**	6,622		45.91	69		21.50
Return Migrant**	248		1.72	28		8.72
Months in the US*		0.9(0.09)			2.9(.65)	
Relatives in the US **	4923		35.64	210		67.74
Overweight/Obese**	9145		64.28	156		49.52
Elevated Waist-Hip Ratio**	4109		28.49	46		14.33
Elevated Waist-Circumference**	3854		26.72	39		12.15
High Blood Pressure*	5280		36.61	88		27.41
Self Reported Diabetes*	855		5.93	8		2.49
Self Reported CVD	472		3.27	10		3.12
Current Smoker	1961		13.6	46		14.33
Recc. Physical Activity	1987		13.87	59		18.38

*p<0.01;** p<0.001; chi-square tests completed for categorical variables; t-tests completed for continuous variables

Table 3.4 Descriptive Statistics & Bivariate Analysis, Desired Migrants v Migrants, MxFLS, Wave 1, n=14,744

Variable	Desired Migrants (n=299)			Migrants (n=321)		
	N	Mean (sd)	%	N	Mean (sd)	%
Age		30(.63)			29(.64)	
Male	156		52.17	168		52.34
Married	163		54.52	171		53.27
High School Education**	103		34.45	65		20.25
Currently Working	184		61.54	186		57.94
Health Insurance**	121		40.47	69		21.50
Return Migrant	30		10.03	28		8.72
Months in the US		3.16(.73)			2.9(.65)	
Relatives in the US	204		68.23	210		67.74
Overweight/Obese	168		57.53	156		49.52
Elevated Waist-Hip Ratio	51		17.06	46		14.33
Elevated Waist-Circumference	58		19.4	39		12.15
High Blood Pressure	87		29.1	88		27.41
Self Reported Diabetes	7		2.34	8		2.49
Self Reported CVD	9		3.01	10		3.12
Current Smoker	55		18.39	46		14.33
Recc. Physical Activity	68		22.74	59		18.38

**p<0.01; p<0.001; chi-square tests completed for categorical variables; t-tests completed for continuous variables

Table 3.5 Descriptive Statistics, Non Return Migrants v Return Migrants, MxFLS, Wave 1, n=14,744

Variable	Non- Return Migrants (n=14,468)			Return Migrants (n=276)		
	N	Mean (sd)	%	N	Mean (sd)	%
Age		40.59(.14)			39.60(.88)	
Male**	6330		43.75	197		71.38
Married	10055		69.50	209		75.72
High School Education	2,918		20.17	48		17.39
Currently Working**	7,783		53.79	183		66.30
Health Insurance**	6591		45.56	100		36.23
Mexico-US Migrant**	293		2.03	28		10.14
Months in the US		---			50.90(3.77	
Relatives in the US **	4943		35.7	190		68.84
Overweight/Obese	9113		63.86	188		69.12
Elevated Waist-Hip Ratio**	4105		28.37	50		18.12
Elevated Waist-Circumference	3825		26.44	68		24.64
High Blood Pressure	5265		36.39	103		37.32
Self Reported Diabetes	854		5.9	9		3.26
Self Reported CVD	473		3.27	9		3.26
Current Smoker	1957		13.53	50		18.12
Recc Physical Activity	1995		13.79	51		18.48

**p<0.01; p<0.001; chi-square tests completed for categorical variables; t-tests completed for continuous variables

Table 3.6 Logistic Regression Models of the Association between Mexico-US Migration and CVD Health, MxFLS Wave 1, n=14,744

US-MX Migrant	Model 1				Model 2			
	OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	0.94	0.01	0.93	0.95	0.94	0.01	0.93	0.96
Male	1.49	0.17	1.19	1.86	1.38	0.17	1.08	1.77
Married	0.75	0.10	0.59	0.96	0.76	0.10	0.59	0.98
Education								
None	2.20	0.78	1.10	4.41	2.23	0.80	1.10	4.49
Elementary	2.69	0.81	1.49	4.87	2.77	0.84	1.53	5.03
Secondary	2.46	0.74	1.36	4.44	2.48	0.75	1.37	4.48
High School	2.14	0.68	1.16	3.98	2.16	0.68	1.17	4.02
Insured	0.39	0.06	0.30	0.52	0.39	0.06	0.30	0.52
Traditional Migration State	1.60	0.19	1.26	2.02	1.61	0.19	1.27	2.04
Obese/Overweight					0.99	0.13	0.77	1.28
Elevated WHC					0.67	0.13	0.46	0.99
High Blood Pressure					0.93	0.13	0.71	1.21
Diabetes					1.17	0.44	0.56	2.42
Cardiovacular Disease					1.91	0.64	0.99	3.69
Smoker					0.97	0.17	0.70	1.37
Recc Level of Physical Activity					1.27	0.19	0.94	1.71

Table 3.7 Logistic Regression Models of the Association between Mexico-US Migration and CVD Health, Desired Migrant Sub-Analysis, MxFLS Wave 1, n=607

US-MX Migrant	Model 1				Model 2			
	OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	0.97	0.01	0.96	0.99	0.98	0.01	0.96	1.00
Education (College-Ref)								
None	9.17	4.91	3.21	26.19	8.59	0.00	2.97	24.86
Elementary	3.43	1.27	1.65	7.11	3.29	1.24	1.57	6.89
Secondary	2.66	0.96	1.30	5.43	2.45	0.90	1.19	5.05
High School	1.90	0.72	0.90	4.00	1.86	0.11	0.88	3.95
Insured	0.53	0.10	0.36	0.77	0.54	0.11	0.37	0.79
Obese/Overweight					0.86	0.17	0.59	1.26
Elevated WHC					0.70	0.18	0.42	1.17
High Blood Pressure					1.04	0.20	0.71	1.53
Diabetes					1.77	1.01	0.58	5.44
Cardiovascular Disease					0.99	0.49	0.38	2.61
Smoker					0.78	0.18	0.50	1.24
Recc Level of Physical Activity					0.82	0.18	0.54	1.25

Table 3.8 Logistic Regression Models of the Association between Exposure to the US and Physical Activity, MxFLS Wave 1, n=14,744

Recommended Level of Weekly Physical Activity	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	0.995	0.002	0.991	0.998	0.995	0.002	0.991	0.998	0.995	0.002	0.991	0.998
Male	1.516	0.074	1.377	1.669	1.508	0.074	1.370	1.660	1.516	0.074	1.377	1.668
Married	0.810	0.043	0.730	0.900	0.809	0.043	0.729	0.898	0.810	0.043	0.730	0.899
Education (College=Ref)												
None	0.281	0.000	0.224	0.354	0.282	0.000	0.224	0.355	0.281	0.000	0.224	0.354
Elementary School	0.409	0.035	0.346	0.484	0.409	0.035	0.346	0.484	0.409	0.035	0.346	0.484
Secondary School	0.711	0.059	0.605	0.836	0.709	0.059	0.603	0.834	0.711	0.059	0.605	0.836
High School	0.943	0.502	0.793	1.120	0.943	0.505	0.794	1.121	0.943	0.501	0.793	1.120
Insured	1.302	0.066	1.179	1.439	1.306	0.066	1.182	1.442	1.303	0.066	1.179	1.440
Traditional Mig State	0.871	0.051	0.777	0.976	0.867	0.050	0.774	0.972	0.870	0.051	0.777	0.975
Return Migrant					1.305	0.210	0.952	1.790				
Time in the US (months)									1.001	0.002	0.996	1.005

Table 3.9 Logistic Regression Models of the Association between Exposure to the US and Smoking, MxFLS Wave 1, n=14,744

Smoker	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Male	3.424	0.205	3.045	3.850	3.423	0.205	3.044	3.850	3.410	0.204	3.033	3.835
Work	1.535	0.094	1.361	1.732	1.535	0.094	1.361	1.732	1.539	0.095	1.364	1.736
Education (Secondary=Ref)												
None	0.801	0.066	0.682	0.940	0.801	0.066	0.682	0.940	0.804	0.066	0.685	0.944
Elementary School	0.742	0.048	0.655	0.842	0.743	0.048	0.655	0.842	0.743	0.048	0.656	0.843
High School	0.914	0.076	0.776	1.076	0.914	0.076	0.776	1.076	0.916	0.076	0.778	1.079
College or Grad	0.819	0.079	0.678	0.989	0.819	0.079	0.678	0.989	0.822	0.079	0.680	0.992
Insured	1.160	0.059	1.050	1.282	1.161	0.059	1.050	1.282	1.164	0.059	1.054	1.286
Return Migrant					1.008	0.164	0.734	1.386				
Time in the US (months)									1.003	0.002	1.000	1.007

Table 3.10 Logistic Regression Models of the Association between Exposure to the US and Obesity/Overweight Status, MxFLS Wave 1, n=14,744

Overweight/Obesity	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	1.018	0.001	1.016	1.021	1.018	0.001	1.016	1.021	1.018	0.001	1.016	1.021
Male	0.782	0.028	0.728	0.839	0.777	0.028	0.723	0.834	0.778	0.028	0.725	0.836
Married	2.140	0.084	1.982	2.310	2.137	0.084	1.980	2.308	2.139	0.084	1.981	2.309
Education (Elementary=Ref)												
None	0.711	0.059	0.604	0.837	0.714	0.059	0.607	0.840	0.714	0.059	0.606	0.840
Secondary School	1.273	0.091	1.107	1.464	1.274	0.091	1.107	1.466	1.272	0.091	1.106	1.464
High School	1.084	0.079	0.940	1.249	1.080	0.078	0.937	1.245	1.080	0.078	0.937	1.244
College or Grad	0.980	0.078	0.839	1.145	0.981	0.078	0.839	1.146	0.979	0.078	0.838	1.144
Insured	1.372	0.052	1.274	1.477	1.375	0.052	1.277	1.481	1.376	0.052	1.278	1.482
Traditional Migration State	0.802	0.032	0.741	0.868	0.798	0.032	0.738	0.864	0.800	0.032	0.739	0.865
Return Migrant					**1.381**	**0.189**	**1.056**	**1.806**				
Time in the US (months)									**1.005**	**0.002**	**1.001**	**1.009**

Table 3.11 Logistic Regression Models of the Association between Exposure to the US and Elevated Waist-Hip-Circumferences, MxFLS, Wave 1, n=14,744

Elevated WHC	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	1.030	0.001	1.027	1.033	1.030	0.001	1.027	1.033	1.030	0.001	1.027	1.033
Male	0.225	0.012	0.203	0.249	0.223	0.011	0.201	0.246	0.224	0.012	0.202	0.248
Married	1.670	0.080	1.520	1.834	1.668	0.080	1.519	1.832	1.669	0.080	1.519	1.833
Work	1.113	0.052	1.016	1.219	1.114	0.052	1.017	1.220	1.114	0.052	1.017	1.220
Education (College=Ref)												
None	1.233	0.130	1.003	1.516	1.238	0.131	1.007	1.522	1.236	0.130	1.005	1.520
Elementary School	1.660	0.155	1.383	1.993	1.664	0.155	1.386	1.998	1.661	0.155	1.384	1.994
Secondary	1.335	0.128	1.105	1.612	1.330	0.128	1.102	1.607	1.332	0.128	1.103	1.609
High School	1.020	0.111	0.823	1.264	1.021	0.112	0.824	1.265	1.019	0.111	0.823	1.263
Insured	1.227	0.051	1.131	1.332	1.231	0.052	1.134	1.336	1.230	0.052	1.133	1.336
Recc. Physical Activity	0.863	0.055	0.761	0.979	0.861	0.055	0.759	0.977	0.863	0.055	0.761	0.979
Return Migrant					**1.452**	**0.220**	**1.079**	**1.953**				
Time in the US (months)									**1.003**	**0.002**	**1.000**	**1.007**

Table 3.12 Logistic Regression Models of the Association between Exposure to the US and High Blood Pressure, MxFLS, Wave 1, n=14,744

High Blood Pressure	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	1.031	0.001	1.029	1.034	1.031	0.001	1.029	1.034	1.031	0.001	1.029	1.034
Male	2.012	0.075	1.870	2.165	2.015	0.075	1.872	2.168	2.011	0.075	1.869	2.163
Married	0.910	0.037	0.840	0.985	0.910	0.037	0.840	0.985	0.910	0.037	0.840	0.985
Education (College=Ref)												
None	0.828	0.044	0.746	0.920	0.828	0.044	0.746	0.919	0.829	0.044	0.746	0.920
Secondary School	0.808	0.041	0.732	0.891	0.808	0.041	0.732	0.892	0.807	0.041	0.731	0.891
High School	0.703	0.046	0.619	0.798	0.703	0.046	0.619	0.798	0.703	0.046	0.619	0.798
College or Grad	0.748	0.054	0.649	0.862	0.748	0.054	0.649	0.862	0.748	0.054	0.649	0.862
Traditional Migration State	0.787	0.033	0.726	0.854	0.788	0.033	0.726	0.855	0.787	0.033	0.725	0.853
Smoker	0.869	0.046	0.783	0.965	0.869	0.046	0.783	0.965	0.869	0.046	0.783	0.965
Return Migrant					0.937	0.123	0.724	1.213				
Time in the US (months)									1.001	0.002	0.998	1.004

Table 3.13 Logistic Regression Models of the Association between Exposure to the US and Self-Reported Diabetes, MxFLS, Wave 1, n=14,744

