

PERCEIVED RACISM AND SUBSTANCE USE AMONG LATINO IMMIGRANT MEN

India Jane Ornelas

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Approved By:

Eugenia Eng, DrPH

Guadalupe X. Ayala, PhD, MPH

Robert DeVellis, PhD

Laura Linnan, ScD

Krista Perreira, PhD

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ABSTRACT

India Jane Ornelas

Perceived Racism and Substance Use among Latino Immigrant Men
(Under the direction of Eugenia Eng)

Introduction: Latino immigrant men face many stressors, including perceived racism, which put them at risk for binge drinking and cigarette smoking. Few studies have assessed the relationship between perceived racism and substance use in this population. **Methods:** This study was a secondary analysis of data from 291 Latino immigrant men in North Carolina. The study's aims were: (1) to evaluate the utility of the Reactions to Race measure of perceived racism, (2) to examine the relationship between perceived racism and substance use behaviors, (3) to examine whether the relationship between perceived racism and substance use was mediated by stress responses to perceived racism, and (4) to examine whether the relationship between perceived racism and substance use was mediated or moderated by coping resources. The reliability and validity of the perceived racism measure was evaluated using correlations and factor analysis. Logistic regression was used to test for the association between perceived racism and odds of having engaged in binge drinking in the past 30 days and being a current cigarette smoker as well as mediation and moderation of this relationship. **Results:** The Reactions to Race items measured three key dimensions of perceived racism: racial consciousness, unfair racial treatment in work and health care settings, and responses to unfair racial treatment. However, the measure did not capture the dimensions of language and legal status discrimination, which were the most cited sources of discrimination. The percentage of binge drinkers (44%) and current cigarette smokers (36%) in our sample were higher than those reported by previous studies of Latinos in North Carolina. Language (OR = 2.69,

95% CI: 1.56 – 4.64) and legal status (OR = 2.05, 95% CI: 1.20 – 3.49) discrimination were associated with increased odds of having engaged in binge drinking in both crude and adjusted models. Perceived racism was not significantly associated with cigarette smoking. Stress responses did not mediate the relationship between perceived racism and binge drinking, nor did coping resources mediate or moderate this relationship. **Conclusion:** Further research is needed on perceived racism, stress, coping and health among Latino immigrants, especially the effects of language and legal status discrimination.

To my parents, whose nurturing and optimism gave me the confidence to achieve my goals.

To my partner, Kate, whose love gives me strength.

To my son, Teo, who inspires me to give more.

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LIST OF ABBREVIATIONS

Abbreviation	Definition
BRFSS	Behavioral Risk Factor Surveillance System
CARDIA	Coronary Artery Risk Disease in Adults
CI	Confidence interval
EOD	Experiences of Discrimination
GEE	Generalized estimating equations
HoMBReS	Hombres Manteniendo Bienestar y Relaciones Saludables
ICC	Intra-class correlation
INS	Immigration and Naturalization Service
IRB	Institutional Review Board
MAN	Men as Navigators
NC	North Carolina
NSOL	National Survey of Latinos
OR	Odds ratio
SRE	Schedule of Racist Events
UNC	University of North Carolina
US	United States

CHAPTER 1: INTRODUCTION

Problem Statement

Increasing migration from Latin America has led to large demographic changes in the United States (US). The number of people who identify themselves as Hispanic or Latino in the US has grown from 22 million in 1990 to 42 million in 2004 (U.S. Census, 2001). In North Carolina (NC), the number of Latinos increased by almost 400% from 1990 to 2000, giving the state the fastest growing Latino population in the US (U.S. Census, 2001). Latino men migrate to the southeastern United States because of the promise of wage-earning opportunities. Nevertheless, these men face significant barriers in adapting to their new environment, including: language differences, legal status, and racism (Cuadros, 2006; Dalla, Ellis, & Cramer, 2005). Exposure to these stressors can contribute to their adopting unhealthy behaviors such as tobacco use and excessive alcohol consumption (Abraido-Lanza, Armbrister, Florez, & Aguirre, 2006; Finch, Kolody, & Vega, 2000).

Among Latino men, 23% report binge drinking within the past 30 days and 23% are current smokers (Centers for Disease Control and Prevention, 2006; Naimi et al., 2003). The health consequences of alcohol and tobacco use are serious. Tobacco use is the leading cause of preventable mortality in the US, contributing to more than 445,000 deaths annually; while alcohol use is the third leading cause of preventable death, contributing to over 85,000 deaths per year (Mokdad, Marks, Stroup, & Gerberding, 2004). Binge drinking, which is defined as at least five drinks per occasion for men, accounts for more than half of all alcohol-related deaths (Centers for Disease Control and Prevention, 2004). Both tobacco use and binge drinking are risk factors for cardiovascular disease and several types of

cancer, which comprise over 40% of deaths among adult Latino males (Heron & Smith, 2007).

Study Rationale

Studies have shown that the longer Latino immigrants reside in the US the greater their risk for substance use (Abraido-Lanza, Chao, & Florez, 2005; Otero-Sabogal, Sabogal, Perez-Stable, & Hiatt, 1995; Vega & Amaro, 1994; Wilkinson et al., 2005). Theory and empirical evidence suggest that this may be partially due to increased exposure to racism. Several scholars have formulated theories or models to explain the impact of racism on health, including the Ecosocial and Biopsychosocial models. Krieger's Ecosocial Model is a multi-level epidemiological framework that describes pathways by which discrimination is embodied and results in poor health outcomes (Krieger, 2000, 2005). The Biopsychosocial Model, developed by Clark and colleagues, conceptualizes racism as a form of stress that results in emotional and physical stress responses that lead to poor health (Clark, Anderson, Clark, & Williams, 1999). The authors of the model assert that researchers should focus on the health effects of *perceived racism*, the subjective experience of racial discrimination; because perceived racism can be harmful, whether or not it is actually experienced. Elements of the Biopsychosocial Model are based on Lazarus and Folkman's theory of stress and coping, which describes how different aspects of coping mediate and moderate the negative health effects of racism (Lazarus & Folkman, 1984). All three theories and models provide a paradigm for understanding racism as a determinant of health; however, few of these theoretical relationships have been empirically tested among Latino populations. Furthermore, most of the empirical evidence linking racism with increased alcohol and tobacco use has focused on the experiences of African-Americans (Paradies, 2006; Williams, Neighbors, & Jackson, 2003). The goal of the dissertation study was to

address this gap in the literature by examining these relationships among Latino immigrant men.

Study Aims

The study was a secondary analysis of cross-sectional data collected for the studies Men as Navigators (MAN) for Health and *Hombres Manteniendo Bienestar y Relaciones Saludables* (HoMBReS) - Men Maintaining Wellness and Healthy Relationships. I used baseline data collected from 291 Latino immigrant men that participated in the MAN for Health and HoMBReS studies in Chatham County, North Carolina during 2005 and 2006. Survey data were collected through self-administered questionnaires which included measures of health behaviors, racism, coping, and demographic characteristics. The specific aims of the study are described below.

Aim 1: To evaluate the utility of the Reactions to Race items as a measure of perceived racism among Latino immigrant men. In order to understand the impact of perceived racism on substance use, it is important to have a clear conceptualization and operationalization of racism among Latino immigrants. Because most previous public health research on perceived racism has focused on the experiences of African Americans, few measures of perceived racism have been tested for validity and reliability among Latino populations. For this aim, I evaluated whether an existing measure of perceived racism, the Reactions to Race module of questions, was appropriate for use among Latino immigrant populations. Through correlation and factor analysis, I identified the latent constructs within the measure. Using descriptive and bivariate statistics, I described the prevalence of perceived racism captured by the items and compared them to other measures of discrimination. The results from this aim informed the measurement of perceived racism in Aims 2 – 4.

Aim 2: To examine the relationship between perceived racism and substance use behaviors among Latino immigrant men. For this aim, I used logistic regression analysis to evaluate whether perceived racism was associated with binge drinking and cigarette smoking among Latino immigrant men. I hypothesized that Latino immigrant men with higher levels of perceived racism would be more likely to have engaged in binge drinking in the past 30 days and/or be a current cigarette smoker than men with lower levels of perceived racism.

Aim 3: To examine whether the relationship between perceived racism and substance use is mediated by emotional and physical stress responses to perceived racism among Latino immigrant men. For this aim, I used multivariate logistic and linear regression analysis to test the hypothesis that Latino immigrant men with higher levels of perceived racism would have a higher frequency of emotional and physical stress responses to perceived racism and, in turn be more likely to have engaged in binge drinking and/or be a current cigarette smoker.

Aim 4: To examine whether the relationship between perceived racism and substance use is mediated or moderated by coping resources among Latino immigrant men. For this aim, I used descriptive statistics to identify patterns of coping resources, specifically coping type and sense of mastery, among Latino immigrant men. I then used multivariate logistic and linear regression analysis to determine whether coping resources mediated or moderated the relationship between perceived racism and substance use. Because of the inconsistent findings in previous studies, I considered this aim to be exploratory and did not make specific hypotheses about the direction and magnitude of any mediation or moderation effects.

Significance of the Study

The proposed study contributed to public health research by addressing several gaps in the current literature. First, it assessed the reliability and validity of a current measure of perceived racism among Latino immigrant men. Second, it described the prevalence of perceived racism among rural Latino immigrant men, including aspects of discrimination that are often excluded in other studies, such as language and legal status. Third, it extended the existing research on perceived racism and substance use among African Americans to Latino populations. Fourth, the study empirically tested theorized pathways of potential mediators and moderators of the relationship between perceived racism and substance use.

The study also provided important formative research for future interventions to address substance use in Latino immigrant communities. Reducing binge drinking and cigarette smoking among adults are both leading health indicators in *Healthy People 2010* (U.S. Department of Health and Human Services, 2000). Understanding the pathways by which perceived racism leads to poor health outcomes is crucial to identifying potential interventions to alleviate these conditions among Latino immigrant men.

Organization of the Dissertation

This dissertation has seven chapters. Chapter 1 has provided an overview of the dissertation study. Chapter 2 provides background information on perceived racism, substance use, and coping among Latino immigrant men. Chapter 3 describes the study's theoretical basis and conceptual model, presents the research questions, and states the hypotheses that were tested. Chapter 4 details the study's methodology, including study design, sample, measures, and an overview of the analysis plan. Chapter 5 is a manuscript (Paper 1) on the conceptualization and measurement of perceived racism, which presents the results from Aim 1. Chapter 6 is a manuscript (Paper 2) on the relationship between

perceived racism and substance use, which presents the results from Aims 2 – 4. Chapter 7 discusses the results, describes the study limitations and presents implications for future research and public health practice.

CHAPTER 2: BACKGROUND AND SIGNIFICANCE

In order to understand the context for the study, this chapter provides background information on the demographic profile of Latinos living in North Carolina and the factors that put them at increased risk for the substance use. I also review the literature on perceived racism, substance use, stress and coping among Latinos.

Latino Immigration to North Carolina

Patterns of Migration

North Carolina is among the fastest growing Latino immigrant communities in the United States and represents new trends of immigrant settlement in the South and Midwest regions of the country (Durand, Massey, & Capoferro, 2005; Kandel & Parrado, 2006; Kochkar, Suro, & Tafoya, 2005). The large influx of Latino residents began in the 1990s, mainly due to the robust economy and demand for labor in North Carolina (Johnson-Webb, 2003; Kasarda & Johnson, 2006). North Carolina's Latino population is now estimated at more than 600,000, comprising 7% of the state's total population (Kasarda & Johnson, 2006). The majority (73%) of the Latino population in North Carolina is foreign-born (North Carolina Center for Health Statistics, 2006). Between 1995 and 2004, over 38% of Latino immigrants came to North Carolina directly from their country of origin, and of this group nearly 75% were from Mexico. Other common countries of origin included El Salvador, Guatemala and Honduras. It is estimated that nearly half of North Carolina's Latino residents do not have legal authorization to reside in the US (Kasarda & Johnson, 2006).

Demographic Profile

Latino immigrants to the United States often leave their countries of origin in search of economic opportunities, given the weak economies in Mexico and Central America (Kandel & Parrado, 2005; Kochkar et al., 2005). In the late 1990s, when the demand for labor in North Carolina was especially strong, males accounted for almost two-thirds of the migrant flow (Kasarda & Johnson, 2006). The gender distribution has since become more balanced; still, over 55% of the Latino population in North Carolina is male (U.S. Census Bureau, 2008). Because many Latino migrants come to the US to work, they have a younger age distribution than the non-Latino population. In North Carolina, 55% of Latinos are between the ages of 18 and 44 (U.S. Census Bureau, 2008).

Few Latino immigrants in North Carolina have more than a high school education (Kochkar et al., 2005). Over half of the state's Latino population has completed less than eight years of schooling. Due in part to low education levels, Latino households annually earn \$7,000 less per capita than non-Latino households (Kasarda & Johnson, 2006). Poverty rates are higher among Latinos (26%) than non-Latinos (15%) in the state (Kasarda & Johnson, 2006). Latino males are most often employed in blue-collar industries such as construction and food processing, which may also contribute to their low income levels (Griffith, 2005; Johnson-Webb, 2003).

A large percentage of Latinos (30%) reside in non-metropolitan or rural areas of the state. Employers have recruited Latino immigrants to rural areas for work in agriculture and food processing industries (Johnson-Webb, 2003). Latino immigrants living in rural communities often represent a small percentage of the total population (Johnson-Webb, 2003; Kasarda & Johnson, 2006).

Chatham County

The data for the dissertation come from men living in Chatham County, a rural county in central North Carolina which had few Latino residents prior to the 1990s. The estimated 2006 population in the county was 60,000, 12% of which were of Latino origin. In 1990, Latinos were less than 2% of the county population (U.S. Census Bureau, 2008). Racial relations in the county became strained as a result of the rapid growth in the Latino population (Love, 2000). In the late 1990s, White residents began to voice their opinions about increasing criminal activity and overcrowding in schools and clinics, which they blamed on the growing number of undocumented immigrants (Cuadros, 2006). The chief of the Chatham county commissioners responded to community concerns by writing a letter to the Immigration and Naturalization Service (INS) asking for greater enforcement in the county. At the height of the tension, David Duke, former Louisiana state legislator and grand wizard of the Ku Klux Klan, was invited to speak at a rally of county residents who claimed their community was being overrun by undocumented immigrants from Mexico (Glascock, 2000).

