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At the Heart of Black Identity: Examining the Influence of Ethnic and Racial Identity on Cardiovascular and Psychological Health for Members of the Black Diaspora

DISSERTATION

submitted in partial satisfaction of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

in Psychological Science

by

Kallie M. Brown

Dissertation Committee:
Professor Belinda Campos, Chair
Associate Professor Amy L. Dent
Assistant Professor DeWayne P. Williams

2024

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DEDICATION

To the memory of
Shaneda Y. Edwards

Thank you for your love, support, and for always being the emotional anchor throughout my life.

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ABSTRACT OF THE DISSERTATION

At the Heart of Black Identity: Examining the Influence of Ethnic and Racial Identity on Cardiovascular and Psychological Health for Members of the Black Diaspora

by

Kallie M. Brown

Doctor of Philosophy in Psychological Science

University of California, Irvine, 2024

Professor Belinda Campos, Chair

Ethnic minorities, and specifically Black Americans, in the U.S. are disproportionately represented in health disparity patterns (Centers for Disease Control and Prevention, 2021). Yet, when discussing the health of the Black/African diaspora in the U.S., ethnic and cultural differences are rarely explored. Utilizing Bronfenbrenner's Ecological model as a conceptual framework, this dissertation investigates whether race, identity, discrimination, socialization, and U.S. acculturation interact to affect health and well-being for diverse subgroups of the Black/African diaspora (African-Americans, Continental Africans, Afro-Caribbeans, and Afro-Latinos). Focusing on within-group variation, this study explores intraracial and intraethnic differences in ethnic/racial identity as it relates to cardiovascular and psychological health in two parts.

Study 1 examines the moderating effects of certain sociocultural factors (e.g., discrimination, racial socialization, and acculturative stress) on the relation of racial identity and health (cardiovascular and psychological) for African-Americans (n=215), Continental Africans (n=124), and Afro- Caribbeans/Latinos (n=59) (N=398). Unexpectedly, regression analyses did not reveal the predicted patterns. There was no significant association of racial identity and

health (cardiovascular and psychological health) for the overall sample. However, notable findings did emerge in three key areas. First, surprisingly, higher (more positive) racial identity related to worse BMI and depression outcomes for the overall sample. Secondly, for Continental Africans, discrimination and socialization were found to moderate the relation of racial identity and physical activity. Specifically, higher racial identity was only related to worse physical activity for those with high levels of socialization and high levels of discrimination. Finally, for African-Americans, higher racial identity was only strongly related to lower depression for those with high levels socialization.

Study 2 examined whether acculturation and years lived in the U.S. moderated the association of ethnic identity with cardiovascular health (cardiovascular disease risk factors) and psychological health (i.e., anxiety and depression) for Afro-Latinos (n=589) and non-Black Hispanic/Latinos (n=9,231) (N=9820). Using regression-based analyses, results suggested that racial identity relates to both cardiovascular health and psychological health, but only for non-Black Hispanic/Latinos. Furthermore, significant moderation effects of acculturation and years lived in the U.S. emerged only for psychological health outcomes among non-Black Hispanic/Latinos. These results suggest that while ethnic identity and acculturation profoundly affect psychological health, their impact on cardiovascular health is less clear, particularly for those who identify as Afro-descended and Hispanic/Latino. Still, overall findings from this novel research highlight the heterogeneity of the Black experience and the need to study within-group variation to obtain a "big picture" of Blackness in the U.S. as it relates to health.

Chapter 1

INTRODUCTION

Health is very complex, and it is increasingly recognized that factors like race, ethnicity, and sociocultural experiences influence the nature, expression, and trajectory of health and well-being (Meyer et al., 2013; Grimm et al., 2012). However, while there continues to be a growing awareness of the importance of good physical and mental health for overall well-being, ethnic minorities in the U.S. are disproportionately represented in health disparity patterns (Centers for Disease Control and Prevention, 2021). For Black Americans in particular, the sociocultural reality of race and racism that is known to directly shape biology plays an important role in health outcomes (Gravlee, 2009). This dissertation aims to extend research on ethnic/racial identity and health by examining the nuanced experiences of diverse peoples of the Blac/African diaspora to better understand the ways in which specific contexts of the Black experience interact to influence health and well-being. This dissertation investigated whether sociocultural factors like discrimination, racial socialization, and acculturative stress (Study 1), and U.S. acculturation and years lived in the U.S. (Study 2) interact with ethnic/racial identity to affect cardiovascular health and psychological health outcomes for diverse subgroups of the Black/African diaspora (African-Americans, Continental Africans, and Afro-Caribbeans/Latinos) in two studies. These subgroups within the Black/African diaspora were explored independently to understand the heterogeneity of the Black experience and obtain a "big picture" of Blackness in the U.S. as it relates to health.

Overarching Theoretical Framework

The theoretical framework that informs the concepts of this dissertation is Bronfenbrenner's ecological model (1979). According to this highly influential model, each

individual is situated in the center of an interconnected set of social systems (Bronfenbrenner, 1979). Within this model, there are five systems. First is the microsystem. The microsystem refers to a person's immediate environment and the relationships and interactions a person has with their immediate surroundings (Crawford, 2020). This microsystem can also include one's personality and beliefs. Next is the mesosystem which is the layer that provides the connection between the components within the microsystem, or a "system of microsystems" (Bronfenbrenner, 1979). For example, the ways in which the parents of a child interact with the child's school is a type of "system of microsystems" that makes up part of the mesosystem. The third system, the exosystem, is defined as the "larger social system where the individual may not function directly" (Crawford, 2020). Similar to the mesosystem, it is made up of microsystems. However, the individual at the center of these systems may not interact directly with or influence the elements within this system. For example, if a parent were to experience discrimination at their workplace, this may have an impact on their parenting choices when interacting with their child. Thus, although the child does not directly interact with the workplace, it still may have positive or negative influences on their development. The macrosystem, the fourth system, is defined by an individual's cultural ideologies, social conditions, and societal elements. Finally, the chronosystem is the system that accounts for the way time and aging can shift our beliefs, development, and thus outcomes.

For marginalized groups, including Black Americans (both foreign-born and U.S. born) living in the U.S., Bronfenbrenner's model provides a valuable framework for understanding the systemic nature of discrimination, socialization, and acculturation, and its impact on health. At the macrosystem level, the pervasive influence of the U.S. racial system and immigration policies shapes the experiences of Black Americans by creating structural barriers to equality and

access to resources. This systemic racism can manifest in various forms, such as disparities in healthcare, economic opportunities, and educational attainment, all of which contribute to health inequities. By examining these different systems, Bronfenbrenner's model allows researchers to see how the broader socio-political context influences the daily lives and health of marginalized groups, providing a comprehensive understanding of the challenges they face. Furthermore, this model is particularly important for emphasizing the complex interactions between individuals and their environments. This approach helps psychologists understand that behavior and development are not solely influenced by internal factors but also by the external context in which individuals are embedded. Through this theory, we can consider the multiple layers of influence, including immediate settings like family and school (microsystem), the interactions between these settings (mesosystem), and broader societal influences (macrosystem).

This current dissertation highlights how structural factors within the macrosystem, such as immigration and U.S. cultural and racial dynamics, permeate through the mesosystem (e.g., discrimination), microsystem (e.g., one's racial identification, parent socialization, and peer socialization), and the chronosystem (e.g., identity development, developmental stages) affecting individual experiences and well-being. This perspective is important for identifying the root causes of health disparities and for understanding both individual behaviors and broader social determinants of health. In sum, this model is useful in providing a more thorough picture of how Black family, peer, and wider social processes influence cardiovascular and psychological health, and was used as a guide to substantiate the concepts of the current studies.

Review Of Literature

Race and Identity in the U.S.

When asked the question “what is race?”, one can be led to a series of very complex answers. In the U.S., race and identity are typically treated in binary black and white terms that leave little room for the possibility of other identities. However, race is made up of social definitions and exists within different social contexts in different ways (Webb, Burrell, & Jefferson, 2019). Race refers more to the physical and sociocultural differences that groups and cultures consider socially significant (Webb, Burrell, & Jefferson, 2019).

To be considered a Black American, it is assumed that you are an American of African descent whose ancestors endured American chattel slavery. However, as the U.S. Black population grows, and subgroups that have previously been lumped under the term “Black” gain more acknowledgement, it becomes more evident that being Black in America is more complex. Members of the Black population in the U.S. have varied histories in the nation. Many are descendants of enslaved people, while others are recently arrived immigrants or recent descendants of immigrants. There are also diverse ethnic and racial identities reflecting intermarriage and international migration. As a result, there are key distinctions in the characteristics between different parts of the U.S. Black population, emphasizing its unique diversity (Pew Research Center, 2021). However, despite the differences, Black Americans of different historical backgrounds can be considered to have similar race-based experiences in the U.S. that can shape their life and identity.

Racial Identity

The construction and development of identity is a critical component of any developmental experience. Generally, this process involves (1) identifying and embracing one’s own distinct qualities, and (2) accepting and understanding one’s various social roles (Hartmann et al., 2018). One of these identity formation processes, especially for ethnic minorities, is racial

identity development. According to Sellers et al (1997), racial identity refers to the personal significance and meaning of race to one's self-concept. Early scholars have looked at racial identity unidimensionally, but racial identity is now recognized to be multidimensional (Allen et al., 1992; Demo & Hughes, 1990; Phinney & Ong, 2007; Thompson, 1995; Sellers et al., 1997).

There are several models that describe racial identity development for all racial groups in the U.S. However, Black Americans have specific models for their racial identity development. One example that has been productively used in the context of African-American identity is the "Nigrescence" model. The Cross (1978) model of "Nigrescence" is often referenced when examining Black racial identity theory. According to this model, there are a number of stages that one must go through to achieve a positive racial identity. However, because Black Americans may encounter racial experiences continuously throughout life, it is possible to revert to a previous stage and go through this "Nigrescence" process multiple times. Thus, racial identity development is a continuous process that occurs throughout the lifespan (Cross, 1995).

Another theory of racial identity, that describes the multifaceted complexity of Black racial identity for African-Americans is the Multidimensional Inventory of Black Identity (MIBI; Sellers et al., 1997). This model contains the three dimensions that define racial identity: (1) centrality, (2) regard, and (3) ideology. Centrality refers to how central race is to one's sense of self. Regard is the extent to which one feels positively or negatively about African Americans and their membership in that group. This dimension gauges how one may feel privately about their own ethnic/racial group (private regard) and how they believe others regard African-Americans (public regard). Ideology refers to the way one may feel about how members of their ethnic/racial group should act. Taken together, these dimensions allow us to understand the extent to which one's race is salient and relevant to their sense of self (salience) (Sellers et al.,

1997). This theory was groundbreaking in highlighting that identity development is not a linear process. Rather, it is a dynamic and evolving experience shaped by multiple interacting factors. Overall, this theory brings awareness to the complexities involved and offers a deeper understanding and recognition of the diverse experiences and perspectives among African-Americans.

Other theories of racial identity have since been developed that intends to capture the essence of a positive identity for diverse groups within the U.S. In particular, the theory of Ethnic and Racial Identity is another concept that has been used to define identity. This is another multidimensional construct that aims to reveal the beliefs and attitudes one has about their ethnic/racial group, how these beliefs develop over time (Umaña-Taylor et al., 2014), and is general enough to be applied to many ethnic/racial groups within the U.S. Furthermore, this theory goes beyond to consider the ethnic, racial, cultural, and contextual factors that influence identity and takes into account the multifaceted history of race and ethnicity here in the U.S. to explain identity development for different ethnic and racial groups.

Largely, the field of research on racial identity and identity development is extensive with its key concerns relating to the possibility and process of developing a positive racial identity. However, the findings this research has generated are not well incorporated into the literature on health for minority populations. This dissertation, by focusing on Black racial identity and examining the ethnic and subcultural differences among Black individuals, aims to provide a more nuanced understanding of the diverse experiences and identities within the Black/African diaspora as it potentially pertains to health and well-being.

Race, Ethnicity, and Identity in the Black Diaspora

While the theory of racial identity is very complex and considers the social contexts that influence racial identity development for African-Americans with substantial history and roots in the U.S., there is little research exploring Black identity development for Black people who are immigrants or descendants of immigrants from countries outside of the U.S. that treat race differently. To explain, in the U.S., race (and racism) has always been understood through a Black/white paradigm due to the black-white divide that has existed. However, outside of the U.S. (where countries are more culturally homogenous), it is more common to have a stronger sense of national identity that supersedes the need for a positive ethnic/racial identity (Nubia-Feliciano, 2016). Thus, it is possible that foreign-born, or descendants of foreign-born Black Americans (like Continental Africans, Afro-Caribbeans, and Afro-Latinos) experience a different process of developing a racial identity as they adapt to a country that pushes them into a rigid racial group that they may not have thought to identify with before. For example, scholars have found little support for U.S. conceptions of being "Black" among non-U.S. born Continental African populations (Bethea, 2006). In addition, Bailey (2001) found that Dominican-Americans (who are likely to have significant African ancestry) face challenges associated with Black racial identification, and often reject the notions of being Black. Bailey (2001) revealed that moving into the U.S. racial hierarchies, Dominican-Americans are excluded from the category of being "White" while deliberately rejecting a Black identity and solely embracing a "Spanish/Hispanic/Latino" identity. Furthermore, Eguchi & Asante (2016) found that immigrants from African countries who learn of negative representations of African-American culture, express their identification as simply "African" to emphasize their identification with their home continent, and their different racial positioning as Black in relation to U.S.-born

African-Americans. Knowing this, the negative representations learned of what it means to be Black in the U.S. may have an influence on the racial identity formation processes for these groups.

Ethnic/Racial Socialization

Despite variation in the experiences and beliefs that lead to identity for Americans of African descent (whether foreign-born or U.S.-born), there are certain factors that contribute to the identity development process. One of these processes is ethnic/racial socialization. Ethnic/racial socialization refers to the transmission of information regarding race and ethnicity from adults to children (Hughes et al, 2006). Ethnic/racial socialization consists of (1) messages related to the social construction of race (racial socialization) (Nelson et al, 2018) and (2) messages about ethnic heritage including cultural rituals, traditions, and artifacts (ethnic socialization).

Many empirical studies highlight the importance of social and demographic factors that influence ethnic/racial socialization. For example, religious involvement, socioeconomic status, parents, family, and peers all influence one's feelings and closeness to their ethnic/racial group (Demo & Hughes, 1990). This dissertation will focus on two of these processes: parent socialization and peer socialization.

Parent Socialization. One of the most influential ways children and adolescents learn about social norms and practices is through parents and family. All parents transmit messages to children about topics such as cultural heritage and group social status, but parents of Black children carry the added responsibility of socializing their children to live in a society where their race is devalued. As a result, parents communicate messages about racial and individual pride, expectations of discrimination, and intergroup relations (Coard & Sellers, 2005; Hughes et

al., 2006; Stevenson, 1997). Research reveals that Black American children whose parents emphasize racial pride report more favorable in-group attitudes (Knight et al., 1993; Marshall, 1995; Stevenson, 1995). However, parents' emphasis on racial bias and discrimination has been associated with both positive (Bowman & Howard, 1985; Neblett et al., 2008; Stevenson et al., 1997) and negative (Marshall, 1995) outcomes. For example, some studies find that parent ethnic/racial socialization relates to lower academic achievement (Marshall, 1995) while other studies report evidence in support of the idea that socialization and beliefs about cultural socialization is associated with better academic outcomes and psychological well-being (Stevenson et al., 1997; Varner et al., 2018).

Research on the effectiveness of parent racial socialization is still unclear, especially for groups with a more complex ethnic/racial history. For example, immigration status may affect socialization practices. Some studies have found that immigrants' understanding of U.S. systems of racial stratification shift across immigrant generations (with younger generations having more "mainstream American" views) (Kasinitz, Mollenkopf, & Waters, 2004) while other studies assert that recent immigrants are more likely to socialize youths regarding their ethnicity, native language, culture and traditions than are their same-ethnicity counterparts who have been in the United States longer (Hughes et al, 2006).

Peer Socialization. Much of the research on ethnic/racial socialization focuses on parents as the socialization agents (Priest et al., 2014; Umaña-Taylor et al., 2014). However, there is emerging empirical evidence that peers may be additional important agents of ethnic/racial socialization. As we age, we tend to spend less time with parents and more time with peers (Umaña-Taylor et al., 2014). Although research on peer socialization is limited, the available research indicates that peers are engaging in cultural socialization (Hu et al., 2015; Lesane-

Brown et al., 2005; Tran & Lee, 2011). For example, in samples of ethnically-diverse adolescents and emerging adults, Wang and Benner (2016) found that ethnic/racial socialization by peers occurs at comparable levels to ethnic/racial socialization by family (e.g., Wang & Benner, 2016). Still, research on peer socialization does not address the influence of peers on individuals who have immigrated from places that conceptualize race differently. For example, although individuals tend to have friends who share the same ethnicity (Kiang et al., 2006), and pairs of ethnic minority friends tend to have similar levels of ethnic/racial identity (Syed & Juan, 2012), recently immigrated individuals in an environment with few others of the same background may fare differently. It is possible that their peers may socialize them to change or assimilate their beliefs to the dominant culture. This assimilation is referred to as acculturation.

Acculturation and Acculturative Stress

Acculturation relates to the changes in values, beliefs, norms, and behaviors that occur when immigrants come into extended contact with a dominant culture that differs from their traditional culture (Berry, 2003). Scholars define it as a dual process where cultural AND psychological changes occur due to living in a society that is culturally different from their own (Berry, 2005). These changes can either be viewed as benign and opportunities that are not stressful, or they may be viewed as stressful, causing acculturative stress (Smith & Khawaja, 2011). Acculturative stress occurs as a result of tension between maintaining the behaviors and characteristics of one's home country and also adopting those from the majority culture (Cervantes et al., 2019). Although this has primarily been studied in Hispanic/Latino populations, acculturative stress is not unique to this group. Many immigrants to the U.S. contend with balancing differences in cultural values, pressure to learn a new language, and adapting to a different way of living. Acculturative stress occurs when these demands exceed the

resources (e.g., psychological, social, etc.) one may have to deal with these changes (Cervantes et al., 2019).

Research on acculturative stress reveals that children who experience high acculturation conflict at home are at risk of developing psychosocial problems (Glatz, et al., 2021). For example, scholars have found that acculturation conflict between parents (specifically, fathers) and children relate to later parent-child conflict and other negative outcomes (internalizing and externalizing symptoms), especially when there is already low parent-child relationship quality (Schofield et al., 2008). However, findings on acculturation and health have been mixed, with some studies showing a positive relationship between acculturation and health, while others demonstrate an inverse effect on health outcomes (Hunt et al., 2004). Nonetheless, it is important to consider how these outcomes may be influenced by factors such as race, country of origin, age, gender, years lived in the U.S., education, and income. For example, Cervantes et al. (2019) assert that although some Hispanic/Latino subgroups experience greater discrimination-related stress than do other immigrant groups, there remains limited research on measuring other acculturation related differences among Hispanic/Latino immigrant subgroups. Do Hispanic/Latinos with significant African ancestry experience acculturation differently from their non-Black counterparts? This key question was examined in this dissertation (Study 2).

Acculturation processes have yet to be intricately explored among the Black population. While studies reveal that African, West Indian, and Caribbean youth subscribe to three identities: American, ethnic/hyphenated (e.g., Jamaican-American or Gambian-American), or immigrant (Awokoya, 2012; De Walt, 2011; Joseph et al., 2013; Waters, 1994), there still remain unanswered questions regarding how this ethnic/racial identification affects health outcomes, especially as they are socialized in certain contexts. It is possible that Black immigrants' cultural

response to racism and oppression in the U.S. worsens health outcomes. After all, scholars assert that Black immigrants who do identify as Black American may experience greater downward assimilation because of internalized racism and the prejudicial treatment of Blacks (Waters, 1994). Does identifying with the U.S.'s fixed category of Blackness, through developing a Black racial identity, affect health and well-being for foreign-born Black Americans?