Diabetes	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	1.047	0.003	1.042	1.052	1.047	0.003	1.042	1.052	1.047	0.003	1.042	1.052
Male	0.682	0.060	0.574	0.810	0.687	0.060	0.578	0.816	0.682	0.060	0.574	0.810
Married	0.832	0.073	0.700	0.988	0.831	0.073	0.700	0.987	0.832	0.073	0.700	0.988
Work	1.483	0.132	1.246	1.765	1.484	0.132	1.247	1.766	1.483	0.132	1.246	1.765
Education (Elementary=Ref)												
None	0.546	0.055	0.448	0.665	0.545	0.055	0.447	0.664	0.546	0.055	0.448	0.665
Secondary School	0.677	0.080	0.537	0.853	0.679	0.080	0.539	0.856	0.677	0.080	0.537	0.853
High School	0.571	0.099	0.407	0.801	0.571	0.099	0.407	0.802	0.571	0.099	0.407	0.801
College or Grad	0.599	0.114	0.412	0.869	0.599	0.114	0.413	0.870	0.599	0.114	0.412	0.869
Insured	1.249	0.094	1.078	1.447	1.246	0.093	1.076	1.444	1.249	0.094	1.078	1.447
Traditional Migration State	0.800	0.069	0.676	0.948	0.802	0.069	0.677	0.951	0.800	0.069	0.676	0.948
Return Migrant					0.681	0.237	0.345	1.347				
Time in the US (months)									0.9999	0.0031	0.9939	1.006

Table 3.14 Logistic Regression Models of the Association between Exposure to the US and Self-Reported CVD, MxFLS, Wave 1, n=14,744

CVD	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	1.044	0.003	1.038	1.051	1.045	0.003	1.038	1.051	1.044	0.003	1.038	1.051
Male	0.632	0.062	0.521	0.767	0.629	0.062	0.518	0.764	0.628	0.062	0.518	0.762
Education												
Elementary	1.469	0.185	1.147	1.881	1.467	0.185	1.146	1.879	1.463	0.185	1.143	1.874
Secondary	1.109	0.210	0.765	1.609	1.105	0.210	0.762	1.603	1.099	0.209	0.757	1.594
High School	1.570	0.337	1.031	2.390	1.569	0.337	1.030	2.389	1.565	0.336	1.028	2.384
College	1.469	0.346	0.926	2.331	1.468	0.346	0.925	2.330	1.470	0.346	0.926	2.333
Return Migrant					1.268	0.441	0.642	2.506	--	--	--	--
Time									**1.005**	**0.002**	**1.000**	**1.009**

Chapter 4 "Recognizing Their Right to Mobility and An IDENTITY!": The Psychosocial Implications of Immigration Policy for Latina/o Health

Across the United States, the deadlock on comprehensive immigration reform at the federal level and shifting migration demographics at the state and local level has spurred the proliferation of federal, state, and local laws, policies, and initiatives related to immigration (C. M. Rodriguez, 2007; Steil & Vasi, 2014). The National Conference of State Legislatures, which tracks state-level activity, reported that in 2005 legislatures in 25 states passed 45 immigration laws, by 2017 the figure had grown to 206 laws across 49 states (National Conference of State Legislatures, 2018). These laws and policies span several legislative and social domains including education, health care, border enforcement, law enforcement, driver's licenses, labor and work rights, among many others (J. P. Stumpf, 2007)

Recognizing this shift, an emerging body of research has begun to explore the role of immigration policies and laws on immigrant health and wellbeing (Aponte-Rivera & Dunlop, 2011; Gee & Ford, 2011; Hatzenbuehler et al., 2017; Martinez et al., 2015; Toomey et al., 2014; Viruell-Fuentes et al., 2012). In this literature, immigration policies are theorized to affect health through two primary mechanisms: First, federal, state, and local governments often use immigration laws and policies to provide or bar access to social and economic resources to migrants, such as health insurance, drivers' licenses, supplemental aid programs, and work permits. The terms of these policies can often directly affect undocumented/unauthorized immigrants and/or documented non-citizen immigrants, and to a lesser extent the US-born children of these immigrant groups. The preponderance of research has primarily focused on

these material mechanisms by studying the health consequences of these policies shifts (Martinez et al., 2015; Rhodes et al., 2014; Toomey et al., 2014; Vargas, 2015; Watson, 2014). For example, following the passage of federal immigration and welfare laws in the 1990s Korenbrot and colleagues studied health care coverage and birth outcomes among foreign born and US born women in California; their analysis showed that foreign-born women were more likely to be uninsured, receive less adequate prenatal care, and did not experience the improvements in birth outcomes that US born women experienced during the same period (Korenbrot, Dudley, & Greene, 2000). Similarly, using qualitative interviews among Latina immigrants in Alabama, White and colleagues found that the state's restrictive immigration laws in 2011 reduced access to and use of health services among women and their U.S. and foreign born children (White, Yeager, Menachemi, & Scarinci, 2014).

The second potential mechanism linking immigration policies to health underscores the symbolic nature of immigration policies. Scholars argue that immigration laws and policies are but one of many features of society that remind immigrant groups of their belonging and membership (Geronimus et al., 2016; Link & Phelan, 2001). While immigration policies are purported to be color-blind, instead scholars have outlined these ways contemporary policies often define national belonging along racial/ethnic lines, shaping ideologies and attitudes about the place of racialized immigrant groups in the US (Aranda & Vaquera, 2015; Douglas, Sáenz, & Murga, 2015). Restrictive immigration policies can contribute to a psychosocial context that is perceived as identity-threatening for immigrant groups who are deemed undesirable, and US-born coethnics who are subsumed under these social-identity groups. As individuals undertake their everyday lives with constant reminders of their social worth and symbolic membership, coping with this threatening context can ultimately tax health via the activation of biological

stress processes in the body (Jackson et al., 2010; Myers, 2009). Throughout this paper, I broadly refer to this mechanism as the psychosocial mechanism or the psyhosocial implications of immigration policy.

To date, however, both theoretical frameworks and empirical research outlining these psychosocial mechanisms have been limited. Researchers studying the associations between anti-immigration policies or immigration enforcement and health outcomes have suggested that psychosocial stress, discrimination, and experiences of othering are the vehicles by which these policies *get under the skin* (Hatzenbuehler et al., 2017; Novak, Geronimus, & Martinez-Cardoso, 2017; Potochnick & Perreira, 2010). However, few have tested these assumptions directly due to data limitations. Qualitative studies provide one way to address these gaps by exploring the underlying psychosocial processes that ensue when immigration policies are implemented and differentially target or benefit certain immigrant groups (Ayón, Gurrola, Salas, Androff, & Krysik, 2012; Viruell-Fuentes, 2011). However qualitative studies can be challenging to implement quickly as policies are passed and implemented. Moreover, while some qualitative studies have unpacked the psychosocial context that emerges in the face of immigration policies, few have linked these processes to health.

Given these gaps, Chapter 4 aims to elucidate the role of immigration policies in shaping the health of Latina/o immigrations and their US-born co-ethnics through these material and psychosocial mechanisms. I focus my analysis on Latina/os because while multiple racial/ethnic groups are impacted by immigration policies, current narratives about Latina/o immigrants, particularly those of Mexican and Central American descent, have put the Latina/o community at the crosshairs of immigration policy and debates about immigration. In this chapter, I situate my argument within literature that outlines how immigration policies fit into a larger framework of

structural and cultural racism to define the national belonging and worth for Latino immigrant groups and Latinos overall. Then, to test these arguments, I conduct a qualitative analysis of Twitter data collected after two immigration policy shifts: the enactment of several inclusive-immigration policies in California in 2013 and the US v Texas Supreme Court decision on the DACA/DAPA programs in 2016. Leveraging this unique data, I explore how individuals discuss the material and psychosocial implications of these policies and draw on potential links to health.

Immigration Policy, the Surround, and Latina/o Health

Stigma theory details how stigma is used to construct a group's social belonging, membership, and worth and offers a useful framework for investigating the psychosocial mechanisms by which immigration policies shape Latina/o health (Clair, Daniel, & Lamont, 2016; Phelan, Link, & Tehranifar, 2010). As discussed by Link and Phelan, stigma operates by (1) creating and assigning culturally and socially salient groups, (2) ascribing stereotypes to those groups, (3) distinguishing stigmatized groups as "them" or "other, (4) and rationalizing status loss, discrimination, and exclusion for these groups in the context of a power structure that allows stigma to unfold (Goffman, 1963; Link & Phelan, 2001). As discussed by Hicken and colleagues, stigmatization is also one of the key pillars of structural racism in the US (Hicken, Kravitz-Wirtz, Durkee, & Jackson, 2018b). In their conceptualization, the stigmatization of racial/ethnic minorities ascribes often powerful and negative labels to individuals who are assigned to racial/ethnic minority groups, which defines both the rights they have access to and their broader membership in the body politic.

The rhetoric and implementation of immigration policies in the U.S. often align with Link and Phelan's stigmatization processes (Massey et al., 2003). As discussed by Newton, while immigration policy no longer explicitly excludes groups based on race or national origin, it

continues to distinguish between right/wrong, good/bad, deserving/undeserving immigrants and forges categories of *us*-Americans and *them/those-immigrants* as a result (Newton, 2008). Policymakers and the public, for example, use national myths about what makes good citizens and good Americans to label certain immigrant groups with these values, and ascribe rights and privileges accordingly (Horton, 2008; Quadagno, 2000). These processes often extend beyond immigrants to the US-born co-ethnics of immigrant groups, whereby Asian-Americans, Latino-Americans, and Muslim-Americans navigate perpetual stereotypes regarding their racial or ethnic immigrant group (B. E. Armenta et al., 2013; Huyn, Devo, & Smalaraz, 2011; Saito, 2001; Wu, 2002).

Linking stigma to health, researchers have theorized and documented the mechanisms by which racialized ideologies and structural stigma shape population health (Geronimus, 2013; Hatzenbuehler et al., 2013; C. T. Miller & Kaiser, 2001; Pearson, 2008). Schools, workplaces, doctor's offices, and neighborhoods have been shown to be identity-affirming or identity-threating based on both subtle or blatant signals regarding one's group status (Claude M. Steele, 2011). Extending this notion, neighborhoods, cities, states, and entire nations can also be identity-affirming or threatening based on the signals sent regarding marginalized groups. Geronimus and others characterize this amorphous and nebulous environment as "the surround". In the face of negative signals, the reception of "othering messages" within one's "surround" over time may activate the physiological stress-process through high-effort coping with stigma, difference, and marginalization, and thus deteriorate health (Geronimus et al., 2016; James, 1994). Further, stigma may cause social isolation and the internalization of negative views of one's group status (Hatzenbuehler et al., 2013)-- all of which can be health taxing.

At the same time, an emerging body of work has demonstrated the opportunity for intervention by turning off these stigma signals and reframing enduring stereotypes (Clair et al., 2016; Davies, Spencer, & Steele, 2005; Geronimus, 2013; Claude M. Steele, 2011). These strategies can range from population-level policies, intense political activism or public advocacy campaigns, as well as subtle yet powerful shifts in everyday life. Psychologists working on stereotype threat, for example, have found evidence that demographic questions (e.g race and gender) can prime test-takers to stereotypes cues (e.g. women are bad a math), inhibiting their working memory capacity and test taking performance; simply shifting these questions to the end of a standardized test improved test performance among Latinos and women (Schmader & Johns, 2003). In the case of immigration, campaigns such as "Drop the I [illegal]" have also helped reframe narratives and stereotypes about immigrants away from perpetual foreigners and criminals (Merolla, Ramakrishnan, & Haynes, 2013; Nicholls, 2013).

So too, immigration policies have the capacity of creating and perpetuating stigma or transforming and shifting stigma and stereotypes regarding immigrants and their US-born co-ethnics, and by extension creating identity safety or identity threats for these groups. For example, despite empirical evidence to the contrary, a popular stereotype and narrative within the US imagination is the notion that immigrants, and particularly undocumented immigrants, have a high propensity for crime (Sampson, 2008). This belief can be traced to various historical periods and immigrant groups; e.g. the term "paddy wagon" originated as an slur against Irish immigrants (Medicine, Education, Population, & Society, 2016). Policies such as the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996 reinforced this notion of criminality by emphasizing a "tough on crime" approach and creating the false premise that mass detainment and deportation was needed to apprehend criminal aliens. Post 9/11 policies

such as the Patriot Act and the creation of the Department of Homeland Security, meanwhile, heightened the surveillance and detention of noncitizens under the auspices of national security (T. A. Miller, 2005). As a result, militarized border zones, large scale worksite immigration raids, and a federal registry of crimes committed by immigrants have emerged as offshoots of these policies and continue to feed into the narrative of immigrant criminality (T. M. Golash-Boza, 2015). Everyday immigrants, those who are documented and undocumented, as well as individuals who are typed as immigrants (which in the contemporary context includes Latinos, Arabs and Muslims, Asians, and Africans), navigate the material and psychosocial consequences of their presumed criminality (Dick, 2011; Selod, 2015).