In addition to this growing tension, workplace raids by the U.S. Immigration and Customs Enforcement (ICE) have increased markedly in the last decade further promoting fear and social isolation among Latino immigrants in North Carolina. Even Latinos who have become naturalized citizens live in fear of being stereotyped as an undocumented immigrant. Studies of the impact of raids on communities have found increased depression and psychological distress (Capps, Castaneda, Chaudry, & Santos, 2007).

The social and political environment created by these events legitimized discrimination towards Latinos resulting in non-Latinos becoming openly hostile towards the newcomers (Cuadros, 2006). Ethnographic studies of other new immigrant destinations in the South have noted anti-immigrant sentiment and racial discrimination towards Latino immigrants although there have been no studies documenting the prevalence of perceived

racism among Latinos in Chatham County (Kandel & Parrado, 2005; Perreira, Chapman, & Stein, 2006).

Substance Use among Latino Immigrant Men

The economic hardship, discrimination and cultural conflicts Latino immigrant men face once they arrive in the United States have important implications for their health (Portes & Rumbaut, 1996). In North Carolina, more than 30% of Latinos reported their health status as being fair or poor, compared to 23% of African Americans and 16% of Whites (North Carolina Center for Health Statistics, 2006). The leading causes of death for Latinos in North Carolina are motor vehicle injuries, cancer and cardiovascular disease (Jones-Vessey, Buescher, Stafford, Parks, & Fan, 2007). Latino men's risk for death and disease is influenced by their health behaviors, including their substance use (Mokdad et al., 2004). In this section, I describe the epidemiology of alcohol use and cigarette smoking among Latino immigrant men.

Alcohol use

Alcohol use is prevalent among Latinos. In 2004-2005, a national household survey found that 45% of Latino adults (ages 18 and older) used any alcohol in the past month (Substance Abuse and Mental Health Services Administration, 2007). While Latino males have a lower overall frequency of alcohol consumption than men in other racial/ethnic groups, they are more likely to consume higher volumes of alcohol (Randolph, Stroup-Benham, Black, & Markides, 1998). Younger age, lower education, unemployment and job insecurity are all associated with greater risk of alcohol use or dependence among Latinos (Caetano and Clark, 1998; Finch, 2003; Wallisch and Spence, 2006).

Heavy drinking is a serious health concern for Latino men, especially binge drinking, which is defined as drinking five or more drinks on one occasion. In the US, Latino men are

more likely than non-Latino White or African American men to report binge drinking and their rates of binge drinking have steadily increased in recent years (American Cancer Society, 2006; Caetano & Clark, 1998; Naimi et al., 2003). A recent national survey found that 23% of Latinos have participated in binge drinking in the past 30 days (Miller et al., 2004). Among Latinos, those of Mexican descent have higher rates of binge drinking than other ethnic groups (Nielsen, 2000).

Rates of binge drinking among Spanish-speaking Latinos in North Carolina are similar to national estimates (18%) and higher than all other racial/ethnic groups in the state (10%) (North Carolina Center for Health Statistics, 2005). Latinos in North Carolina that die in motor vehicle crashes or from other unintentional injuries are also more likely to have higher blood alcohol levels than either Whites or African Americans (Buescher, 2003). A study of Mexican immigrants living in rural eastern North Carolina found that 29% had drunk in the last month, and 12% reported binge drinking on at least one day in the past month (Loury & Kulbok, 2007). In the study, men and those reporting occupational and economic stress were more likely use alcohol. Another study of recent Latino immigrant men working as farmworkers in eastern North Carolina, found that 27% reported frequent binge drinking (2 or more times per month), with over half of those who consumed alcohol meeting criteria for alcohol dependence (Grzywacz, Quandt, Isom, & Arcury, 2007). In this study, heavy drinking was associated with being non-married (OR = 3.3), and having settled in North Carolina as opposed to moving to find work as crops are harvested in different locations (OR = 2.7).

The relationship between acculturation and alcohol consumption among Latinos is unclear. In general, foreign-born Latinos have lower levels of alcohol use and substance use disorders than U.S.-born Latinos (Ojeda, Patterson, & Strathdee, 2008; Vega, Kolody et al., 1998). Some studies have shown alcohol consumption rates and attitudes about alcohol use among Latino immigrant men increase with generation status and time spent in the US

(Abraido-Lanza et al., 2005). For example, U.S.-born Mexican Americans report that they can consume a higher mean number of drinks before their driving is impaired than foreign-born Mexicans (Caetano, Ramisetty-Mikler, & Rodriguez, 2008). One study also found that men with higher levels of acculturation had increased odds of being a drinker, but only if they had above-average incomes (Karriker-Jaffe & Zemore, 2009). Other studies have found that this association varies by gender, meaning alcohol use increases with acculturation for women but not men (Rafaelli et al., 2007; Zemore, 2005).

Cigarette Smoking

Twenty-three percent of Latino males in the US are current smokers (American Cancer Society, 2005). Rates of smoking among Latino men tend to be similar to White men and lower than African American men (Centers for Disease Control and Prevention, 2006; U.S. Department of Health and Human Services, 1998). Latino men tend to be lighter smokers, smoking fewer cigarettes per day on average (12) than White men (23) (U.S. Department of Health and Human Services, 1998; Zhu, Pulvers, Zhuang, & Baezconde-Garbanati, 2007). Correlates of tobacco use among Latino men include having lower levels education, being low income and younger (Centers for Disease Control and Prevention, 2006).

According to data from the 2003 – 2005 North Carolina Behavioral Risk Factor Surveillance System, 17% of all Latinos in the state report being a current smoker (North Carolina Center for Health Statistics, 2006). A study of Mexican immigrants living in eastern North Carolina found similar rates and also found that 68% of the sample reported living with someone who smoked in the home (Loury & Kulbok, 2007). No studies have reported gender-specific rates of smoking among Latino immigrants living in North Carolina.

Similar to alcohol use, the relationship between acculturation and smoking among Latinos is unclear (Abraido-Lanza et al., 2006; Abraido-Lanza et al., 2005; Finch & Vega,

2003). Most national studies have shown that U.S.-born Latinos are more likely to be current smokers than foreign-born Latinos (Perez-Stable et al., 2001). Latino immigrants also smoke fewer cigarettes per day on average (8) than those born in the US (12) (Wilkinson et al., 2005). Some studies suggest that rates of tobacco use among Latinos increase as their length of residence in the US increases (Otero-Sabogal et al., 1995; Vega & Amaro, 1994; Wilkinson et al., 2005). However, as with alcohol use, there is evidence that this association varies by gender; for example, the rates of smoking increase with acculturation for women but not men (Bethel & Schenker, 2005; Perez-Stable et al., 2001).

Substance Use and Stress

There is substantial empirical evidence that substance use such as tobacco and alcohol use increases among individuals under social stress (Aneshensel & Phelan, 1999). Stress is defined as environmental demands that exceed the adaptive capacity of a person, resulting in emotional and physical changes that may be detrimental to their health (Myers, Lewis, & Parker-Dominguez, 2003). Stress that is chronic, unavoidable, and uncontrollable can be particularly harmful to one's health (Taylor & Pilati, 2000). Stressful situations often induce substance use, because of expectations that the activity will relieve stress (Sayette, 2000; Wills & Shiffman, 1985). In fact, researchers believe that alcohol and tobacco's anticipated stress-relieving properties are the reason individuals continue to use substances despite their harmful effects (Sayette, 1999). Substance use is seen as an effective mechanism for coping with life stress because it can both minimize negative mood and maximize positive mood (Wills & Shiffman, 1985).

Stress can influence the initiation, maintenance and cessation of substance use behaviors (Wills & Shiffman, 1985). Those with few coping resources may be less likely to resist the temptation of initiating substance use. Once substance use has become established, those with higher levels of stress are more likely to continue using and pursue

heavy substance use such as addictive smoking, problem drinking or drug dependence. Those attempting to end their substance use may have more difficulty if they are coping with other life stressors.

Both alcohol and tobacco are known to influence mood regulation, relieve tension and anxiety, and affect the appraisal of stressful events (Cooper, Frone, Russell, & Mudar, 1995; Greeley & Oeir, 1999; Wills & Shiffman, 1985). Smokers report that cigarette use reduces negative emotional reactions and provides positive stimulation, especially in social situations. Nicotine can produce states of arousal or relaxation depending on the dose, the situation, and the emotional state of the individual. The mechanism by which alcohol relieves stress is still unclear. According to the attention-allocation model, alcohol reduces stress when drinking occurs in pleasant situations that distract the drinker from his distress. Because alcohol impairs cognitive processing, it narrows perceptions to only the immediate aspects of an experience (Steele & Josephs, 1988). Therefore, drinkers may only perceive and focus on pleasurable features of a situation distracting an individual from the stressful aspects (Sayette, 2000).

Research has shown that socially disadvantaged groups experience high levels of stress due to their differential exposure to stressful life events (Turner 2003, Turner 1995). Thus, Latino immigrant men may be more susceptible to stress due to their social status and the stressors they face once they arrive in the United States (Kim-Goodwin & Bechtel, 2004; Portes & Rumbaut, 1996). Given that alcohol and tobacco are used to cope with stress, immigrants may smoke and drink to alleviate the pressures related to the immigration and acculturation process, including experiences with racism (Abraido-Lanza et al., 2006; Fernander, Shavers, & Hammons, 2007; Finch, Catalano, Novaco, & Vega, 2003; Finch & Vega, 2003; Garcia & Gondolf, 2004; Kassel, Stroud, & Paronis, 2003; Romero & Roberts, 1998). Some studies have documented an association between certain aspects of acculturative stress and substance use among Latino immigrant populations (Buchanan &

Smokowski, 2009; Diaz & Ayala, 2001; Romero & Roberts, 1998; Vega, Alderete, Kolody, & Aguilar-Gaxiola, 1998; Vega, Kolody et al., 1998). More research is needed to fully understand these complex relationships among Latino immigrant men in North Carolina.

Racism as a Determinant of Health

Racism is defined as the beliefs, attitudes, and institutional practices that denigrate individuals or groups based on their race or ethnic group (Clark, Anderson, Clark, & Williams, 2002; Krieger, 2003). Racial discrimination can occur either by privileging members of a “superior” race or oppressing those of an “inferior” race (Paradies, 2006). Jones has defined three distinct levels of racism occurring at multiple levels of society in the US – internalized, interpersonal, and systemic (Jones, 2000). Internalized racism refers to the incorporation of attitudes, beliefs or ideologies about the inferiority of one’s own racial group and/or the superiority of other racial groups. This may be manifested as embracing “Whiteness,” self-devaluation, and resignation. Interpersonal racism refers to personally mediated forms of racism, such as prejudice and discrimination. It manifests as lack of respect, suspicion, devaluation, “scapegoating,” and dehumanization of oppressed racial groups (Jones, 2000). Institutionalized racism occurs at the systemic level and is defined as differential access to the goods, services, and opportunities of society by racial group. It manifests in both material conditions, such as the quality of education and housing, as well as access to power, such as differential access to information, resources, and political representation.

The effects of racism at these three levels are often iterative and intertwined. Therefore, racism can be a social, interpersonal, and intrapersonal determinant of health. Social determinants of health are factors at the societal and community level which influence health through more proximal determinants (Link & Phelan, 1995; Schulz & Northridge, 2004). Interpersonal determinants are factors within an individual’s social environment that

influence their health behavior, such as the thoughts, behavior and support of other people (National Cancer Institute, 2005). Intrapersonal determinants are factors within an individual that influence their health, such as their knowledge, attitudes and beliefs. This study focuses on racism at the societal and interpersonal levels.

Within the field of public health, several scholars have formulated theories or models to explain the impact of racism on health, including the Ecosocial and Biopsychosocial models. Krieger's Ecosocial Model is a multi-level epidemiological framework that describes five pathways by which discrimination can harm health (Krieger, 2000, 2005; Paradies, 2006). The Biopsychosocial Model, developed by Clark and colleagues (1999), conceptualizes racism as a form of stress that results in emotional and physical stress responses that lead to poor health outcomes. Elements of the Biopsychosocial Model (Clark et al., 1999) are based on Lazarus and Folkman's theory of stress and coping, which describes how coping resources can both mediate and moderate the negative health effects of perceived racism (Lazarus & Folkman, 1984). All three theories and models provide a paradigm for understanding the potential mechanisms through which perceived racism can harm health. In Chapter 3, I provide a more detailed discussion of their constructs and how they were used to guide the conceptual model for this study. I now turn to a review of the empirical literature on racism among Latinos.

Latinos' Experiences with Racism

Patterns of racial and ethnic discrimination among Latinos remain understudied; however, a series of recent national surveys indicate that it is a prevalent problem. The National Survey of Latinos (NSOL) conducted by the Pew Hispanic Center in 2002, 2004, and 2006 is a nationally representative cross-sectional telephone survey that collects information about Latino attitudes and experiences with discrimination (Pew Hispanic Center, 2006; Pew Hispanic Center & Kaiser Family Foundation, 2002, 2004). According to

the most recent survey, 82% of Latinos felt racial discrimination was a problem that prevents them from succeeding in America (Pew Hispanic Center, 2006). Latinos who were not U.S. citizens were more likely to think that discrimination was a major problem than Latinos who were citizens (Pew Hispanic Center & Kaiser Family Foundation, 2002, 2004). The same was true for foreign-born Latinos, who were more likely to think discrimination was a major problem than those born in the US (Pew Hispanic Center & Kaiser Family Foundation, 2004).

According to the survey, over 30% of Latinos reported that they had been personally discriminated against or had someone close to them discriminated against in the last five years because of their racial or ethnic background (Pew Hispanic Center, 2006). When asked about specific types of discrimination, Latinos reported being treated with less respect than other people (45%), receiving poorer service in restaurants and stores (41%), being called names or insulted (30%), and not being hired or promoted because of their race/ethnicity (14%) (Pew Hispanic Center & Kaiser Family Foundation, 2002). In addition, more than half of Latinos surveyed reported increases in discrimination as a result of recent immigration policy debates (Pew Hispanic Center, 2006).

Racism occurs in variety of settings, including work, health care, education and housing (Krieger, 2000). In a national study of Latinos, 28% reported experiencing discrimination in the health care setting as a result of their race (LaVeist, Rolley, & Diala, 2003). Latinos in the study were more than three times as likely to feel they had been discriminated against than non-Latinos (OR = 3.55) and 15% percent felt they would have received better care if they were of a different race. Similarly, a study of recent Latino immigrants in the Midwest found that 26% cited perceived racism as a barrier to seeking health care (Blankenau 2000). A survey of Latino immigrants in Durham County, North Carolina found that 40% thought racism was a major problem in education, 37% in the workplace, 40% in health care, and 35% in housing (Friedman et al., 2005).