Overall, anyone who is not a part of the dominant culture in the U.S. (Whiteness) is understood to be suffering acculturative stress to varying degrees (Anderson, 1991; Walker et al, 2008). Thus, this dissertation not only examined U.S. acculturation and acculturative stress for foreign-born Black Americans but also native-born Black Americans who may contend with similar experiences of acculturation to the dominant U.S. culture.

Health and the Black Diaspora

Since the previous century, research has shown that Black Americans experience worse health than their white counterparts on a wide array of physical and mental health outcomes (Williams and Sternthal, 2010). For example, Black adults have a higher prevalence of diabetes, strokes, hypertension, and heart disease than their white counterparts (Farmer and Ferraro, 2005; Pleis et al., 2010). Furthermore, although Black Americans have lower rates of depression than whites, the cases of depression among Black Americans were more persistent and severe (Williams et al., 2007). While these differences in health outcomes amongst Black- versus White-Americans are well documented, intraracial differences have been largely understudied. Some studies show that there are differences in mortality from cardiovascular causes among native-born and foreign-born Black adults that exceed differences between Black and White people (Fang et al., 1996). However, most research has grouped individuals of African descent into a singular group, without accounting for within-group variation.

Although there are many similarities in the health, social, and economic experiences of the Black/African diaspora, there are also marked differences in the experiences of these groups. This points to the need to move beyond ignoring ethnicity as a significant variable in the analysis of health amongst Black people in the U.S., especially since "Black" labels have been used as a global uniform category that generalizes all groups within the diaspora (Nazroo et al., 2008). Having a "Black" identity may have different meanings for different Black groups. Moreover, that variation may have implications for health and well-being.

Black Identity and Health for Afro-Descended Persons

One's sense of self and collective identity can influence overall health outcomes, making the relationship between ethnic/racial identity and health an important area of research. Studies have shown that a positive identity can promote better mental health, lower stress levels, and even enhance physical health outcomes (Neblett et al., 2012; Rivas-Drake et al., 2014; Smith & Silva, 2011; Williams et al., 2012). Conversely, identity-related stressors, like discrimination or racism, can negatively impact health, leading to increased risks of various diseases. Understanding the connection between identity and health can assist with identifying new approaches to foster a positive ethnic/racial identity to protect against adverse health outcomes.

Cardiovascular Health. Cardiovascular disease (CVD) risk factors have been found to be influenced by behavioral, cultural, and societal factors (Chow et al. 2009; Kreatsoulas & Anand, 2010; Lang et al., 2011). In particular, there is emerging research on race and cardiovascular health where scholars aim to understand how the complex interplay between one's racial identity and/or experiences of discrimination can impact cardiovascular disease and health outcomes (Bell et al., 2018; Hill et al., 2017; Lewis et al. 2014; Panza et al. 2019; Udo & Grilo, 2017; Williams et al., 2019; Williams et al., 2021). Still, few studies have highlighted the significant

role that racial identity may individually play in cardiovascular health outcomes. For example, one study found that for Black Americans, feelings of closeness to other Black Americans relate to increased cardiovascular disease risk factors for African-Americans, but not for Caribbean Americans (Dagadu & Christie-Mizell, 2014). In addition, positive racial regard relates to better cardiovascular health outcomes (Dagadu & Christie-Mizell, 2014). However, while this study examined racial identity and its relation to cardiovascular health, most previous literature has examined racial identity as a mediator or moderator that explains or buffers against the negative effects of discrimination, racism, or stress on health (Chae et al., 2010; Drolet & Lucas, 2020; Manns-James, 2020; Neblett Jr., & Carter, 2012; Thomas Tobin et al., 2022; Thompson et al., 2002; Volpe et al., 2019). These studies reveal that specific facets of racial identity (e.g., racial centrality, public regard) mitigate the negative effects of discrimination and/or stress on physiological and cardiovascular health. While this body of research underscores the importance of racial identity as a mediator or buffer that may explain, exacerbate, or protect against cardiovascular disease risk, there is still limited research on the importance of racial identity specifically for cardiovascular health, especially considering the ethnic diversity of Black Americans in the U.S.

Psychological Health

Research on the relation of racial identity and psychological health is more extensive. Many studies have examined the role of racial identity and identity development for predicting a multitude of psychological health outcomes for diverse groups in the U.S. across the lifespan (Binning et al, 2009; Mossakowski, 2003; Sellers et al., 2003; Umaña-Taylor & Updegraff, 2007). The majority of these studies conclude that having a positive racial identity relates to

better psychological health outcomes (e.g., lower depression, lower anxiety, higher well-being) (Phinney & Chavira., 1992; Roberts et al., 1999; Williams et al., 2012).

For Black Americans in particular, there is also a substantial body of research (Mushonga & Henneberger, 2020; Sellers et al., 2003; Sellers et al., 2006; Turnage, 2004; Yip et al., 2006) with most studies concluding that positive racial identity is associated with higher self-esteem, lower depressive symptoms, less anxiety, and better overall psychological health (Hurd et al., 2013; Mushonga & Henneberger, 2020; Sellers et al., 2003; Settles et al., 2010; Williams et al., 2012; Willis & Neblett, 2020). However, similar to most research on Black/Afro-descended Americans in the U.S., these studies do not consider the unique experiences of ethnic groups within the Black/African diaspora that may influence these health outcomes. It is possible that for foreign-born, or descendants of foreign-born Afro-descended persons (like Continental Africans, Afro-Caribbeans, and Afro-Latinos) there is a different process of developing a racial identity as they adapt to U.S. racial dynamics, and this distinction may relate to differences in health.

Current Studies

Statement of the Problem

Afro-descended Americans comprise 14% of the U.S. population (Pew Research Center, 2021). Moreover, the population of Black immigrants in the United States has tripled since the 1980s (Mwangi, 2014). While Black immigrants from Latin America and Africa share some of the racialized experiences of U.S.-born Black Americans, they also have distinctive cultural contexts and identities (Mwangi & English, 2017). There may be a shared experience, but Black immigrants from ethnically homogenous countries are assumed to be (and treated as) Black yet were not socialized to this dichotomous American way of viewing race. Becoming socialized to

U.S. views of race through the process of acculturating to U.S. culture may have implications on health. Thus, it is important to understand the intraracial and intraethnic variability in the association of racial identity and health (cardiovascular and psychological). Furthermore, various factors can either facilitate or buffer the effects of racial identity on health outcomes, and this dissertation individually evaluated the importance of three of these factors for the relation of ethnic/racial identity and health.

The current research investigated race/ethnicity and its relation to cardiovascular and psychological health by examining intraracial differences (Study 1) and intraethnic differences (Study 2). This plan of research was divided into two studies.

Studies 1 and 2

Understanding Racial Identity and Health within the Black/African Diaspora (Study 1). Study 1 examined within-group variation within the Black/African diaspora as it relates to racial identity to test for a link of positive racial identity on cardiovascular and psychological health in three groups. Specifically, this study investigated: (1) whether racial identity is associated with cardiovascular and psychological health, (2) whether discrimination, socialization, and acculturative stress moderates this predicted relation of racial identity and both types of health, and (3) whether there are ethnic differences in these relations among three distinct groups of the Black/African diaspora. The three groups were: African-Americans, Continental Africans, and Afro-Caribbean/Latinos. "African-American" is defined as those who identify as Black American descendants of U.S. slavery. "Continental African" is a term used to refer to individuals who have recent ancestry from and identify with a specific African country (e.g., Sierra Leone, Ghana, etc.). For Study 1, Afro-Caribbeans and Afro-Latinos were placed

into one group ("Afro-Caribbean/Latinos") to represent those of African descent who identify as Black and from Latin America and/or the Caribbean. It was hypothesized that:

Hypotheses:

(H2) Racial Identity and Health

H1a. Racial identity is positively associated with cardiovascular health, with those higher in racial identity reporting better cardiovascular health outcomes.

H1b. Racial identity is positively associated with psychological health, with those higher in racial identity reporting better psychological health outcomes.

(H2) Discrimination as a Moderator

H2a. Discrimination will moderate the relation of racial identity and cardiovascular health, such that more reported discrimination will be associated with worse cardiovascular health.

H2b. Discrimination will moderate the relation of racial identity and psychological health, such that more reported discrimination will be associated with worse psychological health.

(H3) Racial Socialization as a Moderator

H3a. Racial socialization will moderate the relation of racial identity and cardiovascular health, such that more reported socialization will be associated with better cardiovascular health.

H3b. Racial socialization will moderate the relation of racial identity and psychological health, such that more reported socialization will be associated with better psychological health.

(H4) Acculturative Stress as a Moderator

H4a. Acculturative stress will moderate the relation of racial identity and cardiovascular health, such that more reported acculturative stress will be associated with worse cardiovascular health.

H4b. Acculturative stress will moderate the relation of racial identity and psychological health, such that more reported acculturative stress will be associated with worse psychological health.

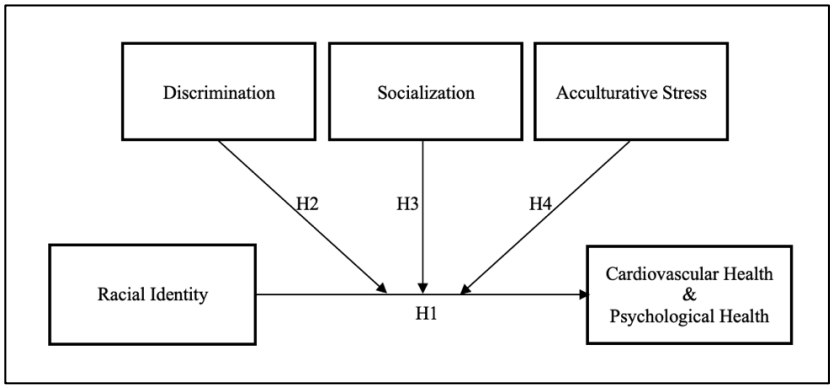
(H5) Exploratory Hypotheses:

H5. There are differences between African American, Continental African, and Afro-Caribbean/Latinos in the relation of racial identity and health (cardiovascular and psychological) and the moderation effects of discrimination, socialization, and acculturative stress on this relation. Specifically, higher racial identity will be more likely to relate to better health for African-Americans than for Continental Africans and Afro-Caribbeans/Latinos. Also, the moderating effects of discrimination, socialization, and acculturative stress on this relation will be stronger for African-Americans.

The underlying assumption guiding this study is that individuals are part of larger social systems that shape health and well-being, beginning with socialization circles (parents and peers) and extending to the greater society. It is vital to understand the role of these factors for health outcomes and better understand ethnic and cultural diversity among Black Americans.

Figure 1.

Study 1 Conceptual Moderation Model for Ethnic Identity, Discrimination, Socialization, Acculturative Stress, and Health.



Examining Race, Ethnic Identity and Health Among Hispanic/Latinos (Study 2).

Similar to Study 1, Study 2 examined the relation of identity, acculturation, and health, but for Black and non-Black Hispanic/Latinos in the U.S. Specifically, I wanted to analyze those who identify as Hispanic/Latino to determine if the additional identity of being Black (and Hispanic/Latino) has implications for cardiovascular and psychological health.

Afro-Latinos are likely to experience discrimination stemming from the multiplicative relationships among their identities, placing them in "multiple jeopardy" (King, 1988). Based on the research to date, there is reason to believe that Afro-Latinos contend with a complex, intersectional, identity which may increase exposure to ethnic and racial discrimination relative to groups having one non-marginalized identity (e.g., non-Hispanic/Latino White) or one marginalized identity (non-Black Hispanic/Latino). These separate identities intersect to compound oppression and thus may impact cardiovascular and psychological health outcomes.

The overall goal of the study was to (1) explore differences in ethnic identity and health between Afro-Latinos and non-Black Hispanic/Latinos in the U.S., and (2) understand the

potential moderating role of acculturation and years lived in the U.S. in the context of cardiovascular and psychological health. Specifically, this study examined whether acculturation and years lived in the U.S. moderate the association of ethnic identity with cardiovascular health (cardiovascular disease risk factors) and psychological health (i.e., depression and anxiety) in the Afro-Latino and non-Black Hispanic/Latino samples from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) dataset. The self-reported measure of race was used as there is something unique about Hispanic/Latinos who actively choose to self-identify as a specific race, especially after moving from contexts (i.e., Latin America) that view ethnicity and race differently from the U.S. While many HCH/SOL participants responded to the question of race with "Unknown/Don't Know" or refused to answer, it is possible that there may be a protective factor of having a specific racial identification for those who did respond, and this may subsequently relate to health outcomes.

Previous research studies have explored acculturation and its relationship with cardiovascular health, physical health, and well-being (Camplain et al., 2020; Daviglus et al., 2014; Daviglus et al., 2016; González et al., 2016; Kershaw et al., 2016; Perreira et al., 2015; Rodriguez et al., 2021), as well as the relation of Hispanic/Latino background group with cardiovascular health (Castañeda et al., 2016; Daviglus et al., 2016; González et al., 2016). However, Study 2 is the first to examine acculturation and years lived in the U.S. as potential moderators influencing the relation of ethnic identity with cardiovascular and psychological health for Afro-Latinos, a group with multiple marginalized identities. As such, this research will advance knowledge on Afro-Latinos, a Hispanic/Latino group that remains woefully understudied. The proposed project used data from the overall HCHS/SOL Study.

Hypotheses:

(H1) Ethnic Identity and Health

H1a. Ethnic identity is positively associated with cardiovascular health, with those higher in ethnic identity reporting better cardiovascular health outcomes.

H1b. Ethnic identity is positively associated with psychological health with those higher in ethnic identity reporting better psychological health outcomes.

(H2) Acculturation as a Moderator

H2a. Acculturation will moderate the relation of ethnic identity and cardiovascular health, such that higher levels of acculturation will be associated with worse cardiovascular health outcomes for the overall sample.

H2b. Acculturation will moderate the relation of ethnic identity and psychological health, such that higher levels of acculturation will be associated with worse psychological health outcomes for the overall sample.

(H3) Years Lived in the U.S. as a Moderator

H3a. Years Lived in the U.S. will moderate the relation of ethnic identity and cardiovascular health, such that more years lived in the U.S. will be associated with worse cardiovascular health outcomes for the overall sample.

H3b. Years Lived in the U.S. will moderate the relation of ethnic identity and psychological health, such that more years lived in the U.S. will be associated with worse psychological health outcomes for the overall sample.

(Exploratory)

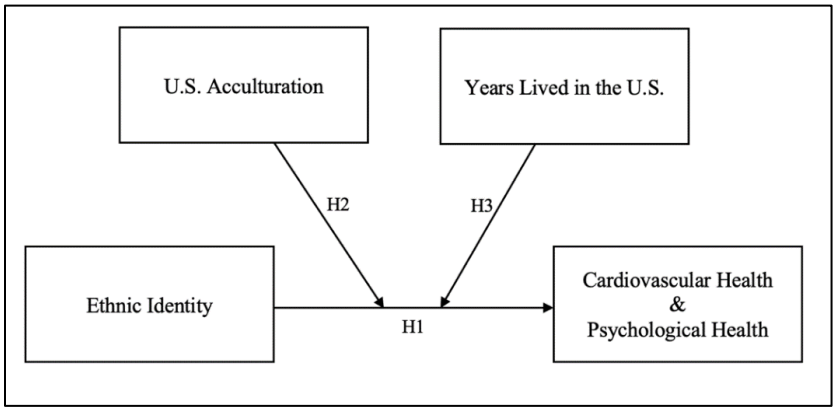
H4a. The relation of ethnic identity and health (cardiovascular and psychological) will be stronger for non-Black Hispanic/Latinos compared to Afro-Latinos.

H4b. The moderating effect of U.S. acculturation on the relation of ethnic identity and health (cardiovascular and psychological) will be stronger for non-Black Hispanic/Latinos compared to Afro-Latinos.

H4c. The moderating effect of years lived in the U.S. on the relation of ethnic identity and health (cardiovascular and psychological) will be stronger for non-Black Hispanic/Latinos compared to Afro-Latinos.

Figure 2.

Study 2 Conceptual Moderation Model for Ethnic Identity, U.S. Acculturation, Years Lived in U.S., and Health.



CHAPTER 2

STUDY 1 METHOD

Research Design & Procedure

Study recruitment occurred in two phases. In phase 1, the initial plan for this study involved in-person data collection. The aim was to collect data on heart rate variability and blood pressure to measure cardiovascular health for members of the Black/African diaspora. Participants visited the research lab to have their physical cardiovascular data collected and to

answer survey questions. However, due to a smaller population of Black/Afro-descended persons in the area where data were collected, only 35 participants were recruited and completed the study. The second phase of recruitment utilized online data collection procedures to reach the desired sample size for understanding racial identity and its relation to health. For the purpose of this study, cardiovascular health was operationalized as self-reported physical activity and self-reported Body Mass Index (BMI).

Participants

Participants were recruited online through several methods: Historically Black College/University (HBCU) club listservs, Black organizational social medica pages, and college/university group messaging applications that Black students are known to frequent. In order to be eligible to participate, participants had to meet the following eligibility requirements: (1) identify as Black/Afro-Descended, (2) be between the ages of 18-55, (3) identify as African-American, Continental African, Afro-Caribbean, or Afro-Latino, and (4) live in the U.S. Interested persons completed an online Interest Form before being sent the link to the survey. A total of 617 individuals completed this Interest Form. Of these, 92.2% were university students, with 43.9% of these students attending an HBCU.

Of the participants who completed the interest form, 404 participants completed the survey. As an incentive for participation, participants were offered a $10 gift card to Amazon or Target for their participation. Six cases were omitted due to having a significant amount of missing data (more than 50% of items unanswered). The final overall sample consisted of 398 participants who identified as Black/Afro-descended, lived in the US, and were between the ages of 18 and 55 years old (N=398; M Age = 23.63, SD = 6.94). A small number of participants (n =

47) identified as Black/Afro-descended and a combination of one or more other racial backgrounds. They were included in the overall sample and analyses.

Measures

Demographics. Questions relating to participants' demographic information were collected as part of this study. Information on ethnicity, gender, age, highest level of education achieved, income, nativity, and regional location were included in the survey.

Racial Identity. To measure racial identity, the Sellers et al., (1997) Multidimensional Inventory of Black Identity (MIBI) was used. The full MIBI measure has three subscales which measure (1) centrality, (2) regard, and (3) ideology. For the purpose of this study, only the racial centrality subscale was used to measure positive racial identity. Participants were prompted to think of their racial group when responding, and response options for each item ranged from 1 (strongly disagree) to 7 (strongly agree). Sample items from the centrality subscale include, "*I have a strong sense of belonging to Black people"* and "*I am proud to be Black*". The reported Cronbach's alpha coefficients for the subscales ranged from a low of .60 (regard) to .79 (centrality) (Sellers et al, 1997). However, for the current sample, the Cronbach's alpha coefficient for the centrality subscale was 0.79. Scores were averaged with higher scores indicated higher, positive racial identity.

Perceived Discriminatio*n*. Perceived discrimination was measured using the 17-item Perceived Ethnic Discrimination Questionnaire-Community Version (PEDQ-CV) (Brandolo et al., 2005). The PEDQ-CV measures everyday perceived ethnic/racial discrimination and includes subscales that assess the exclusion, stigma, experienced discrimination, and threat/aggression aspects of discrimination experiences. Questions were on a scale that ranged from 1 (never) to 5 (very often). Sample items include "*Because of your ethnicity or race, have you been treated*

unfairly by co-workers or classmates" and "*because of your ethnicity or race, have others thought you couldn't do things or handle a job?"*. The original overall scale had strong construct validity and the reported Cronbach's alpha coefficient in the original questionnaire was 0.87 (Brondolo et al., 2005; Arellano-Morales et al., 2015). The reported Cronbach's alpha coefficient for this sample was 0.92. Scores were averaged with higher scores indicating more reported experiences of discrimination.