However, immigration policies and initiatives also have the potential to destigmatize. For example, through various state and federal policy initiatives, undocumented youth have achieved both access to material benefits but also the psychosocial credit of belonging and worth. This shift emerged in the early 2000s when a generation of undocumented youth began challenging notions of undocumented immigrants as criminals and lawless. Instead these DREAMERS framed themselves as everyday Americans who were brought to the US without status as children, contesting their constructions as illegal or criminal (L. Abrego, 2008; L. J. Abrego, 2011; Nicholls, 2013). Indeed, most Americans now believe that undocumented youth should be allowed to remain in the US, and in some cases granted a pathway to citizenship (Kurtzleben, 2018).

"Lifting the Veil" using Twitter

In the Souls of Black Folks, W.E.B. Dubois wrote about "lifting the veil" to reveal and better understand the double consciousness and experiences of Black Americans. In a similar vein, social science researchers are challenged to "lift the veil" in order to explore the interplay

between stigma and racialization, policy, and health. In these pursuits, researchers have used traditional approaches such as population surveys or qualitative interviews. While surveys provide access to large samples and often contain empirical measures of health status, existing population level surveys rarely capture broader processes of stigma and sense of belonging and membership beyond cursory measures. Meanwhile, qualitative data allow for a more nuanced exploration of stigma and racialization, but the richness of these data are off-set by small sample size and generalizability issues. Both surveys and qualitative interview methods are also limited in that they often cannot be implemented quickly enough as changes in immigration policies and laws unfold.

The advent of social media data may address some of the limitations of these traditional approaches. Specifically, scraping social media may enable researchers to obtain large swaths of text-based data from a diverse sample of individuals who share their views, beliefs, and experiences regarding social issues. Furthermore social networks respond in real-time to emerging political, social, and economic current events. Indeed the about page of Twitter, one of the most popular social media sites, lauds itself for being the "best and fastest place to see what's happening and what people are talking about all around the world". A growing body of evidence also suggests that marginalized groups increasingly utilize social media to gain greater visibility and engage in civic participation and dialogue (Bonilla & Rosa, 2015).

Social science researchers have developed and adopted a variety of approaches to tap into social media data. One popular avenue has been scrapping data from the popular microblogging site, Twitter. Twitter is a free social media site that was launched in 2006 and allows users to set up profiles, "follow" other users, and send out tweets of up to 140 characters[12] to the

[12] In November 2017 Twitter updated the character limit to 280 characters.

Twittersphere. In 2017 there were over 326 million registered Twitter users and 115 million active Twitter users (Team, 2017). Approximately 21% of all adults in the US use Twitter (Greenwood, Perrin, & Duggan, 2016). Although Twitter does not directly collect demographic information about their users, based on the Pew Internet and American Life Survey 18-30 year olds, Democratic/liberals, African Americans, and Latinos are more likely to use Twitter (Brenner, 2013; Greenwood et al., 2016). Finally, a range of research topics and areas of inquiry have been explored using social media and Twitter data and researchers have adopted computational approaches to handle large datasets, text mining methods such as sentiment analysis and topic searches, and more traditional qualitative approaches (Batrinca & Treleaven, 2015). This chapter considers the use of Twitter data after the passage of two major immigration policies in the US.

Shifting Immigration Policy Landscape.

California's "Year of the Immigrant".

In October 2013, California passed eight legislative measures that extended rights and protections to the state's documented and undocumented immigrant population ("Governor Brown Signs Immigration Legislation," 2013). The bills that were signed into law were expansive including labor, education, criminal justice, and legal protections and rights (Table 4.1). For example, California extended access to driver's license for undocumented immigrants (AB 60), allowed undocumented immigrants to be admitted into the state bar (AB 1024), protected workers from employer retaliation based on their citizenship status (SB 66), and prohibited law enforcement personnel from detaining an individual based on an immigration hold when they otherwise could be released (AB 4, "Trust Act").

In passing these laws, California state legislators remarked that they were bypassing the federal stalemate on comprehensive immigration reform, and creating policies that dealt with the realities of California's immigrant community. At the time of the passage of the bills, an estimated 2.3 million undocumented immigrants resided in California making up nearly 6 percent of the state's population .(Hayes & Hill, 2017) . California was also (and continues to be) home to the largest number of undocumented immigrants compared to all other states, and nearly a quarter of all undocumented immigrants in the US.

Table 4.1 California Immigration Laws, October 2013

Bill No.	Major Provisions
AB 4	Prohibits a law enforcement official from detaining an individual on the basis of a United States Immigration and Customs Enforcement (ICE) hold after that individual becomes eligible for release from custody, unless specified conditions are met.
AB 35	Mandates that immigration consultants, attorneys, notaries public, and organizations accredited by the United States Board of Immigration Appeals are the only individuals authorized to charge a fee for providing services associated with filing an application under the U.S. Department of Homeland Security's deferred action program.
AB 524	Provides that a threat to report the immigration status or suspected immigration status of an individual or the individual's family may induce fear sufficient to constitute extortion.
AB 1024	Allows applicants, who are not lawfully present in the United States, to be admitted as an attorney at law.
AB 1159	Imposes various restrictions and obligations on persons who offer services related to comprehensive immigration reform.
SB 141	Requires that the California Community Colleges and the California State University, and requests that the University of California, exempt a United States citizen who resides in a foreign country, and is in their first year as a matriculated student, from nonresident tuition if the student demonstrates financial need, has a parent or guardian who was deported or voluntarily departed from the U. S., lived in California immediately before moving abroad, and attended a secondary school in California for at least three years.

SB 150	Authorizes a community college district to exempt pupils attending community colleges as a special part-time student from paying nonresident tuition.
SB 666	Provides for a suspension or revocation of an employer's business license for retaliation against employees and others on the basis of citizenship and immigration status, and establishes a civil penalty up to $10,000 per violation.

Source: Office of Governor Edmund G Brown, 2013

The immigration bills passed in California arguably represented a shift in state-based immigration policy. Their passaged contested traditional notions of citizenship and social membership while invoking national debates about the place of undocumented and documented immigrants in the US. Importantly California stood in stark contrast to states such as Arizona, Alabama, and South Carolina, which gained national attention for their passage of restrictive immigration policies in 2010 and 2011. Drawing on our framework, the CA immigration laws, therefore, represent case studies of immigration policies that may be affirming for one's social identity with material and psychosocial implications for health.

US v Texas: Deadlock on DAPA And DACA.

The second policy that I consider in this analysis is the Supreme Court ruling on the expansion of the Deferred Action for Childhood Arrivals (DACA) and Deferred Action for Parents of Americans (DAPA) programs in the US v Texas case in 2016. In June 2012 President Obama authorized the creation of a new policy, Deferred Action for Childhood Arrivals (DACA), which provided deportation relief and renewable work permits to qualified undocumented young people. Over the years, many legislative efforts in Congress had attempted to pass a similar policy through the DREAM (Development, Relief and Education for Alien

Minors) Act. After various failed attempts and mounting political pressure, however, Obama used his executive action powers to implement and institute DACA[13].

In order to qualify for DACA, individuals had to meet a series of criteria and administrative steps. The program was targeted to young undocumented immigrants who had been brought to the US as children. As such individuals had to have entered the US prior to age 16 and June 2007, and be younger than 31 years old. In addition, they had to prove through school records and other documentation that they had maintained physical presence in the U.S. Individuals had to be enrolled in high school or college, completed high school or a GED, or been honorably discharged from the armed forces. Finally, felony convictions, serious misdemeanors, and three or more misdemeanors disqualified an individual from the program. In total, an estimated 1.5 million undocumented youth qualified for DACA, 800,000 received DACA status, and 690,000 are currently enrolled in the program (López & Krogstad, 2017). Ninety percent of DACA recipients are from Latin American countries while the majority live in California (29%) or Texas (16%), are women (53%), and younger than 25 (López & Krogstad, 2017).

Drawing on the experience of the DACA program and gridlocked by the failure of the 2013 "Gang of 8" comprehensive immigration reform bill[14], Obama announced the creation of the Deferred Action for Parents of Americans (DAPA) and the expansion of the existing DACA program through executive action in 2014. DAPA would have granted deportation relief and a work permit to undocumented immigrants who had lived in the US since 2010, had least one child who was a citizen or permanent resident, and did not have a criminal record. Meanwhile

[13] Unlike DACA, the DREAM Act was a Congressional bill that, if passed, would have been a law. In addition, the DREAM Act would have provided conditional resident status and an eventual path to citizenship.
[14] Officially, the Border Security, Economic Opportunity, and Immigration Modernization Act,

the expanded DACA program would have granted DACA status to older undocumented individuals who had arrived in the US as children but aged out of the existing DACA program (i.e. those older than 31). If implemented, DAPA would have provided protections to an estimated 3.7 million undocumented immigrant parents, and 330,000 undocumented childhood arrivals through the expanded DACA (Krogstad & Passel, 2014)

However, prior to the rollout of DAPA/expanded DACA 26 states, led by Texas, sued the federal government in the US District Court for the Southern District of Texas in December 2014. In February 2015, The Texas court issued a preliminary injunction which halted the implementation of DAPA/DACA. The Department of Justice filed an appeal in the 5th U.S. Circuit Court of Appeals in New Orleans, which enjoined the DACA expansion and DAPA in November 2015. Soon after, the Obama administration announced that it would ask the Supreme Court to reverse the lower courts' ruling; oral arguments were held in the Supreme Court in April 2016. On June 23, 2016 the 8 member court, ruled 4-4 in a deadlocked decision, leaving the lower court's injunction in place, and halting the implementation of DAPA/expanded DACA indefinitely.

Research Questions

In this study I sought to understand how immigration policies work through both material and psychosocial mechanisms to shape health. This research focuses on two recent immigration policies, the CA "Year of the Immigrant" laws and the Supreme Court US v Texas announcement. These policies represent case studies of policies that may be affirming (CA) or threatening for health (US v Texas). The research questions that guide this inquiry include: How did the Twitter user perceive the passage of the CA laws and failure of the DACA/DAPA policies? What type of benefits, material, psychosocial, or other, do Twitter users discuss that

they gain or lost in light of these policy shifts? What might be the broader health implications of these policies and benefits for the Latino immigrant and co-ethnic community?

Methods

Data Collection

I collected data relevant to the passage of the 2013 California Immigration policies and the 2015 US v Texas Supreme Court decision on Twitter. Specifically, I used a third-party software, Tweet Archivist, to collect Twitter data. Tweet Archivist allows users to run multiple simultaneous search queries and scans the Twitter API in real-time to return tweets that match the query (Appendix G). Tweet Archivist only returns tweets from Twitter users who have set their profile to public, which excludes users with private profiles (approximately 12 percent of Twitter users). The Tweet Archivist software provided the Tweet text, username, timestamp, Tweet language, hashtags, user mentions, and media links included in the tweet. Based on Google Search trends, I specifically ran queries for the keywords:

- California and immigration, California and undocumented immigrant, California and illegal immigrant, California & AB60 and Governor Brown signs.
- Deferred action, DAPA, and DACA

The research was considered exempt by the University of Michigan Institutional Review Board (HUM00078091).

California Tweets Data Cleaning Procedures

While Tweet Archivist is able to capture Tweets related to our search terms and the passage of the California immigration policies, the data collection also included Tweets that were marginally relevant or unrelated to our topics of interest. Therefore, I trained a team of

undergraduate students to clean and organize the data prior to the qualitative analysis. For the purposes of this analysis, I was most interested in analyzing Tweets that (1) originated from Twitter accounts belonging to people/individuals and (2) expressed a sentiment, opinion, or viewpoint related to the CA immigration policies. Therefore, the research team manually reviewed each Tweet and categorized each Tweet based on the "Type of Tweeter", the "Type of Tweet", and its relevance to the CA immigration policies. In addition, the team identified Retweets, tweets that re-shared Twitter content from another Twitter user.

In categorizing the relevance of Tweets, the team coded tweets as relevant, related, or not relevant. Relevant tweets included those that directly referred to or discussed the CA immigration policies. Related tweets included those that mentioned immigration or immigration policies in California more broadly, but did not refer to the policies of interest (e.g. Valley #Republicans Valadao and Denham on board with #Democrats on reforming #immigration). Not Relevant tweets included those that had no relevance to immigration or the CA immigration policies (e.g. New @HooverInst poll shows that GOP has a shot in CA--for more see my piece @BloombergView #tcot)

The Type of Tweeter categories included: individuals, news organizations, political or government organization, or other organizations. While Twitter accounts are generally manned by individuals, the accounts themselves represent a variety of entities including private individuals, celebrities, government officials and political representatives, as well as businesses, nonprofits, and media organizations. In addition, there are numerous Twitter accounts that can be best classified as spam or feed accounts and use automated techniques to post tweets. For this analysis, I was most interested in filtering out the noise from partisan organizations, businesses and media accounts, and spam accounts to focus exclusively on public or private

individuals/people. A member of the research team visited the Twitter profile that each Tweet originated from to determine the type of Twitter user based on the account's description, tweets, and photos. Meanwhile, the Type of Tweet categories included: opinion/viewpoint, news sharing, and information sharing. This classification system was based on a previous analysis of types of tweets by Java and colleagues (Java, Song, Finin, & Tseng, 2007).