Aspects of Latino racial and ethnic identity other than their physical appearance, such as the language they speak and their legal status in the US contribute to their experiences with discrimination. The NSOL found that more Latinos reported being discriminated against based on their language (35%) than either physical appearance alone (24%), or both language and physical appearance (20%) (Pew Hispanic Center, 2006). Foreign-born Latinos were more likely to cite language alone as the basis for discrimination (54%) than U.S. born Latinos. A study of U.S. and foreign-born Mexican Americans in Fresno County, California found that those born in Mexico or who claimed Mexico as a primary residence were more likely to report perceived discrimination than native residents of the US (Finch et al., 2000). In this study, levels of perceived discrimination increased with higher levels of acculturation for immigrants, but decreased for native born. Immigrants may be more at risk for exposure to discrimination as their English usage, and therefore contact with American culture increases.

Findings also suggest that Spanish-speaking Latinos are at increased risk for experiencing discrimination. In the NSOL, more than 55% of Spanish-dominant Latinos reported experiencing discrimination, compared to 38% of bilingual Latinos and 29% of English-dominant Latinos. Latino participants in the 2001 California Health Interview Survey also cited language or accent among the most common reasons for discrimination (Trivedi & Ayanian, 2006).

Measurement of Racism among Latinos

Research on the health impacts of racism among Latinos has been limited by the fact that much of the previous work on the conceptualization and measurement of perceived racism is based on the experiences of African Americans (Araujo & Borrell, 2006; Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005). Unlike African Americans, evidence suggests that Latinos are discriminated against based on factors related to both their racial

identity (such as, skin color and facial features) and their ethnic identity (such as, language use) (Araujo & Borrell, 2006). Likewise, Latino immigrants in the US face unique types of discrimination related to their social and legal status (Viruell-Fuentes, 2007). In this section, I review the measures of racism most commonly used in the public health literature; describe the extent to which they have been tested in Latino populations and identify gaps in the literature related to the measurement of racism among Latinos.

Since it is difficult to objectively observe or measure exposure to racism, most research on the health effects of racism focuses on *perceived racism*. Perceived racism is defined as the subjective experience of prejudice or discrimination based on race. Perceived racism has been assessed using a wide variety of measures, ranging from single-items to multi-item scales which capture the frequency of various discriminatory events (Paradies, 2006; Williams, Yu, Jackson, & Anderson, 1997). These measures aim to assess several dimensions of perceived racism, including type (e.g., verbal, physical), level (e.g., interpersonal, institutional), dose (e.g., acute or chronic), time frame (e.g., past month, lifetime), setting (e.g., work, health care), and target (e.g., self, family, friends, or others in your ethnic group). Consistent with Stress and Coping Theory, another dimension captured by some measures is individual responses or reactions to racism. Similar to coping type, responses to perceived racism are often categorized by the extent to which they are active, avoidant, cognitive, behavioral or some combination of these types (Paradies, 2006).

The measures most commonly used to assess perceived racism include the Experiences of Discrimination (EOD) measure, the Schedule of Racist Events (SRE), the Major and Everyday Discrimination measure and the BRFSS Reactions to Race Module (Jones & Measures of Racism Working Group, 2001; Krieger et al., 2005; Landrine & Klonoff, 1996; Williams et al., 1997). The Experiences of Discrimination measure was developed based on previous questions used as part of the Coronary Artery Risk Development in Adults (CARDIA) study (Krieger & Sidney, 1996; Krieger et al., 2005). The

measure included questions about the frequency of having experienced discrimination based on race, ethnicity, or color in each of nine specified situations, as well as questions about individuals' responses to these experiences. Both English and Spanish versions of the scale have been shown to be valid and reliable among lower and middle class Latinos; however, only a few studies have used the measure among Latino populations (Krieger et al., 2005).

The Major and Everyday discrimination measure consists of two sets of questions regarding perceived racism (Williams et al., 1997). The Major questions ask whether the respondent has experienced unfair treatment based on ten characteristics (e.g., ancestry or national origin, skin color) and whether this was the main reason for this experience. The Everyday questions ask about the frequency of unfair treatment based on ten characteristics as well as the main reason for this mistreatment. Although the measure has been used in samples including Latinos, few studies have reported Latino specific estimates of the prevalence of discrimination using this measure (Kessler, Mickelson, & Williams, 1999; Krieger et al., 2005).

The Schedule of Racist Events (Landrine & Klonoff, 1996) is an 18-item scale that measures the frequency of experiencing perceived racism in the past year and lifetime. The SRE also includes an assessment of how stressful the experience was for the respondent. One study suggests that a modified version of the scale, the General Ethnic Discrimination scale, is valid and reliable among Latinos (Landrine, Klonoff, Corral, & Fernandez, 2006).

Since 2002, the Behavioral Risk Factor Surveillance System has made the Reactions to Race module available to state health departments to include in their statewide surveys (Centers for Disease Control and Prevention, 2002). This module, developed by Jones and colleagues, includes six items related to attitudes about racism, experiences with unfair racial treatment in work and health care settings, and responses to unfair racial treatment (Jones & Measures of Racism Working Group, 2001). These questions have

been used in surveys conducted among Latinos in various states throughout the US in both English and Spanish; however, to date no information on the validity or reliability of the items has been published.

In addition to these scales, several measures have been developed to assess levels of stress due to acculturation among Latino immigrant populations (Cervantes, Padilla, & Salgado de Snyder, 1990, 1991; Mena, Padilla, & Maldonado, 1987; Romero & Roberts, 2003). These measures often include items related to perceived racial and ethnic discrimination because it is a type of stressor that immigrants experience. Examples of these measures include the Societal, Attitudinal, Familial, and Environmental Acculturative Stress scale, the Hispanic Stress Inventory, and the Migrant Farmworker Stress Inventory (Cervantes et al., 1991; Hovey & Magana, 2002; Hovey, Magana, Flores Smith, & Gordon, 2002; Mena et al., 1987). Much of the existing research on discrimination among Latinos has been conducted using items from these scales (Finch et al., 2003; Finch, Hummer, Kol, & Vega, 2001; Finch et al., 2000). However, there are limitations to these measures. They frame exposure to racism as a failure to acculturate or effectively cope with the stress of acculturation. In addition, the response options often only measure the frequency or intensity of the stress associated with the stressor, not perceived exposure to the actual stressor.

Empirical Research Linking Perceived Racism and Health

Perceived Racism and Health Status

Several studies show that perceived racism is associated with increased levels of stress, risky health behaviors, and poor mental and physical health outcomes among racial and ethnic minorities (Karlsen & Nazroo, 2006; Paradies, 2006; Williams et al., 2003). However, much of this research has focused on the experiences of African Americans, leaving questions about whether the same associations are present among Latino

populations. A recent review of articles on perceived racism and health found that 95 of 138 studies focused on African Americans compared to 26 studies that included Latinos, only 15 of which focused on immigrant populations (Paradies, 2006). Studies including Latinos have found that perceived racism was associated with worse mental health, physical health and health care utilization (Diaz, Ayala, & Bein, 2004; Diaz, Ayala, Bein, Henne, & Marin, 2001; Finch et al., 2001; Finch et al., 2000; Finch & Vega, 2003; Krieger et al., 2005; Ryan, Gee, & Laflamme, 2003; Stuber, Galea, Ahern, Blaney, & Fuller, 2003).

Similar associations have been reported among Latino immigrants (Diaz et al., 2004; Diaz et al., 2001; Finch et al., 2001; Finch et al., 2000; Ryan et al., 2003). A study of 490 recent Latino immigrants living in New Hampshire found that those with higher levels of perceived racism had lower levels of self-reported health, controlling for several demographic and health-related variables (Ryan et al., 2003). In this study, perceived racism was measured as an index of three items assessing negative emotional responses to racism, frequency of discrimination experienced in health care, as well as the impact of discrimination on life goals. Finch, Kolody and Vega (2000) found that perceived racial/ethnic discrimination was associated with higher levels of depressive symptoms in a sample of over 3,000 Mexican Americans in Fresno County, California (68% of which were Mexican born). The relationship was moderated by acculturative stress due to legal status such that those with higher levels of stress experienced more depressive symptoms. A similar study among the same sample found that perceived discrimination was associated with poor self-reported physical health and chronic conditions, controlling for demographic characteristics and acculturation stress (Finch et al., 2001). In both studies, perceived discrimination was measured as an index of three items assessing unfair treatment towards the respondent or their friends. Finally, a study of over 900 gay and bisexual Latino men (72% of which were immigrants) living in San Francisco and Chicago found that perceived

racism predicted social isolation, low self-esteem and psychological distress, controlling for age, acculturation and city (Diaz et al., 2004; Diaz et al., 2001).

The impact of perceived racism on health may be due in part to the adoption of unhealthy behaviors. Two behaviors that have consistently been associated with perceived racism among African Americans are alcohol use and cigarette smoking (Friedman et al., 2005; Landrine & Klonoff, 1996, 2000; Noh, Beiser, Kaspar, Hou, & Rummens, 1999; Paradies, 2006; Smedley, Stith, & Nelson, 2003). However, of the few studies that have demonstrated an association between perceived racism and health behaviors among Latinos, few have focused on substance use (Steffen & Bowden, 2006; Trivedi & Ayanian, 2006). In the following sections, I summarize the literature related to perceived racism and substance use.

Perceived Racism and Alcohol Use

Previous studies have shown that perceived racism is associated with increased alcohol use, although most of this research has been limited to African Americans (Borrell et al., 2007; Paradies, 2006). People use alcohol to cope with the stress of discrimination, especially in the context of the workplace (Finch et al., 2003; Martin, Tuch, & Roman, 2003; Yen, Ragland, Greiner, & Fisher, 1999, 1999). A large study of residents in three cities across the US found that African Americans experiencing racial discrimination in at least three of seven domains measured had a higher odds of reported alcohol use in the past year (OR = 2.12) than those experiencing no discrimination (Borrell et al., 2007). In a national survey of African American workers, perceived discrimination was associated with being a problem drinker (OR = 2.12) and endorsing the utility of drinking as a way to relieve stress and to cope with problems in life (Martin et al., 2003). The association was stronger among those that endorsed the belief that drinking helps reduce job pressure. Yen and colleagues (1999, 1999) conducted two studies among San Francisco transit operators to

assess the relationship between perceived racial discrimination and alcohol use. They found that non-White operators who reported five or more domains of discrimination drank an average of 13 more drinks per month than those that reported no domains of discrimination. They were also more likely to be heavy drinkers (OR = 2.16) and to be dependent on alcohol (OR = 2.02) (Yen et al., 1999). In addition, non-White Transit operators who reported discrimination in at least one situation, out of a possible four, were more likely to be classified as having an alcohol disorder compared to those reporting no instances of discrimination (Yen et al., 1999). The one study showing an association among Latinos found racial discrimination related to employment was significantly associated with past-year alcohol abuse/dependence (OR = 1.57) among Latino labor migrants in California, controlling for age, time in the US, family income, education, gender, employment status and marital status (Finch et al., 2003).

Perceived Racism and Cigarette Smoking

Previous studies have also reported a relationship between perceived racism and cigarette smoking (Borrell et al., 2007; Chae et al., 2008; Paradies, 2006). A recent national study of smoking among Asian Americans found that odds of current smoking were higher among those that reported high levels of unfair treatment (OR= 2.8) and racial/ethnic discrimination (OR = 2.4) than those that reported no unfair treatment and discrimination, controlling for sociodemographic characteristics (Chae et al., 2008). Similar results were found in a study of African Americans living in three large cities in the US (OR = 1.87) (Borrell et al., 2007). Two studies by Landrine and Klonoff (1996, 2000) found that perceived racism was associated with smoking prevalence among African American adults. The first study was conducted among a sample of 153 African American university students and staff, where the smoking prevalence for those who experienced frequent discrimination was 26.7% compared to 6.4% among those who experienced infrequent discrimination.

Discrimination was the only significant predictor of cigarette smoking in a model that included age, gender, income and education. The second study conducted among a community sample of 158 African Americans in Los Angeles found similar results (Landrine & Klonoff, 2000). In both studies, smokers reported that the racial discrimination that they experienced as more stressful than discrimination reported by non-smokers. A separate study with a combined student and community sample (n=1569) that included Latinos also showed an association between perceived racism and cigarette smoking (Landrine et al., 2006). In the study, perceiving racial discrimination was significantly associated with increased odds of being a current smoker. Those who experienced either moderately frequent (OR = 1.9) or frequent discrimination (OR = 2.3) were more likely to be smokers than their low-discrimination counterparts, indicating a dose-response relationship.

Perceived Racism, Stress and Coping

Some studies suggest that the relationship between racism and health is influenced by individuals' stress responses and coping resources (Noh & Kaspar, 2003; Walters, 2004). For example, if a person experiences a negative emotional response to perceived racism, such as fear or anger, he may be more likely to use alcohol or tobacco to alleviate or numb these emotions. Likewise, their responses to racism may vary depending on the resources they have to cope with stressful situations.

Many emotional and physical stress responses can follow perceptions of racism (Armstead, Lawler, Gorden, Cross, & Gibbons, 1989; Bullock & Houston, 1987; Gizlice & Ngui, 2004). Examples of emotional stress responses include anger, anxiety, and fear. Physical stress responses include pounding or racing heart, headaches, back pain and stomach aches. No studies have assessed whether stress responses mediate the relationship between perceived racism and substance use. However, in a study of Latino college students (n = 223), the relationship between perceived racism and physical and

mental health symptoms was mediated by racism-related stress, which was defined as the stress appraisal of repeated discriminatory experiences (Walters, 2004). In a study of African American parents (n = 684), perceived racism was significantly associated with both current and future substance use (which included both alcohol and tobacco), controlling for negative life events, financial hardship and relationship stress (Gibbons, Gerrard, Cleveland, Wills, & Brody, 2004). The study found that this relationship was partially mediated by psychological distress, which was measured by two scales of depressive and anxiety symptoms in the past year.