Socialization. To assess socialization, a latent variable indicated by measures of parent socialization and peer socialization was modeled. The correlation among these two measures was significantly high ($r = .52$, $p < .001$) with a Cronbach's alpha coefficient of 0.87 for the combined scales.

Parent Socialization. The Racial Socialization Questionnaire (RSQ) (Lesane-Brown et al., 2003) was used to measure parent racial socialization. This 26-item measure is composed of six subscales (racial pride, racial barrier, egalitarian, self-worth, negative, and racial socialization behaviors), all of which measure different aspects of racial socialization that parents can provide to their children. For the purpose of this study, a modified version of the RSQ was used to specifically measure parent socialization. In addition, only the Racial Pride and Racial Barrier subscales were included in analyses to reflect the two most commonly assessed types of socialization messages (pride and preparation for bias) (Harris-Britt et al., 2007; Smalls, 2010). Participants were asked to indicate the frequency with which their parents said or engaged in these socialization practices while growing up using a 3-point Likert-type scale ranging from 0 (never) to 2 (more than twice). Sample items from each subscale include "*You should be proud to be Black*" (racial pride), "*Blacks have to work twice as hard as whites to get ahead*" (racial barrier). For the original scale, the reported Cronbach's alpha coefficients for the subscales

ranged from .63 (racial pride) to .69 (racial barrier) in previous studies (Neblett et al., 2009). The reported Cronbach's alpha coefficient for this sample was 0.75 for the racial pride subscale and 0.83 for the racial barrier subscale. Scores were averaged with higher scores indicating higher frequency of socialization messages from parents while growing up.

Peer Socialization. To measure peer socialization, the eight items from the racial pride and racial barriers subscales of the Racial Socialization Questionnaire (RSQ) were adapted to capture participants' perceptions of racial socialization messages from their peers by changing the word "parents" to "close friends." A similar adaptation of racial socialization scales has been used in previous studies (Hu et al., 2017; Nelson et al., 2018). The reported Cronbach's alpha coefficient for this sample was 0.88 for the racial pride subscale and 0.85 for the racial barrier subscale with higher scores indicating a higher frequency of socialization messages from peers while growing up.

Acculturative Stress. Acculturative stress was measured using a shortened 13-item form of the Social, Attitudinal, Familial, and Environmental (SAFE) Acculturative Stress Scale (Suh et al., 2016; Mena et al., 1987). This scale measures acculturative stress in social, attitudinal, familial, and environmental contexts. Participants were asked to rate an experience or situation by how stressful it made them on a scale from 1 (not stressful) to 5 (extremely stressful). Participants also had the option of choosing "Does not apply to me" (scored as 0) if they haven't experienced a particular stressor. Sample items include "*People look down upon me if I practice customs of my culture*" (general acculturative stress) and "*It bothers me that family members I am close to do not understand my new values*" (family acculturative stress). The reported Cronbach's alpha coefficient for this scale has ranged from 0.89 to 0.93 in different studies (Choi et al., 2016). For the current sample, the Cronbach's alpha coefficient was originally 0.80. One

item was removed (i.e., *"I don't have any close friends"*) which resulted in an increase of the Cronbach's α to 0.82. Scores were summed with higher scores indicating more stress associated with acculturation.

Cardiovascular Health. For the purpose of this study, cardiovascular health was operationalized by measuring two of the seven main cardiovascular disease risk factors defined by the American Heart Association (AHA) Strategic Planning Task Force & Statistics Committee (Folsom et al., 2011): BMI and physical activity.

BMI. BMI was measured using participants self-reported height (inches) and weight (pounds) to calculate a BMI value. Higher scores indicate a higher body mass index.

Physical Activity. Physical activity was measured using the short version of the International Physical Activity Questionnaire (IPAQ) (Craig et al., 2003). The IPAQ collects information on participants sedentary and physical activity within the past seven days using four intensity levels: (1) vigorous-intensity activity, (2) moderate-intensity activity, (3) walking, and (4) sitting. Sample items include "*During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?*" and "*How much time did you usually spend doing vigorous activities on one of those days?*" Participants reported total weekly physical activity and a categorical variable associated with their total physical activity was created. This categorical variable assigns a value of 1 to those with low total physical activity levels, a value of 2 to those with moderate total physical activity levels, and a value of 3 to those with high total physical activity levels. See Craig (2003) for more information on scoring and how these values are assigned. For the current study, scores were reversed so that a value of 1 was assigned to those with high total physical activity levels, a value of 2 to those with moderate total physical activity levels, and a value of 3 to those with low total physical activity

levels. This was done to be consistent with the other measures of health in this study (i.e., BMI, anxiety, and depression) where higher scores relate to worse health. Thus, higher scores indicate lower physical activity.

Psychological Health. Psychological health was measured by assessing anxiety and depression.

Anxiety. Anxiety was measured using the short version of the State Trait Anxiety Inventory (STAI) (Zsido et al., 2020). This 10-item questionnaire asks participants to describe temporary conditions of "state anxiety" (5 items) and general long-term feelings of "trait anxiety" (5 items). Sample items include participants indicating how they feel right now (e.g., *"I feel nervous"*) and how they generally feel (e.g., *"I worry too much over something that really doesn't matter."* Items were on a scale that ranged from 1 (not at all) to 4 (very much so). The shortened version of this scale has strong construct validity, and all reliabilities exceeded the minimum acceptable alpha coefficient levels of 0.70 (0.91 for State and 0.86 for Trait) (Zsido et al., 2020). The reported Cronbach's alpha coefficient for this sample was 0.78 for the State subscale and 0.81 for the Trait subscale. Scores were averaged with higher scores indicating higher anxiety.

Depression. Depression was measured using the shortened version of the Center for Epidemiological Studies-Depression Scale (CES-D 10) (Andresen et al., 1994). The 10 items on this scale assess for depression symptoms experienced in a person's past week. Sample items include "*I was bothered by things that usually don't bother me*" and "*I felt lonely,*" and were on a scale ranging from 0 [Rarely or none of the time (less than one day)] to 3 [Most of the time (5-7 days)]. The reported Cronbach's alpha coefficient for this scale exceeded 0.85 in several samples

(Bradley et al., 2010; Irwin et al., 1999). For the current overall sample, the Cronbach's alpha coefficient was 0.81. Scores were averaged with higher scores indicating higher depression.

Study 1: Data Analysis Plan

Before running the analyses, data were examined for missing values. An analysis of missing values (MVA) revealed that 95.44% of participants had no missing data. In addition, no item had more than 2.7% missing values. Little's (1988) missing completely at random (MCAR) analysis revealed a non-significant chi-square statistic, indicating that the data were MCAR. Therefore, missing values were replaced by using multiple imputation procedures in SPSS 26.0. This process imputes missing values by replicating the dataset multiple times and replacing missing values with estimated values using multiple imputation methods (de Goeij et al., 2013). Following these procedures, there was no missing data for the variables of interest included in this study and the data showed normal distribution. See Table 2 for percent missing in original data and after using multiple imputation procedures.

Data Analytic Strategy. Linear regression analyses were conducted to test hypotheses 1a and 1b. Moderation analyses using the PROCESS macro for SPSS (Model 1; Hayes, 2017), were conducted to test the remaining hypotheses. Twelve separate analyses were conducted in which racial identity served as the independent variable and cardiovascular health (BMI and physical activity) and psychological health (anxiety and depression) served as the four dependent variables. Discrimination, socialization, and acculturative stress were entered separately as moderators. Age, gender, education, and regional location were entered as covariates in all models to ensure that any observed effects are not solely attributable to these variables as they have been previously shown to significantly relate to racial identity, discrimination, socialization, and/or health (Mokdad et al., 2018; Ross & Wu, 1995; Thomas et al., 2011; Yip et al., 2006).

Study 1: Results

Descriptive analyses were conducted using IBM SPSS statistics 26.0. The mean age of the overall sample was 23.63 years (80.7% were between 18-28 years). There were more women than men (79.1% women), and 14.4% of the population were born outside of the mainland U.S. 50 states/DC. The largest percentage of this Black/Afro-descended sample was of African-American heritage (54.0%) followed by 31.2% identifying as Continental African, 10.0% identifying as Afro-Caribbean, and 4.8% as Afro-Latino. Consistent with U.S. demographics, most of the population reported an annual income of less than $50,000 (45.3%). The education level of the population ranged from "high school or GED completed" to "graduate degree." In addition, 21.1% of the sample had completed at least a Bachelor's degree education. Table 1 provides a summary of the participants' self-reported demographic characteristics.

Table 1.

Study 1: Demographic Characteristics for Overall Sample (N=398)

	African-American (n=215)		**Continental African (n=124)**		**Afro-Caribb./Latino (n=59)**		**Total (n=398)**	
	Freq. (n)	Pctg (%)	Freq. (n)	Pctg (%)	Freq. (n)	Pctg (%)	Freq. (n)	Pctg (%)
Age								
18-21	81	37.7	87	70.2	38	64.4	206	51.8
22-28	79	36.7	21	16.9	15	25.4	115	28.9
29-35	30	14.0	7	5.6	5	8.5	42	10.6
36+	21	9.8	4	3.2	0	0	25	6.3
Missing	4	1.9	5	4.0	1	1.7	10	2.5
Sex								
Male	31	14.4	24	19.4	7	11.9	62	15.6
Female	173	80.5	91	73.4	51	86.4	315	79.1
Other	7	3.3	5	4.0	0	0	12	3.0
Missing	4	1.9	4	3.2	1	1.7	9	2.3
Yearly Household Income								

Less than $25,000	44	20.5	30	24.2	19	32.2	93	23.4
$25,000-$49,999	55	25.6	23	18.5	9	15.3	87	21.9
$50,000-$74,999	32	14.9	12	9.7	8	13.6	52	13.1
$75,000-$99,999	10	4.7	7	5.6	2	3.4	19	4.8
$100,000-$200,000	28	13.0	15	12.1	6	10.2	49	12.3
More than $200,000	8	3.7	5	4.0	3	5.1	16	4.0
Prefer not to say	33	15.3	28	22.6	10	16.9	71	17.8
Missing	5	2.3	4	3.2	2	3.4	11	2.8
Education								
High School or GED	44	20.5	45	36.3	22	37.3	111	27.9
Some College	47	21.9	37	29.8	11	18.6	95	23.9
Associate's Degree	12	5.6	5	4.0	6	10.2	23	5.8
Bachelor's Degree	56	26.0	15	12.1	13	22.0	84	21.1
Master's Degree	39	18.1	15	12.1	4	6.8	58	14.6
Graduate Degree	13	6.0	2	1.6	1	1.7	16	4.0
Missing	4	1.9	5	5.0	2	3.4	11	2.8
Location								
Northeast/Mid-Atlantic	58	27	33	26.6	23	39.0	114	28.6
Southeast	61	28.4	24	19.4	17	28.8	102	25.6
West	47	21.9	20	16.1	12	20.3	79	19.8
Southwest	22	10.2	14	11.3	4	6.9	40	10.1
Midwest	19	8.8	27	21.8	2	3.4	48	12.1
Other	3	1.4	2	1.6	0	0	5	1.3

Table 2 and Table 3 report means, standard deviations, minimums, maximums, and percentage of responses missing before and after multiple imputation for hypothesized study variables (Table 2) as well as zero-order correlations among hypothesized study variables (Table 3).

Table 2.

Study 1: Means, Standard Deviations, Minimum, Maximum, and Percentage of Responses Missing for Study Variables (N=398)

	M(SD)	Min	Max	%missing before imputation	%missing after imputation

1. Racial Identity	5.43(0.96)	1.00	7.00	0.16	0
2. Discrimination	2.07(0.69)	1.00	5.00	1.80	0
3. Socialization	1.40(0.40)	0.00	2.00	0.69	0
4. Acculturative Stress	36.12(7.90)	12.00	60.00	0.77	0
Cardiovascular Risk Factors					
5. BMI	27.31(6.78)	16.16	54.52	0.01	0
6. Physical Activity	1.77(0.81)	1.00	3.00	0.04	0
Psychological Health					
7. Anxiety	18.52(5.57)	10.00	40.00	1.16	0
8. Depression	11.24(5.93)	0.00	27.00	0.54	0

Table 3.

Study 1: Zero-Order Correlations Among Study Variables for The Overall Sample (N=398)

	1	2	3	4	5	6	7
1. Racial Identity	1						
2. Discrimination	0.13**	1					
3. Socialization	0.22**	0.28**	1				
4. Acculturative Stress	0.13*	0.51**	0.17**	1			
5. BMI	0.15**	0.12*	0.13*	0.10*	1		
6. Physical Activity	0.06	-0.13**	-0.08	0.01	0.08	1	
7. Anxiety	0.05	0.36**	0.05	0.37**	0.08	0.05	1
8. Depression	0.11*	0.31**	0.06	0.40**	0.14**	0.18**	0.66**

Note. Correlations marked with * or ** are significant at the .05 or .01 alpha level, respectively.

Several significant small to large effects were found (.10 = small, .30 = medium, and .50 = large; Cohen, 1992). Specifically, racial identity was associated with discrimination, socialization, acculturative stress, BMI, and depression. Discrimination was associated with all study variables. However, socialization was only associated with acculturative stress and BMI. Acculturative stress was associated with BMI, anxiety, and depression. One-way analysis of

variance was conducted to assess for mean differences between participants' self-identified ethnic group (i.e., African-American, Continental African, and Afro-Caribbean/Latinos) on all variables. The results showed significant differences among the groups in racial identity [$F(2,397) = 5.74$, $p < .01$], socialization [$F(2,397) = 6.37$, $p < .01$], and BMI [$F(2,397) = 12.61$, $p < .01$]. See Table 4 for Tukey post hoc test results comparing the three ethnic groups on racial identity, socialization, and BMI.

Table 4.

Study 1: Tukey Post Hoc Test Results Comparing Mean Differences in Racial Identity, Socialization, and BMI for African-Americans, Continental Africans, and Afro-Caribbean/Latinos (N=398)

	(I) Ethnic Group	(J) Ethnic Group	Mean Diff. (I-J)	Std. Error	Sig.	95% CIs Lower	95% CIs Upper
Racial Identity	African-American	Continental African	0.36*	0.11	**.003**	.10	.61
		Afro-Caribbean/Latino	0.06	0.14	.908	-.27	.39
	Continental African	African-American	-0.36*	0.11	**.003**	-.61	-.11
		Afro-Caribbean/Latino	-0.30	0.15	.115	-.65	.05
	Afro-Caribbean/Latino	African-American	-0.06	0.14	.908	-.39	.27
		Continental African	0.30	0.15	.115	-.05	.65
Socialization	African-American	Continental African	0.16*	0.04	**.001**	.05	.26
		Afro-Caribbean/Latino	0.08	0.06	.338	-.05	.22
	Continental African	African-American	-0.16*	0.04	**.001**	-.26	-.05
		Afro-Caribbean/Latino	-0.08	0.06	.443	-.22	.07
	Afro-Caribbean/Latino	African-American	-0.08	0.06	.338	-.22	.05
		Continental African	0.08	0.06	.443	-.07	.22
BMI	African-American	Continental African	4.13*	0.74	**<.001**	2.40	5.86
		Afro-Caribbean/Latino	2.79*	0.96	**.011**	.54	5.05
	Continental African	African-American	-4.13*	0.74	**<.001**	-5.86	-2.40
		Afro-Caribbean/Latino	-1.34	1.03	.396	-3.77	1.09
	Afro-Caribbean/Latino	African-American	-2.79*	0.96	**.011**	-5.05	-.54

		Continental African	1.34	1.03	.396	-1.09	3.77

Note. *. The mean difference is significant at the 0.05 level.

Hypothesis Testing

Hypothesis 1a: Racial identity is positively associated with cardiovascular health, with those higher in racial identity reporting better cardiovascular health outcomes.

This hypothesis was tested by conducting multiple regression analyses to determine whether higher racial identity was associated with better cardiovascular health outcomes. Racial identity was the predictor, and cardiovascular disease risk factors (BMI and physical activity) were criterion variables in separate analyses. Age, gender, education, and regional location were entered as covariates. Results showed that racial identity was significantly associated with BMI ($\beta = 0.12$, $p = .017$). However, this positive association indicates that higher racial identity was associated with worse BMI outcomes. In addition, results also showed that racial identity was not significantly associated with physical activity ($\beta = 0.03$, $p = .559$). Thus, hypothesis 1a was not supported. See Tables 5 and 6 for results.

A scatterplot (Figure 3) is also included below to illustrate this significant interaction and decide if the relation of racial identity and BMI were reasonably linear. Most of the sample falls within the moderately overweight BMI range (25-29.99). However, there are several outliers with a significantly high BMI (>40). This concentration in the moderately overweight category with outliers present in the high BMI (severe obesity) range may account for the significant findings in the regression analysis.

Figure 3.

Study 1: Scatterplot Displaying Racial Identity vs. BMI for Overall Sample (N=398)

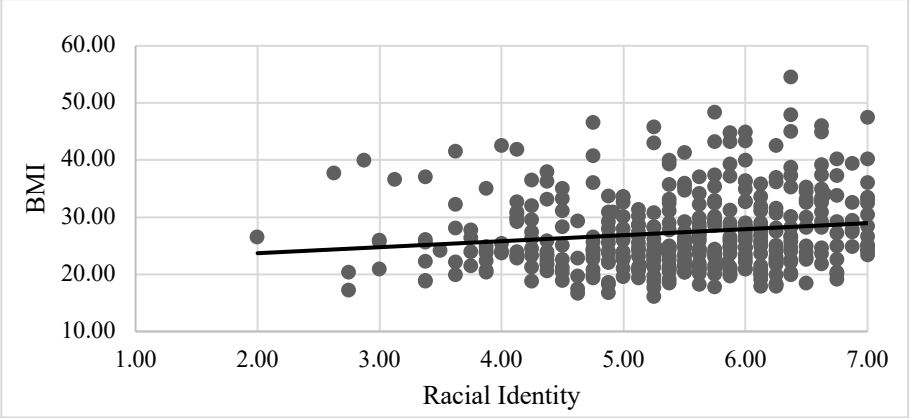


Table 5.

Study 1: Regression Model of Racial Identity Predicting BMI (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	14.78	2.62		5.64	<.001
Age	.24	.06	.24	3.97	<.001
Gender	1.409	.78	.09	1.80	.073
Education	.07	.21	.02	.34	.734
Regional Location	-.22	.25	-.04	-.86	.389
Racial Identity	.83	.35	.12	2.40	.017
					F (5,392) = 8.083, p < .001, R^2= .093

Table 6.

Study 1: Regression Model of Racial Identity Predicting Physical Activity (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	.63	.32		1.95	.052

Age	.01	.01	.03	.53	.599
Gender	.36	.10	.19	3.78	<.001
Education	.04	.03	.10	1.64	.102
Regional Location	.01	.03	.01	.17	.869
Racial Identity	.03	.04	.03	.59	.559
				F (5,392) = 4.353, p < .001, R^2= .053	

Hypothesis 1b: Racial identity is positively associated with psychological health, with those higher in racial identity reporting better psychological health outcomes.

This hypothesis was tested by conducting multiple regression analyses to determine whether higher racial identity was associated with better psychological health outcomes. Racial identity was the predictor, and psychological health (anxiety and depression) were criterion variables in separate analyses. Age, gender, education, and regional location were entered as covariates. Results showed that racial identity was not significantly associated with anxiety (β = 0.04, p = .475). In contrast, results also showed that racial identity was significantly associated with depression (β = 0.11, p = .030). However, this positive association indicates that higher racial identity was associated with worse depression outcomes. Thus, hypothesis 1b was not supported. See Tables 7 and 8 for results.