DAPA/DACA Tweets Data Cleaning Procedures

The data collection after the DAPA/DACA Supreme Court announcement resulted in datasets with over 30,000 tweets. The sheer quantity of data proved unrealistic to clean and categorize manually and required a different approach. Therefore, I utilized Amazon Mturkers to categorize the Tweets in preparation for the qualitative analysis. Amazon MTurk is "a crowdsourcing Internet marketplace enabling individuals and businesses (known as Requesters) to coordinate the use of human intelligence to perform tasks that computers are currently unable to do." Requesters are able to create human intelligence tasks (HITS) which are shared on the Mturk platform and can be completed by MTurk workers for payment (Appendix H). Using MTurk, I uploaded the dataset of Tweets and had MTurkers clean the data to prepare it for analysis. This approach has been similarly utilized in other studies using Twitter data (Finin et al., 2010; Nguyen et al., 2016).

The workflow in Appendix I provides a visual of the data cleaning procedures. First, I filtered out tweets with duplicate text (i.e. Retweets) for a separate analysis. Next, I included Tweets that were only in English or Spanish using a code that was provided by the Tweet Archivist platform. Logistically, I only had the capacity to read or translate Tweets in English and Spanish and conceptually, I was most interested in understanding the implications of immigration policy for Latino immigrants and coethnics. Finally, I performed an initial review of

the data and filtered out irrelevant Tweets (e.g. Twitter user with DAPA/DACA in their username, Twitter users referencing Dapa, a village in Colombia). This clean dataset consisted of nearly 10,000 Tweets.

Again, I was most interested in coding Tweets that (1) originated from Twitter accounts belonging to people/individuals and (2) expressed a sentiment, opinion, or viewpoint about the DACA/DACA programs and Supreme Court decision. Therefore, I used MTurkers to categorize tweets by "Type of Tweeter" and "Type of Tweet" in two distinct steps. In Step 1, the clean dataset was uploaded and MTurkers categorized the "Type of Tweeter" as either a person/individual, organization, or legal. Each Tweet was categorized by two MTurkers and discrepancies were rectified manually. Tweets that did not originate from accounts of people/individual were removed from the master dataset. In Step 2, the revised dataset was then re-uploaded to MTurk and categorized for "Type of Tweet." Again, each tweet was categorized by two MTurkers and discrepancies were rectified manually. The final dataset of tweets that emerged from the Mturk categorization procedures was used for the qualitative content analysis, there were nearly 1200 Tweets in the final dataset.

Amazon Mturk works effectively when tasks are clearly defined, easy to complete, and use the appropriate Mturk workers. In the MTurk platform I provided categories and examples of Tweets that fit these categories to facilitate efficient categorization processes. Below I discuss how these categories were created and pilot tested. In addition, I broke up the categorization into small distinct steps, "Type of Tweeter" and then "Type of Tweet". Each MTurker was paid $.02 for each Tweet they coded. Finally, Mturk allows Requesters to specify qualification criteria for MTurkers who are allowed to complete HITs. For both MTurk steps, I restricted the HITS to MTurkers who had a high record of satisfactory HIT completion (95 percent), lived in the United

States, and had Master's Qualification, a special designation for individuals who have completed a high volume of HITS accurately,

"Type of Tweeter" Categories

For this analysis, I was most interested in filtering out the noise from partisan organizations, businesses and media accounts, and spam accounts and exclusively focus on Tweets from individuals. In order to ensure that tweets were properly categorized and achieved high interrater reliability and content validity, I conducted a series of pilot tests to create appropriate categories in the MTurk platform to filter out these tweets.

I conducted three pilot tests to determine the appropriate categories for MTurkers to classify tweets. In each test, MTurkers were provided a hyperlink to the Twitter user's profile and asked to classify the Twitter user based on categories in the HIT. The initial pilot test of "Type of Tweeters" included several categories, similar to the California Tweets coding, in an attempt to get a sense of the variety of Twitter accounts in the data. This first round included categories for: news/media organizations or representatives, private people/individuals, government representatives and organizations, or advocacy organization or representatives. However, this approach proved too complex for Mturkers and resulted in low interrater reliability and a large number of discrepancies, as Mturkers were unable to pick-up the nuance in these categories. Therefore, in a second pilot test we simplified the categories to ask the Mturker to categorize whether the Tweet was from a person or not a person, and included examples. This approach led to a high interrater reliability, far fewer discrepancies, and still provided a dataset with substantive results despite the limited categories. However we still encountered a large volume of Tweets from lawyers and law firms who were promoting their services and practices (e.g. Confused about DACA/DAPA, schedule a consultation with us today). Therefore we

created a third category, legal, and instructed MTurkers to select legal only if the Twitter account promoted a law firm or lawyer's practice. Appendix J provides the final categorization field that was used in the Mturk platform.

"Type of Tweet" Categories

In addition to the variety of Tweeters, tweets also express a plethora of content and information ranging from news and media links, casual chatter, sharing information and resources, and advocacy and public campaigns. The data I collected revealed rich pockets of conversations in reaction to the Supreme Court case announcement. However, for the purposes of this analysis, I was most interested in understanding how people felt about this decision and how they felt it would affect their lives, the lives of their community, and the nation. This task, again, had to be simplified for Mturk Workers so I conducted another series of pilot tests to determine the best categorization approach. Two pilot tests use Mturk's built-in sentiment project system to have Mturkers code the sentiment of each Tweet (strongly negative to strongly positive; and positive-neutral-negative); tweets that had a positive or negative sentiment would be classed as those with an opinion and included in the analysis. Another pilot test instead created a dichotomous category of opinion or not opinion and provided examples and context for what classified an opinion. In comparing the three pilot tests, the sentiment approach generated a high volume of discrepancies and data that had to be sorted manually the dichotomous opinion mining approach, however had a stronger fit for the data. Appendix K provides the final categorization field that was used in the Mturk platform.

Qualitative Data Analysis.

After the data cleaning was completed, I proceeded with the qualitative data analysis of the final 1449 Tweets. The qualitative analysis of the Twitter was conducted in NVivo. I first

began with an in-depth reading of the Twitter data to familiarize myself with the content and noted initial thoughts with memos. I then adopted a variety of Saldana's approach to first-cycle coding techniques that were most appropriate for this type of data and research topic in order to iteratively gauge meaning from the data. I first began with structural coding and highlighted Tweets that specifically referred to the psychosocial and material implications of the immigration policies as this was the subject of interest for this project. I also engaged in descriptive codes to capture the context that users described in their tweets. In addition, given that Twitter users largely expressed their opinions and viewpoints, I used magnitude codes to capture the neutrality and intensity of their language as well as affective codes to note their emotions, values, and beliefs.

At this point, I stepped back and generated code maps and lists in order to visualize the data and codes, note repetitions, duplications, and gaps, and refine my coding scheme. Saldana refers to this process as second-cycle coding. During this process, I also collapsed codes, created relationships between codes, and returned to the data to recode as necessary. Once I felt I had reached saturation and a tight coding scheme, I engaged in a variety of steps to began "theme-ing" the codes and developing higher order relationships, patterns, and theoretical arguments to undergird my results

Retweets Analysis

While the original focus of this analysis was on original tweets that shared an opinion or viewpoint, retweeting on Twitter is common and represented a large amount of the original data. Retweets refer to messages reposted by a user that originally were originally created by another user. In an analysis of retweet behavior, Metaxas and colleagues found that Twitter users, and especially those who are private users, generally engage in retweeting when they have an interest

and agreement with the original message (Metaxas, Mustafaraj, Wong, Zong, O'Keefe, Fin, 2013). Retweets in our data arguably capture users' viewpoints and opinions about the immigration policies although they might originate from a different source. Therefore I conducted a separate analysis of retweets in the data. To do this, I created a summary of duplicate tweets to identify these retweets. In addition, I reviewed tweets to ensure that tweets with similar messages but slight modifications would be collapsed together. With this summary I selected the most common retweets, reviewed the external links included in these tweets for context, and engaged in a qualitative content analysis of the narratives in these tweets.

Results

California Immigration Policy Tweets

The tweet harvesting from October 5 through October 17, 2015 yielded a total of 3229 tweets using the search terms we queried; of these tweets 1153 or 36 percent of the tweets contained information relevant to the passage of the California immigration laws. Overall, the search term "Governor Brown signs" yielded the most relevant tweets (n=768), although the majority of these tweets were related to other topics (n=1868). The terms "undocumented immigrant" and "illegal immigrant" returned approximately the same amount of relevant Tweets. The overwhelming majority of tweets originated from Twitter accounts of individual users (82 percent), followed by news media (11 percent), and organizations (5 percent). While most tweets shared a news link or news content (65 percent), an important subset of tweets included substantive opinions or commentary on the immigration laws (28 percent). Finally retweets were prevalent within the sample; 67 percent of the tweets were classified as retweets, most of which re-shared news content. A total of 329 tweets were included in the analysis.

DACA/DAPA Supreme Court Tweets

The tweet harvesting from June 23-July 1 yielded a total of 32,658 tweets using the search terms we queried. After removing duplicates (i.e. Retweets) and tweets that were not in English and Spanish, 9978 tweets remained. Based on the Mturk "Type of Tweeter" cleaning, nearly half of the tweets originated from accounts of private individuals. We removed approximately 5000 tweets that originated from accounts of organizations, businesses, news media groups, and legal firms. Of these remaining 4812 tweets, the second step of the MTurk cleaning classified 1120 of these tweets, approximately 23 percent, as containing substantive opinions. These 1120 tweets were used for the qualitative analysis.

Qualitative Findings

In the section below I present the major themes that emerged in the analysis

Setting the Stage: Immigration Policies in Sociopolitical Context

This section discusses the broader social, political, and economic events that were occurring in the US and globally that shaped sentiments about the immigration policies. These contextual events were most often referenced in tweets when users expressed strong negative views, such as frustration or anger. In the California case the Federal government shutdown, which was entering its second week, loomed in the backdrop. Meanwhile in the case of the DAPA/DACA Supreme Court announcement, users regularly mentioned the outcome of the Brexit vote, acquittal of officers in the Freddie Gray case[15], upcoming US presidential election, and the 'No Bill No Break' gun-control sit in by House Democrats.

[15] Freddie Gray was a Black man who endured a spinal cord injury while being transported in a van in police custody, fell into a coma, and died. The death was ruled a homicide.

In the California case, Twitters users expressing their opposition to the immigration laws drew links between the federal government shutdown and CA policies as examples of the state and country going to *"hell and a handbasket…".* One tweet that was shared and retweeted repeatedly included, *"California bill would let illegal immigrants serve on juriesad shouts out "have you tried turning it off and on again*!"[grammatical errors original]. As reflected in this tweets and others, users were incredulous that undocumented immigrants were gaining access to rights in the state. True to the sarcasm prevalent on Twitter, the tweet includes a references to a popular meme " Have you tried turning it off and on again?". This IT catchphrase was circulating during the government shutdown, suggesting that resetting the government would be as simple as resetting an internet router or computer. In the same way, users remarked on the State of the California and asked for a reset. The federal government shut-down raised concerns about the ability of the country to operate and govern, which were similarly expressed in tweets in opposition to the CA laws. Users cited the potential impact of inclusive immigrations laws on the education system, taxes, and job opportunities.

Scraping the surface, however, these concerns about the state of the nation and California revealed deeper seated sentiments about immigrants and the state of the Union. In the most extreme tweets, users believed the laws were *"an Act of war"* and "*treasonous",* and raised calls for Attorney Governor Eric Holder to issue a lawsuit. These characterizations evolved to include more extreme racial animus such as tweeters writing, *"Illegal aliens are creapy creatures,that think #CALIFORNIA will stop ICE, job,if immigration wanted,they can get out and rid those abusers."* and *"#California land of #progressive fascists who have ruined the economy and culture. 3rd World full of anti American Mexicans #Immigration."* These tweets reveal the undercurrents of stigmatization and racialization processes faced by immigrant groups in the US.

Labeling undocumented immigrants as "illegal aliens" and associating them with creatures is akin to dehumanizing. As shown by the second tweet, this representation extends beyond the immigrant community to include "Anti-American Mexicans.", the US-born. Notably across all these negative tweets, the only country or racial/ethnic group mentioned included Mexicans and Mexico, illuminating the groups that were targeted in this particular case.

Concerns over the State of the US and the world more broadly also dominated many of the twitter users who were dismayed by the Supreme Court decision and the failure of the DACA/DAPA program. On June 23, 2016, news of the DACA/DACA announcement played out along with the Brexit vote in Britain, Freddie Gray case, and other major headlines. In this instance, Twitter users also thought the *"future looks a bit scary"*, expressed *"a rollercoaster of emotions"*, and launched calls for a *"reset"*. Beyond these surface sentiments, however, Twitter users associated the current state of events in the world as a reflection of more ingrained issues. Many users expressed that the Brexit and DAPA/DACA were *"signs of growing xenophobia in the most powerful countries on earth"* while others noted the irony of anti-immigrant sentiments with tweets like, *"#Brexit #DAPA #Trump is about how the West fucks shit up in half the world then decides they don't like displaced black and brown [people]…"*. In these Tweets, users were quick to highlight salient features of cultural racism that were pervasive across the globe, and an undercurrent of these policies.

Tweets relating to the broader sociopolitical context highlight a salient feature of immigration debates: rarely is immigration solely about immigrants or immigration. Instead scholars have pointed to both economic insecurity/competition and cultural backlash as undercurrents in these debates (Inglehart & Norris, 2016). In the same way, Twitter users, particularly those against the policies, mobilized references to other current events to raise their

larger concerns about the State of the Union, and *their* state in the Union. With this context in mind, I now turn to the material and psychosocial costs and benefits of these policies that emerged from the data and their potential health implications.