Coping resources refer to factors which have the capacity to hinder, prevent or buffer the appraisal of stress and its outcomes (Pearlin, 1999). Two coping resources that may mediate or moderate the influence of perceived racism on substance use, are coping type and sense of mastery (Aneshensel & Phelan, 1999). Coping responses are the thoughts and behaviors that individuals use to offset or overcome adversity and disadvantage, and manage stressful aspects of their environment. Coping responses are often classified into two types: active and avoidant. Those who use active coping take on problems directly; whereas avoidant coping involves efforts to avoid, distract or selectively ignore the problem. Little is known about the patterns coping responses of Latino immigrants in the US (Farley, Galves, Dickinson, & Diaz Perez, 2005).

The literature offers mixed evidence regarding the impact of coping on the relationship between perceived racism and health (Krieger, 1990; Krieger & Sidney, 1996; Noh & Kaspar, 2003; Paradies, 2006). Some studies have shown that active coping is associated with more positive health outcomes in the presence of discrimination. Krieger (1990) found that African American women who kept quiet and accepted unfair treatment were 4.4 times more likely to report hypertension than those who took action and talked to others. In a separate study, Krieger and Sidney (1996) reported that African American

adults who accepted unfair treatment had higher blood pressure than those that challenged it.

Only a few studies have assessed the impact of coping among immigrant populations. In their study of Korean immigrants living in Toronto, Noh and Kaspar (2003) found that active coping, defined as personal confrontation, taking formal action and seeking social support, were more effective in reducing the impact of discrimination on depression than avoidant coping, which include passive acceptance and emotional distraction. In contrast, a study of Southeast Asian refugees in Canada found that avoidant coping strategies were actually associated with decreased depression (Noh et al., 1999). The Southeast Asian refugee population in this study was less acculturated and was exposed to more acculturation-related stressors than the Korean sample in the subsequent study. The findings of the second study suggest that avoidant coping strategies may be protective in environments where immigrants have few avenues for addressing or confronting perceived racism. Little is known about whether coping type influences the relationship between discrimination and health among Latino immigrant men (Paradies, 2006).

Another coping resource, sense of mastery, also contributes to stress responses and their resulting health outcomes (Pudrovska, Schieman, Pearlin, & Nguyen, 2005). Individuals with a sense of mastery believe in their power to influence the environment and bring about desired outcomes. Persons with little or no sense of mastery feel less able to control the events and circumstances of their lives and perceive that external forces dictate their fate. Higher levels of sense of mastery are considered to be stress-buffering and have direct positive effects on health (Wheaton, 1985). Theory suggests that patterns of sense of mastery reflect variations in social status such that levels of mastery are lower among those who are socially disadvantaged (Lachman & Weaver, 1998). However, few studies have measured levels of mastery among Latino populations (Meyer, Schwarz, & Frost, 2008).

Only one study has assessed whether sense of mastery contributes to the

relationship between perceived racism and health (Moradi & Hasan, 2004). In this study of a sample of Arab Americans surveyed after the attacks of September 11th, personal control mediated the relationship between perceived discrimination and mental health outcomes, which were measured as self-esteem and psychological distress (Moradi & Hasan, 2004). Another study showed that racial and ethnic minority and immigrant adolescents with a strong sense of mastery felt more competent interacting with people of other ethnic groups, and in turn perceived less discrimination (Phinney 1998). However, the study did not assess the impact of discrimination on health outcomes.

In this chapter, I described the demographic profile of Latino immigrant men in North Carolina. I also reviewed the empirical evidence suggesting that perceived racism is an important but understudied determinant of health and health behaviors among Latinos. This review of the literature provides context and rationale for studying perceived racism, substance use, and coping among Latinos. In the following chapter, I describe the theoretical framework and conceptual model for study, and outline the research questions and hypotheses.

CHAPTER 3: THEORETICAL FRAMEWORK AND CONCEPTUAL MODEL

The previous chapter provided a review of the empirical research on Latino men's health that serves as a background and rationale for the study. In this chapter, I describe the theoretical framework for the study, present a theoretically informed conceptual model, and state the study aims, research questions and hypotheses.

Theoretical Framework

The theoretical framework for the study is informed by one theory and two models for explaining the effects of perceived racism on health. The first, the Ecosocial Model, describes different pathways through which racism influences population health outcomes (Krieger, 2004). The second, the Biopsychosocial Model, defines perceived racism as a stressor which causes emotional and physical responses to stress that can lead to negative health outcomes (Clark et al., 1999). The third, Stress and Coping Theory, describes how coping mediates and moderates the relationship between stressors, such as perceived racism and health (Folkman, 1984). I describe each theory and model below. Specific elements have been integrated into the conceptual model and research questions for the study and are presented later in this chapter.

The Ecosocial Model

The Ecosocial Model is a multi-level epidemiological framework that integrates social and biological reasoning with a dynamic, historic and ecological perspective to help understand mechanisms and address social inequalities (Krieger, 2004; Paradies, 2006).

First proposed by Krieger in 1994, the model asserts that individuals biologically embody the experiences and exposures around them, including those of racial discrimination (Krieger, 2004). Discrimination is hypothesized to harm health through five pathways including: (1) economic and social deprivation; (2) exposure to toxic substances and hazardous conditions; (3) socially inflicted trauma; (4) targeted marketing of unhealthy substances and, (5) inadequate health care (Krieger, 2000, 2005). As an example, the pathway of “socially inflicted trauma” would include emotional and physical distress resulting from perceived racism. Krieger also posits that the effect of racial discrimination on health varies depending on the timing, intensity, frequency and duration of the event. For example, perceived racism that occurs frequently or over a long period of time may be more damaging to health than shorter, less intense exposures.

In addition to the five pathways, the model conceptualizes two types of responses to racial discrimination that can influence health outcomes: protective and harmful (Krieger, 2000). Protective responses are defined as creating safe spaces for self-affirmation and active resistance to racist treatment. Examples of protective responses include community organizing, lawsuits to address illegal forms of discrimination, and seeking social support (Allison, 1998). Harmful responses are defined as internalized oppression or denial of racist treatment and the use of psychoactive substances, such legal or illegal drug use (Allison, 1998).

Although no studies have explicitly tested the model, it has been used for conceptualizing the health effects of racism in Krieger’s own research (Krieger & Gruskin, 2001; Krieger et al., 2006). Krieger also cites substantial empirical studies as indirect evidence for each of the pathways (Krieger, 2000). Of these studies, most used self-reported measures of perceived racism and focused on mental and cardiovascular health outcomes among African American adults (Krieger, 1990; Krieger & Sidney, 1996; Paradies, 2006; Williams et al., 2003).

The Biopsychosocial Model

Clark and colleagues developed the Biopsychosocial Model of perceived racism to synthesize the growing literature on the health effects of perceived racism among African Americans and provide guidance for future research (Clark et al., 1999). Their model focuses on racism at the interpersonal level and even more specifically on perceived racism. The authors define perceived racism as the subjective experience of prejudice or discrimination based on race. The model suggests that perceived racism is a stressor, and that the emotional and physical responses to stress mediate the effects of racism on health outcomes. According to the model, the perception of discriminatory experiences as racism is moderated by individuals' sociodemographic characteristics, and psychological and behavioral factors (Keith & Herring, 1991). Sociodemographic factors relevant to the relationships proposed in the model include occupational status, income and ethnicity. Examples of psychological and behavioral factors include personality traits, self-esteem and personal control. The model adopts concepts from Stress and Coping Theory to describe how coping influences the relationship between perceived racism and health outcomes (Clark et al., 1999; Lazarus & Folkman, 1984). This part of the model is described in further detail in the section below.

The Biopsychosocial Model was developed based on a synthesis of existing literature on the health effects of perceived racism, therefore many of the proposed relationships in the model are supported indirectly by empirical evidence (Clark et al., 1999; Krieger & Sidney, 1996; Landrine & Klonoff, 1996; Williams, 1997). As described in the previous chapter, one study has tested the model in sample of Latino college students (Walters, 2004). In this study, racism-related stress mediated the relationship between perceived racism and health outcomes; however the relationship was not moderated by coping responses to racism. Other published studies conducted with African Americans have shown that perceived racism results in emotional stress responses (e.g., anger,

anxiety, frustration and resentment) and physical stress responses, (e.g., headache, upset stomach, tensing of muscles, and pounding heart) (Armstead et al., 1989; Bullock & Houston, 1987; Gizlice & Ngui, 2004). However, few have tested whether emotional and physical stress responses mediate the effect of perceived racism on health behaviors (Gibbons et al., 2004).

Stress and Coping Theory

The theory of stress and coping provides a framework for predicting how coping resources mediate and moderate the negative health effects of perceived racism (Lazarus & Folkman, 1984; Myers et al., 2003). Coping resources are defined as the efforts and resources individuals use to manage the internal and external demands of stressful situations (Folkman, 1984; Folkman & Lazarus, 1980). Part of the variation in how individuals respond to stressful experiences is due to their coping responses. According to the theory, coping resources can influence the appraisal of racism as stressful (Miller & Kaiser, 2001), and thus may determine which coping resources are used to mitigate the health effects of the stressor (mediation). The health effects of perceived racism also result from the interaction of the stressor and the individual's coping type or sense of mastery (moderation) (Folkman, 1984).

Coping responses are the thoughts and behaviors that individuals use to offset or overcome adversity and disadvantage, such as racism, and manage stressful aspects of their environment (Folkman & Lazarus, 1980). Theory and empirical evidence suggest that these responses can be classified into various *coping types* (Folkman, 1984). Active coping is the process of taking on a problem directly by defining and analyzing the problem, seeking information, weighing alternative solutions and taking positive action to resolve the problem. Active coping can be comprised of both cognitive and behavioral strategies (Moos & Schaefer, 1993). Active cognitive coping includes logical analysis and attempts to

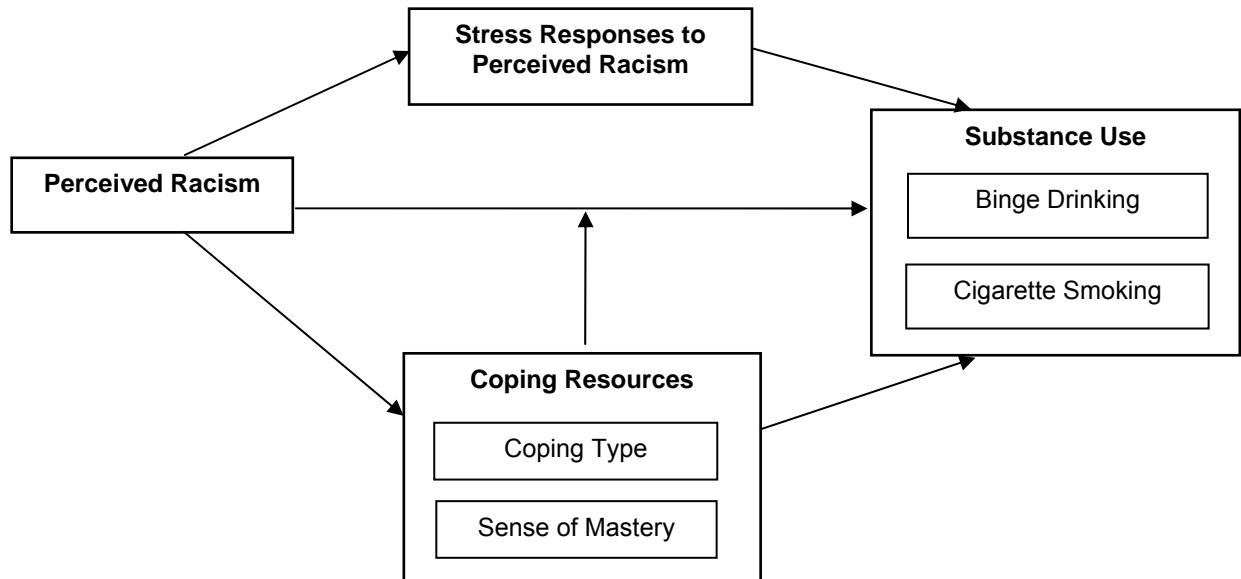
manage the appraisal of an event as stressful; active behavioral coping refers to overt behavioral attempts to directly deal with the problem and its effects (Billings & Moos, 1981). Active coping strategies are also especially effective with stressors that are controllable (Myers et al., 2003). Avoidant coping strategies aim to manage emotional distress through avoidance, minimization, distancing, distraction or selectively ignoring the problem. In general, studies have demonstrated that avoidant coping is associated with poor mental and physical health outcomes (Moos & Schaefer, 1993), while active coping tends to be associated with better mental and physical health outcomes (Karlsen & Nazroo, 2006).

Sense of mastery is defined as the extent to which individuals regard their life chances as being under their own control in contrast to being ruled by fate (Pudrovskaya et al., 2005). Individuals with a high sense of mastery believe in their power to influence the environment and bring about desired outcomes. Persons with a low sense of mastery feel less able to control the events and circumstances of their lives and perceive that external forces dictate their fate. Most research shows that high sense of mastery is a coping resource that protects individuals' emotional and physical health in the face of adversity or disadvantage (Pearlin & Schooler, 1978). However, some have theorized that believing one has control over a stressor can actually heighten its threat, especially when the appraisal of control does not match the actual controllability of a stressful event (Folkman, 1984).

Stress and Coping Theory is based on a large body of empirical evidence demonstrating the influence of coping types and sense of mastery on emotional and physical health outcomes (Folkman, 1984; Folkman & Lazarus, 1980; Folkman & Moskowitz, 2004; Lazarus & Folkman, 1984; Moos & Billings, 1982; Pudrovskaya et al., 2005). Several studies have tested whether different aspects of coping moderate the relationship between perceived racism and health outcomes among African Americans and Asian immigrant groups (Clark, 2006; Clark & Gochett, 2006; Martin et al., 2003; Noh et al., 1999; Noh & Kaspar, 2003). As described in Chapter 2, the research on the influence of coping

type on perceived racism and health is mixed. No studies have assessed whether sense of mastery moderates the relationship between perceived racism and health behaviors.

Figure 3.1 Conceptual Model for the Study



Conceptual Model

Drawing on both the theoretical and empirical literature presented above and in the previous chapter, I have created a conceptual model to depict the hypothesized relationships tested in this study (Figure 3.1). The conceptual model shows perceived racism having a direct effect on the substance use behaviors of binge drinking and cigarette smoking. This relationship can be seen as the pathway identified in the Ecosocial Model as “socially inflicted trauma” which leads to poor health. Because the Ecosocial Model does not describe the potential mediators and moderators of this relationship, the conceptual model also draws on the Biopsychosocial Model. In the conceptual model, the relationship between perceived racism and substance use is hypothesized as being mediated by

emotional and physical stress responses to perceived racism. Consistent with the Biopsychosocial Model and Stress and Coping Theory, coping resources are hypothesized to mediate and/or moderate the relationship between perceived racism and substance use. In the following sections, I provide a conceptual definition for each of the constructs in this model.