Table 7.

Study 1: Regression Model of Racial Identity Predicting Anxiety (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	17.43	2.20		7.94	<.001
Age	-.11	.05	-.14	-2.29	.023
Gender	1.94	.66	.15	2.96	.003

Education	.07	.18	.03	.41	.684
Regional Location	-.52	.21	-.12	-2.45	.015
Racial Identity	.21	.29	.04	.72	.475
				F (5,392) = 4.810, p < .001, R^2= .058	

Table 8.

Study 1: Regression Model of Racial Identity Predicting Depression (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	7.05	2.34		3.02	.003
Age	-.10	.05	-.12	-1.93	.055
Gender	2.17	.70	.15	3.11	.002
Education	-.04	.19	-.02	-.23	.816
Regional Location	-.33	.22	-.07	-1.47	.143
Racial Identity	.67	.31	.11	2.18	.030
				F (5,392) = 5.039, p < .001, R^2= .060	

Hypothesis 2a: Discrimination will moderate the relation of racial identity and cardiovascular health, such that more reported discrimination will be associated with worse cardiovascular health.

Racial Identity, Discrimination, and BMI. Results indicate that the overall model was significant, F(7, 390) = 6.19, R^2 = 0.10, p < .01. Racial identity was significantly associated with BMI (b = 0.77, SE = 0.35, t = 2.20, *p* = .028), indicating that a higher racial identity was associated with higher BMI. However, discrimination was not significantly associated with BMI (b = 0.73, SE = 0.48, t = 1.53, *p* = .126), thus indicating that discrimination did not predict BMI for this overall sample. The interaction term between racial identity and discrimination was not significant (b = -0.26, SE = 0.45, t = -0.58, *p* = .562), suggesting that discrimination did not

moderate the relation of racial identity and BMI. Simply put, racial identity and BMI did not vary as a function of discrimination. See Table 9 for results.

Racial Identity, Discrimination, and Physical Activity. The overall model was significant, $F(7, 390) = 4.74$, $R^2 = .08$, $p < .01$. Racial identity was not significantly associated with physical activity (b = 0.04, SE = 0.04, t = 1.01, p = .316). However, discrimination was significantly associated with physical activity (b = -0.19, SE = 0.05, t = -3.27, $p < .01$), indicating that more reported discrimination predicts physical activity for this overall sample. The interaction term between racial identity and discrimination was not significant (b = -0.04, SE = 0.05, t = -0.72, $p = .472$), suggesting that discrimination did not moderate the relation of racial identity and physical activity. Thus, racial identity and physical activity did not vary as a function of discrimination. See Table 10 for results.

Table 9.

Study 1: Summary of Regression Analyses for Variables Predicting BMI (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	19.38	2.01		9.62	<.001
Age	.23	.06	.23	3.81	<.001
Gender	1.39	.80	.09	1.75	.081
Education	.09	.21	.03	.42	.674
Regional Location	-.18	.25	-.04	-.73	.469
Racial Identity	.77	.35	.11	2.20	.028
Discrimination	.73	.48	.08	1.53	.126
Racial Identity x Discrimination	-.26	.45	-.03	-.58	.562
				$F(7,390) = 6.194$, $p < .001$, $R^2 = .100$	

Table 10.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	.70	.24		2.88	.004
Age	.01	.01	.05	.74	.460
Gender	.40	.10	.20	4.12	<.001
Education	.04	.03	.10	1.52	.128
Regional Location	-.01	.03	-.01	-.09	.932
Racial Identity	.04	.04	.05	1.01	.315
Discrimination	-.19	.06	-.16	-3.28	.001
Racial Identity x Discrimination	-.04	.05	-.04	-.72	.472
				F (7,390) = 4.741, p < .001, R^2= .078	

Hypothesis 2b: Discrimination will moderate the relation of racial identity and psychological health, such that more reported discrimination will be associated with worse psychological health.

<u>*Racial Identity, Discrimination, and Anxiety*</u>. The overall model was significant, F(7, 390) = 12.29, R^2 = 0.18, p < .01. Racial identity was not significantly associated with anxiety (b = -0.05, SE = 0.27, t = -0.19, p = .849. However, discrimination was significantly associated with anxiety (b = 2.85, SE = 0.37, t = 7.64, p < .01), indicating that higher discrimination predicted higher anxiety for this overall sample. The interaction term between racial identity and discrimination was not significant (b = 0.07, SE = 0.35, t = 0.19, p = .849), suggesting that discrimination did not moderate the relation of racial identity and anxiety. Thus, racial identity and anxiety did not vary as a function of discrimination. See Table 11 for results.

Racial Identity, Discrimination, and Depression. The overall model was significant, $F(7,390) = 9.39$, $R^2 = 0.144$, $p < .01$. Racial identity was not significantly associated with depression ($b = 0.44$, $SE = 0.30$, $t = 1.48$, $p = .140$. However, discrimination was significantly associated with depression ($b = 2.52$, $SE = 0.41$, $t = 6.18$, $p < .01$, indicating that higher discrimination did predict higher depression for this overall sample. The interaction term between racial identity and discrimination was not significant ($b = 0.30$, $SE = 0.38$, $t = 0.79$, $p = .429$), suggesting that discrimination did not moderate the relation of racial identity and depression. Thus, racial identity and depression did not vary as a function of discrimination. See Table 12 for results.

Table 11.

Study 1: Summary of Regression Analyses for Variables Predicting Anxiety (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	19.24	1.58		12.18	<.001
Age	-.14	.05	-.18	-3.00	.003
Gender	1.57	.62	.12	2.52	.012
Education	.13	.16	.05	.78	.438
Regional Location	-.39	.20	-.09	-2.00	.046
Racial Identity	-.05	.27	-.01	-.19	.849
Discrimination	2.86	.37	.36	7.64	<.001
Racial Identity x Discrimination	.07	.35	.01	.19	.849
				$F(7,390) = 12.29$, $p < .001$, $R^2 = .181$	

Table 12.

Study 1: Summary of Regression Analyses for Variables Predicting Depression (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	11.39	1.72		6.62	<.001
Age	-.12	.05	-.14	-2.43	.016
Gender	1.78	.68	.13	2.61	.009
Education	.01	.18	.01	.02	.984
Regional Location	-.22	.21	-.05	-1.04	.298
Racial Identity	.44	.30	.07	1.48	.140
Discrimination	2.52	.41	.30	6.18	<.001
Racial Identity x Discrimination	.30	.38	.04	.79	.429
				$F(7,390) = 9.390$, $p < .001$, $R^2 = .144$	

Hypothesis 3a: Racial socialization will moderate the relation of racial identity and cardiovascular health, such that more reported socialization will be associated with better cardiovascular health.

Racial Identity, Socialization, and BMI. The overall model was significant, $F(7,390) = 6.23$, $R^2 = 0.101$, $p < .01$. Racial identity was significantly associated with BMI ($b = 0.70$, $SE = 0.36$, $t = 1.96$, $p = .050$), indicating that a higher racial identity was associated with higher BMI. However, socialization was not significantly associated with BMI ($b = 1.51$, $SE = 0.86$, $t = 1.77$, $p = .078$), thus indicating that socialization did not predict BMI for this overall sample. The interaction term between racial identity and socialization was not significant ($b = 0.19$, $SE = 0.75$, $t = 0.25$, $p = .805$), suggesting that socialization did not moderate the relation of racial identity and BMI. Thus, racial identity and BMI did not vary as a function of socialization. See Table 13 for results.

Racial Identity, Socialization, and Physical Activity. The overall model was significant, $F(7,390) = 3.63$, $R^2 = 0.247$, $p < .01$. Racial identity was not significantly associated with physical activity ($b = 0.04$, $SE = 0.04$, $t = 0.95$, $p = .342$), indicating that a higher racial identity was not associated with higher physical activity. Socialization was also not significantly associated with physical activity ($b = -0.20$, $SE = 0.11$, $t = -1.88$, $p = .060$), thus indicating that socialization did not predict physical activity for this overall sample. The interaction term between racial identity and socialization was not significant ($b = -0.03$, $SE = 0.09$, $t = -0.28$, $p = .773$), suggesting that socialization did not moderate the relation of racial identity and physical activity. Thus, racial identity and physical activity did not vary as a function of socialization. See Table 14 for results.

Table 13.

Study 1: Summary of Regression Analyses for Variables Predicting BMI (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	19.31	2.01		9.63	<.001
Age	.23	.06	.23	3.80	<.001
Gender	1.42	.78	.09	1.82	.070
Education	.10	.21	.03	.49	.627
Regional Location	-.21	.25	-.04	-.84	.400
Racial Identity	.70	.36	.10	1.96	.050
Socialization	1.51	.86	.09	1.77	.078
Racial Identity x Socialization	.19	.75	.01	.25	.805
				$F(7,390) = 6.24$, $p < .001$, $R^2 = .101$	

Table 14.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	.76	.25		3.10	.002
Age	.01	.01	.04	.70	.486
Gender	.36	.10	.19	3.77	<.001
Education	.04	.03	.09	1.48	.141
Regional Location	.01	.03	.01	.14	.886
Racial Identity	.04	.04	.05	.95	.342
Socialization	-.20	.11	-.10	-1.88	.060
Racial Identity x Socialization	-.03	.09	-.01	-.29	.773
				F (7,390) = 3.629, p < .001, R^2= .061	

Hypothesis 3b: Racial Socialization will moderate the relation of racial identity and psychological health, such that more reported socialization will be associated with better psychological health.

<u>*Racial Identity, Socialization, and Anxiety*</u>. The overall model was significant, F(7,390) = 3.60, R^2 = 0.061, p < .01. Racial identity was not significantly associated with anxiety (b = 0.13, SE = 0.30, t = 0.42, p = .676). Socialization was also not significantly associated with anxiety (b = 0.66, SE = 0.72, t = 0.92, p = .358) and the interaction term between racial identity and socialization was also not significant (b = -0.30, SE = 0.63, t = -0.48, p = .634). Thus, racial identity and anxiety did not vary as a function of socialization. See Table 15 for results.

<u>*Racial Identity, Socialization, and Depression*</u>. The overall model was significant, F(7,390) = 3.97, R^2 = 0.07, p < .01. Racial identity was significantly associated with depression (b = 0.65, SE = 0.32, t = 2.05, p = .041), indicating that a higher racial identity was associated

with higher depression. However, socialization was not significantly associated with depression (b = 0.83, SE = 0.76, t = 1.09, p = .276), thus indicating that socialization did not predict depression for this overall sample. The interaction term between racial identity and socialization was not significant (b = 0.88, SE = 0.67, t = 1.31, p = .192), suggesting that socialization did not moderate the relation of racial identity and depression. Thus, racial identity and depression did not vary as a function of socialization. See Table 16 for results.

Table 15.

Study 1: Summary of Regression Analyses for Variables Predicting Anxiety (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	18.61	1.68		11.05	<.001
Age	-.12	.05	-.15	-2.37	.018
Gender	1.95	.66	.15	2.97	.003
Education	.08	.18	.03	.45	.652
Regional Location	-.51	.21	-.12	-2.43	.016
Racial Identity	.13	.30	.02	.42	.676
Socialization	.66	.72	.05	.92	.358
Racial Identity x Socialization	-.30	.63	-.02	-.48	.634
				F (7,390) = 3.602, p < .001, R^2= .061	

Table 16.

Study 1: Summary of Regression Analyses for Variables Predicting Depression (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	10.62	1.79		5.94	<.001
Age	-.11	.05	-.13	-2.01	.045

Gender	2.16	.70	.15	3.09	.002
Education	-.02	.19	-.01	-.08	.936
Regional Location	-.33	.22	-.07	-1.48	.140
Racial Identity	.65	.32	.11	2.05	.041
Socialization	.83	.76	.06	1.09	.276
Racial Identity x Socialization	.88	.67	.07	1.31	.192
				F (7,390) = 3.971, p < .001, R^2= .067	

Hypothesis 4a: Acculturative stress will moderate the relation of racial identity and cardiovascular health, such that more reported acculturative stress will be associated with worse cardiovascular health.

Racial Identity, Acculturative Stress, and BMI. The overall model was significant, F(7,390) = 6.16, R^2 = 0.10, p < .01. Racial identity was significantly associated with BMI (b = 0.75, SE = 0.35, t = 2.15, p = .032), indicating that a higher racial identity was associated with higher BMI. However, acculturative stress was not significantly associated with BMI (b = 0.06, SE = 0.04, t = 1.58, p = .115), thus indicating that acculturative stress did not predict BMI for this overall sample. The interaction term between racial identity and acculturative stress was not significant (b = -0.02, SE = 0.04, t = -0.42, p = .676), suggesting that acculturative stress did not moderate the relation of racial identity and BMI. Thus, racial identity and BMI did not vary as a function of acculturative stress. See Table 17 for results.

Racial Identity, Acculturative Stress, and Physical Activity. The overall model was significant, F(7,390) = 3.54, R^2 = 0.06, p < .01. Racial identity was not significantly associated with physical activity (b = 0.02, SE = 0.04, t = 0.56, p = .573), indicating that a higher racial identity was not associated with higher physical activity. Acculturative stress was also not significantly associated with physical activity (b = -0.01, SE = 0.01, t = -0.43, p = .669), thus

indicating that acculturative stress did not predict physical activity for this overall sample. The interaction term between racial identity and acculturative stress was not significant (b = -0.01, SE = 0.01, t = -1.65, p = .099), suggesting that acculturative stress did not moderate the relation of racial identity and physical activity. In sum, racial identity and physical activity did not vary as a function of acculturative stress. See Table 18 for results.

Table 17.

Study 1: Summary of Regression Analyses for Variables Predicting BMI (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	19.50	2.01		9.69	<.001
Age	.23	.06	.24	3.91	<.001
Gender	1.23	.80	.08	1.54	.124
Education	.10	.21	.03	.48	.634
Regional Location	-.19	.25	-.04	-.74	.459
Racial Identity	.75	.35	.11	2.15	.032
Socialization	.07	.04	.08	1.58	.115
Racial Identity x Acculturative Stress	-.02	.04	-.02	-.42	.676
				$F(7,390) = 6.158$, $p < .001$, $R^2 = .100$	

Table 18.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	.74	.25		2.99	.003
Age	.01	.01	.03	.51	.612
Gender	.38	.10	.20	3.92	<.001
Education	.04	.03	.10	1.62	.106

Regional Location	.01	.03	.01	.19	.848
Racial Identity	.02	.04	.03	.57	.573
Acculturative Stress	-.01	.01	-.02	-.43	.669
Racial Identity x Acculturative Stress	-.01	.01	-.08	-1.65	.099
				$F(7,390) = 3.542, p < .001, R^2 = .060$	

Hypothesis 4b: Acculturative stress will moderate the relation of racial identity and psychological health, such that more reported acculturative stress will be associated with worse psychological health.

Racial Identity, Acculturative Stress, and Anxiety. The overall model was significant, $F(7,390) = 11.73$, $R^2 = 0.174$, $p < .01$. Racial identity was not significantly associated with anxiety ($b = -0.06$, $SE = 0.28$, $t = -0.22$, $p = .822$), indicating that racial identity was not associated with anxiety. However, acculturative stress was significantly associated with anxiety ($b = 0.25$, $SE = 0.03$, $t = 7.40$, $p < .01$), indicating that higher acculturative stress did predict higher anxiety for this overall sample. The interaction term between racial identity and acculturative stress was not significant ($b = -0.01$, $SE = 0.03$, $t = -0.24$, $p = .807$), suggesting that acculturative stress did not moderate the relation of racial identity and anxiety. Thus, racial identity and anxiety did not vary as a function of acculturative stress. See Table 19 for results.

Racial Identity, Acculturative Stress, and Depression. The overall model was significant, $F(7,390) = 12.93$, $R^2 = 0.19$, $p < .01$. Racial identity was not significantly associated with depression ($b = 0.37$, $SE = 0.29$, $t = 1.29$, $p = .199$). However, acculturative stress was significantly associated with depression ($b = 0.28$, $SE = 0.03$, $t = 7.84$, $p < .01$), thus indicating that higher acculturative stress does predict higher depression for this overall sample. The interaction term between racial identity and acculturative stress was not significant ($b = -0.01$, SE

= 0.03, t = -0.04, p = .970), suggesting that acculturative stress did not moderate the relation of racial identity and depression. Thus, racial identity and depression did not vary as a function of acculturative stress. See Table 20 for results.

Table 19.

Study 1: Summary of Regression Analyses for Variables Predicting Anxiety (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	19.40	1.58		12.25	<.001
Age	-.13	.05	-.16	-2.67	.008
Gender	1.19	.63	.09	1.89	.059
Education	.18	.16	.06	1.06	.289
Regional Location	-.42	.20	-.10	-2.11	.036
Racial Identity	-.06	.28	-.01	-.23	.822
Socialization	.25	.03	.35	7.41	<.001
Racial Identity x Acculturative Stress	-.01	.03	-.01	-.25	.807
				$F(7,390) = 11.732$, $p < .001$, $R^2 = .174$	

Table 20.

Study 1: Summary of Regression Analyses for Variables Predicting Depression (N=398)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	11.66	1.67		6.97	<.001
Age	-.11	.05	-.13	-2.31	.022
Gender	1.32	.66	.09	1.99	.047
Education	.07	.17	.02	.42	.678
Regional Location	-.22	.21	-.05	-1.05	.296
Racial Identity	.37	.29	.06	1.29	.199

Acculturative Stress	.28	.04	.37	7.84	<.001
Racial Identity x Acculturative Stress	-.00	.03	-.00	-.04	.970
				F (7,390) = 12.931, p < .001, R^2= .188	

Ethnic Differences

Exploratory Hypotheses:

Hypothesis 5: There are differences between African American, Continental African, and Afro-Caribbean/Latinos in the relation of racial identity and health (cardiovascular and psychological) and the moderation effects of discrimination, socialization, and acculturative stress on this relation.

Although findings reveal that neither discrimination, socialization, nor acculturative stress moderate the relation of racial identity and health (cardiovascular and psychological), these models were probed for each ethnic group. Significant findings are presented below.

African-Americans

Results indicated that for African-Americans, racial identity (B = 0.67, SE = 0.42, t = 1.61, *p* = 0.108) and socialization (B = -0.36, SE = 1.13, t = -0.32, *p* = 0.749) were not associated with depression. Furthermore, the interaction between racial identity and socialization was not significant (B = 1.69, SE = 0.97, t = 1.74, *p* = 0.083), suggesting that the effect of racial identity did not depend on the level of socialization. Together, the variables accounted for approximately 1% of the variance in depression, R^2 = 0.01, F(7,207) = 3.04, *p* = .083. Still, simple slopes for the association between racial identity and depression were tested for low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of socialization. Simple slope tests revealed racial identity was only strongly related to higher depression for high levels of socialization (B = 1.27, SE = 0.56, t = 2.28, *p* = .024), compared to moderate (B = 0.74, SE =

0.42, t = 1.76, p = 0.081) or lower levels (B = 0.11, SE = 0.51, t = 0.21, p = .837) of socialization. See Table 21 and for results. Figure 4 plots the simple slopes for the interaction.