Economic Costs & Opportunities

In the California case, undocumented and documented immigrants in the state were granted a number of social and material benefits, many of which have been traditionally restricted to US citizens or documented immigrants. In contrast, the DACA/DAPA announcement put many important resources and protections on the chopping block for "Elder Dreamers" and the undocumented parents of U.S citizens who would have been the beneficiaries of the program. Notably, however, mentions of economic or material benefits and opportunities were largely absent from the discussions on Twitter. To be sure, people mentioned work permits and driver's licenses among other resources of these policies. For example, the DAPA/DACA decision occurred around the anniversary of DACA, the program for younger undocumented immigrants, and people took the opportunity to write about the benefits they gained with DACA such as "get[ing] a job at a world class museum", "pay for school", and better wages. In the CA case, many highlighted how the employment protections extended to undocumented workers would ensure their access to fair wages, guaranteed pay, and prevent retaliation from employers. Individuals also expressed how these benefits also allowed them to do for others and advance the socioeconomic prospects of their families and networks in different ways. In one unique case, a Twitter user writes. "it's good to have a driver's license. I just legally drove my wife to the ER."

However, these material features of the policies were not the highlight of the bulk of the Twitter conversations. Instead, Twitter users largely framed the economy, other US citizens, and the US overall as the economic winners of immigration policies. In these Tweets, users wrote

about the profound ways undocumented and documented immigrants contributed to the state and nation through the creation of businesses, paying taxes, and "putting more into the economy than they take out". This framing likely originates from the liberal or left's framing of the economic benefits of immigration to make policies more palatable to fiscal conservatives (Citrin, Green, Muste, & Wong, 1997; Mehan, 1997). Juxtaposing these individual and social benefits, one DACA recipient writes, "the US economy has ALWAYS benefitted from immigrant labor. DACA helped us benefit from our own labor. My life is better economically." Users also noted the social costs when immigration reform policies fail, such as the expenses of implementing deportations. Most notably, however, the real "opportunity cost" of policies like DAPA/expanded DAC was the lost potential and investment in people and communities with much to both gain from these policies, but also give to their communities and nation.

Rights & Benefits: An Individual and Community Good

"Citizenship can feel like a guilty privilege when your parents are undocumented"

In similar ways, Twitter users championed the immigration policies not only for their own good, but especially for their families, friends, neighbors, and community. The voices on Twitter were likely to be young DACA-eligible youth or the US born family members of immigrants. As such, mothers, parents, and families were at the center of discussions about what these policies meant for broader communities. After the DACA/DAPA announcement, for example, a popular hashtag that circulated #legalizemymom and their associated Tweets captured how the announcement mattered for youth even with DACA status or citizenship. One user wrote, "I need my parents to dream" and another "All I can think of is my parents..that's all. They deserve this too." Beyond families, one user wrote, "I've been in the US 22 years and am one of the 7 million who would be excluded, but I still want SCOTUS to approve DAPA".

Gleaning information from the Tweet, I surmised that this user was undocumented and didn't qualify for the expanded DACA program. Nonetheless their support for the program as well as users remarking on the importance of the policies for their parents reflects a prevalent theme of the data, that rights and benefits can be a shared community good.

In contrast, tweets from users who opposed the California bills often framed rights as a zero-sum game. Twitters users

Membership Denied

"our government sends a message again to people of color: you don't matter."

Following the announcement of the DACA/DAPA Supreme Court case, many Twitter conversations highlighted the paradox of undocumented individuals feeling out of place in the only country they have ever known. For example, One Twitter user poignantly explains, "A number of my students got jobs thanks to DACA. They work so hard in a country that hates them". Echoing these sentiments another tweets, "Georgia is my home, even if it doesn't like me." And finally one user, directing his Tweet to then-candidate Trump wrote, "@realDonaldTrump I'm an illegal immigrant. Work as a truck driver, pay my taxes, own a home. Are you deporting me? #DACA #Mexican #USA"[16]. In these tweets, users reference the United States as their home, in which they have both built and contributed to their communities such as through work, school, taxes, and families. However, they contrast these material and physical enactments of home and community with the lingering psychosocial feeling of not belonging. These tweets highlight the process of ***Membership Denied,*** the ways in which racialized groups negotiate explicit and implicit messages of exclusion, and the psychological

[16] Initially the language seemed overly-inflammatory and potentially originating from a spam account, however review of the account verified that it was likely from an authentic person.

gymnastics they undertake to understand their place in US society. As these tweets demonstrate, while undocumented individuals often work to gain social and economic mobility in a system designed against them, these gains are offset by the repeated denial of their full membership in society.

Twitter users also had a varied responses to the denial of their membership or the membership of their family and friends. Some, for example, expected that DAPA/DACA would be denied and in rationalized the loss of immigration benefits as part of the immigration experience. "They tried to bury us, they didn't know we were seeds. -A Mexican proverb" tweeted one user in sharing a popular adage that has circulated in the contemporary immigration debates. These narratives of hope and struggle also included the tweet "Tomorrow we pick up again and go for it. Progress is never linear. No se acaba mientras no nos rindamos [It's not over if we don't give up]." Others, however, where less reticent in waiting for the arc of justice to bend towards freedom. For example, one user tweeted "We fought and waited, fought and waited, fought and waited; for what… Bullshit!!". Similarly another user anticipating the hope narratives wrote, "already tired of articles on DAPA/DACA ruling saying it's "only a matter of time" before we see comprehensive immigration reform.

Navigating Uncertainty

"Para muchos es la pesadilla qu no termina."

"Form many it is the nightmare that never ends."

Finally one of the most salient themes that emerged in the outcome of both the California laws and DACA/DAPA case is the role of these policies in perpetuating or mitigating uncertainty in the lives of undocumented immigrants and individuals within their networks. Twitter users explained that the CA laws for examples brought, "*relief"* and "*refuge*". These characterizations

of the laws reflect the ways in which inclusive policies can provide shelter from the storm of uncertainty dominates the lives of the undocumented.

The DACA/DAPA announcement however maintained the uncertain and liminal status of undocumented people. Individuals tweeted about again having to "put their lives on hold" and rerouting plans for their future. One user mused about moving to another country because there was nothing left for them here. Highlighting the ironies of structures in the US against the undocumented, in a series of tweets one user wrote, "LET THEM LIVE THEIR DREAMS THE WAY THEY ENABLE YOU TO LIVE YOURS" In addition, many conjectured what the fate of the existing DACA plan demonstrating that even with protections in place, the psychosocial context against the undocumented could threaten their own temporary status. Tweeting about their DACA status being removed as " [my] biggest fear", it was notable how many users remarked how this uncertainty plagued their ability to focus on their workdays, time with family and friends, and lives. In these ways, deferred action and the threats of deportation were in actuality not deferred in their lives at all.

Retweets: Building a Community of Shared Voices

While the original tweets revealed unique and important themes, the analysis of the retweet data captured another angle of the perspectives of Twitter users. In the retweet analysis, I selected 100 of the most common tweet messages in the corpus of the data. Retweets were shared by an average of 83 users but some of the most popular tweets were shared 200-700 times. These 100 tweet messages represented 33% (n=9065) of the entire sample of English and Spanish tweets in the data. Therefore the themes from these retweets arguably represent the most prevalent viewpoints and opinions in the data.

In the California case, the vast majority of retweets shared major news articles related to the signing of the state immigration laws. The most popular articles referenced AB60, the law that provided driver's licenses for the undocumented, and the Trust Act, which limited the detention of undocumented individuals by local or state police. On the whole the news articles that accompanied these tweets were largely neutral in their tone and language, however many noted how the passage of these policies reflected that state's growing recognition of people "'who by their fervor, their faith, and their numbers transformed California' " (Lloyd, 2013). In contrast, another popular tweet shared the headline "Jerry Brown signs bill making CA a Sanctuary State for most illegals." By largely mischaracterizing the CA immigration bills as creating a "sanctuary state", this tweet and the accompanying article reflected popular tropes about the undocumented unduly receiving undeserved benefits and yet another free pass. In general the retweets analysis of the CA tweets did not substantively add insights to the conversations Twitter users were having surrounding the policies

However, the DAPA/DACA retweets numbered in the thousands and highlighted unique themes that the original tweets did not. First, while the original tweets shared individuals' fears and heartbreak surrounding the immigration policies, the retweets instead ignited a community of shared voices that helped to affirm immigrants' place and sense of belonging in the US. For example, a common thread across these retweets were calls to action. Twitter users shared, "we have work ahead of us to live" and immediately began mobilizing on twitter to combat the halt of DACA/DAPA. Users disseminated links to immigration moratorium petitions, messages to Obama (.e.g @Potus) calling for the dismantling of ICE, and reassurances to the Twitter community that the "fight is not over." In this way, Twitter users reflected the modern ways in

which groups continue to create and maintain identity safety even in the face of "heartbreaking" and "dream shattering" policies.

So too, another body of popular retweets evoked sentiments of belonging and mattering for the immigrant groups who lost access to the DACA/DAPA benefits. For example, one politician wrote that the immigrants who would have been covered by the laws were already "Americans by every important measure." Similarly, users retweeted messages from young immigrants and the children of immigrants who shared stories about the ways in which their parents reflected the best of what immigrants have to contribute in the US. In one tweet that circulated repeatedly, for example, a young woman referred to her mother as "American's housekeeper." At the same time, these retweets often worked to humanize and personalize undocumented immigrants, parents, and families. Two of the most common retweets in Spanish read, "Los indocumentados no son numeros, son personas" [The undocumented are not numbers, they are people] and "Casi 730,000 beneficiarios de #DACA son estadounidenses aspirantes, cada uno con una historia única" [Nearly 730,000 DACA beneficiares are aspiring Americans, each one with a unique story]. Collectively, these tweets point to the ways in which even in the face of dehumanizing policies, messages of inclusion that framed immigrants as Americans and people prevailed within immigrant communities and across the public more broadly.

Conclusion

In a press conference following the passage of AB60, one of the October 2013 California immigration bills that expanded driver's license to undocumented immigrants in the state, California's Governor Jerry Brown stated, "When a million people without their documents drive legally and with respect in the state of California, the rest of this country will have to stand up and take notice. No longer are undocumented people in the shadows." This quote is

emblematic of the material and psychosocial implications of immigration policies for the lives of undocumented immigrants, documented immigrants, and US-born coethnics.

This analysis aimed to develop a theoretical framework that linked psychosocial mechanisms of racial belonging to the health of immigrants and coethnics, and an empirical exploration of this framework using Twitter data. Given both the focus of this dissertation and the immigration landscape in the US today, my framework focused on Latina/os and I selected two immigration policy developments in the US that have had particularly important ramifications for Latino immigrants and their coethnic community, the passage of inclusive CA immigration policies in 2013 and the failure of the DACA/DAPA program in 2016. As demonstrated in this analysis, Twitter users similarly highlighted both the psychosocial and material implications of the California omnibus immigration policies and DACA/DAPA Supreme Court announcement.

Across the data the psychosocial implications of these policies stood out as the most highlighted benefit in Twitter users' perspective. In addition, the analysis also pointed to new ways of conceptualizing how the psychosocial might matter for health. *Membership denied*, likely has a multitude of potential health effects depending on one's response to and understanding of their denied membership. While expectation of challenges may be assumed among recent immigrants, those with years in the US or the US-born are perhaps more likely to perceive these obstacles as emblematic of structural inequities. Scholars have shown that learning about, navigating, and contending with membership denial in a highly inequitable world can be taxing for health(Brody et al., 2013; James, 1994; Viruell-Fuentes, 2011).

Uncertain futures in a tumultuous social, political, or economic landscape has also been well documented as a salient factor that influences physiological and mental health for (Kim &

von dem Knesebeck, 2015; Mokdad et al., 2016; Stuff et al., 2004; Wessely, Hyams, & Bartholomew, 2001). So too, immigration scholars and sociologists have written about how legal uncertainty dominates the lives of undocumented immigrants and their families (R. G. Gonzales, 2016; Menjívar, 2006). Rarely, however, have these bodies of work coalesced to theorize how legal liminality in the lives of undocumented immigrants and individuals in their social networks and families through the psychosocial mechanism of uncertainty. Importantly, the aforementioned immigration scholars often mention the prevalence of anxiety and depression among the communities they study, however health is rarely directly measured and references to physical health is scant. Uncertain futures in the context of immigration, however, is poised to take up mental-bandwidth and, as an emerging body of research shows, can lead to a cascade of deleterious health effects (Schilbach, Schofield, & Mullainathan, 2016).

Furthermore, this project tested the feasibility of using Twitter as a data source for research, and the capacity of using social media data to glean a better understanding about our social world. The immigration policies that I used as case studies generated both a small dataset, the CA Tweets, and a more traditional large social media dataset, the DACA/DAPA Supreme Court announcement. With the CA dataset I was able to examine and explore the data closely, while the DACA/DAPA dataset challenged me to explore innovative methods to make the data useful for analysis. Both datasets, however, revealed important limitation of Twitter data. A large portion of data that was collected included tweets that Retweeted another users' content or shared a news or media link. Indeed US adults report that they are more likely to use Twitter for their news source in comparison to other social media platforms (Shearer & Gottfried, 2017). In addition, although individuals Tweet abundantly a wide swath of data originated from organizations, businesses, and news profiles. As such, mining for opinions and viewpoints from

individuals and private citizens can be limiting. Furthermore, the character limits on Twitter and the nature of social media language made it difficult to glean substantive meaning from some Tweets. For example, many Tweets included short phrases such as *huh??, this is stupid, and can you believe this!?* While some analysis leverage these type of data for sentiment analysis, for the purposes of this study, these expressions were not particularly useful. These findings, suggest that future researchers must be intentional in their approach when tapping into social media data and cautious in interpreting their findings, particularly when making conclusions using large datasets.