Substance Use

The substance use behaviors chosen as the dependent variables for this study are alcohol and tobacco use. Excessive alcohol use is conceptualized as having engaged in binge drinking in the past 30 days and tobacco use is conceptualized as current cigarette smoking. Binge drinking and cigarette smoking were chosen as outcomes based on the prevalence of these behaviors among Latino immigrant men and the fact they lead to increased risk for several serious health outcomes (American Cancer Society, 2006; Naimi et al., 2003; National Institute of Alcohol Abuse and Alcoholism, 2000; Schultz et al., 1991). In addition, there is an established literature linking perceived racism and substance use among African Americans (Landrine & Klonoff, 1996, 2000; Yen et al., 1999, 1999). The outcomes chosen for this study are also consistent with the Ecosocial Models' notion of harmful or maladaptive responses to discrimination which can lead to poor health outcomes.

Perceived Racism

Perceived racism is the independent variable in the conceptual model. The conceptual definition of perceived racism is based on the work of previous researchers. As stated in the previous chapter, I define racism as the beliefs, attitudes, and institutional practices that denigrate individuals or groups based on their race or ethnic group (Clark et al., 2002; Krieger, 2003). In this study, racism is conceptualized as *perceived* racism, which is the subjective experience of prejudice or racial discrimination. Perceived racism can

include perceptions of both interpersonal and institutional racism. This is consistent with both the Ecosocial and Biopsychosocial models, which argue that perceived racism can be detrimental to health, whether or not it is objectively experienced.

Stress Responses to Perceived Racism

Stress responses to perceived racism were hypothesized as mediators in this study. I conceptualized stress responses as the frequency of unfair racial treatment resulting in emotions such as feeling angry, sad or frustrated, and physical symptoms such as headaches, tensing of muscles or a pounding heart (Paradies, 2006).

Coping Resources

Based on my theoretical framework, coping resources are hypothesized to mediate and/or moderate the association between perceived racism and substance use. Two types of coping resources are evaluated. The first is the type of coping (active behavioral, active cognitive and avoidant) that is used in the context of a stressful experience. The second is sense of mastery. Because of the inconsistent findings in previous research, I did not hypothesize whether (or which) coping resources would lead to increased substance use (mediation pathway). Nor did I hypothesize whether coping resources would influence the magnitude or direction of the relationship between perceived racism and substance use (moderation pathway).

Study Aims, Research Questions and Hypotheses

Aim 1: To evaluate the Reactions to Race items as a measure of perceived racism among Latino immigrant men. The first step in understanding the impact of perceived

racism on health is to consider the conceptualization and measurement of perceived racism among Latino immigrants. Therefore, I answered the following questions in my study:

Research Question 1.1: How has perceived racism among Latinos been conceptualized in the literature?

Research Question 1.2: How does the Reactions to Race measure perform among Latino immigrant men? What are the relationships between the items and are they indicators of common latent constructs?

Research Question 1.3: What are the patterns of perceived racism in the study sample? How do they compare with patterns observed in previous studies?

Aim 2: To examine the relationship between perceived racism and substance use behaviors among Latino immigrant men.

Research Question 2: To what extent is perceived racism associated with binge drinking and cigarette smoking among Latino immigrant men?

Hypothesis 2.1: Latino immigrant men with higher levels of perceived racism will be more likely to have engaged in binge drinking in the past 30 days than men with lower levels of perceived racism.

Hypothesis 2.2: Latino immigrant men with higher levels of perceived racism will be more likely to be current cigarette smokers than men with lower levels of perceived racism.

Aim 3: To examine whether the relationship between perceived racism and substance use is mediated by emotional and physical stress responses to perceived racism among Latino immigrant men.

Research Question 3.1: To what extent do emotional and physical stress responses to perceived racism mediate the relationship between perceived racism and binge drinking among Latino immigrant men?

Hypothesis 3.1. Latino immigrant men with higher levels of perceived racism will have a higher frequency of emotional and physical stress responses to perceived racism and, in turn be more likely to have engaged in binge drinking in the past 30 days.

Research Question 3.2: To what extent do emotional and physical stress responses to perceived racism mediate the relationship between perceived racism and cigarette smoking among Latino immigrant men?

Hypothesis 3.2. Latino immigrant men with higher levels of perceived racism will have a higher frequency of emotional and physical stress responses to perceived racism and, in turn be more likely to be current cigarette smokers.

Aim 4: To examine whether the relationship between perceived racism and substance use is mediated or moderated by coping among Latino immigrant men. Given the lack of previous research on perceived racism, coping and substance use in this population, this aim was considered exploratory. While it was hypothesized that coping resources would mediate and moderate the relationship between perceived racism and substance use, no hypotheses were made about the direction and/or magnitude of the relationships.

Research Question 4.1: What are the patterns of coping (coping type and sense of mastery) among Latino immigrant men?

Research Question 4.2: To what extent does coping mediate the relationship between perceived racism and binge drinking among Latino immigrant men?

Research Question 4.3: To what extent does coping mediate the relationship between perceived racism and cigarette smoking among Latino immigrant men?

Research Question 4.4: To what extent does coping moderate the relationship between perceived racism and binge drinking among Latino immigrant men?

Research Question 4.5: To what extent does coping moderate the relationship between perceived racism and cigarette smoking among Latino immigrant men?

In this chapter, I described the theoretical framework for the study and presented the theoretically informed conceptual model for the study. The theoretical framework is based on the Ecosocial Model, Biopsychosocial Model and Stress and Coping Theory. The conceptual model shows how elements of each of these theories will be used to test the relationships between perceived racism and substance use among Latino immigrant men. Theory also informed the aims, research questions and hypotheses for the study. The following chapter describes the study design, methods and analytic approach for achieving the study aims.

CHAPTER 4: RESEARCH DESIGN AND METHODS

In this chapter, I present: (1) the research design of the original data sources and a description of the sample used for this study; (2) the construction and operationalization of study variables; (3) data preparation and preliminary analyses; and, (4) analytic strategies for each study aim.

Data Source

Description

The data sources for the study were the parent studies, Men as Navigators (MAN) for Health and *Hombres Manteniendo Bienestar y Relaciones Saludables* (HoMBReS). The goal of the MAN for Health study was to use a community-based participatory research (CBPR) approach to improve health behaviors among urban and rural African American men and rural Latino men by focusing on two factors that contribute to gender and racial health disparities. The two factors were communities' male gender socialization that promotes men's high-risk attitudes and behaviors and local health departments' organizational culture of institutionalized racism that limits services to men of color.

MAN was designed by a 15-year CBPR partnership between the University of North Carolina at Chapel Hill (UNC) Gillings School of Global Public Health, three community coalitions (1 rural Latino, 1 rural African American, 1 urban African American), and three health departments (Chatham, Orange, and Wake Counties) serving populations of color in North Carolina. MAN for Health was led by Dr. Eugenia Eng and funded by the Centers for

Disease Control and Prevention (CDC) from September 2003 – March 2007. The intervention took place in three counties in central North Carolina (Chatham, Orange, and Wake). In Orange County, the intervention aimed to improve prostate health behaviors among rural African American men. In Wake County, the focus was on cardiovascular health behaviors among urban African American men. In Chatham County, the intervention addressed sexual health behaviors among rural Latino men. MAN for Health partners recruited and trained 54 men of color as lay health advisors, called Navigators, who: (1) recruited community men, called Confidants, through African American churches, neighborhood groups, and Latino soccer leagues; (2) encouraged Confidants' movement toward taking greater control of their preventive health and help-seeking behaviors; and (3) served as co-investigators in collecting and interpreting evaluation data. The HoMBReS study complemented MAN for Health by adding a comparison group of Latino men in the Chatham County site only. HoMBReS was also funded by CDC and led by Dr. Scott Rhodes, Associate Professor of Public Health at Wake Forest University.

Both process and impact evaluations were conducted as part of MAN for Health. A quasi-experimental multiple-cohort design with 382 men of color was used to: (1) evaluate the impact of the male LHA intervention on health behaviors associated with cardiovascular disease and prostate cancer (physical activity, diet, smoking, use of preventive health and early detection services) and sexual health (use of condoms and STD screening services); and (2) distinguish important variations between rural and urban communities, racial/ethnic identities, and health outcomes.

Approval for the MAN for Health study was obtained from the UNC Public Health Institutional Review Board (IRB) prior to data collection. Approval for HoMBReS was obtained by the IRB at Wake Forest University. The secondary data analysis for this study was also approved by the UNC IRB.

Study Sample

For the current study, I used baseline data collected from 297 Latino immigrant men who participated in the MAN for Health and HoMBReS studies in Chatham County. The parent studies used a non-probability purposive sampling strategy to recruit Navigators, Confidants and men in the comparison group. As part of the Chatham County intervention, 21 Navigators were recruited by the site's Project Coordinator from an existing soccer league operated by and for Latino immigrant men (*La Liga Hispana de Fútbol de NC*). Each Navigator played with a different team and was expected to recruit up to 10 - 12 men from his team as Confidants. The rationale was that this pre-existing relationship between Navigators and Confidants would ensure the exchange of information and assistance with their use of health services, sexual risk behaviors, and attitudes toward health. Comparison group men were recruited by the Project Coordinator from Latino soccer teams in a neighboring community.

The sample included Latino Navigators (n = 20), their Confidants (n = 142) and Latino men in the comparison group (n = 129). To be eligible for participation in the parent studies, the men had to: (1) self-identify as Latino or Hispanic; (2) be a member of a Hispanic soccer league in North Carolina; (3) be 18 years of age or older; (4) be literate in Spanish or English; and (5) provide informed consent. Because the focus of the current study was on Latino immigrants, six participants who were born in the continental US were excluded from the analysis, for a total sample of 291.

Data Collection Procedures

Three waves of data were collected by the MAN for Health parent study from the Navigators and Confidants. Baseline data were collected before the intervention began, which was followed by data collection during the intervention at six months and immediately after the intervention was completed at 12 months. Data from the comparison group in

Chatham County were collected by HoMBReS at baseline and at 12 months. All questionnaires with Latino participants were conducted in Spanish. The study uses only the baseline data from the intervention and comparison groups, which were collected between the summers of 2005 and 2006. I chose to use the baseline data for two reasons. There was substantial attrition in the second and third waves of data collection. Using the baseline data allowed me to retain an adequate sample size for answering the research questions. Although substance use was not a focus of the intervention, the intervention did focus on general health promotion behaviors. Because I used only baseline data, participation in the intervention was not a threat to internal validity.

The Navigator questionnaires were administered by the Project Coordinator in a group setting and took approximately 30 minutes to complete. The Project Coordinator received IRB certification after being trained on interviewing procedures and research ethics prior to data collection. The Project Coordinator in Chatham County had an Associates degree in psychology, was bilingual (Spanish and English), a native of Mexico and a resident of the community. At baseline, Project Coordinators read the Navigator consent brochure to the group, "Consent Form for Navigator Interviews," and answered any questions the Navigators had about participation in the study. Navigators signed the consent form if they agreed to participate. Questionnaires were self-administered by the Navigators, but the Project Coordinator was present to read each question and response option aloud to the group and answer any questions. Navigators sealed their completed surveys in an envelope to protect their confidentiality before submitting them to the Project Coordinator. Each month Navigators received a stipend of \$50 as well as \$50 worth of soccer related equipment and fees for participating in the intervention and completing the questionnaires.

Navigators administered the same questionnaire to their Confidants in a group setting and were trained on interviewing procedures and research ethics prior to data

collection. At baseline, the informed consent brochure “Consent Form for Confidant Interviews” was read to the Confidants before they self-administered the questionnaire. The Navigator answered questions asked by their Confidants, who then signed the consent form if they agreed to participate in the study. The questionnaire was self-administered by having each Navigator read the questions aloud as Confidants marked their responses on their individual surveys. When completed, Confidants sealed their questionnaires in envelopes to protect their confidentiality before submitting them to their Navigators.

Comparison group questionnaires were administered by the Project Coordinator in a process similar to the Navigators. The Confidant and comparison group questionnaires took approximately 30 - 60 minutes to complete. Confidants and comparison group men received \$5 for completing the baseline questionnaire.

Data Collection Instrument and Measures

Data Collection Instrument

The MAN for Health/HoMBReS baseline questionnaire administered in Chatham County contained 194 items, including measures of health behaviors, racism, coping, and demographic characteristics. The survey was developed in partnership with community representatives over almost a year. The MAN for Health Evaluation Coordinator, Dr. Guadalupe X. Ayala, worked with academic and community representatives from each site to identify existing scales and develop new scales to measure agreed-upon determinants and outcomes. The process resulted in developing a survey that was culturally relevant for men in all three sites, yet still allowed for comparisons across sites. Prior to data collection, the survey was pilot-tested with community advisory group members at each site and modified as needed before translating the survey into Spanish using standard procedures (Brislin, 1970). The measures used in the study are described below. Full descriptions of how each variable was coded for specific analyses are presented in the Methods sections of

Chapters 5 and 6.

Substance Use Behaviors (Dependent Variables)

There are two outcomes of interest in the study: binge drinking and cigarette smoking. Binge drinking was measured as a count of the number of times in the past 30 days respondents had five or more drinks on one occasion. Respondents could also check a box to indicate that they did not drink alcohol. An indicator variable was created for those who binge drank at least one time in the past 30 days. Cigarette use was measured by a question asking whether the respondent currently smoked daily, occasionally, or not at all. Those who smoked daily or occasionally were also asked to indicate the number of cigarettes they smoked on average and to indicate whether the amount was per day or week. An indicator variable was created for those who currently smoked daily or occasionally. Both items were taken from the Spanish version of the CDC BRFSS questionnaire (Centers for Disease Control and Prevention, 2003)

Perceived Racism (Independent Variables)

For this study, several dimensions of perceived racism were measured by the Reactions to Race module from the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System. The module has been administered in nine states and one urban area (Washington, D.C.) and has been previously used with Spanish-speaking Latino populations (Centers for Disease Control and Prevention, 2004).

Racial consciousness. Three items relate to individuals' awareness of race and racism in their everyday lives. The first question asked how often the participant thought about their race, with seven response options (never, once a year, once a month, once a week, once a day, once an hour, and constantly). The second item asked individuals how often they notice other people treated unfairly based on their race/ethnicity with the same

seven response options. The third question, “How big a problem do you think racism is in the US?” had six response options (not at all, very minor, minor, moderate, serious, and very serious).