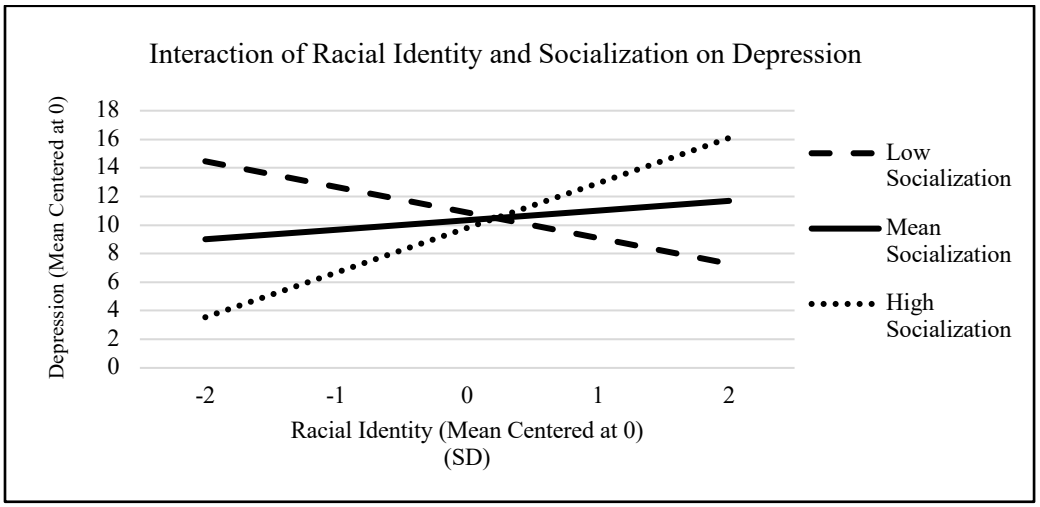
Table 21.

Study 1: Summary of Regression Analyses for Variables Predicting Depression for African-Americans (N=215)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	10.35	2.38		4.35	<.001
Age	-.07	.06	-.09	-1.14	.254
Gender	2.72	.97	.19	2.81	.005
Education	-.34	.31	-.07	-1.12	.266
Regional Location	-.27	.25	-.09	-1.11	.267
Racial Identity	.67	.42	.11	1.61	.108
Socialization	-.36	1.13	-.02	-.32	.749
Racial Identity x Socialization	1.69	.97	.12	1.74	.083
				F (7,207) = 3.044, p = .083, R^2= .013	

Figure 4.

Study 1: Interaction of Racial Identity and Socialization on Depression for African-Americans (N=215)



Continental Africans

Results indicated that for Continental Africans, racial identity (B = 0.08, SE = 0.08, t = 1.11, p = 0.27) and discrimination (B = -0.03, SE = 0.11, t = -0.27, p = .791) were not associated with physical activity. However, the interaction between racial identity and discrimination was significant (B = 0.21, SE = 0.09, t = 2.20, p = .030), suggesting that the effect of racial identity on physical activity depended on the level of discrimination. Together, the variables accounted for approximately 8% of the variance in physical activity, R^2 = 0.08, F(7,116) = 1.49, p = .178. Simple slopes for the association between racial identity and physical activity were tested for low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of discrimination. Simple slope tests revealed racial identity was only strongly related to physical activity at high levels of discrimination (B = 0.19, SE = 0.09, t = 2.11, p = .037), compared to moderate (B = 0.07, SE = 0.08, t = 0.96, p = 0.340) or lower levels (B = -0.06, SE = 0.10, t = -

0.62, p = .540) of discrimination. See Table 22 for results. Figure 5 plots the simple slopes for the interaction.

Results indicated that for Continental Africans, racial identity (B = 0.13, SE = 0.08, t = 1.69, p = 0.094) and socialization (B = -0.24, SE = 0.17, t = -1.48, p = .142) were not associated with physical activity. Furthermore, the interaction between racial identity and socialization was not significant (B = 0.25, SE = 0.15, t = 1.70, p = .093), suggesting that the effect of racial identity did not depend on the level of socialization. Together, the variables accounted for approximately 8% of the variance in physical activity, R^2 = 0.08, F(7,116) = 1.62, p = .136. Still, simple slopes for the association between racial identity and physical activity were tested for low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of socialization. Simple slope tests revealed racial identity was only strongly related to physical activity for high levels of socialization (B = 0.45, SE = 0.22, t = 2.10, p = .038), compared to lower levels (B = -0.19, SE = 0.19, t = -0.99, p = .322) of socialization. See Table 23 for results. Figure 6 plots the simple slopes for the interaction.

Table 22.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity for Continental Africans (N=124)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	1.20	.45		2.64	.010
Age	.01	.02	.09	.72	.470
Gender	.21	.15	.13	1.39	.168
Education	-.04	.05	-.07	-.79	.429
Regional Location	-.01	.05	-.04	-.31	.759

Racial Identity	.08	.08	.11	1.11	.268
Discrimination	-.03	.11	-.03	-.27	.791
Racial Identity x Discrimination	.21	.09	.20	2.20	.030
				F (7,116) = 1.487, p = .178, R^2= .082	

Table 23.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity for Continental Africans (N=124)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	1.16	.45		2.57	.011
Age	.01	.02	.08	.66	.511
Gender	.23	.15	.14	1.51	.133
Education	-.03	.05	-.06	-.61	.543
Regional Location	-.01	.05	-.03	-.28	.778
Racial Identity	.13	.08	.16	1.69	.094
Socialization	-.24	.17	-.14	-1.48	.142
Racial Identity x Socialization	.25	.15	.16	1.70	.093
				F (7,390) = 1.622, p = .136, R^2= .082	

Figure 5.

Study 1: Interaction of Racial Identity and Discrimination on Physical Activity for Continental Africans (N=124)

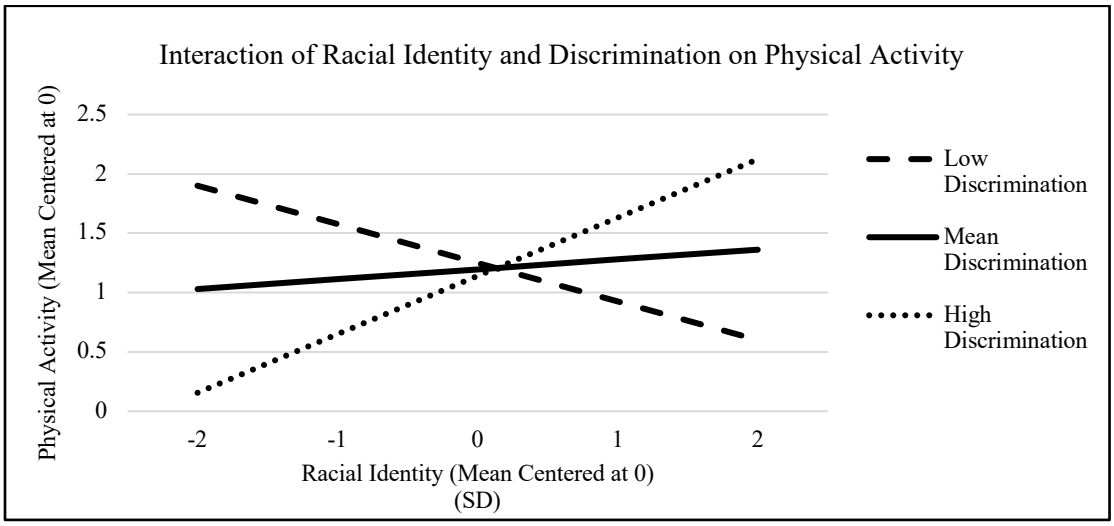
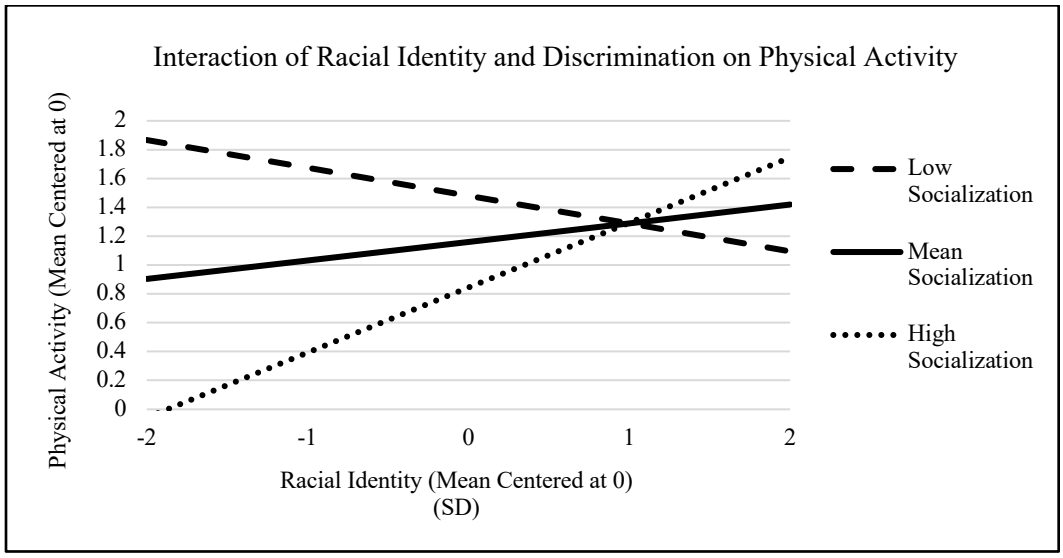


Figure 6.

Study 1: Interaction of Racial Identity and Socialization on Physical Activity for Continental Africans (N=124)



Afro-Caribbeans

Although the sample size for those who identify as Afro-Caribbean/Latino was small, moderation models were still run for this group. However, these results should be taken with caution. Results indicated that for Afro-Caribbean/Latinos, racial identity (B = 0.05, SE = 0.13, t = 0.36, p = .721) and socialization (B = -0.28, SE = 0.25, t = -1.09, p = .281) were not associated with physical activity. However, the interaction between racial identity and socialization was significant (B = -0.78, SE = 0.32, t = -2.42, p = .019), suggesting that the effect of racial identity depended on the level of socialization. Together, the variables accounted for approximately 8% of the variance in physical activity, R^2 = 0.08, F(7,51) = 5.84, p = .019. See Table 24 for results.

Results indicated that for Afro-Caribbean/Latino*s*, racial identity (B = 0.03, SE = 0.12, t = 0.27, p = .788) and acculturative stress (B = 0.01, SE = 0.02, t = 0.30, p = .764) were not associated with physical activity. However, the interaction between racial identity and acculturative stress was significant (B = -0.05, SE = 0.02, t = -2.57, p = .013), suggesting that the effect of racial identity depended on the level of acculturative stress. Together, the variables accounted for approximately 9% of the variance in physical activity, R^2 = 0.09, F(7,51) = 6.58, p = .013. See Table 25 for results.

Table 24.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity for Afro-Caribbeans (N=59)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	.00	.80		.00	1.000
Age	.06	.04	.28	1.41	.165
Gender	.06	.32	.02	.19	.850

Education	.20	.10	.24	1.93	.059
Regional Location	.01	.08	.03	.14	.891
Racial Identity	.05	.13	.05	.36	.721
Socialization	-.28	.25	-.14	-1.09	.281
Racial Identity x Socialization	-.78	.32	-.32	-2.42	.019
				F (7,51) = 5.841, p = .019, R^2= .083	

Table 25.

Study 1: Summary of Regression Analyses for Variables Predicting Physical Activity for Afro-Caribbeans (N=59)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	-.36	.87		-.41	.683
Age	.09	.04	.45	2.30	.026
Gender	-.04	.33	-.02	-.13	.901
Education	.21	.10	.25	2.01	.050
Regional Location	-.06	.08	-.13	-.68	.502
Racial Identity	2.02	.77	2.09	2.63	.011
Acculturative Stress	.01	.02	.043	.30	.764
Racial Identity x Acculturative Stress	-.06	.02	-2.06	-2.57	.013
				F (7,51) = 6.582, p = .013, R^2= .094	

Study 1: Discussion

This study aimed to explore the association of racial identity with health (cardiovascular and psychological), and the possibility of moderating effects of discrimination, socialization, and acculturative stress among African-Americans, Continental Africans, and Afro-Caribbeans/Latinos. Overall, hypotheses were not supported but three key patterns emerged.

First, higher (more positive) racial identity related to worse BMI and depression outcomes for the overall sample. For African-Americans, racial identity was only strongly related to depression for those with high levels of socialization. Additionally, for Continental Africans, discrimination and socialization moderated the relation of racial identity and physical activity. Specifically, racial identity was only strongly related to physical activity for those with high levels of discrimination and high levels of socialization. Unfortunately, due to a small sample size, moderation analyses for Afro-Caribbeans/Latinos could not be interpreted.

Several factors might account for the observed findings. First, the relative lack of significant results across all regression analyses testing the association of higher racial identity and health (cardiovascular and psychological) could be due to the complex interplay between racial identity and health outcomes, which may not be fully captured by the measures used in this study. Racial identity is multifaceted and can influence health through various pathways, including stress, discrimination, coping mechanisms (e.g., emotion regulation), and access to resources. The specific dimensions of racial identity and the contexts in which individuals experience and express their identity may vary, thus affecting health outcomes differently.

Because most previous research has examined racial identity as a mediator or moderator that protects against the negative effects of discrimination, racism, or stress on health (Brown, K., unpublished manuscript; Chae et al., 2010; Drolet & Lucas, 2020; Manns-James, 2020; Neblett Jr., & Carter, 2012; Thomas Tobin et al., 2022; Thompson et al., 2002; Volpe et al., 2019), this study aimed to understand the main effects of racial identity for health. While most of the findings linking racial identity to health were not significant for the overall sample, discrimination significantly related to physical activity, anxiety, and depression. This is consistent with most previous research that showed that while higher discrimination relates to

worse anxiety and depression as expected, (Carden et al., 2022; English et al., 2014; Levine et al., 2014; Monk, 2015; Moody et al., 2023; Soto et al., 2011; Zimmerman & Miller-Smith, 2022), it also relates to more physical activity (Borrell et al., 2013) for African-Americans specifically. This physical activity may be a form of coping mechanism to mitigate the stress and negative emotions associated with experiences of discrimination. Physical activity can serve as a social outlet, fostering community support and solidarity among peers who share similar experiences. Additionally, young adults, who are more likely to report experiences of discrimination (Yip et al., 2008), are also generally more physically active, and this sample was mostly comprised of young adults. Therefore, physical activity among the sample in this study may partly reflect the coping strategies employed by young adults facing higher levels of discrimination.

Given the findings of this study, I decided to explore other possible pathways where racial identity might function more effectively as a moderator, buffering against the negative effects of discrimination. In an exploratory analysis, racial identity was entered as a moderator that buffers against the negative effects of discrimination (IV) and health (cardiovascular and psychological) for this sample. Despite the theoretical rationale, the results for this exploratory analysis were also non-significant in the overall sample and within each subgroup.

Ethnic Differences. For Continental Africans, discrimination and socialization significantly moderated the relation of racial identity on physical activity. This suggests that social and environmental factors play a role in health behaviors. Racial socialization processes might influence how individuals perceive and engage in physical activity, potentially through community norms, support systems, and cultural practices. Discrimination, as a stressor, might either motivate individuals to engage in physical activity as a coping mechanism or hinder their

ability to do so due to psychological distress and reduced access to safe and supportive environments.

The finding that socialization moderates the relation of racial identity and depression for African-Americans also underscores the importance of social context in psychological health. It was found that higher racial identity was only strongly related to higher depression for high levels of socialization. Although socialization can provide individuals with a sense of belonging and support (racial pride), it also consists of reminding individuals of the potential for discrimination and prejudice they may face (preparation for bias/racial barriers). This heightened awareness can increase stress, making one more vigilant and/or potentially more sensitive to experiences of bias. As a result, individuals with a strong racial identity who frequently receive messages about the need to prepare for bias may experience a greater psychological burden (higher levels of depression).

Limitations

This study has several limitations that should be acknowledged. First, the cross-sectional design limited the ability to infer causality. Longitudinal studies are needed to better understand the temporal relationships between racial identity, moderating factors, and health outcomes. Second, the self-reported nature of the measures, particularly for cardiovascular health, may be subject to bias. Objective measures of health outcomes should be included in future research to enhance the validity of the findings. Additionally, many of the participants in this sample attend HBCUs. These institutions provide unique environments where Black students are less likely to encounter racial discrimination compared to students at predominantly white institutions (PWIs). This supportive atmosphere may result in students experiencing fewer instances of racial stress and discrimination, which could influence their daily lives and psychological health. Moreover,

the presence of a strong, affirming community at HBCUs might mean that students do not have to actively think about or navigate their ethnic/racial identity as frequently as they would in less supportive environments. This reduced salience of racial identity in their daily experiences might have contributed to the lack of significant findings in this study. Finally, the small sample size for some subgroups, particularly Afro-Caribbean/Latinos, limits the generalizability of the findings. Future research should aim to include larger and more diverse samples to better understand the experiences and health outcomes of Afro-Caribbeans and Afro-Latinos.

Implications and Future Directions

Despite the limitations, this study highlights the importance of considering social and environmental factors, such as discrimination, socialization, and acculturative stress, in understanding the relationship between racial identity and health. The findings suggest that physical activity and psychological health among Black/Afro-descended populations should be further explored and consider ethnic variation and the role of social support and cultural practices.

This study only examined racial centrality and its association with health. Future studies should also explore other dimensions of racial identity and their interactions with various health outcomes. It is possible that racial regard or racial ideology may be more important for health and may play a more important role for Black/Afro-descended persons. Additionally, investigating other potential moderators, such as emotion regulation or social support could provide a more nuanced understanding of the pathways linking racial identity to health.

In conclusion, while this study did not find significant relationships between racial identity and health outcomes, there were identified moderating effects of discrimination and socialization on specific health indices for African-Americans, Continental Africans, and Afro-

Caribbean/Latinos. This underscores the need for culturally sensitive and contextually relevant resources for members of the Black diaspora, and this can play an important role in improving health and well-being outcomes.

CHAPTER 3

STUDY 2

Study 1 examined whether racial identity relates to two important cardiovascular disease risk factors and psychological health for those who identify racially as Black/Afro-descended. In Study 1, cardiovascular health was operationalized using self-reported health relating to two of the seven cardiovascular disease risk factors. In Study 2, I was able to empirically test cardiovascular health. Specifically, Study 2 tested six of the seven main cardiovascular disease risk factors defined by the American Heart Association (AHA) (Folsom et al., 2011), providing a more comprehensive picture of cardiovascular health. This approach allowed us to better understand the interplay between ethnic identity and a broader range of cardiovascular health indicators. Study 2 examined cardiovascular health intraethnically (Hispanic/Latino) using a national cohort study: the Hispanic Community Health Study/Study of Latinos (HCHS/SOL).

Method

Research Design & Participants

Data from HCHS/SOL was used to examine the relation of ethnic identity, acculturation, and years lived in the U.S. on cardiovascular health (hypertension, BMI, dyslipidemia, diabetes, smoking, and physical activity) and psychological health (anxiety and depression). This national cohort study aimed to examine risk factors for major chronic diseases among 16,415 Hispanics/Latinos. The HCHS/SOL study recruited participants from a randomly selected

sample of households in San Diego, CA, Chicago, IL, Miami, FL and Bronx, NY during 2008-2011. These four locations each collected data on more than 4,000 participants from various Hispanic/Latino backgrounds. A baseline assessment was first administered to obtain demographic measures. Several ancillary studies were (and continue to be) conducted. For this study, only the baseline data was used. Of the 16,514 Hispanics/Latinos, 589 participants identified as Afro-Latino. Thus, the influence of racial background on cardiovascular disease and psychological health could be analyzed by comparing Afro-Latino participants to non-Black Hispanic/Latino participants.