In today's political landscape, the future of immigration reform is uncertain. Federal, state, and local governments continue to experiment with new laws, policies, and initiatives to shape migration and the lives of immigrants in the US. The policy directions that our governments and policymakers take reflect broader social views of immigrant groups. Marginalized immigrant groups, such as Latinos, who have undergone processes of stigmatization and racialization in the US often stand the most to gain and lose with these policy shifts. By engaging in inclusive immigration laws and policies, our governments can cast a welcoming light on immigrant communities with, as I argue in this paper, potentially positive health implications. However, policies can also cast long shadows, further marginalizing, stigmatizing, and racializing communities that may already be in the dark, and exacerbating health inequities in already vulnerable populations. The health implications of immigration policies can manifest themselves through traditional avenues such as material resources, access to sanctioned-employment, scholarships, driver's licenses. But these material resources work in tandem with a broader psychosocial context that is identity-affirming or threatening to immigrants and their co-ethnics. In this way, policies hold symbolic power in pausing some of

the deep-seated racial stigmas about immigrants, and "Jedi-mind tricking" immigrants and their co-ethnics to simply "move along"[17].

[17] Jedi mind tricks and "moving along" originates from Geronimus' conceptualization of Jedi Public Health and references a Star Wars scene in which Jedi, Obi-Wan Kanobi, uses his mind-tricking powers to convince storm-troopers to pass.

Chapter 5 Conclusion

The social and political landscape in the United States in the years leading up to this dissertation has put into sharp focus the racialized environment that Latino immigrants and their US-born coethnics navigate in the US. Across the campaign trail in 2016, then presidential candidate Donald Trump repeatedly referred to Mexicans as drug dealers and rapists. Once in office Trump would later refer to immigrants from El Salvador, Honduras, Haiti, and African nations as coming from "shithole countries". In a similar fashion, other lawmakers and policymakers as well as everyday residents hurled disparaging remarks towards their Latino constituents, coworkers, classmates, and neighbors. Tweets, videos, and pictures of these dehumanizing interactions have flooded our news feeds and media streams. While each new incident is alarming to the psyche and the soul, they provide in-the-flesh examples of just some of the ways in which people of color navigate racism in the US. Moreover, these contemporary clashes reveal the underbelly of a deep-rooted racial animus that has shaped our nation's identity and landscape- an animus that underscores the notion that Latino immigrants and their US-born co-ethnics are criminals, undeserving, not-fully-people.

Yet, despite the wide evidence of contemporary and historical experiences of inequality and oppression faced by Latino immigrants and their US born co-ethnics, scholars studying Latino health inequities have largely ignored the sociopolitical "surround" that shapes Latinos' lives and health (Echeverría et al., 2013; Viruell-Fuentes, Miranda, & Abdulrahim, 2012; Zambrana & Carter-Pokras, 2010). This dissertation contributes to this gap by anchoring

research on Latino health inequities with theoretical frameworks and literature that demonstrate links between race and structural racism as fundamental causes of health inequities. Drawing on this literature, I contribute to the body of research that suggests that as Latino immigrants and US born Latinos navigate a racialized context in the US, declines in health may emerge due to repeatedly dealing with the material and psychosocial consequences of racism across time and generations. My dissertation encompassed three papers to undertake this endeavor and I review their major findings, strengths, and limitations below.

Chapter 2 offered a critical review of the literature on health among US and foreign-born Latinos and a discussion of the limitations of the current approaches for understanding the Latino health paradox. This chapter argued that the predominate explanations for Latino health inequities largely do not hold up to their theoretical or empirical claims. In setting this stage, I then turned to literature and theory from the social sciences and public health to more clearly define and outline structural racism in the United States and associated processes that may relate to health. This discussion adds to the literature because while scholars are increasingly interested in connecting race and racism to health, our current approaches often lack theoretical specificity and fail to detail plausible biopsychosocial mechanisms to health. With this more elaborate conceptualization of structural racism, I concluded the chapter by detailing how structural racism may operate for Latinos across time and generations in the US to shape declines in health.

The conceptual model that emerged from this chapter, "Becoming American", offers an emerging blueprint for the ways in which cultural and structural racism shape Latinos experiences in a racialized society and the implications of these processes for health. A notable strength of this work is that I aimed to incorporate interdisciplinary research in order to theorize the ways in which racial structures are created and embodied. Despite these contributions, I note

that this conceptual model largely homogenizes Latinos as a monolithic group and does not explicitly attend to the diversity of experiences across subgroups. As I elaborate below, while "Becoming American" is an important first step, future work will be needed to continue to refine components of the model and engage in empirical work to prove its arguments.

Chapter 3, however, offered one empirical test of the "Becoming American" model using quantitative data from the Mexican Family and Life Survey (MxFLS). In this analysis I first investigated differences in cardiovascular health profiles among Mexico-US migrants and non-migrants in order to test the health selection or healthy immigrant hypothesis. As I hypothesized, Mexico-US migrants and non-migrants had similar health profiles at baseline. These results suggested that health selection may not be a salient factor for future migration to the United States. Instead, other factors such as education, marital status, employment, and state of residence were stronger predictors of migration. I further tested this question by conducting a sub-analysis of health between Mexico-US migrants and desired migrants, individuals who had goals of migrating to the US but had not by the second wave of the study. Again I found that the health of Mexico-US migrants and desired migrants were largely similar at baseline. In light of these findings, the popular argument that Mexican migrants to the US are healthier at baseline in comparison to their compatriots who do not migrate, and therefore inflate the health profiles of Mexican immigrants in the US was not supported in my analysis.

Furthermore, I leveraged data about migration histories in the MxFLS to construct a group of US-Mexico return migrants, individuals who reported that they had lived in the US, and a summary measure of total time spent in the US. Using these measures, I explored how exposure to the US shaped the cardiovascular health of US-Mexico return migrations in comparison to non-migrants. In addition I tested whether differences in health were mediated by

physical activity or smoking behavior. I find partial support for my hypothesis that exposure to the US is associated with worse health. Return migrants had an increased odds of elevated waist-hip circumferences and obesity/overweight in comparison to nonmigrants, and time in the US was positively associated with cardiovascular disease. Neither physical activity nor smoking contributed to these findings. However no differences were found for diabetes or hypertension, which may be due to the time it takes for these conditions to manifest.

While this paper contributes some preliminary answers to long-standing questions about immigrant health, I also note the limitations of the data and my methodological approach. First, while the MxFLS is one of the few studies that surveys and tracks Mexican migrants and nonmigrants the sample size of migrants in this analysis was small and longitudinal data on migrants' health was unavailable. Future waves of the study will help to address these sample size and data issues and bolster the results of my cross-sectional analysis. In addition, the MxFLS includes only a limited number of health variables and indicators which limited my ability to test physiological processes related to stress response dysregulation more directly. While the measures I chose for the analysis, blood pressure, obesity, waist-hip-ratio, are useful proxies later waves of the MxFLS include some additional health measures such as CRP and cortisol which will be useful for future work. Finally, given that the dataset was collected in Mexico and focuses on demographic and economic trends, the current dataset does not capture information about migrants' experiences in the US nor does it include other Latinos beyond Mexicans. It is unclear, then, if the findings for Mexican migrants will be reflected in the health of other Latinos. To address this limitation, new cross-sectional data in the US with large Latino samples would help answer questions related to health selection, acculturation, and the exposure hypothesis among Latinos across country of origin.

Importantly Chapter 4 tapped into the social mileau that Latinos navigate in the US by unpacking how shifts in immigration policy shape the material benefits and psychosocial landscape for US and foreign-born Latinos, and the implications of this surround for their health. This chapter built on "Becoming American" by outlining how cultural racism involves the perpetuation of identity-threatening stigma and stereotypes about immigrant groups. Further, I introduced literature that argues about news ways in which these threatening signals may be disrupted at a population level. To test the identity-affirming and identity-threatening power of immigration policy, I conducted a qualitative content analysis after the passage of immigration case studies in the US. Interestingly, I find that identity-affirming messages of psychosocial inclusion and belonging were most often transmitted on Twitter after the passage of restrictive immigration policies, while inflammatory and xenophobic Tweets dominated conversations after the passage of inclusive policies. I attribute these findings to these a consistent trend on Twitter wherein users are more likely to share their opposition to policy or news. In addition, the qualitative analysis of the data lent support to my argument that the psychosocial implications of immigration policy may perhaps be a more powerful driver of immigration policy's impact on health. Specifically, while Twitter users commented on the material benefits and resources they gained and lost through these policies, instead these Tweets were dominated by conversations about the family and community ties that would be changed, dreams that would be shattered or bolstered, and the context of membership or belonging that would be altered due to these policies.

Chapter 4 took a unique approach by utilizing qualitative data on Twitter to answer my research questions. While novel, this approach contributed to some of the limitations in this Chapter. Specifically, it was difficult to answer complex research questions with data that was

restricted by short character limits and very little context. Contrary to standard qualitative data approaches, I found myself having to code "outside of the data" and drawing inferences beyond the texts immediately in front of me. In addition, most of the messages on Twitter represent retweets, new links, or messages sent by organizations or public personas. Therefore, while I began with a large sample of data, the useable data was much smaller once I limited my target tweets to original tweets from private users that expressed a viewpoint or sentiment. To augment this data, then, I conducted a separate analysis of the most popular retweets in the data. These messages represented nearly a third of all of the tweets in my study, and revealed important and unique themes that the original tweets had not. Although these methodological hurdles posed challenges for the analysis this chapter offers a better understanding of the potential contributions and limitations of social medial data for understanding our social world.

Future Research Directions

Finally, the findings of this dissertation point to new avenues to continue exploring how structural racism operates to shape the lives and health of Latinos in the US. Specifically, future research should elaborate how structural racism unfolds across particular historical moments, sociopolitical contexts, and Latino subgroups. In addition, health researchers should continue to adopt new methodological strategies to better capture how these experiences then become embodied among Latinos and other racialized groups. I elaborate on these points below.

Structural Racism and the Dynamics of Race

As I argue in this dissertation, structural racism is a ubiquitous phenomenon that shapes and colors the experiences and life chances of all racial/ethnic groups in the United States. However, scholars are increasingly pointing to the ways in which race, one's experience of race, and the implications of race for health are dynamic and contingent on one's social identity,

historical moment, and sociopolitical context (Geronimus et al., 2016). The current literature on Latinos and health not only largely ignores the role of structural racism on health, but also the unique ways in which race is experienced by Latinos with diverse identities and trajectories in the US.

An important next step in this research, then, would be to monopolize the diversity of Latinos' experiences in the US to study the distinct experience of race within the Latino population. Specifically, Latinos encompass a population with various countries of origin, immigrations status, language-use, socioeconomic status, and racial identities. In addition, Latinos are spread across various regions and communities in the US, which undeniably shapes their experiences of race. To make inroads in this area, future research should collect and utilize more data that is representative of the entire population of Latinos, including understudied subgroups. In addition, given the large role that immigration plays in the Latino experience, bi-national data that captures the experience of Latinos throughout the migration process is key.

Furthermore, existing datasets should incorporate new and innovative measures that capture the effects of structural racism and the experience of race. For example, Garcia and colleagues used skin color, ascribed race, and discrimination experiences to create a multidimensional measure of the experience of race to study self-reported health (Garcia, Sanchez, Sanchez-Youngman, Vargas, & Ybarra, 2015). In addition, the SOL/HCHS dataset, MxFLS, and others include large samples of Latinos across countries of origin, immigration status, context of residence, and other social characteristics that are key to health. Leveraging this data and diversity would allow scholars to theorize how the experience of race across contexts have salience and meaning for health.

Unpacking Structural Racism Beyond Social and Material Resources:

Future research on racism and health should also attend to the complex role that structural racism plays in shaping cultural racism and its impact on health. The first generation of research on racism and health focused on reported experiences of perceived discrimination (e.g. Everyday and Lifetime Discrimination), while the current stream of research has shifted towards studying markers of institutional and societal racial bias (e.g. neighborhood segregation, inequities in policing and incarceration, barriers to healthcare). This research largely focuses on studying the consequences of these social, economic, and material inequities on population health.

A major tenant of structural racism, however, includes its powerful role on shaping cultural racism- the social psychological disadvantages of "non-white" groups relative to "whites" through ideology, language, and power (Phelan & Link, 2015). Prominent examples of the enduring effects of cultural racism include the assumption and expectation that whites should dominate in positions of power, that whites are superior, and the desires of white to maintain social distance from non-white groups. As I argue in this dissertation, these processes in turn shape notions of belonging, membership, and personhood which have been shown to matter for health in ways that material resources don't capture. While emerging qualitative and quantitative research, including the findings in Chapter 4, have begun to unpack the implications of stereotypes and pervasive cultural scripts on the lives of Latinos, more scholarship is needed to demonstrate the tangible links between these psychosocial processes and health .