Unfair racial treatment. Two items measured the frequency of perceived racism experienced in the past 12 months in both work and health care settings. The questions stated, “Within the past 12 months, [when seeking health care /at work], do you feel your experiences were worse than, the same as, or better than for people of other races/ethnicities?” The six response options were: (1) worse than other races/ethnicities; (2) the same as other races/ethnicities; (3) better than other races/ethnicities; (4) worse than some, better than others; (5) only encountered people of the same race/ethnicity; and, (6) no health care sought/work during the past six months.

Perceived Discrimination (Independent Variables)

In order to assess exposure to different types of discrimination, participants were asked “In what ways, if any, do you differ from those with the greatest opportunity for success in this country?” Response options included a list of social factors on which they might differ from others, including race, ethnicity, language and legal status. Indicator variables were created for each of these factors.

Stress Responses to Perceived Racism (Mediator Variables)

Stress responses to perceived racism were hypothesized to mediate the relationship between perceived racism and substance use. The measure for stress responses was composed of two items from the Reactions to Race module which measured the frequency of emotional and physical responses to unfair racial treatment. The first item asked “Within the past 12 months on average, how often have you felt emotionally upset, for example angry, sad, or frustrated, as a result of how you were treated based on your race/ethnicity?” The

second item asked “Within the past 12 months on average, how often have you experienced any physical symptoms, for example a headache, an upset stomach, tensing of your muscles, or a pounding heart, as a result of how you were treated based on your race/ethnicity?” Both questions had seven response options (never, once a year, once a month, once a week, once a day, once an hour, and constantly).

Coping Resources (Mediator and Moderator Variables)

Two aspects of coping were tested as mediators and moderators in the analyses: coping type and sense of mastery.

Coping Type. The measure for coping type was a 19-item scale of coping responses (Billings & Moos, 1981). Three additional items were added to the scale for the MAN for Health study and response options were altered. The scale contains three coping type subscales: active behavioral (7 items), active cognitive (6 items), and avoidant coping (7 items) types. Responses for subscales (not like me, somewhat like me, a lot like me) were summed with higher scores indicating a higher likelihood of using the coping type. The scale was translated for use on this survey and has not been previously validated among Spanish speaking Latino populations.

Sense of Mastery. The seven-item sense of mastery scale assessed how much control an individual feels over events in his or her life (Pearlin, Menaghan, Lieberman, & Mullan, 1981). Responses to the items ranged from 1 (strongly disagree) to 4 (strongly agree). After two of the items were reverse scored, item values were averaged to create a summary score, with higher scores indicating higher levels of mastery. The scale was translated for use on this survey and has not been previously validated among Spanish-speaking Latino populations.

Sociodemographic Characteristics

Several measures of sociodemographic characteristics were also used to describe the study sample and control for confounding. These included age, marital status, household size, level of education, income, length of residence in the US (in years), country of origin and acculturation. Level of acculturation was measured with a ten-item scale based on a previously published media-based acculturation scale (Ramirez, Cousins, Santos, & Supik, 1986). The scale included questions related to language preferences and the amount of contact with Latino and non-Latino persons, and was altered to provide bidimensional response options (both Latino and Anglo preferences) (Marin & Gamba, 1996).

Data Analysis

The data analysis for this study was conducted in three stages. First, I prepared the data for analysis and completed the descriptive, bivariate and factor analyses outlined in Aim 1. Second, I used logistic regression to determine the independent associations between perceived racism and substance use outlined in Aim 2. Finally, to achieve Aims 3 and 4, I used multivariate linear and logistic regression to test for mediation and moderation of the relationship between perceived racism and substance use. All analyses were performed using SAS Version 9.1 (SAS Institute, 2002).

Data Preparation and Preliminary Analyses

Screening. Univariate descriptive statistics (e.g., frequencies, distributions, means, and measures of dispersion) were used to identify outliers, missing values and variable distributions. This process ensured accurate input of the data and allowed me to verify any implausible values. Normality was assessed using histograms with plotted normal curves and statistical tests of skewness and kurtosis.

Missing Values. Given the rigorous data collection methods of the parent study, there were not large numbers of missing values. For length of residence in the US, 14 missing values were replaced with values for months lived in the area. Cases with missing values on several sociodemographic characteristics ($n = 3$) and/or substance use ($n = 13$) were dropped from the descriptive and logistic regression analyses. Additional cases with missing data on perceived racism and coping were dropped from logistic regression analyses. For example, in cases where models with different independent variables were being compared, cases with missing values for any of the independent variables were deleted to ensure a consistent sample size. The number of missing cases for each variable and the number of observations (n) for each analysis were reported in each table.

Assessing Reliability and Validity of Measures. The scales used to measure acculturation, coping type, and sense of mastery had not been previously tested among Spanish-speaking Latino populations. Therefore, I assessed the construct validity of the scales by conducting factor analysis in SAS Version 9.1 (SAS Institute, 2002). Factor loadings and scree plots of eigenvalues were used to determine whether items had been loaded on to the correct domains and if the scales need to be modified (DeVellis, 2003). I also calculated a Cronbach's alpha coefficient for each scale to assess internal consistency. Any modifications to the scales are reported in the Methods sections of Chapter 5 and 6.

Assessing Intra-class Correlation of Substance Use Behaviors. The MAN for Health study design and intervention required Confidants, who comprise 49% of the study sample ($n = 142$), to be recruited by Navigators. The Navigators at the Chatham County site that participated in the intervention recruited an average of 9 Confidants each (ranging from 5 – 12 per Navigator). Although I did not assess Confidant behaviors after their participation in the intervention, behaviors may have been correlated due to having been recruited by the same Navigator. I tested this assumption of independence by calculating an intra-class correlation coefficient (ICC) for frequency of substance use. The ICC was estimated using

the formula specified by Cohen et al. (Cohen, Cohen, West, & Aiken, 2003), with the mean square error between and within the cluster calculated for dichotomous outcomes (Fleiss, Levin, & Paik, 2003). For these analyses, Navigators were grouped into clusters with their confidants and men in the comparison group were considered to be individuals within their own cluster. The ICC was .16 for binge drinking and .20 for cigarette smoking. I adjusted for this clustering in all regression analyses described below using SAS procedures for generalized estimating equations with robust standard errors (SAS Institute, 2002; Stokes, Davis, & Koch, 2000).

Power Analysis. To evaluate the probability of correctly rejecting null hypotheses when they are false, I calculated power for bivariate associations between perceived racism and substance use. Power estimates were influenced by the clustered sampling design of the study. To adjust for clustering by lay health advisors, I estimated design effects based on the ICC and the mean number of cases per cluster (1.95). The sample size of 291 was divided by the design effects for cigarette smoking (1.20) and binge drinking (1.15) to obtain effective sample sizes for smoking (243) and binge drinking (253).

I used the adjusted sample sizes and known proportions of substance use in the sample to calculate power estimates for detecting differences in proportions. The percentage of current smokers in the sample was 36% and the proportion of binge drinkers was 44%. All calculations used two-sided tests, setting alpha at .05. I chose a 20% difference in proportions as a probable effect size given the results of previous studies of perceived racism on substance use prevalence among African Americans (Landrine & Klonoff, 2000; Yen et al., 1999). For cigarette smoking, with group sizes of 156 and 87, the power for detecting a difference of .20 was .91. For binge drinking, with group sizes of 142 and 111, the power for detecting a difference in proportions of .20 is .94. Therefore, with a sample size of 291 adjusted for clustering within the sample, I had adequate power to detect

a 20% difference in substance use between those with high and low levels of perceived racism.

Statistical Analysis by Study Aim

In this section I briefly describe the general analysis strategy for each study aim. Specific descriptions of the analyses are also presented in the Methods sections of Chapters 5 and 6.

Aim 1: To evaluate the utility of the Reactions to Race items as a measure of perceived racism among Latino immigrant men. Descriptive, bivariate and factor analyses were used to describe the study sample and answer the research questions related to Aim 1. This included descriptive statistics for all study variables. Correlation coefficients were calculated for the perceived racism variables as well as factor analysis. Bivariate statistics were used to assess differences in perceived racism by sociodemographic characteristics. Based on these analyses, logistic regression models were used to estimate the prevalence of perceived racism adjusting for sociodemographic characteristics. Statistical tests were considered significant at an alpha level of .05. Results from this analysis were used to inform the coding of variables for Aims 2 – 4.

Aim 2: To examine the relationship between perceived racism and substance use among Latino immigrant men. I tested the hypothesis that higher levels of perceived racism were associated with binge drinking in the past 30 days and current cigarette smoking. I examined bivariate associations using chi-square statistics, followed by logistic regression analysis to examine multivariate relationships. Each substance use behavior (binge drinking or cigarette smoking) was individually regressed on the variables for perceived racism. Sociodemographic characteristics were added to the models as covariates based on significant bivariate associations with either perceived racism or substance use. Final models included all significant covariates so that estimates could be compared across

models. Estimated regression parameters for the model slope were transformed into an odds ratio for occurrence of the given behavior. I used an alpha level of .05 (or a 95% confidence interval) for test statistic significance.

Aim 3: To examine whether the relationship between perceived racism and substance use is mediated by emotional and physical stress responses to perceived racism among Latino immigrant men. I tested the hypothesis that emotional and physical stress responses mediated the relationship between perceived racism and substance use. I used logistic regression to conduct the four steps for testing mediation outlined by Baron and Kenny (Baron & Kenny, 1986; Frazier, Tix, & Barron, 2004; MacKinnon & Dwyer, 1993). The first step in the mediation analysis, testing the association between perceived racism and substance use, was conducted in the analyses for Aim 2. The second step was to test the association between perceived racism and emotional and physical stress responses (mediators). The third step was to test the association between emotional and physical stress responses and substance use. This step involved adding the mediator variable to the original regression model from step one, which estimated the association between the mediator and the dependent variable (substance use) controlling for the independent variable. The fourth step involved assessing whether the strength of the relationship between the independent and dependent variables is reduced when the mediator is added to the model, followed by testing for the significance of any observed mediated effects. For all of the above steps, emotional and physical stress responses were tested as both combined and separate variables. Covariates included in the final models from Aim 2 were also included in the tests for mediation.

Aim 4: To determine whether the relationship between perceived racism and substance use is mediated or moderated by coping resources among Latino immigrant men. For this aim, I first used descriptive and bivariate statistics to examine patterns of coping among Latino immigrant men. I then answered the first set of research questions: whether

coping resources (coping type and sense of mastery) mediated the relationship between perceived racism and substance use. Tests for mediation were conducted as outlined above, with separate analyses for each coping type and sense of mastery. Because of the potential suppression effects of coping on the relationship between perceived racism and substance use, mediation effects of coping were tested even if there was not a significant relationship between perceived racism and substance use (MacKinnon, Krull, & Lockwood, 2000).

When there were significant associations between perceived racism and substance use, I answered the second set of research questions: whether coping resources moderated the effect of perceived racism on substance use. Moderator variables (coping type and sense of mastery) were centered for interpretation of coefficients and to avoid multicollinearity when both variables and their product term were added to regression models. Logistic regression models estimating the odds of binge drinking and cigarette smoking included the independent variable (perceived racism), the moderator variable (coping type or sense of mastery), the product term, and covariates. Moderation effects were considered significant when the alpha level for the product term was equal to or less than .05.

CHAPTER 5: MEASURING PERCEIVED RACISM AMONG LATINO IMMIGRANT MEN

Increasing migration from Latin American has led to large demographic changes in the United States, and Latinos are now the largest racial/ethnic minority group comprising 15% of the population. A small but growing body of literature suggests that perceived racism is associated with worse mental and physical health among Latinos (Finch et al., 2001; Finch et al., 2000; Ryan et al., 2003). Despite the growth of this population, little is known about the validity and reliability of measures of perceived racism among Latino immigrants. Accurately measuring Latinos perceptions of racism is critical to understanding their influence on health. In this paper, I evaluate the utility of an existing measure of perceived racism among Latino immigrants, describe the prevalence of perceived racism among a sample of Latino immigrant men living in North Carolina, and make recommendations for future studies on the conceptualization and measurement of perceived racism in Latino communities.

Conceptualizing Racism among Latino Immigrants

Racism is defined as the beliefs, attitudes, and institutional practices that denigrate individuals or groups based on their race or ethnic group (Clark et al., 2002; Krieger, 2003). Latinos experience many of the same barriers to full participation in U.S. society as other disadvantaged racial groups; however, they also face unique forms of discrimination based on their social and cultural history as a minority in this country (Panel on Methods for Assessing Discrimination, Committee on National Statistics, & Education, 2004). Other

than physical appearance, aspects of Latino identity such as languages spoken, country of origin and immigration status also contribute to their exposure to racial discrimination.

Findings from recent national surveys support the notion that racism is a pervasive problem for Latino immigrants and that it is composed of many types of discrimination. According to the National Survey of Latinos (NSOL), an annual nationally representative cross-sectional telephone survey, 82% of Latinos felt racial discrimination was a problem that prevents them from succeeding in America (Pew Hispanic Center, 2006). Latino immigrants were more likely to think that discrimination is major problem and report that they have been the victim of discrimination than those born in the US (Pew Hispanic Center, 2007). More Latinos reported being discriminated against based on their language (35%) than either physical appearance alone (24%), or both language and physical appearance (20%) (Pew Hispanic Center, 2006). In addition to language discrimination, immigrant status was seen as the main cause of discrimination among 19% of Latino citizens and 28% of non-citizen Latinos (Pew Hispanic Center, 2007).

Measuring Perceived Racism among Latino Immigrants

Valid and reliable measures of racism are needed to fully understand the complex relationships between racism and health. Previous research on the measurement of racial discrimination has been based largely on the experiences of African Americans (Araujo & Borrell, 2006; Krieger et al., 2005). In order to understand how racism contributes to Latino health disparities, researchers need accurate measures of perceived racism that capture the unique aspects of discrimination for Latino immigrant populations.

Since it is difficult to objectively observe or measure exposure to racism, most research on the health effects of racism focuses on *perceived racism*. Perceived racism is defined as the subjective experience of prejudice or discrimination based on race (Clark et al., 1999; Paradies, 2006). Social and behavioral scientists have developed a wide variety

of measures of perceived racism, ranging from discrete single items to multi-item scales assessing the frequency and impact of discriminatory events (Paradies, 2006; Williams et al., 1997). Current measures often aim to assess several dimensions of perceived racism, including type (e.g., verbal, physical), level (e.g., interpersonal, institutional), dose (e.g., acute or chronic), time frame (e.g., past month, lifetime), setting (e.g., work, health care), and target (e.g., self, family, friends, or others in your ethnic group). In addition, some capture individuals' responses or reactions to racism.