Measures

Demographics. Demographic information collected included self-reported age, sex, Hispanic/Latino background (e.g., Dominican, Mexican, Central American, etc.), income, number of years living in the U.S., and highest level of education. Questions on race asked participants to self-identify with a racial group (e.g., Black, White, Asian, etc.). This is similar to U.S. census-based questions where individuals are asked to indicate one race with which they predominantly identify. Because the goal of this study was to understand the potential importance of individuals explicitly identifying with a racial group (Black vs. non-Black Hispanic/Latinos), I focused on the subset of participants who clearly indicated a racial identification. Participants who reported their race as “Black” was coded as Afro-Latino (n=589). Participants who reported their race as "White" or "More than one race" were coded as non-Black Hispanic/Latino (n=9,231). Analyses excluded anyone with missing race and those who chose other categories (e.g., American Indian, Asian, “unknown” or “don’t Know/Refuse”).

Ethnic Identity. The HCHS/SOL Baseline Study dataset contains two questions from the Phinney (1992) Multigroup Ethnic Identity Scale. These two questions measure affirmation and

belonging to one's ethnic group. In this study, the mean scores of these two questions were used to assess level of ethnic identity. The two items were "*I have a strong sense of belonging to my own ethnic group*" and "*I have a lot of pride in my ethnic group*". Response options ranged from 1 (Strongly Disagree) to 4 (Strongly Agree) with high scores indicating higher ethnic identity. The scale has strong construct validity, and the reported Cronbach's alpha coefficient levels exceeded .81 for the original scale (Phinney, 1992).

Acculturation. To measure acculturation levels for Hispanic/Latinos in the HCHS/SOL Study, this study used two subscales derived from the Short Acculturation Scale for Hispanics (Marin et al., 1987): the Language Use Subscale and Ethnic Social Relations subscale. The six questions of the language subscale assess the degree of language acculturation and the four questions of the social subscale assess the degree of ethnic social acculturation. Sample items include "*What language(s) do you usually speak at home? (Range: Only Spanish to Only English)* (Language)" and "*If you could choose your children's friends, you would want them to be: (Range: All Hispanic/Latinos to All Americans)* (Social)." The scale has strong construct validity, and the reported Cronbach's alpha coefficient levels were 0.90 for the Language Use subscale and 0.78 for the Ethnic and Social Relations subscale for the original scale (Ellison et al., 2011). The Cronbach's alpha coefficient for this HCHS/SOL sample was 0.92 for the Language Use subscale and 0.73 for the Ethnic Social Relations subscale. For the purposes of this research, the mean scores of these two subscales were combined and used to measure acculturation with higher scores indicating more acculturation to U.S. customs.

Years Lived in the U.S. Years Lived in the U.S. was defined in two ways: if a participant was not born in the U.S., this value represents how many years they have lived in the U.S. since

moving to the mainland U.S. If a participant was born in the U.S., this number was equal to their age.

Cardiovascular Health. For the purpose of this study, cardiovascular health was operationalized by measuring six of the seven main cardiovascular disease risk factors that are known to distinctly relate to cardiovascular health: *hypertension, BMI, dyslipidemia, diabetes, smoking, and physical activity*. The seventh main cardiovascular disease risk factor (diet) was not included in this study. To reduce the number of analyses, I computed a composite score for cardiovascular disease risk factors using the averaged Z scores of these six measures. Hypothesized models were analyzed using this score.

Hypertension. To measure hypertension, the HCHS/SOL dataset contains a variable that classifies participants into four categories based on a combination of data derived from lab tests and self-report: (1) having an average systolic blood pressure greater than 140 mmHg, (2) having an average diastolic blood pressure greater than 90 mmHg, (3) using blood pressure lowering medication, and (4) self-report of being diagnosed with high blood pressure or hypertension. Scores for this four-category variable range from: 1 (No hypertension), 2 (Pre-hypertension), 3 (Treated hypertension), and 4 (Untreated hypertension). Thus, higher scores indicated a more severe hypertension condition.

BMI. BMI was measured using participants self-reported height (inches) and weight (pounds) to calculate a BMI value. Higher scores indicate a higher body mass index.

Dyslipidemia. To measure dyslipidemia and cholesterol, this dataset contains a variable that determines the presence or absence of dyslipidemia based on participants' high and low-density lipoproteins (HDL and LDL) and triglycerides results. A 0 for this variable indicated "Not dyslipidemic" whereas a 1 indicated "Dyslipidemic."

Diabetes. To measure diabetes, the HCHS/SOL dataset contains a variable that takes into account lab tests results for fasting blood glucose levels, A1C percentages, and participants' self-report of a diabetes diagnosis. Scores for this three-category variable are: 1 (No diabetes), 2 (Pre-diabetes), or 3 (Diabetic). Thus, higher scores indicated a more severe diabetes condition.

Smoking. The HCHS/SOL dataset contains information on participants' current smoking status and number of years spent smoking cigarettes. Using this information, a categorical variable was created for smoking status with the following options: 1 (Never), 2 (Former), or 3 (Current). Thus, higher scores indicated a more severe history of smoking.

Physical Activity. Physical activity was measured using the Global Physical Activity Questionnaire (GPAQ) (Bull, Maslin, & Armstrong, 2009). The GPAQ was developed by the World Health Organization (WHO) and collects information on sedentary behavior and physical activity in three settings (work, commuting, and leisure). Sample items include "*In a typical week, on how many days do you do vigorous intensity sports, fitness or recreational (leisure) activities?*" and "*How much time do you spend walking or bicycling for travel on a typical day?*" Participants reported total daily physical activity and a categorical variable associated with their total physical activity was created. This categorical variable assigns a value of 1 to those with high total physical activity levels, a value of 2 to those with moderate total physical activity levels and a value of 3 to those with low total physical activity levels. See Bull, Maslin, & Armstrong, 2009 for more information on scoring and how these values are assigned. The scale has strong construct validity, and all reliabilities coefficients met the minimum acceptability (Kappa 0.67 to 0.73; Spearman's rho 0.67 to 0.81). (Bull, Maslin, & Armstrong, 2009).

Psychological Health. Psychological health was measured by assessing anxiety and depression.

Anxiety. Like study 1, anxiety was measured using the short version of the State Trait Anxiety Inventory (STAI) (Zsido et al., 2020). This 10-item questionnaire asks participants to describe temporary conditions of "state anxiety" (5 items) and general long-term feelings of "trait anxiety" (5 items). Items were on a scale that ranged from 1 (Not at all) to 4 (Very much so). The Cronbach's alpha coefficient for this sample was 0.92 for those who completed the survey in English and 0.94 for Spanish. Scores were averaged with higher scores indicating higher anxiety.

Depression. Depression was measured using the shortened version of the Center for Epidemiological Studies-Depression Scale (CES-D 10) (Andresen et al., 1994). The 10 items on this scale assesses for depression symptoms experienced in the past week. Sample items include "*I was bothered by things that usually don't bother me*" and "*I felt lonely*" and were on a scale ranging from 0 [Rarely or none of the time (less than one day)] to 3 [Most of the time (5-7 days)]. For the current HCHS/SOL sample, the Cronbach's alpha coefficient was 0.82. Scores were averaged with higher scores indicating higher depression.

Study 2: Data Analysis Plan

Before running the analyses, the data were examined for missing values. An analysis of missing values (MVA) revealed that 84% of participants had no missing data. In addition, no item had more than 4.6% missing values. Little's (1988) missing completely at random (MCAR) analysis revealed a non-significant chi-square statistic, indicating that the data were MCAR. Therefore, missing values were replaced by using multiple imputation procedures in SPSS 26.0. See Table 26 for percent missing in original data and after using multiple imputation procedures.

Due to the complex survey design of the HCHS/SOL dataset, unequal weighting, stratification, and cluster sampling can impact the results of the study. Thus, per HCHS/SOL

guidelines, complex survey-specific procedures were done to account for the two-stage sampling design and sample weights (Sorlie et al., 2010). Before proceeding with analyses, complex-survey procedures were done using SPSS 26.0.

After imputing missing data, employing complex survey procedures, generating descriptive statistics for all variables, and creating analysis variables (e.g., acculturation, cardiovascular health composite score), bivariate correlations were run to examine the associations between ethnic identity, acculturation, years lived in the U.S., cardiovascular health, and psychological health. In addition, linear regression analyses were used to test the association between the criterion variable (ethnic identity) and each outcome variable (cardiovascular health, anxiety, and depression).

Following this, a series of moderation analyses were conducted to formally test the remaining hypotheses. Before conducting all analyses, continuous predictors were mean centered to avoid multicollinearity (Iacobucci et al., 2016). Six separate analyses were conducted in which ethnic identity served as the independent variable and cardiovascular health and psychological health (anxiety and depression) served as the three dependent variables. Acculturation and years lived in the U.S. were entered separately as moderators[1]. Age, sex, income, Hispanic/Latino background, field center, and education were entered as covariates in all models.

Study 2: Results

Descriptive analyses were conducted using IBM SPSS statistics 26.0. The mean age of the overall sample (N=9,820) was 42.67 years (66.7% were 54 years or younger). There were more women than men (53.3% women), and 79.3% of the population were born outside of the mainland U.S. 50 states/DC. The largest percentages of this Hispanic/Latino sample were of Cuban and Mexican heritage (31.4% and 28.0%, respectively). Consistent with U.S.

demographics, most of the population reported an annual income of less than $40,000 (70.9%). The education level of the population ranged from “no high school or GED completed” to “greater than high school or GED education.” In addition, 44.0% of the sample had completed at least a high school (or GED) education. Table 26 provides a summary of the participants’ self-reported demographic characteristics.

Table 26.

Study 2: Weighted Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociodemographic Characteristics for Afro-Latinos, Non-Black Hispanic/Latinos, and Overall Sample (N=16,415)

	Afro-Latino (n=589)		**Non-Black Hispanic/Latino (n=9,231)**		**Total HCHS/SOL Sample (n=16,415)**	
	Freq. (n)	Pctg (%)	Freq. (n)	Pctg (%)	Freq. (n)	Pctg (%)
Age						
18-29	154	26.1	2138	23.2	4462	27.2
30-39	113	19.1	1882	20.4	3455	21.1
40-49	131	22.2	2139	23.2	3577	21.8
50-59	106	18.0	1568	17.0	2640	16.1
60-69	64	10.8	1129	12.2	1747	10.6
71-74+	22	3.7	376	4.1	527	3.2
Missing	0	0.0	0	0	6	0.01
Sex						
Male	303	51.5	4281	46.4	8558	52.1
Female	286	48.5	4950	53.6	7857	47.9
Yearly Household Income						
Less than $10,000	121	20.6	1194	12.9	2171	13.2
$10,001-$20,000	181	30.7	2640	28.6	4699	28.6
$20,001-$40,000	140	23.8	2685	29.1	4941	30.1
$40,001-$75,000	57	9.6	1219	13.2	2160	13.2
More than $75,000	13	2.1	574	6.2	873	5.3
Missing	78	13.2	920	10.0	1570	9.6
Years Lived in the U.S.						
Born in the U.S.	166	28.1	1866	20.2	3845	23.4

Born outside the U.S. with >10 years residence	129	21.9	2953	32.0	4510	27.5
Born outside the U.S. with <=10 years residence	294	49.9	4412	47.8	8060	49.1
Hispanic/Latino Heritage						
Cuban	181	30.7	2906	31.5	3271	19.9
Dominican	169	28.7	661	7.2	1624	9.9
Puerto Rican	151	25.6	1214	13.2	2639	16.1
Mexican	20	3.4	2727	29.5	6106	37.2
Central American	36	6.1	768	8.3	1210	7.4
South American	7	1.1	537	5.8	814	5.0
More than one/other heritage	26	4.3	417	4.5	675	4.1
Missing	0	0	2	0.01	76	0.5

Table 27, Table 28, and Table 29 report means, standard deviations, and percentage of responses missing for hypothesized study variables (Table 26 and Table 27) as well as zero-order correlations among hypothesized study variables (Table 28).

Table 27.

Study 2: Means, Standard Deviations, and Percentage of Responses Missing for Study Variables for Current Overall Study Sample (n=9,820) and Overall HCHS/SOL Sample (N=16,415)

	Overall Study Sample M(SD)	*Overall HCHS/SOL* M(SD)	%missing before imputation	%missing after imputation
1. Ethnic Identity	3.20(.56)	3.19(0.57)	1.50	0
2. Years Lived in U.S.	17.76(13.17)	17.16(13.61)	0.70	0
3. Acculturation (Social)	2.19(.60)	2.24(0.60)	4.50	0
4. Acculturation (Language)	2.05(1.13)	2.13(1.15)	0.60	0
Cardiovascular Risk Factors				
5. BMI	29.23(6.07)	29.36(6.12)	0.40	0
6. Hypertension	1.89(.98)	1.83(0.96)	0.00	0
7. Dyslipidemia	0.39(.49)	0.38(0.49)	1.30	0
8. Diabetes	1.67(.73)	1.66(0.73)	0.10	0
9. Smoking	1.62(.82)	1.60(0.82)	1.60	0
10. Physical Activity	2.23(.68)	2.28(0.69)	0.90	0

Psychological Health				
11. Anxiety	16.82(5.66)	17.03(5.69)	2.70	0
12. Depression	6.96(5.97)	7.00(5.91)	2.70	0

Table 28.

Study 2: Means and Standard Deviations for Study Variables for Afro-Latinos (n=589) and Non-Black Hispanic/Latinos (n=9231)

	Minimum	Maximum	*Afro-Latino* M(SD)	*Non-Black* M(SD)
1. Ethnic Identity	1	4	3.17(0.58)	3.20(0.56)
2. Years Lived in U.S.	0	73	19.94(13.10)	17.62(13.16)
3. Acculturation (Social)	1	5	2.34(0.55)	2.18(0.60)
4. Acculturation (Language)	1	5	2.34(1.28)	2.03 (1.12)
Cardiovascular Risk Factors				
5. BMI	14	68	30.02(6.54)	29.18(6.04)
6. Hypertension	1	4	2.04(0.98)	1.88(0.98)
7. Dyslipidemia	0	1	0.30(0.46)	0.39(0.49)
8. Diabetes	1	3	1.63(0.73)	1.67(0.73)
9. Smoking	1	3	1.72(0.88)	1.61(0.82)
10. Physical Activity	1	3	2.31 (0.68)	2.32(0.68)
Psychological Health				
11. Anxiety	10	40	18.03(5.84)	16.74(5.64)
12. Depression	0	30	8.58(6.56)	6.86(5.91)

Table 29.

Study 2: Zero-order Correlations Among Study Variables for The Current HCHS/SOL Sample (N=9,820)

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Ethnic Identity	1										
2. Years in U.S.	-0.09**	1									
3. Accult. (Soc.)	-014**	0.29**	1								
4. Accult. (Lang.)	-0.17**	0.46**	0.57**	1							
5. BMI	-0.03**	0.01	0.03**	0.03**	1						
6. Hypertension	0.04**	0.18**	-0.12**	-0.17**	0.21**	1					
7. Dyslipidemia	0.01	-0.01	-0.06**	-0.07*	0.15**	0.15**	1				
8. Diabetes	0.01	0.21**	-0.11**	-0.18**	0.26**	0.36**	0.18**	1			
9. Smoking	-0.02*	0.05**	0.01	0.05**	-0.01	0.02*	0.09**	0.04**	1		
10. Phys. Activity	-0.01	0.04**	-0.12**	-0.11**	0.05**	0.10**	0.01	0.12**	-0.05**	1	
11. Anxiety	-0.06**	0.06**	0.01	0.07**	0.09**	0.00**	-0.04**	0.01	0.10**	0.06**	1
12. Depression	-0.05**	0.09**	0.01	0.05**	0.11**	0.05**	-0.01	0.06**	0.12**	0.08**	0.73**

Note. Correlations marked with * or ** are significant at the .05 or .01 alpha level, respectively.

Hypothesis Testing

H1a. Ethnic identity is positively associated with cardiovascular health, with those higher in ethnic identity reporting better cardiovascular health outcomes.

This hypothesis was tested by conducting multiple linear regression analyses to determine whether higher ethnic identity was associated with better cardiovascular health outcomes. Ethnic identity was the predictor, and cardiovascular health was the criterion variable. Age, sex, income, education, Hispanic/Latino background, and field center were entered as

covariates. Results showed that ethnic identity was significantly associated with cardiovascular health (β = -0.02, p = .019). This negative association indicates that for the overall sample, higher ethnic identity was associated with better cardiovascular health outcomes (lower cardiovascular health score). Thus, hypothesis 1a was supported. See Table 30 for results.

Table 30.

Study 2: Regression Model of Ethnic Identity Predicting Cardiovascular Health (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	-.57	.03		-16.51	<.001
Age	.02	.00	.50	56.74	<.001
Sex	.09	.01	.09	9.84	<.001
Income	-.01	.00	-.04	-4.24	<.001
Hispanic/Latino Background Group	.00	.00	.00	-.05	.959
Field Center	-.00	.00	-.01	-1.0	.318
Education	-.04	.01	-.07	-8.32	<.001
Ethnic Identity	-.02	.01	-.02	-2.34	.019
				F (7,9819) = 502.78, p < .001, R^2= .264	

H1b. *Ethnic identity is positively associated with psychological health with those higher in ethnic identity reporting better psychological health outcomes.*

This hypothesis was tested by conducting multiple regression analyses to determine whether higher ethnic identity was associated with better psychological health outcomes. Ethnic identity was the predictor, and anxiety and depression were the criterion variables in separate analyses. Age, sex, income, education, Hispanic/Latino background, and field center were entered as covariates. Results showed that ethnic identity was significantly associated with

anxiety (β = -0.05, p < .01). This negative association indicates that for the overall sample, higher ethnic identity was associated with better anxiety outcomes (lower anxiety score). In addition, results also showed that ethnic identity was significantly associated with depression (β = -0.04, p < .01). This negative association indicates that for the overall sample, higher ethnic identity was associated with better depression outcomes (lower depression score). Thus, hypothesis 1b was supported. See Table 31 and Table 32 for results.

Table 31.

Study 2: Regression Model of Ethnic Identity Predicting Anxiety (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	1.09	.08		14.29	<.001
Age	-.00	.00	-.02	-2.30	.021
Sex	-.26	.02	-.13	-13.01	<.001
Income	-.03	.01	-.07	-7.24	<.001
Hispanic/Latino Background	.01	.01	.02	1.69	.090
Field Center	-.06	.01	-.07	-6.53	<.001
Education	-.17	.01	-.14	-14.14	<.001
Ethnic Identity	-.10	.02	-.05	-5.51	<.001
				F (7,9819) = 76.47, p < .001, R^2= .052	

Table 32.

Study 2: Regression Model of Ethnic Identity Predicting Depression (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	11.15	.46		24.52	<.001
Age	.03	.00	.07	6.97	<.001

Sex	-1.69	.12	-.14	-14.33	<.001
Income	-.15	.03	-.06	-5.66	<.001
Hispanic/Latino Background	.08	.04	.02	1.97	.049
Field Center	-.54	.05	-.10	-9.96	<.001
Education	-.63	.07	-.09	-9.01	<.001
Ethnic Identity	-.46	.11	-.04	-4.39	<.001
				F (7,9819) = 76.80, p < .001, R^2= .052	

H2a. Acculturation will moderate the relation of ethnic identity and cardiovascular health, such that higher levels of acculturation will be associated with worse cardiovascular health outcomes for the overall sample.

The statistical model that included all of the predictors accounted for 26% of the variation in cardiovascular health [$AdjR^2$ = 0.26; F(9,9819)=391.91, p < .01]. Results suggested that the interaction of ethnic identity and acculturation on cardiovascular health was not statistically significant, [b = 0.01; t(9819)=0.83, CI_b (-0.01, 0.03), p = .409]. However, the main effect of ethnic identity on cardiovascular health was statistically significant, [b = -0.02; t(9819)=-1.97, CI_b (-0.03, 0.00), p = 0.049] and the main effect of acculturation was statistically significant [b = 0.02; t(9819)=2.45, CI_b (0.01, 0.03), p = .015] *(see Table 33)*.

Table 33.