Lifecourse and Intergenerational Research

Finally, while the analysis in Chapter 2 uses quasi-longitudinal binational data, few studies engage in lifecourse research that connects experiences across the stages of migration to health. For example, scholars have failed to consider how stressors among Latinos are unique

within the US context, in relation to similar or more extreme sources of stress and disadvantage within Latin America. That is, many migrants leave their countries of origin as a result of deep economic instability, violence, and limited opportunity. Those who remain in their countries are still exposed to these sources of stress which may also exact a toll on their health. To argue that sources of social, economic, and racial stress in the US supersede the stressors in Latin America poses theoretical challenges that have not been fully addressed in the literature. To address this gap, longitudinal data that captures lifecourse stressors before and after migration is key. In addition, qualitative research in which migrants themselves share experiences that shape their lives across stages of migration would help us theorize how various sources of stress uniquely impact their health.

In a similar vein, work that builds on the intergenerational transmission of racism and health among Latinos would also contribute to arguments for "Becoming American." I argue that the children and grandchildren of immigrants face deleterious health outcomes in part due to their individual experiences, but also from the experiences of prior generations and the sociopolitical circumstances that shaped the lives of each generation. In general, however, intergenerational approaches are scant in the literature both from a theoretical and empirical perspective. However a growing body of literature suggests that experiences in-utero, childhood, and early adulthood may be more formidable in shaping racial/ethnic health inequities that experiences in later adulthood.

In summary, this dissertation offered new data and new explanations for advancing research on Latino health and contributes to a growing body of literature that suggests that health declines among Latinos in the United States is due to lifelong and repeated exposures to racialized stress processes

Appendices

Appendix A. Table A.1 Missing vs Complete Case Analysis, MxFLS, Wave I, n=14,744

Variable	Complete %/$\bar{x}$	Missing %/$\bar{x}$
Age**	40.57	30.60
Male**	44.27	53.53
Married**	69.61	50.06
High School Education**	20.12	22.52
Currently Working	54.03	46.60
Health Insurance**	45.38	42.39
Mexico-US Migrant**	2.18	4.39
Desired Migrant**	2.35	3.24
Return Migrant**	1.87	0.86
Months in the US	0.95	0.57
Relatives in the US	36.35	35.95
Overweight/Obese**	63.96	39.78
Elevated Waist-Hip-Ratio**	28.18	16.34
Elevated Waist Circumference**	26.40	15.43
High Blood Pressure**	36.41	29.38
Self-reported CVD*	3.27	2.21
Current Smoker**	13.61	12.49
Minutes of Physical Activity/Week**	80.59	113.05

*p<0.05 **p<0.001

Appendix B. Table A.2 Correlation Matrix, MxFLS, Wave I, n=14,744

Variable	Age	Weight (lb)	Height (in)	BMI	WHC	WHR	SPB	DBP
Age	1							
Weight (lb)	0.02	1						
Height (in)	-0.20	0.48	1					
BMI	0.15	0.81	-0.12	1				
WH Circumference	0.33	0.78	0.18	0.76	1			
WH Ratio	0.41	0.36	0.18	0.27	0.69	1		
Systolic (SBP)	0.35	0.26	0.05	0.26	0.37	0.33	1	
Diastolic (DBP)	0.06	0.25	0.13	0.19	0.25	0.22	0.59	1

Appendix C. Table A.3 Mixed Effects Model of the Association between Mexico-US Migration and CVD Health, MxFLS Wave 1, n=14,744

US-MX Migrant	Model 1			
	OR	s.e.	95% CI	
Age	0.92	0.009	0.90	0.93
Male	1.979	0.37	1.37	2.85
Married	0.57	0.11	0.38	0.86
Education				
None	3.11	0.78	1.10	4.41
Elementary	4.34	0.81	1.49	4.87
Secondary	3.46	0.74	1.36	4.44
High School	2.70	0.68	1.16	3.98
Insured	0.27	0.06	0.30	0.52
Obese/Overweight	0.96	0.19	0.65	1.41
Elevated WHC	0.63	0.17	0.36	1.08
High Blood Pressure	0.75	0.16	0.50	1.13
Diabetes	0.88	0.47	0.31	2.53
Cardiovascular Disease	2.33	1.25	0.82	6.66
Smoker	1.07	0.28	0.65	1.80
Recc Level of Physical Activity	1.40	0.33	0.88	2.23
Intraclass correlation		ICC		
Level 2: Family		0.438		
Level 3: State		0.748		

Appendix D. Table A.4 Mixed Effects Model of the Association between Exposure to the US and Obesity/Overweight Status, MxFLS Wave 1, n=14,744

BMI	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	**1.021**	0.002	1.018	1.024	**1.021**	0.002	1.018	1.024	**1.021**	0.002	1.018	1.024
Male	**0.758**	0.030	0.701	0.820	**0.753**	0.030	0.696	0.814	**0.754**	0.030	0.697	0.816
Married	**2.407**	0.112	2.197	2.637	**2.404**	0.112	2.194	2.634	**2.405**	0.112	2.195	2.635
Education (College=Ref)												
None	**0.698**	0.067	0.579	0.842	**0.700**	0.067	0.581	0.844	**0.700**	0.067	0.580	0.844
Elementary School	**1.339**	0.111	1.139	1.574	**1.340**	0.111	1.140	1.576	**1.338**	0.111	1.138	1.574
Secondary School	1.108	0.092	0.942	1.304	1.104	0.092	0.938	1.300	1.104	0.092	0.938	1.299
High School	0.978	0.089	0.819	1.168	0.979	0.089	0.820	1.169	0.977	0.088	0.818	1.167
Insured	**1.439**	0.064	1.319	1.569	**1.442**	0.064	1.323	1.573	**1.444**	0.064	1.324	1.575
Return Migrant					**1.385**	**0.214**	**1.023**	**1.873**				
Time in the US (months)									**1.005**	0.002	1.001	1.010
Intraclass correlation	ICC				ICC				ICC			
Level 2: Family	0.09				0.09				0.09			
Level 3: State	0.18				0.18				0.18			

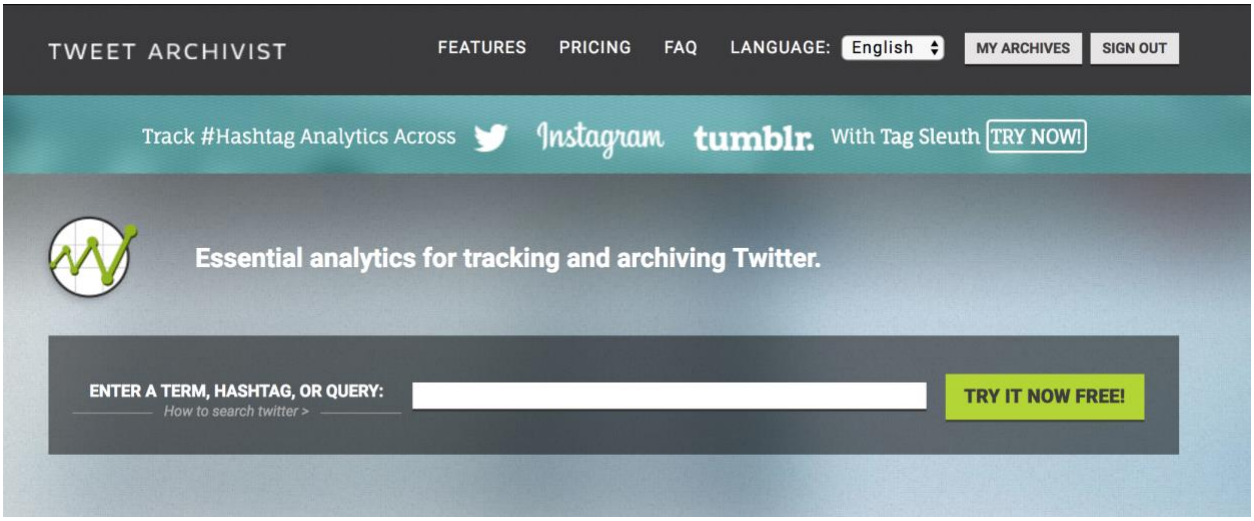
Appendix E. Table A.5 Mixed Effects Model of the Association between Exposure to the US and Elevated Waist-Hip Circumferences, MxFLS, Wave 1, n=14,744

Elevated WHC	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	**1.035**	0.002	1.032	1.039	**1.035**	0.002	1.032	1.039	**1.035**	0.002	1.032	1.039
Male	**0.183**	0.011	0.162	0.206	**0.181**	0.011	0.160	0.204	**0.182**	0.011	0.161	0.206
Married	**1.798**	0.099	1.614	2.003	**1.796**	0.099	1.612	2.002	**1.797**	0.099	1.613	2.002
Work	**1.126**	0.060	1.015	1.249	**1.127**	0.060	1.016	1.250	**1.127**	0.060	1.016	1.250
Education (College=Ref)												
None	1.259	0.151	0.996	1.592	**1.265**	0.151	1.000	1.599	1.262	0.151	0.999	1.596
Elementary School	**1.740**	0.184	1.415	2.140	**1.744**	0.184	1.418	2.145	**1.741**	0.184	1.415	2.141
Secondary	**1.359**	0.147	1.099	1.680	1.354	0.147	1.095	1.675	**1.356**	0.147	1.097	1.677
High School	0.993	0.121	0.782	1.262	0.995	0.122	0.783	1.264	0.993	0.121	0.781	1.261
Insured	**1.240**	0.061	1.126	1.365	**1.244**	0.061	1.129	1.370	**1.243**	0.061	1.128	1.369
Recc. Physical Activity	**0.849**	0.062	0.735	0.979	**0.847**	0.062	0.734	0.977	**0.848**	0.062	0.735	0.979
Return Migrant					1.525	0.262	1.088	2.136				
Time in the US (months)									**1.003**	**0.002**	**1.000**	**1.007**
Intraclass correlation	ICC				ICC				ICC			
Level 2: Family	0.09				0.08				0.09			
Level 3: State	0.20				0.20				0.20			

Appendix F. Table A.6 Mixed Effects Model of the Association between Exposure to the US and Self-Reported CVD, MxFLS, Wave 1, n=14,744

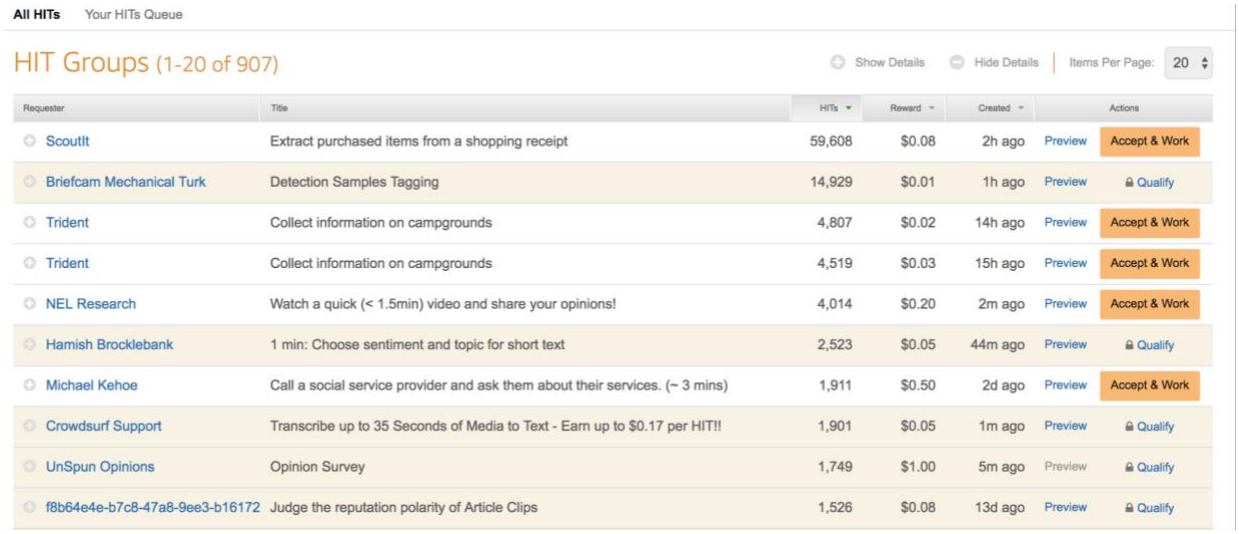
CVD	Model 1				Model 2				Model 3			
	OR	s.e.	95% CI		OR	s.e.	95% CI		OR	s.e.	95% CI	
Age	**1.045**	0.003	1.039	1.052	**1.045**	0.003	1.039	1.052	**1.045**	0.003	1.039	1.052
Male	**0.627**	0.063	0.516	0.763	**0.624**	0.063	0.513	0.760	**0.623**	0.062	0.513	0.758
Education (No Education=Ref)												
Elementary School	**0.678**	0.087	0.527	0.872	**0.679**	0.087	0.528	0.873	**0.681**	0.087	0.529	0.875
Secondary School	0.756	0.120	0.554	1.031	0.753	0.120	0.552	1.028	0.752	0.119	0.551	1.026
High School	1.074	0.201	0.743	1.551	1.074	0.202	0.743	1.551	1.074	0.202	0.744	1.552
College	1.004	0.215	0.660	1.526	1.004	0.215	0.661	1.527	1.008	0.215	0.663	1.532
Return Migrant					1.275	0.449	0.639	2.542				
Time									**1.005**	0.002	1.000	1.010
Intraclass correlation	ICC				ICC				ICC			
Level 2: Family	0.04				0.04				0.03			
Level 3: State	0.07				0.07				0.07			