Measures commonly used in health research include the Experiences of Discrimination (EOD) measure, the Major and Everyday Discrimination measure, and the Schedule of Racist Events (SRE) (Krieger et al., 2005; Landrine & Klonoff, 1996; Williams et al., 1997). However, the use of these measures in research conducted with Latino populations has been limited. The Experiences of Discrimination measure includes questions about the frequency of having experienced discrimination in nine specified situations, as well as questions about individuals' responses to these experiences (Krieger et al., 2005). Both English and Spanish versions of the scale have been shown to be valid and reliable among lower- and middle-class Latinos; however, only one study has used the measure among Latino populations (Krieger et al., 2005). The Major and Everyday Discrimination measure assesses whether the respondent has experienced unfair treatment based on ten characteristics (e.g., ancestry or national origin, skin color) and the frequency of unfair treatment based on the ten characteristics (Williams et al., 1997). Although the measure has been used in samples including Latinos, few studies have reported Latino-specific estimates of the prevalence of discrimination using this measure (Kessler et al., 1999; Krieger et al., 2005). The Schedule of Racist Events (Landrine & Klonoff, 1996) is an 18-item scale that measures the frequency of experiencing perceived racism in the past year and lifetime. The measure includes an assessment of how stressful the experience was for the respondent. A modified version of the scale, the General Ethnic Discrimination

scale, has been shown to be valid and reliable for Latino populations but has only been used in a few studies (Landrine et al., 2006).

In addition to these scales, several measures have been developed to assess levels of stress due to acculturation among Latino immigrant populations; examples include the Societal, Attitudinal, Familial, and Environmental Acculturative Stress scale, the Hispanic Stress Inventory, and the Migrant Farmworker Stress Inventory (Cervantes et al., 1990, 1991; Mena et al., 1987; Romero & Roberts, 2003). These measures include items related to perceived racial and ethnic discrimination as an indicator of one type of stressor that immigrants experience. Much of the existing research on discrimination among Latinos has been conducted using items from these scales (Finch et al., 2003; Finch et al., 2001; Finch et al., 2000) However, there are limitations to these measures. They frame exposure to racism as a failure to acculturate or effectively cope with the stress of acculturation; and, the response options often measure the frequency or intensity of the stress associated with the stressor, not perceived exposure to the actual stressor.

More recently, a measure of perceived racism developed by Jones and colleagues has been added to the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (Jones & Measures of Racism Working Group, 2001). The Reactions to Race module has been available for use in statewide health surveys since 2002 and includes questions about individuals' attitudes about race and racism, unfair racial treatment in work and health care settings, and responses to unfair racial treatment (Centers for Disease Control and Prevention, 2002). These questions have been administered by telephone, in both English and Spanish, to Latino respondents in various states throughout the US; however, to date no information on the psychometric properties of the items has been published.

Given the limited availability of valid and reliable measures of perceived racism among Latino immigrants, the study aimed to evaluate the utility of the Reactions to Race

questions in a sample of Latino immigrants living in central North Carolina. As part of this evaluation, I assessed the reliability and validity of the module, described the prevalence of perceived racism as captured by the module, and compared the prevalence to other types of self-reported discrimination.

Methods

Data Source and Study Population

The data for this study come from the Men as Navigators (MAN) for Health and *Hombres Mantiendo Bienestar y Relaciones Saludables* (HoMBReS) studies, which evaluated a lay health advisor intervention targeting Latino men in central North Carolina (see Chapter 4 for a full description of the parent studies). The current study used baseline data collected from 291 Latino immigrant men recruited in Chatham County, North Carolina. A non-probability purposive sampling strategy was used to recruit men to participate in the intervention and comparison groups. The project coordinator recruited 21 lay health advisors (Navigators) to participate in the intervention from an existing soccer league operated by and for Latino immigrant men. Each Navigator played with a different team and recruited up to 12 men from his team as Confidants, i.e. men with whom he would share health information. Comparison group men were recruited by the project coordinator from Latino soccer teams in a neighboring community in the same county. To be eligible for participation in the parent study, the men had to: (1) self-identify as Latino or Hispanic; (2) be a member of a Hispanic soccer league in North Carolina; (3) be 18 years of age or older; (4) be literate in Spanish or English; and, (5) provide informed consent.

Data Collection and Measures

Baseline survey data were collected between the summers of 2005 and 2006. The baseline survey contained 194 items, including measures of health behaviors, perceived

racism, coping, and demographic characteristics. Prior to data collection, the survey was pilot-tested with community advisory group members and modifications made before the survey was translated into Spanish using standard procedures (Brislin, 1970). All men chose to complete the self-administered surveys in Spanish, which took approximately 30 minutes. Participants were read and given a copy of the consent brochure which they signed if they agreed to participate. Surveys were sealed in an envelope by the respondents before they were given to project staff in order to protect their confidentiality. The study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill.

Perceived Racism. A series of questions related to individuals' experiences with and reactions to racism were taken from the Reactions to Race module used by the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS). The following dimensions of racism were measured:

Racial consciousness. Three items relate to individuals' awareness of race and racism in their everyday lives. The first question asked how often the participant thought about their race with seven response options (never, once a year, once a month, once a week, once a day, once an hour, and constantly). For the factor analysis, the variable was collapsed into five categories by combining responses for once an hour and constantly, as well as combining once a day with once a week. For regression analyses, I used an indicator variable for those who thought about their race constantly, which included the responses for once an hour and was based on the distribution of responses. The second item asked individuals how often they noticed other people treated unfairly based on their race/ethnicity with the same seven response options. For regression analysis, I used an indicator variable for those that observed racism towards others at least once a month based on the distribution of the responses. The third question, "How big a problem do you think racism is in the US?" had six response options (not at all, very minor, minor, moderate,

serious, and very serious). For regression analysis, I used an indicator variable for those that reported racism in the US was a “serious” or “very serious” problem based on the distribution of responses.

Unfair racial treatment. Two items measured the frequency of perceived racism experienced in the past 12 months in both work and health care settings. The questions stated “Within the past 12 months, [when seeking health care /at work], do you feel your experiences were worse than, the same as, or better than for people of other races/ethnicities?” The six response options were: (1) worse than other races/ethnicities; (2) the same as other races/ethnicities; (3) better than other races/ethnicities; (4) worse than some, better than others; (5) only encountered people of the same race/ethnicity; and, (6) no health care sought/work during the past six months. For the factor analysis and correlations, the last two response categories were combined into one group considered to be “not applicable.” For the regression analyses, an indicator variable was created from those who reported racial treatment worse than and worse than some, better than others (coded “1”) and all other categories coded “0.”

Responses to unfair racial treatment. Two items measured the frequency of emotional and physical responses to perceived racism. The first item asked “Within the past 12 months on average, how often have you felt emotionally upset, for example angry, sad, or frustrated, as a result of how you were treated based on your race/ethnicity?” The second item asked “Within the past 12 months on average, how often have you experienced any physical symptoms, for example a headache, an upset stomach, tensing of your muscles, or a pounding heart, as a result of how you were treated based on your race/ethnicity?” Both questions had seven response options (never, once a year, once a month, once a week, once a day, once an hour, and constantly). For the factor analysis, the variable was collapsed into five categories by combining responses for once an hour and constantly, as

well as combining once a day with once a week. Indicator variables were also created for those that reported emotional and physical health symptoms at least once a month.

Perceived Discrimination. In order to assess exposure to different types of discrimination, participants were asked “In what ways, if any, do you differ from those with the greatest opportunity for success in this country?” Response options included a list of social factors on which they might differ from others, including race, ethnicity, language and legal status. Indicator variables were created for each of these factors.

Sociodemographic Characteristics. Respondents were asked several questions about their sociodemographic characteristics. Age was reported in years, which was categorized into the following groups: 18 to 24, 25 to 29, 30 to 34, and 35 and older. The marital status of those who were single, divorced or widowed was coded as “single,” and those that were married (living with or without their family) or single but living with a partner were coded as “married or living as married.” Household size was measured as the number of people living in the respondents’ home, including themselves. Level of education was measured as the number of years of education the respondent had completed, and was recoded into two categories, those with a high school education, general equivalency degree (GED) or more education, and those with less than a high school education (or GED). Respondents were asked to indicate the category that represented their total income before taxes in the past year, as well as the number of people their income supported. Response options included ten categories ranging from less than \$10,000 to more than \$58,000. The income variable was recoded into five categories based on the distribution of responses. Respondents were asked to report the country in which they were born. Responses were grouped into those from Mexico and those from other countries. Length of residence in the US was measured as the number of months the respondent had lived in the US, which were then recalculated into years. Level of acculturation was measured with a ten item scale ($\alpha = .92$) based on a previously published media-based acculturation scale

(Ramirez et al., 1986). The scale included questions related to language preferences and the amount of contact with Latino and non-Latino persons, and was altered to provide bidimensional response options (both Latino and Anglo preferences) (Marin & Gamba, 1996).

Data Analysis

Descriptive statistics were used to describe the study sample and the prevalence of perceived discrimination and perceived racism. Three cases were dropped from all analyses due to missing data on several sociodemographic characteristics, additional cases with missing data were dropped from the logistic regression analyses depending on the dependent variable. I calculated correlation coefficients and conducted factor analysis on cases with no missing data to assess the association between the perceived racism items. Based on a literature review, I identified three theoretical constructs underlying the items in the Reactions to Race module. Therefore, three factors were initially specified using an oblique (*promax*) rotation to allow for correlated factors. Logistic regression models were used to estimate the prevalence of perceived discrimination and perceived racism controlling for sociodemographic characteristics. The final models contained only those sociodemographic characteristics that were significant for at least one of the perceived racism or discrimination variables. All analyses were conducted using SAS Version 9.1 (SAS Institute, 2002). To account for the correlation within clusters (Confidants recruited by the same Navigator), models were estimated using the SAS procedures for generalized estimating equations (GEE) with robust standard errors. Statistical tests were considered significant at an alpha level of .05.

Results

Table 5.1 shows the sociodemographic characteristics of the study sample. The mean age of the men was 29.4 years. Most were married or living as married with an average household size of 4.5. The majority of the men had less than a high school education and incomes less than \$22,000 per year. Almost 70% of the men were from Mexico. Other countries of origin reported were Brazil, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Nicaragua, Peru, Puerto Rico, and Venezuela. Average length of residence in the US was eight years. The average level of acculturation among the men was 1.8 (range 1 to 4), with 41% reporting that they spoke and read only Spanish.

Table 5.1 Sociodemographic Characteristics of the Study Sample (n = 288)

	Number	Percent	Mean (SD)	Range	Missing
Age (years)			29.4 (8.0)	18 - 71	7
18 - 24	83	29.5%			
25 - 29	79	28.1%			
30 - 34	55	19.6%			
35+	64	22.8%			
Marital Status					5
Single	95	33.6%			
Married or living as married	188	66.4%			
Household size			4.5 (1.8)	2 - 12	5
Education					5
Less than High School/GED	175	62.3%			
High School/GED or greater	108	37.7%			
Income					15
Less than \$10,000	46	16.9%			
\$10,000 - \$16,000	73	26.7%			
\$16,001 - \$22,000	62	22.7%			
\$22,001 - \$28,000	45	16.5%			
\$28,001 or more	47	17.2%			
Country of Origin					8
Mexico	200	69.4%			
Other country	80	27.8%			
Years living in the U.S.			8.0 (6.8)	1 - 54	9
Level of acculturation			1.8 (0.7)	1 - 4	

Table 5.2 Correlation Matrix for Perceived Racism Variables (n=250)

	1	2	3	4	5	6	7
1. To what extent is racism a problem in the U.S. today	1.000						
2. How often do you think about your race	0.249 <i>p</i> <.0001	1.000					
3. How often do you notice other people being treated unfairly	0.319 <i>p</i> <.0001	0.296 <i>p</i> <.0001	1.000				
4. Frequency of unfair racial/ethnic treatment at work	0.130 <i>p</i> =0.04	0.005 <i>p</i> =0.94	0.139 <i>p</i> =0.02	1.000			
5. Frequency of unfair racial/ethnic treatment in health care	0.091 <i>p</i> =0.15	0.015 <i>p</i> =0.82	-0.127 <i>p</i> =0.04	0.183 <i>p</i> =.004	1.000		
6. Emotional responses to racial/ethnic treatment	0.221 <i>p</i> =0.0004	0.227 <i>p</i> =.0003	0.375 <i>p</i> <.0001	0.195 <i>p</i> =0.002	-0.031 <i>p</i> =0.62	1.000	
7. Physical responses to racial/ethnic treatment	0.138 <i>p</i> =0.029	0.175 <i>p</i> =0.006	0.363 <i>p</i> <.0001	0.127 <i>p</i> =0.04	-0.121 <i>p</i> =0.05	0.572 <i>p</i> <.0001	1.000

The correlation matrix for the items in the Reactions to Race module is presented in Table 5.2. Correlations between the items ranged from .005 to .572. Results from the factor analysis are presented in Table 5.3. Two of the three factors had eigenvalues greater than 1.00. The first factor, “responses to racial treatment” included the items measuring the emotional and physical health symptoms resulting from perceived racism. These items were also moderately correlated ($r = 0.57, p < .0001$). The second factor, “racial consciousness,” included three items related to awareness of race and racism: to what extent do you think racism is a problem in the US, how often you think about your race, and if you observe perceived racism towards others. These items were also moderately correlated with coefficients ranging from 0.25 to 0.32 ($p < .0001$). The third factor, “racial treatment,” included the items measuring the frequency of racism experienced at work or in health care settings ($r = 0.28, p < .0001$). Because two of the factors only had two items per factor (one of which had an eigenvalue lower than 1.00 in the initial solution, I also ran the factor analysis without specifying the number of factors. In this analysis, the same three items loaded on to the first factor and the four remaining items loaded on to the second factor. All factor loadings were slightly lower than the initial solution.