Study 2: Summary of Regression Analyses for Variables Predicting Cardiovascular Health (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	-.63	.02		-26.94	<.001
Age	.01	.00	.50	54.45	<.001

Sex	.09	.01	.08	9.60	<.001
Income	-.01	.00	-.04	-4.32	<.001
Hispanic/Latino Background	-.00	.00	-.01	-.75	.454
Field Center	-.00	.00	-.00	-.41	.684
Education	-.05	.01	-.08	-8.64	<.001
Ethnic Identity	-.02	.01	-.02	-1.97	.049
U.S. Acculturation	.02	.01	.03	2.45	.015
Ethnic Identity x U.S. Acculturation	.01	.01	.01	.83	.409
	F (9,9819) = 391.91, p < .001, $AdjR^2$= .264				

H2b. Acculturation will moderate the relation of ethnic identity and psychological health, such that higher levels of acculturation will be associated with worse psychological health outcomes for the overall sample.

Ethnic Identity, Acculturation, and Anxiety. For anxiety, the model that included all of the predictors accounted for 6% of the variation in anxiety [$AdjR^2$ = 0.06; F(9,9819)=66.88, $p < .01$]. Results indicated that the interaction of ethnic identity and acculturation on anxiety was statistically significant, [b = -0.57; t(9819)=-4.50, CI_b (-0.82, -0.32), $p < .01$]. In addition, the main effect of ethnic identity on anxiety was statistically significant [b = -0.42; t(9819)=-4.17, CI_b (-0.62, -.22), $p < .01$] and the main effect of acculturation on anxiety was also statistically significant [b = 0.50; t(9819)=5.84, CI_b (0.33, 0.66), $p < .01$] *(see Table 34)*.

The interaction of ethnic identity and acculturation on anxiety was then probed at one standard deviation above and one standard deviation below the sample average for acculturation. For those who reported higher U.S. acculturation (i.e., one SD above the sample mean), the simple slope was statistically significant [b = -1.01; t(9819)=-5.76, CI_b (-2.19, -1.08), $p < .01$]. Regarding effect size, for every additional point in ethnic identity for individuals with higher

acculturation, there was a predicted 1.01-unit decrease in severity of anxiety. For individuals with lower acculturation (i.e., one SD below the sample mean), the simple slope was also statistically significant [b = 0.79; t(9819)=2.72, CI_b (0.22, 1.37), $p < .01$]. Regarding effect size, for every additional point in ethnic identity for individuals with higher acculturation, there was a predicted 0.79-unit increase in severity of anxiety.

Ethnic Identity, Acculturation, and Depression. The statistical model that included all of the predictors accounted for 6% of the variation in depression [$AdjR^2 = 0.06$; $F(9,9819)=66.44$, $p < .01$]. Results suggested that the interaction of ethnic identity and acculturation on depression was not statistically significant, [$b = -0.19$; $t(9819)=-1.44$, CI_b (-0.46, 0.07), $p = 0.149$]. However, the main effect of ethnic identity on depression was statistically significant, [$b = -0.33$; $t(9819)=-3.06$, CI_b (-0.53, -0.11), $p < .01$] and the main effect of acculturation was statistically significant [$b = 0.64$; $t(9819)=7.14$, CI_b (0.47, 0.82), $p < .01$]. See Table 35 for results.

Table 34.

Study 2: Summary of Regression Analyses for Variables Predicting Anxiety (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	21.02	.29		71.84	<.001
Age	-.00	.00	-.00	-.16	.870
Sex	-1.52	.11	-.13	-13.64	<.001
Income	-.20	.03	-.08	-7.65	<.001
Hispanic/Latino Background	-.01	.04	-.00	-.22	.823
Field Center	-.24	.05	-.05	-4.58	<.001
Education	-1.01	.07	-.15	-14.96	<.001
Ethnic Identity	-.42	.10	-.04	-4.17	<.001
U.S. Acculturation	.50	.09	.07	5.84	<.001

Ethnic Identity x U.S. Acculturation	-.57	.13	-.05	-4.50	<.001
	F (9,9819) = 66.88, p < .001, $AdjR^2$= .058				

Table 35.

Study 2: Summary of Regression Analyses for Variables Predicting Depression (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	9.48	.31		30.70	<.001
Age	.04	.00	.09	8.98	<.001
Sex	-1.77	.12	-.15	-15.00	<.001
Income	-.16	.03	-.06	-6.02	<.001
Hispanic/Latino Background	-.01	.04	-.00	-.26	.795
Field Center	-.43	.06	-.08	-7.79	<.001
Education	-.73	.07	-.10	-10.20	<.001
Ethnic Identity	-.33	.11	-.03	-3.06	.002
U.S. Acculturation	.64	.09	.08	7.14	<.001
Ethnic Identity x U.S. Acculturation	-.19	.13	-.01	-1.44	.149
	F (9,9819) = 66.44, p < .001, $AdjR^2$= .057				

H3a. Years Lived in the U.S. will moderate the relation of ethnic identity and cardiovascular health, such that more years lived in the U.S. will be associated with worse cardiovascular health outcomes for the overall sample.

The statistical model that included all of the predictors accounted for 27% of the variation in cardiovascular health [$AdjR^2$ = 0.27; F(9,9819)=394.77, p < .01]. Results suggested that the interaction of ethnic identity and years lived in the U.S. on cardiovascular health was not statistically significant, [b = 0.00; t(9819)=-0.51, CI_b (-0.01, 0.01), p = 0.613]. In addition, the main effect of ethnic identity on cardiovascular health was not statistically significant, [b = -0.02;

t(9819)=-1.87, CI_b (-0.03, 0.01), *p* = 0.062]. However, the main effect of years lived in the U.S. was statistically significant [*b* = 0.02; *t*(9819)=4.97, CI_b (0.00, 0.01), *p* < .01] *(see Table 36)*.

Table 36.

Study 2: Summary of Regression Analyses for Variables Predicting Cardiovascular Health (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	-.61	.02		-25.85	<.001
Age	.02	.00	.48	52.06	<.001
Sex	.09	.01	.08	9.67	<.001
Income	-.01	.00	-.04	-4.09	<.001
Hispanic/Latino Background	-.00	.00	-.01	-1.08	.279
Field Center	.00	.00	.00	-.06	.956
Education	-.04	.01	-.07	-8.18	<.001
Ethnic Identity	-.02	.01	-.02	-1.87	.062
Years Lived in U.S.	.00	.00	.05	4.97	<.001
Ethnic Identity x Years in U.S.	.00	.00	-.00	-.51	.613
	F (9,9819) = 394.77, p < .001, $AdjR^2$= .266				

H3b. Years Lived in the U.S. will moderate the relation of ethnic identity and psychological health, such that more years lived in the U.S. will be associated with worse psychological health outcomes for the overall sample.

<u>*Ethnic Identity, Years Lived in U.S., and Anxiety*</u>. For anxiety, the model that included all of the predictors accounted for 6% of the variation in anxiety [$AdjR^2$ = 0.06; F(9,9819)=65.04, *p* < .01]. Results indicated that the interaction of ethnic identity and years lived in the U.S. on anxiety was statistically significant, [b = -0.04; t(9819)=-5.24, CI_b (-0.05, -0.02), *p* < .01]. In

addition, the main effect of ethnic identity on anxiety was statistically significant [b = -0.48; t(9819)=-4.85, CI_b (-0.68, -.28), $p < .01$] and the main effect of years lived in the U.S. on anxiety was also statistically significant [b = 0.02; t(9819)=4.29, CI_b (-0.01, 0.03), $p < .01$] (see Table 37).

The interaction of ethnic identity and years lived in the U.S. on anxiety was then probed at one standard deviation above and one standard deviation below the sample average for years lived in the U.S. For those who lived more years in the U.S. (i.e., one SD above the sample mean), the simple slope was statistically significant [b = -1.16; t(9819)=-7.27, CI_b (-1.48, -0.85), $p < .01$]. Regarding effect size, for every additional point in ethnic identity for individuals with more years in the U.S., there was a predicted 1.16-unit decrease in severity of anxiety. For individuals with less years lived in the U.S. (i.e., one SD below the sample mean), the simple slope was not statistically significant [b = 0.20; t(9819)=1.17, CI_b (0.13, 0.52), $p = 0.240$].

Ethnic Identity, Years Lived in U.S., and Depression.

For depression, the model that included all of the predictors accounted for 6% of the variation in depression [$AdjR^2 = 0.06$; F(9,9819)=64.84, $p < .01$]. Results indicated that the interaction of ethnic identity and years lived in the U.S. on depression was statistically significant, [b = -0.03; t(9819)=-4.46, CI_b (-0.05, -0.02), $p < .01$]. In addition, the main effect of ethnic identity on depression was statistically significant [b = -0.39; t(9819)=-3.73, CI_b (-0.60, -.19), $p < .01$] and the main effect of years lived in the U.S. on depression was also statistically significant [b = 0.02; t(9819)=4.70, CI_b (0.01, 0.03), $p < .01$] *(see Table 38)*.

The interaction of ethnic identity and years lived in the U.S. on depression was then probed at one standard deviation above and one standard deviation below the sample average for years lived in the U.S. For those who lived more years in the U.S. (i.e., one SD above the sample

mean), the simple slope was statistically significant [b = -1.00; t(9819)=-5.94, CI_b (-1.34, -0.67), $p < .01$]. Regarding effect size, for every additional point in ethnic identity for individuals with more years in the U.S., there was a predicted 1.00-unit decrease in severity of depression. For individuals with less years lived in the U.S. (i.e., one SD below the sample mean), the simple slope was not statistically significant [b = 0.22; t(9819)=1.24, CI_b (-0.13, 0.56), $p = .220$].

Table 37.

Study 2: Summary of Regression Analyses for Variables Predicting Anxiety (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	21.40	.30		72.48	<.001
Age	-.01	.00	-.04	-3.53	<.001
Sex	-1.47	.11	-.13	-13.17	<.001
Income	-.19	.03	-.07	-7.24	<.001
Hispanic/Latino Background	.03	.04	.01	.71	.479
Field Center	-.29	.05	-.06	-5.52	<.001
Education	-.93	.07	-.14	-14.08	<.001
Ethnic Identity	-.48	.10	-.05	-4.85	<.001
Years Lived in U.S.	.02	.01	.05	4.29	<.001
Ethnic Identity x Years in U.S.	-.04	.01	-.05	-5.24	<.001
				F (9,9819) = 65.04, p < .001, $AdjR^2$= .056	

Table 38.

Study 2: Summary of Regression Analyses for Variables Predicting Depression (N=9,820)

Variables	*B*	*SE*	*β*	t	*P*
(constant)	9.88	.31		31.72	<.001
Age	.02	.00	.05	5.11	<.001
Sex	-1.71	.12	-.14	-14.50	<.001
Income	-.15	.03	-.06	-5.62	<.001
Hispanic/Latino Background	.04	.04	.01	.91	.366
Field Center	-.49	.06	-.09	-8.84	<.001
Education	-.62	.07	-.09	-8.93	<.001
Ethnic Identity	-.39	.11	-.04	-3.73	<.001
Years Lived in U.S.	.02	.01	.05	4.70	<.001
Ethnic Identity x Years in U.S.	-.03	.01	-.04	-4.46	<.001
				F (9,9819) = 64.84, p < .001, $AdjR^2$= .056	

Racial Differences

The regression and moderation models examining the relation of ethnic identity and health (cardiovascular and psychological), moderated by acculturation and the years lived in the U.S., was run separately for those who identify as Afro-Latino and those who are non-Black Hispanic/Latino. Significant results are presented below.

H4a. The relation of ethnic identity and health (cardiovascular and psychological) is stronger for non-Black Hispanic/Latinos compared to Afro-Latinos.

Cardiovascular Health. A regression analysis was conducted to test whether the relationship between ethnic identity and cardiovascular health differs between non-Black Hispanic/Latinos and Afro-Latinos. The main effect of ethnic identity was significant (B = -0.02, t(9819) = -1.98, *p* = .048) indicating that higher ethnic identity was associated with less

cardiovascular disease risk factors (better cardiovascular health). The main effect of racial group membership was not significant (B = 0.30, t(9819) = 1.574, p = .116), indicating no significant difference in cardiovascular health between non-Black Hispanic/Latinos and Afro-Latinos when ethnic identity is average. In addition, the interaction term between ethnic identity and racial group membership was not significant (B = -0.03, t(9819) = -1.04, p = .30) suggesting that the strength of the relationship between ethnic identity and health did not differ significantly between Afro-Latinos and non-Black Hispanic/Latinos.

Psychological Health. A regression analysis was conducted to test whether the relationship between ethnic identity and anxiety differs between non-Black Hispanic/Latinos and Afro-Latinos. The main effect of ethnic identity was significant, B = -0.51, t(9819) = -5.01, p < .01, indicating that higher ethnic identity was associated with better anxiety outcomes. The main effect of racial group membership was also significant, B = 1.03, t(9819) = 4.27, p < .01, indicating that Afro-Latinos have significantly worse anxiety (higher scores on anxiety measure) compared to non-Black Hispanic/Latinos when ethnic identity was at its mean. However, the interaction term between ethnic identity and racial group membership was not significant, B = -0.40, t(9819) = -0.98, p = .326, suggesting that the strength of the relationship between ethnic identity and anxiety did not differ significantly between non-Black Hispanic/Latinos and Afro-Latinos.

A regression analysis was conducted to test whether the relationship between ethnic identity and depression differed between non-Black Hispanic/Latinos and Afro-Latinos. The main effect of ethnic identity was significant, B = -0.45, t(9819) = -4.18, p < .01, indicating that higher ethnic identity was associated with better depression outcomes. The main effect of racial group membership was also significant, B = 1.37, t(9819) = 5.39, p < .01, indicating that Afro-

Latinos have worse depression outcomes (higher scores on depression scale) compared to non-Black Hispanic/Latinos when ethnic identity is at its mean. However, the interaction term between ethnic identity and racial group membership was not significant, B = 0.06, t(9819) = 0.14, p = .89, suggesting that the strength of the relationship between ethnic identity and depression did not differ significantly between non-Black Hispanic/Latinos and Afro-Latinos. Thus, hypothesis 4a was not supported.

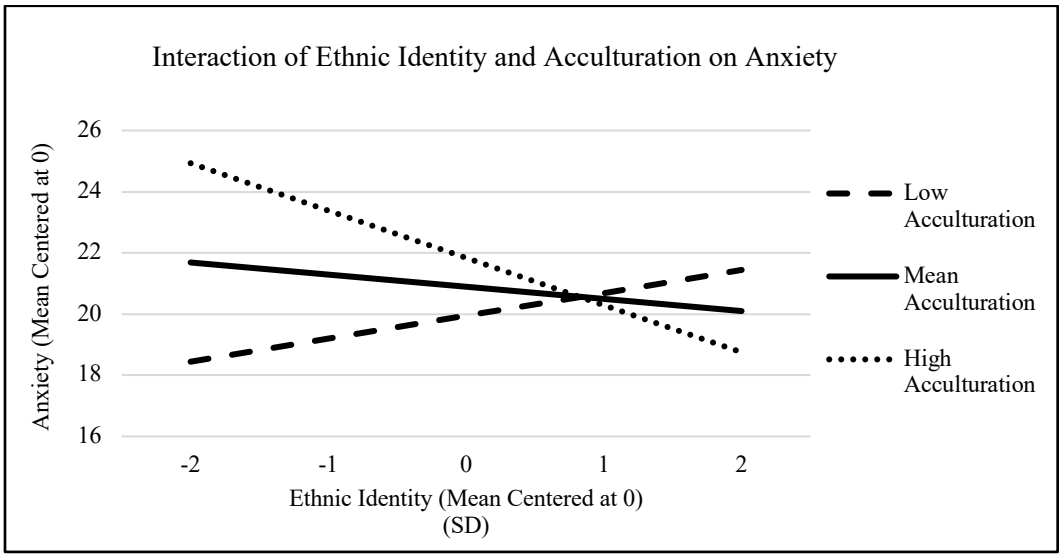
H4b. The moderating effect of acculturation on the relation of ethnic identity and health (cardiovascular and psychological) will be stronger for non-Black Hispanic/Latinos compared to Afro-Latinos.

Ethnic Identity, Acculturation, and Anxiety. For Non-Black Hispanic/Latinos, the overall model was significant [AdjR^2 = .05; F(9,9230)=57.81, p < .01], explaining a significant proportion of variance in anxiety. Ethnic identity [b = -0.40; t(9230)=-3.83, CI_b (-0.60, -0.19), p < .01] and acculturation [b = 0.45; t(9230)=5.14, CI_b (0.28, 0.62), p < .01] significantly predicted severity in anxiety. In addition, the interaction term between ethnic identity and acculturation was also significant [b = -0.54; t(9230)=-4.13, CI_b (-0.80, -0.29), p < .01]. This suggests that for every additional point for ethnic identity, non-Black Hispanic/Latinos experienced a 0.54-unit decrease in the severity of anxiety. Figure 7 visually illustrates this interaction.

Conversely, for Afro-Latinos, although acculturation was a significant predictor of anxiety [b = 0.93; t(588)=2.42, CI_b (0.18, 1.69), p = .016], ethnic identity [b = -0.70; t(588)=-1.70, CI_b (-1.51, 0.11), p = .090] and the interaction term between ethnic identity and acculturation [b = -0.79; t(588)=-1.58, CI_b (-1.77, 0.19), p =.115] were not significant predictors of anxiety. This suggests that, for Afro-Latinos, changes in ethnic identity and years in the U.S. did not significantly affect the severity of anxiety.

Figure 7.

Study 2: Interaction of Ethnic Identity and Acculturation on Anxiety for non-Black Hispanic/Latinos (n=9,231)



H4c. The moderating effect of years lived in the U.S. on the relation of ethnic identity and health (cardiovascular and psychological) will be stronger for Afro-Latinos compared to non-Black Hispanic/Latinos.

Ethnic Identity, Years Lived in U.S., and Anxiety.

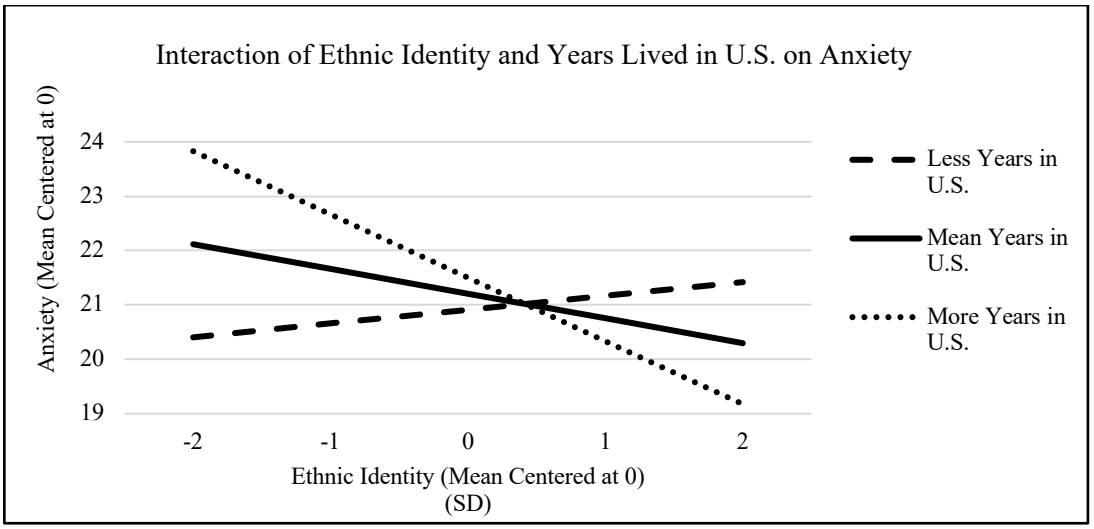
For Non-Black Hispanic/Latinos, the overall model was significant [AdjR^2 = .05; F(9,9230)=56.85, $p < .01$], explaining a significant proportion of variance in anxiety. Ethnic identity [b = -0.46; t(9230)=-4.42, CI_b (-0.66, -0.25), $p < .01$] and years lived in the U.S. [b = 0.02; t(9230)=3.52, CI_b (0.01, 0.03), $p < .01$] significantly predicted severity in anxiety. In addition, the interaction term between ethnic identity and years in the U.S. was also significant [b = -0.04; t(9230)=-5.34, CI_b (-0.06, -0.03, $p < .01$]. This suggests that for every additional point for ethnic identity, non-Black Hispanic/Latinos experienced a .04-unit decrease in the severity of

anxiety for those with an average amount of years lived in the U.S. Figure 8 visually illustrates this interaction.