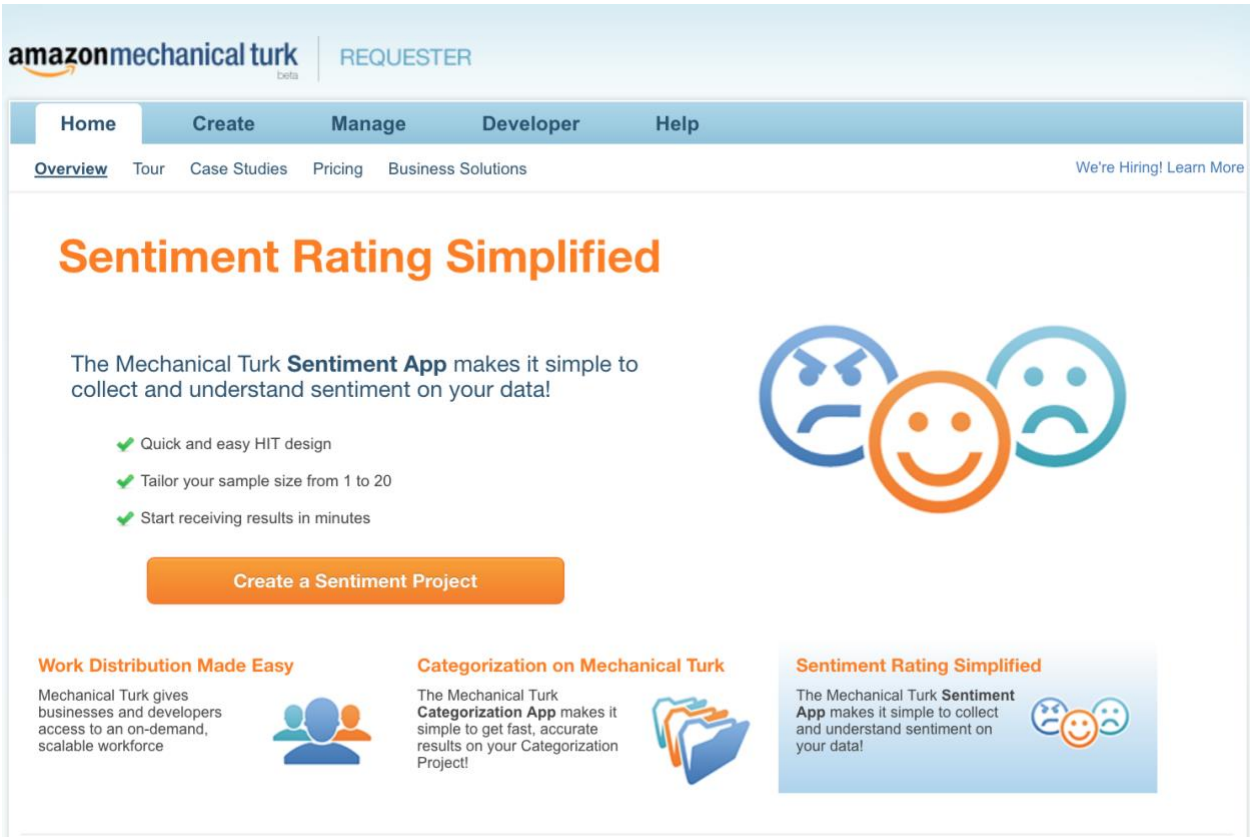
Appendix G. Figure A.1 Tweet Archivist Platform



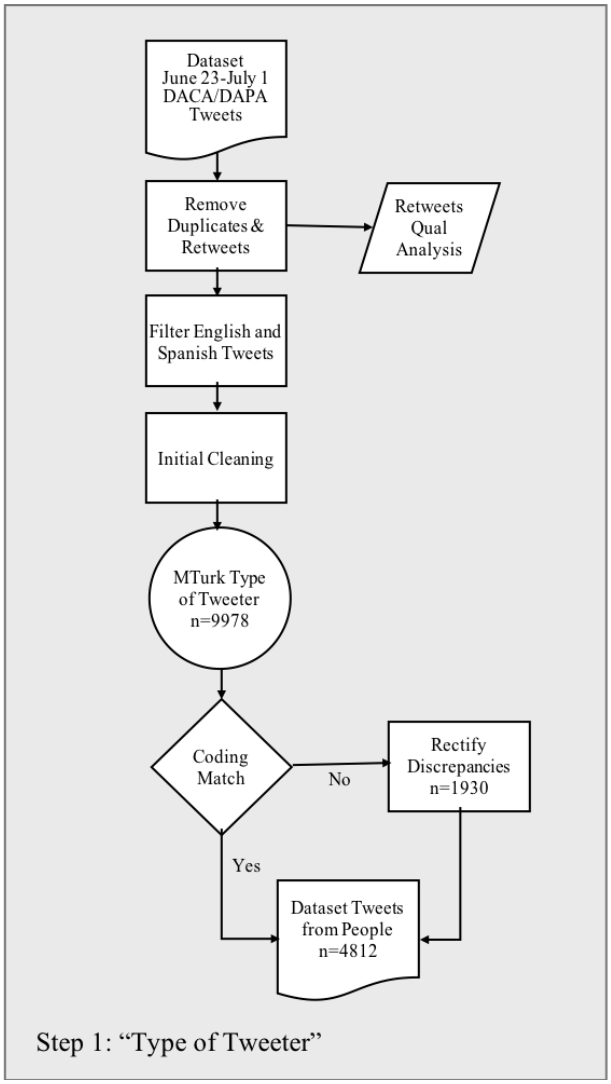
SEARCH TERM	COUNT	START DATE	END DATE	PRIVACY	
prop8	39,465	6/26/2013	6/26/2013		
prop8	1,210	6/29/2013	6/29/2013		
california and immigration	99	10/5/2013	10/5/2013		
california and undocumented immigrants	43	10/5/2013	10/5/2013		
california and immigration	419	10/5/2013	10/5/2013		

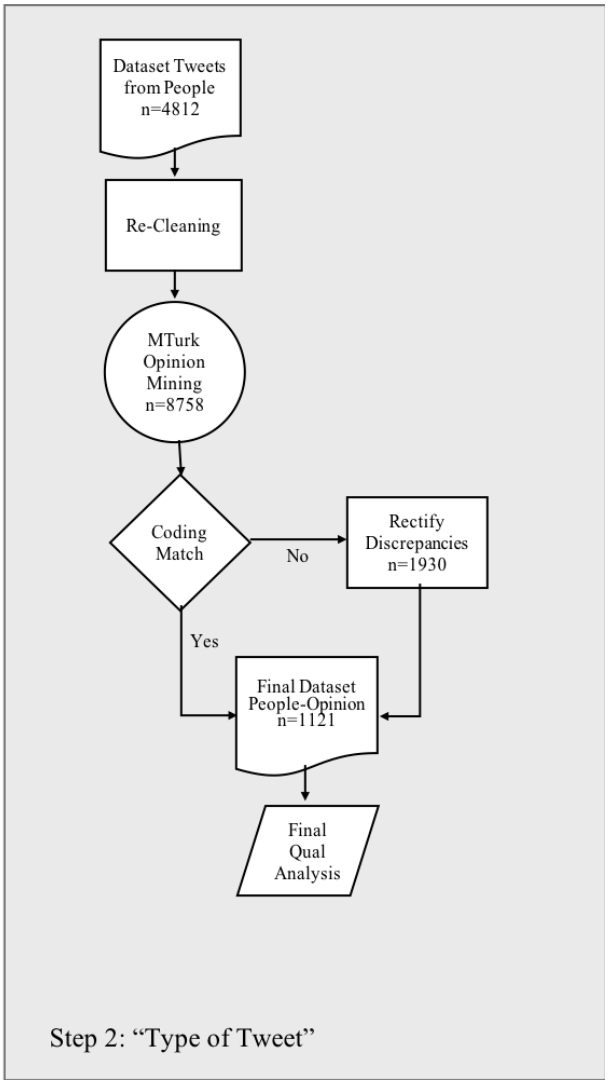
Appendix H. Figure A.2 Human Interactive Tasks Queue





Appendix I. Figure A.3 Twitter Data Cleaning Flowchart





Appendix J. Figure A.4 MTurk "Type of Twitter User" HIT

Type of Tweeter Instructions

Pick the BEST category that describes the "type of Tweeter". See the **Selection Criteria** below for more details.

Type of Tweet	Includes	Example
Private Person, Individual, or Representative	This tweeter is an individual who is tweeting from a personal account. They could include a government representative, a politician, a reporter, a private account, or a representative of an organization.	
Organization	This tweeter is an organization of any kind, presenting their organization's political or social position. They include news/media organizations, community organizations, or government organizations. They are NOT a person or an individual representative.	
Lawyer or Law Firm	This tweeter is a lawyer or a law firm presenting information on immigration law or promoting their practice. Their bio contains information about their law firm and their tweets are about immigration policy or legal information.	
Link Inactive	Select only if "Sorry that page doesn't exists" displays	

Link to the Website:

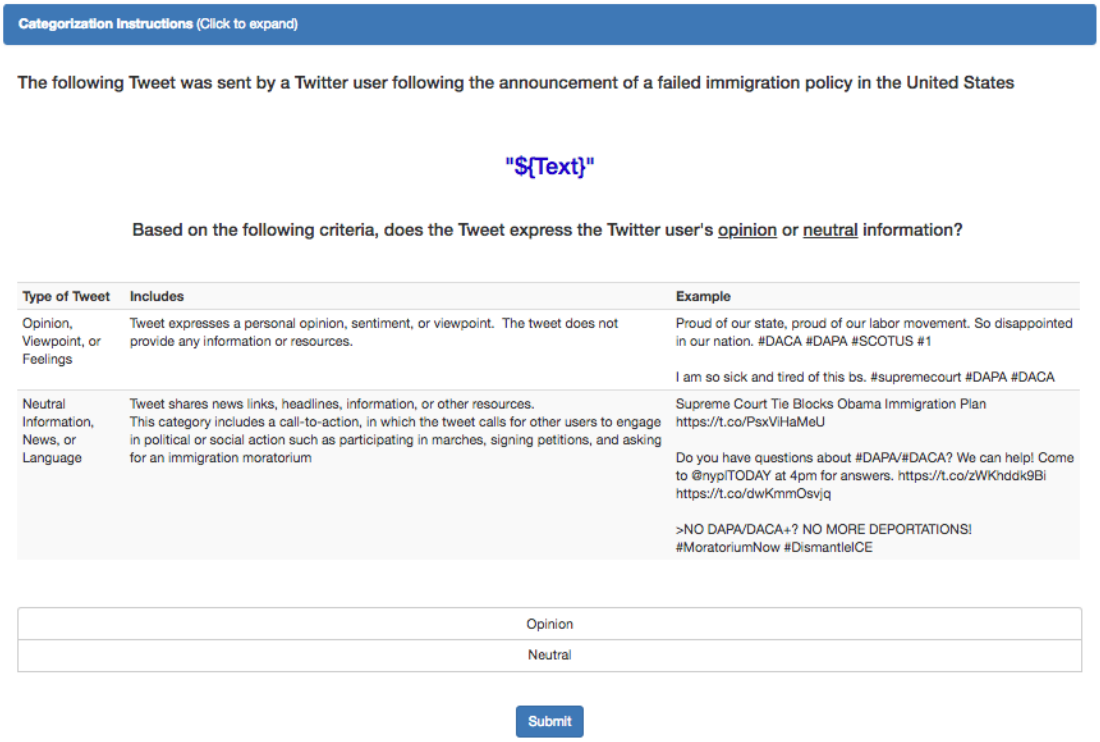
${website_url}

Choose a category:

- Private Person, Individual, or Representative
- Organization
- Lawyer or Law Firm
- Link Inactive

Submit

Appendix K. Figure A.5 MTurk "Type of Tweet" HIT



Categorization Instructions (Click to expand)

The following Tweet was sent by a Twitter user following the announcement of a failed immigration policy in the United States

"${Text}"

Based on the following criteria, does the Tweet express the Twitter user's opinion or neutral information?

Type of Tweet	Includes	Example
Opinion, Viewpoint, or Feelings	Tweet expresses a personal opinion, sentiment, or viewpoint. The tweet does not provide any information or resources.	Proud of our state, proud of our labor movement. So disappointed in our nation. #DACA #DAPA #SCOTUS #1 I am so sick and tired of this bs. #supremecourt #DAPA #DACA
Neutral Information, News, or Language	Tweet shares news links, headlines, information, or other resources. This category includes a call-to-action, in which the tweet calls for other users to engage in political or social action such as participating in marches, signing petitions, and asking for an immigration moratorium	Supreme Court Tie Blocks Obama Immigration Plan https://t.co/PsxViHaMeU Do you have questions about #DAPA/#DACA? We can help! Come to @nyplTODAY at 4pm for answers. https://t.co/zWKhddk9Bi https://t.co/dwKmmOsvjq >NO DAPA/DACA+? NO MORE DEPORTATIONS! #MoratoriumNow #DismantleICE

Opinion

Neutral

Submit

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