Conversely, for Afro-Latinos, although years lived in the U.S. was a significant predictor of anxiety [b = 0.06; t(588)=3.05, CI_b (0.02, 0.10), p = .002], ethnic identity [b = -0.77; t(588)=-1.90, CI_b (-1.57, 0.02), p = .058] and the interaction term between ethnic identity and years in the U.S. [b = -0.01; t(588)=-0.25, CI_b (-0.07, 0.05), p = .800] were not significant predictors of anxiety. This suggests that, for Afro-Latinos, changes in ethnic identity and years in the U.S. did not significantly affect the severity of anxiety.

Figure 8.

Study 2: Interaction of Ethnic Identity and Years Lived in the U.S. on Anxiety for non-Black Hispanic/Latinos (n=9,231)



Ethnic Identity, Years Lived in U.S., and Depression.

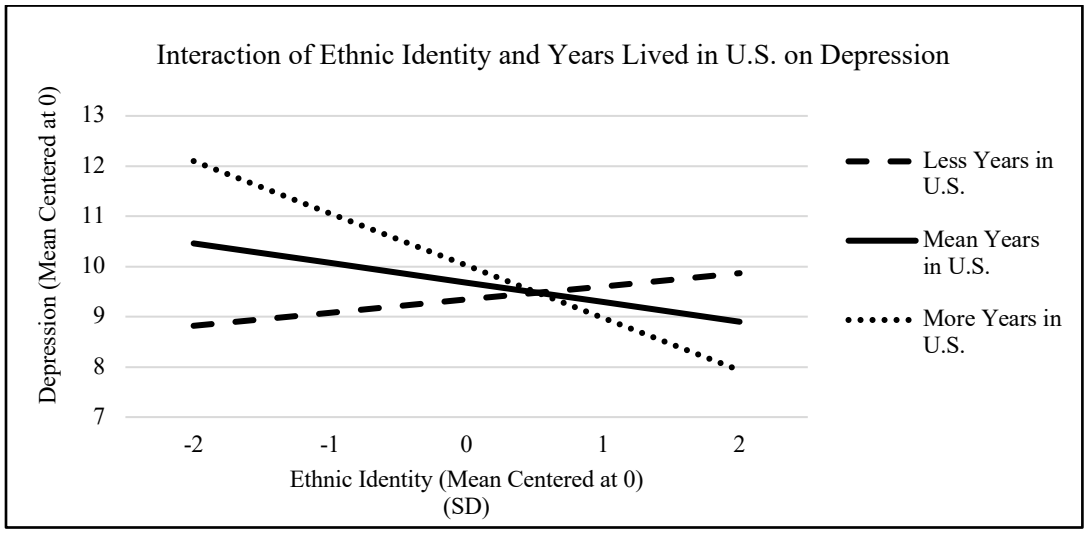
For Non-Black Hispanic/Latinos, the overall model was significant [AdjR^2 = .05; F(9,9230)=55.92, p < .01], explaining a significant proportion of variance in depression. Ethnic

identity [b = -0.39; t(9230)=-3.61, CI_b (-0.60, -0.18), $p < .01$] and years lived in the U.S. [b = 0.02; t(9230)=3.83, CI_b (0.01, 0.03), $p < .01$] significantly predicted severity in depression. In addition, the interaction term between ethnic identity and years in the U.S. was also significant [b = -0.04; t(9230)=-4.68, CI_b (-0.05, -0.02), $p < .01$]. This suggests that for every additional point for ethnic identity, non-Black Hispanic/Latinos experienced a .04-unit decrease in the severity of depression. Figure 9 visually illustrates this interaction.

Conversely, for Afro-Latinos, although years lived in the U.S. was a significant predictor of depression [b = 0.07; t(588)=3.18, CI_b (0.03, 0.12), $p = .002$], ethnic identity [b = -0.28; t(588)=-0.61, CI_b (-1.18, 0.62), $p = .543$] and the interaction term between ethnic identity and years in the U.S. [b = 0.00; t(588)=0.03, CI_b (-0.07, 0.07), $p = .975$] were not significant predictors of depression. This suggests that, for Afro-Latinos, changes in ethnic identity and years in the U.S. did not significantly affect the severity of depression.

Figure 9.

Study 2: Interaction of Ethnic Identity and Years Lived in the U.S. on Depression for non-Black Hispanic/Latinos (n=9,231)



Study 2: Discussion

Study 2 aimed to investigate the importance of ethnic identity on cardiovascular health and psychological health, with a particular focus on how acculturation and years lived in the U.S. moderate these relations for Afro-Latinos and non-Black Hispanic/Latinos. The findings of this study reveal that: (1) for the overall sample, ethnic identity was associated with all three types of health (cardiovascular health, anxiety, and depression) and (2) neither acculturation nor years lived in the U.S. moderated the relation of ethnic identity with cardiovascular health. However, (3) acculturation and years lived in the U.S. did moderate the association of ethnic identity with anxiety, and (4) years lived in the U.S. moderated the relation of ethnic identity and depression. However, when analyzing the racial groups separately, these moderation effects were only seen for non-Black Hispanic/Latinos.

The significant interaction between ethnic identity and acculturation/years lived in the U.S. for psychological health outcomes suggests that ethnic identity plays a crucial role in the mental well-being of non-Black Hispanic/Latinos in the U.S., specifically. This finding aligns with previous research indicating that a strong sense of racial or ethnic identity can provide psychological benefits, such as greater self-esteem and resilience against stressors related to discrimination and marginalization (Phinney & Chavira., 1992; Roberts et al., 1999; Williams et al., 2012). For non-Black Hispanic/Latinos, acculturation appears to enhance the protective effects of ethnic identity, potentially by facilitating better coping mechanisms and access to supportive social networks. It is possible that because Afro-Latinos who live in the U.S. must contend with racial dynamics of the U.S. that differ from their home country and in ways that non-Black Hispanic/Latinos do not have to, a positive ethnic identity may not be as important for health outcomes for this group. Specifically, Hispanic/Latinos who explicitly identify as Black

might face unique stressors and discrimination experiences that differ from those of non-Black Hispanic/Latinos, potentially altering the way ethnic identity and acculturation interact to affect health. The intersection of racial and ethnic identities might require a more nuanced approach to fully understand the distinct experiences and health outcomes within this subgroup.

It is also possible that the process of acculturation differs significantly between non-Black Hispanic/Latinos and Afro-Latinos. Non-Black Hispanic/Latinos might experience a more linear process of acculturation, where increased acculturation aligns with improved psychological health outcomes due to better social integration and support. In contrast, Afro-Latinos may face compounded stressors related to both racial and ethnic discrimination, which could dilute the potential benefits of acculturation and positive ethnic identity on their health. For example, non-Black Hispanic/Latinos might find more supportive environments that validate their ethnic identity as they acculturate, leading to better psychological outcomes. Black Hispanic/Latinos, however, might experience more systemic racism and social exclusion, which could overshadow the positive effects of a strong ethnic identity and acculturation on their psychological health.

In addition, the interaction between ethnic identity and acculturation/years lived in the U.S. did not yield significant results for cardiovascular health outcomes for neither group. This discrepancy might be attributed to several factors. Cardiovascular health is influenced by a complex interplay of biological, environmental, and behavioral factors that may not be as directly impacted by ethnic identity and acculturation as psychological health is. Similar to Study 1, future research exploring how other potential moderators, such as familism, emotion regulation, or social support may provide a better understanding of the pathways linking ethnic identity, acculturation, and cardiovascular health.

Limitations and Conclusion

Although this study provides great insight into the relevance of ethnic identity for cardiovascular and psychological health, there are some limitations. First, a large number of participants in the overall HCHS/SOL sample (N=16,415) either declined to indicate their race or self-reported their race as "unknown" (35.4% of the overall HCHS/SOL sample). Thus, there may be a significant number of participants in the HCHS/SOL study who are of Afro-Latino or non-Black Hispanic/Latino backgrounds that were not included in analyses. However, given that I am interested in explicit racial identification, this study was still able to examine those who identify with a specific race (high racial centrality), which is important for understanding identity. Another limitation is the cross-sectional design, and that all variables of interest were tested at the same time point. Thus, conclusions cannot be drawn about temporality or causality, and other models (e.g., acculturation or years lived in the U.S. affecting ethnic identity) may be plausible. Furthermore, the participants of the present study were only recruited from four major cities within the U.S. from 2008-2011. Since then, there has been more recognition given to the ethnic/racial dynamics in the Hispanic/Latino community which may affect current levels of ethnic identity for Hispanic/Latinos today. Despite these limitations, this study underscores the importance of considering the intersectionality of racial and ethnic identities in health research.

Overall, findings from this study highlight the need to consider the racial dynamics and unique experiences of racial subgroups within Hispanic/Latinos. By acknowledging and addressing these differences, we can better support the physical and psychological health of all Hispanic/Latino individuals.

Chapter 4

GENERAL DISCUSSION

The aim of this dissertation research was to explore the significance of racial and ethnic identity for both cardiovascular and psychological health across two separate studies. Study 1 focused on African-Americans, Continental Africans, and Afro-Caribbean/Latinos, examining the moderating effects of discrimination, racial socialization, and acculturative stress on the relation of racial identity and health (cardiovascular and psychological). Study 2 extended this investigation to Hispanic/Latinos, assessing how acculturation and years lived in the U.S. moderates the relation of ethnic identity and health for Afro-Latinos and non-Black Hispanic/Latinos.

In Study 1, the results indicated that, contrary to the initial hypotheses, most findings were not significant, except for three key areas. First, higher racial identity related to worse BMI and depression outcomes for the overall sample. Second, for African-Americans, higher racial identity was only strongly related to worse depression for those with high levels of socialization. Third, for Continental Africans, discrimination and socialization were found to moderate the relation of racial identity and physical activity. Specifically, higher racial identity was only strongly related to lower physical activity for those with high levels of discrimination and high levels of socialization. This suggests that racial identity might play a more complex and nuanced role in health outcomes than previously understood, with varying impacts depending on the specific health outcome and Black/Afro-descended group.

In Study 2, the results suggest the following: (1) ethnic identity was associated with all three types of health (cardiovascular health, anxiety, and depression), (2) neither acculturation nor years lived in the U.S. moderated the relation of racial identity and cardiovascular health, (3)

acculturation and years lived in the U.S. moderated the relation of racial identity and anxiety, and (4) years lived in the U.S. moderated the relation of racial identity and depression. However, for all significant moderation results, these patterns were only observed for non-Black Hispanic/Latinos. Thus, overall, the findings on the moderating effects of acculturation and years lived in the U.S. on the relation of ethnic identity and health were significant only for psychological health outcomes, and exclusively for non-Black Hispanic/Latinos. This indicates that while ethnic identity and acculturation/years lived in the U.S. significantly impact psychological health, these variables do not have the same effect on cardiovascular health within this sample. Several factors could explain the differences in findings between the two studies and across different groups.

Immigration and Acculturative Stress. Immigrants often face significant stressors, including cultural adaptation, discrimination, and changes in social support systems. These stressors can impact psychological health more immediately and profoundly than cardiovascular health. The significant findings for psychological health in non-Black Hispanic/Latinos may reflect the acute mental health challenges associated with acculturation and the protective role of a high, positive ethnic identity in mitigating these challenges. However, when adding race, these patterns are different for Afro-Latinos, highlighting the complexity of a Black racial identity, Hispanic/Latino ethnicity, immigrant identity, and other factors that compound to affect acculturative stress.

*Differential Impact of Identity***.** The differing significance of ethnic/racial identity on health outcomes between African-Americans, Continental Africans, and Afro-Caribbeans/Latinos suggests that identity might interact with health in complex ways. For African-Americans, a strong racial identity related to worse depression at high levels of racial

socialization. This may be due to this heightened awareness (high socialization) leading to increased stress about potential discrimination (preparation for bias), which exacerbates depressive symptoms. To explain, the cultural norms for African-Americans that focus on racial pride and identity, while empowering, can sometimes make individuals more aware of the systemic barriers and discrimination they face, leading to greater psychological distress. Furthermore, the constant emphasis on preparing for bias can amplify feelings of stress. This can lead to a heightened sense of threat and anxiety, contributing to depressive symptoms.

It is also possible that for Continental Africans and Afro-Caribbeans/Latinos, ethnic identity is more protective for psychological health in ways that are not relevant for African-Americans who are more likely to have a salient racial identity. Ethnic identity may be more relevant for foreign-born Black Americans (and recent descendants of foreign-born Black Americans) who often maintain a strong sense of national, ethnic, and cultural identity tied to their country of origin (Acheme & Cionea, 2024). This intricate identity can be a source of pride and community, distinct from the racial identity they develop in the U.S. In contrast, African-Americans have developed a significant, monolithic, identity that is more closely tied to race, shaped by a history of racial experiences and systemic discrimination within the U.S. context. Therefore, racial identity plays a more central role in the lives of African-Americans, influencing their social interactions and mental health more profoundly.

Still, findings were significant for physical health for Continental Africans and Afro-Caribbeans/Latinos because increased socialization into U.S. standards is associated with worse physical health outcomes. To explain, for Continental Africans and Afro-Caribbean/Latinos, higher racial identity was more strongly related to worse physical health (physical activity) when racial discrimination and socialization was high. This is potentially due to cultural norms and

practices related to physical health. The cultural adjustment and the added pressure to navigate a new environment (the U.S.) can lead to chronic stress, which negatively affects physical health and reduces the likelihood of engaging in physical activities. These groups, who have not had generations to adapt physically to U.S. cultural norms (like African-Americans have) are seeing the physical effects of being socialized into a culture where one is likely to experience racial discrimination. In contrast, this pattern is not observed among African-Americans, who have a long history within the U.S. and may have developed more robust coping mechanisms against the stressors present in the U.S. context on physical health.

Intersectionality and Systemic Factors. The lack of significant findings for identity, acculturation/years lived in the U.S., and cardiovascular health could also be attributed to systemic factors that disproportionately affect minority populations in the U.S. Structural racism, socioeconomic disparities, and limited access to healthcare might overshadow the protective effects of a positive racial or ethnic identity. These systemic issues can contribute to chronic stress and adverse health outcomes that are not easily mitigated by individual-level factors like identity.

Overall, the findings from these studies have important implications for understanding health disparities within the Black/African diaspora. First, strengthening racial and ethnic identity could be a valuable strategy for enhancing psychological resilience in these populations. Still, Black/Afro-descended persons are a unique group, and this dissertation research highlights the need to not only focus on individual behaviors and identities but also systemic barriers such as access to healthcare, inequality, and discrimination.

Future Directions

Future research should continue to explore the complex interplay between identity, acculturation, and health outcomes across diverse racial and ethnic groups. Longitudinal studies could provide deeper insights into how these relationships evolve over time and across different stages of acculturation.

Future research should also consider the developmental stage of participants as it may significantly impact the formation of and levels of ethnic/racial identity. In Study 1, the participants were on average young adults (M=23.63). Young adulthood is a crucial period for identity development, including ethnic and racial identity, as individuals are often in the process of exploring and solidifying their sense of self (Phinney, 2006; Schwartz & Pantin, 2006; Syed & Azmitia, 2009; Umaña-Taylor et al., 2014). This stage is marked by significant life transitions, such as pursuing higher education, entering the workforce, and establishing independent living, all of which can influence identity formation. The challenges and experiences young adults face, including encounters with discrimination and opportunities for socialization, can shape their ethnic and racial identity in profound ways.

In contrast, Study 2 involved participants who were on average 42.67 years old. At this stage of life, individuals typically have a more stable and established sense of identity, including their ethnic and racial identity. Midlife is often characterized by a focus on maintaining established roles and responsibilities, such as career advancement, family commitments, and community involvement. The experiences of individuals in this age group with discrimination and socialization may differ from those in younger adulthood, potentially influencing the way ethnic and racial identity relates to cardiovascular and psychological health outcomes. It is possible that the differences in the average age of participants between the two studies may

account for variations in the findings. Future research should consider these developmental stages to better understand how identity evolves and impacts health across the lifespan, especially in the context of immigration and the significant impact it may have on identity development when it occurs at various life stages.

The next steps for this research involve incorporating qualitative methods that could help capture the lived experiences of individuals and provide a more comprehensive understanding of how identity impacts health. Because ethnic and racial identity was measured using standardized measures, there may be aspects of Black identity that were not captured through these scales. A qualitative study would allow participants from different Black/Afro-descended backgrounds to share their personal narratives and perspectives on their identity development here in the U.S. This can potentially reveal the subtle and nuanced components of identity and its connection to health that quantitative methods can draw from in the future.

Conclusion

Today, research in cardiovascular and psychological health is of critical importance for Black Americans, who consistently experience the worst health outcomes among racial and ethnic groups in the United States. This is especially important for cardiovascular health as this population faces disproportionately higher rates of hypertension, heart failure, stroke, and related complications, contributing to a significantly lower life expectancy (Carnethon et al., 2018). Although social determinants of health, like socioeconomic status and access to quality healthcare, play an important role in these disparities, systemic racism and the chronic stress associated with racial discrimination further exacerbate these health issues. By focusing research efforts on understanding the role of a positive racial identity and other protective factors in cardiovascular health, we can develop holistic ways to address these disparities.

It is time to move past examining health from a deficit perspective for Black Americans and move towards highlighting and fostering the positive, protective factors such as social support, community engagement, and resilience. This will play a significant role in mitigating the adverse effects of systemic inequities on overall health. Furthermore, by placing the spotlight on Black Americans in health research, we can explore the cultural differences among members of the Black/African diaspora living in the U.S. as this is also critical for creating effective strategies that account for diverse experiences. Though other Black/Afro-descended groups have distinct cultures and histories that should be recognized, African-Americans possess a significant history with established roots in the U.S. that carry important implications for health and well-being. Thus, due to these real and consequential differences, we should evolve from categorizing every Black/Afro-descended person in the U.S. as African-American, as this erases the uniqueness of each group.

In conclusion, the findings from these studies emphasize the need for a multidimensional approach to health that considers the cultural, social, and structural factors influencing health in diverse communities within the Black/African diaspora. Although most of the hypotheses lacked evidence to support the importance of racial identity for cardiovascular health for Black/Afro-descended persons, these studies are encouraging for further exploring ethnic differences within the diaspora. Furthermore, they highlight the need to understand immigration and acculturation for those coming to the U.S. and adapting to American ideas of race and ethnicity. By addressing these multifaceted factors, the field of psychology, and society altogether, can work towards reducing health disparities and promoting health equity for all.

Footnotes:

[1]Initially, I planned to run a mediation analysis to test whether acculturation mediates the relation of years lived in the U.S. and health (cardiovascular and psychological). However, after a thorough review of the literature, I found evidence suggesting a more complex interaction between these variables. Consequently, my research model shifted to examining whether acculturation and years lived in the U.S. moderated the relation of ethnic identity and health. Although I tested the proposed mediation model, the empirical data did not support it, and therefore, it is not further discussed in this study.

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