The prevalence of perceived racism and perceived discrimination are presented in Table 5.4. There was a high level of awareness of race and racism among the men. Over 40% of the participants reported thinking about their race constantly. Almost half of the men reported observing racism towards others at least once of month; however, 35% reported never noticing other people being treated unfairly based on their race/ethnicity. The majority of men also thought that racism was a serious or very serious problem in the United States (54%). Similar rates of unfair racial treatment were reported in work and health care settings (15% and 12%, respectively). However, over 10% reported only encountering people of the same race/ethnicity at work and 20% reported that they sought no health care during the

Table 5.3 Factor Loadings for Perceived Racism Variables (n=250)

	Factor 1	Factor 2	Factor 3
<i>Items</i>			
1. To what extent is racism a problem in the U.S. today?	0.157	0.824	0.161
2. How often do you think about your race?	0.267	0.757	0.041
3. How often do you notice other people being treated unfairly?	0.549	0.631	0.091
4. Within the past 12 months at work, do you feel you were treated worse than, the same as, or better than people of other races/ethnicities?	0.225	0.156	0.834
5. Within the past 12 months when seeking health care, do you feel you were treated worse than, the same as, or better than people of other races/ethnicities?	0.303	0.045	0.823
6. Within the past 12 months on average, how often have you felt emotionally upset as a result of how you were treated based on your race/ethnicity?	0.848	0.320	0.331
7. Within the past 12 months on average, how often have you felt physical symptoms as a result of how you were treated based on your race/ethnicity?	0.885	0.195	0.245
<i>Eigenvalues</i>	2.515	1.291	0.922

Table 5.4 Prevalence of Perceived Racism and Perceived Discrimination (n=288)

	Number	%	Missing
<i>Racial Consciousness</i>			
How often do you think about your race?			7
Never	59	21.0%	
Once a year	31	11.0%	
Once a month	26	9.3%	
Once a week	26	9.3%	
Once a day	20	7.1%	
Once an hour	1	0.4%	
Constantly	118	42.0%	
How often do you notice other people being treated unfairly?			2
Never	99	34.6%	
Once a year	52	18.2%	
Once a month	47	16.4%	
Once a week	21	7.3%	
Once a day	4	1.4%	
Once an hour	1	0.4%	
Constantly	62	21.7%	
To what extent is racism a problem in the U.S. today?			1
Not at all	31	10.8%	
Very minor	29	10.1%	
Minor	25	8.7%	
Moderate	48	16.7%	
Serious	85	29.6%	
Very serious	69	24.0%	
<i>Unfair Racial Treatment</i>			
At work			2
Worse than other races/ethnicities	33	11.5%	
Same as other races/ethnicities	191	66.8%	
Better than other races/ethnicities	14	4.9%	
Worse than some, better than others	10	3.5%	
Only encountered people of same race/ethnicity	32	11.2%	
No work during past 12 months	6	2.1%	
When seeking health care			7
Worse than other races/ethnicities	25	8.9%	
Same as other races/ethnicities	170	60.5%	
Better than other races/ethnicities	9	3.2%	
Worse than some, better than others	10	3.6%	
Only encountered people of same race/ethnicity	11	3.9%	
No health care seeking during past 12 months	56	19.9%	

Table 5.4 Prevalence of Perceived Racism and Perceived Discrimination (Continued)

	Number	%	Missing
<i>Responses to Unfair Racial Treatment</i>			
Emotional symptoms			6
Never	116	41.1%	
Once a year	70	24.8%	
Once a month	41	14.5%	
Once a week	17	6.0%	
Once a day	10	3.6%	
Once an hour	3	1.1%	
Constantly	25	8.9%	
Physical symptoms			7
Never	149	53.0%	
Once a year	59	21.0%	
Once a month	40	14.2%	
Once a week	13	4.6%	
Once a day	6	2.1%	
Once an hour	0	0.0%	
Constantly	7	5.0%	
<i>Types of Discrimination</i>			
Language	167	58%	
Legal Status	145	50%	
Education	110	38%	
Race	86	30%	
Wealth	41	14%	
Culture	37	13%	
Ethnicity	34	12%	
Gender	26	9%	
Religion	21	7%	
Sexual orientation	14	5%	

Table 5.5 Sociodemographic Characteristics Associated with Perceived Racism and Perceived Discrimination (n=258)

	Racism is a serious problem		Think about race constantly		Observe racism towards others at least once a month	
	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	0.26	(0.05 - 1.33)	0.22	(0.07 - 0.69)	**	0.04 (0.01 - 0.17) ***
Age group ^a						
18 - 24	0.80	(0.34 - 1.87)	0.51	(0.26 - 0.99)	*	1.85 (0.78 - 4.39)
25 - 29	1.32	(0.61 - 2.85)	1.30	(0.68 - 2.59)		2.26 (0.85 - 6.05)
30 - 34	0.90	(0.42 - 1.96)	1.26	(0.65 - 2.45)		3.03 (1.20 - 7.65) *
High school education	1.51	(0.89 - 2.58)	1.29	(0.76 - 2.20)		3.01 (1.63 - 5.56) ***
Income ^b						
Less than \$10,000	2.18	(0.90 - 5.30)	1.76	(0.74 - 4.22)		0.81 (0.31 - 2.11)
\$10,000 - \$16,000	1.48	(0.62 - 3.56)	3.08	(1.37 - 6.94)	**	1.61 (0.68 - 3.83)
\$16,001 - \$22,000	1.99	(0.68 - 5.82)	2.21	(0.96 - 5.08)		2.03 (0.80 - 5.20)
\$22,001 - \$28,000	3.19	(1.17 - 8.66)	1.78	(0.76 - 1.02)		2.98 (0.81 - 10.99)
Acculturation	1.26	(0.82 - 1.95)	1.32	(0.89 - 1.98)		2.61 (1.63 - 4.18) ***

* p ≤ .05, ** p ≤ .01, *** p ≤ .001

^a Reference group is 35 years and older

^b Reference group is \$28,000 or more

Table 5.5 Sociodemographic Characteristics Associated with Perceived Racism and Perceived Discrimination (Continued)

	Racial discrimination		Ethnic discrimination		Language discrimination		Legal status discrimination					
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI				
Intercept	0.05	(0.02 - 0.17)	***	0.05	(0.01 - 0.22)	***	1.85	(0.61 - 5.67)	0.29	(0.09 - 0.93)	*	
Age group ^a												
18 - 24	2.05	(0.82 - 5.11)		0.91	(0.36 - 2.35)		0.34	(0.17 - 0.68)	**	0.54	(0.27 - 1.10)	*
25 - 29	1.64	(0.71 - 3.76)		0.89	(0.37 - 2.18)		0.51	(0.25 - 1.05)		0.46	(0.21 - 1.00)	
30 - 34	1.58	(0.55 - 4.51)		0.99	(0.27 - 3.65)		0.68	(0.33 - 1.46)		0.82	(0.34 - 1.97)	
High school education	1.69	(0.85 - 3.34)		1.49	(0.43 - 5.11)		0.87	(0.46 - 1.65)		1.42	(0.72 - 2.85)	
Income ^b												
Less than \$10,000	1.81	(0.83 - 3.95)		1.28	(0.32 - 5.14)		2.99	(1.28 - 6.95)	**	4.20	(1.65 - 10.70)	**
\$10,000 - \$16,000	2.55	(1.15 - 5.67)	*	0.72	(0.22 - 2.38)		4.17	(1.67 - 10.43)	**	8.92	(3.48 - 22.86)	***
\$16,001 - \$22,000	2.54	(1.02 - 6.34)	*	1.46	(0.66 - 3.20)		1.78	(0.78 - 4.09)		3.54	(1.49 - 8.40)	**
\$22,001 - \$28,000	1.68	(0.73 - 3.82)		2.03	(0.64 - 6.42)		1.82	(0.91 - 3.68)		2.42	(1.10 - 5.36)	*
Acculturation	1.55	(1.06 - 2.26)	*	1.52	(0.96 - 2.43)		0.82	(0.52 - 1.30)		1.24	(0.82 - 1.87)	

* p ≤ .05, ** p ≤ .01, *** p ≤ .001

^a Reference group is 35 years and older

^b Reference group is \$28,000 or more

past 12 months. The men reported frequent emotional and physical health symptoms as a result of perceived racism in the past 12 months. One third of the men reported being emotionally upset at least once a month, and 10% of the sample reported being constantly emotionally upset because of unfair treatment. One quarter reported having physical health symptoms at least once a month in the past year, and 5% reported constant physical symptoms. The majority of the men reported at least one type of discrimination (80%). Language and legal status were the most common types of discrimination, each reported by over half the men in the study.

To identify correlates of perceived racism and perceived discrimination, I estimated models of the prevalence of four types of discrimination (racial, ethnic, language and legal status) and the perceived racism items adjusted for sociodemographic characteristics. Estimates from full models with significant covariates are presented in Table 5.5. All odds ratios reported in the text are significant at the $p < .05$ level unless otherwise noted. Being in the youngest age group (18 to 24) was significantly associated with decreased odds of thinking about your race constantly (OR = 0.51) compared to those 35 and older. Having a high school education and increased level of acculturation were significantly associated with increased odds of observing racism towards others at least once a month. In general, lower income levels were also associated with increased odds of thinking race was a serious problem, thinking about your race constantly and observing racism towards others. There were similar findings for perceived discrimination. Lower income levels were associated with increased racial, language and legal status discrimination. Younger age was associated with significantly lower odds of experiencing language discrimination (OR = 0.34) and legal status discrimination (OR = 0.46), compared to those in the highest age group (35 and older). A one-unit increase in the level of acculturation was associated with a 55% increased odds of reporting racial discrimination.

Models were also estimated for unfair racial treatment at work and health care and responses to unfair racial treatment; however, there was only one significant association with sociodemographic characteristics in all of the models (results not shown). Men with an income between \$16,000 and \$22,000 had three times the odds of reporting emotional responses to unfair racial treatment as those in the highest income category (OR = 3.11, 95% CI:1.15 – 8.43, $p = .02$).

Discussion

As part of the growing literature on racism and health, several measures have been developed to assess perceived racism. However, few have been tested among Latino populations. The purpose of the study was to assess the utility of an existing measure of perceived racism among Latino immigrant men. As part of my analysis, I assessed the internal consistency and reliability of the Reactions and Race module. I also examined patterns of perceived racism among Latino immigrant men based on this measure, and compared the results to other measures of discrimination.

The results indicated that the Reactions to Race items did not have the construct validity or internal consistency to be used as a one-dimensional measure of perceived racism. While the items assessed three key dimensions of perceived racism (racial consciousness, unfair racial treatment, and responses to unfair racial treatment), the measure failed to capture other important aspects of perceived racism for Latino immigrants such as discrimination based on language and legal status. In this section I compare the results to previous studies on perceived racism and health, and make recommendations for future studies of perceived racism in Latino immigrant populations.

While a significant proportion of the men in the study reported being constantly aware of their race, a large percentage also reported never thinking about their race. Previous research using this measure has shown a similar bimodal pattern of responses among other racial/ethnic minorities (Jones, 2000; North Carolina Center for Health Statistics, 2002), which indicates that while the question is salient for many racial/ethnic minorities (including Latino immigrants), it is not for others. Although the question was developed to capture the level of stress an individual feels as a result of the racial climate they are living in, thinking about one's race may also be an indicator of racial/ethnic pride or racial/ethnic centrality (Jones & Measures of Racism Working Group, 2001). It is not clear how the question was interpreted by the study sample. Further research is needed to understand how Latino immigrants interpret this question. Studies comparing responses to this item with other measures of discrimination can help determine whether it is an indicator of racism-related stress.

In addition to those that constantly thought about their race, a large percentage of men reported constantly witnessing unfair racial treatment towards others. Theory suggests that witnessing perceived racism towards other group members can result in vicarious stress responses (Miller & Kaiser, 2001). Given the constant threat of racism, Latino men in the study live in a state of heightened awareness about how they themselves and other Latinos are perceived by others. Hypervigilance is an emotional and psychological response to oppression that has been described as a chronic stressor among other racial/ethnic groups (Myers et al., 2003). Recent research indicates that hypervigilance may be particularly stressful for immigrants who live in fear of being deported or suspected of being in the country illegally. In the 2007 National Survey of Latinos, 67% of foreign-born Latinos said they worried a lot that they, a family member or close friend could be deported (Pew Hispanic Center, 2007).

Given these findings, it is not surprising that 54% of the men in the study felt that racism was a serious problem in the US. The proportion of men that held this attitude was somewhat higher than rates reported in a study of Latinos living in a neighboring North Carolina county. In that study, 37% Latinos participating in the telephone survey thought racism was a major problem at work, 40% thought it was a major problem in healthcare, 40% in education, and 35% in housing (Friedman et al., 2005). However, rates in the current study were similar to the percentage that believed racism as a major problem in a national sample (Pew Hispanic Center, 2007).

I was somewhat surprised to find that men in the study reported relatively low levels of perceived racism at work, especially given higher rates reported in previous studies among Latino populations (Finch et al., 2003; Friedman et al., 2005; Pew Hispanic Center, 2007). The findings suggest that work may not be the most relevant setting for measuring discrimination among this population, as more than 10% of the men reported only encountering people of the same race/ethnicity at their workplace. Common workplaces for this population include poultry plants and construction sites where the men may be isolated from White co-workers in higher level administrative positions (Cuadros, 2006; Kochkar et al., 2005). Furthermore, discrimination associated with employment may occur before men ever enter the workplace - during the hiring process, for example. In a recent national survey, 15% of Latinos reported having trouble finding or keeping jobs in the past year because they are Latino (Lopez & Minushkin, 2008).

In the study, rates of perceived racism in health care were also lower than rates reported in previous studies. In a national survey of foreign-born Latinos, 24% reported difficulty accessing health care in the past year as a result of their race/ethnicity (Pew Hispanic Center & Kaiser Family Foundation, 2002). Similarly, a study of recent Latino immigrants in the Midwest found that 26% cited perceived racism as a barrier to seeking health care (Blankenau, Boye-Beaman, & Mueller, 2000). As with the workplace, health

care may not be a setting where young Latino men who rarely seek health care services experience significant levels of perceived racism.

Despite the low levels of discrimination reported in work and health care settings, the men reported frequent emotional and physical responses to unfair racial treatment in the past year, supporting previous research on the harmful effects of racism on the emotional and physical health of Latino immigrants (Diaz et al., 2004; Diaz et al., 2001; Finch et al., 2001; Finch et al., 2000; Finch & Vega, 2003; Krieger et al., 2005; Ryan et al., 2003; Steffen & Bowden, 2006; Stuber et al., 2003). Similar to these findings, previous research has shown stronger associations between perceived racism and emotional health than physical health outcomes (Paradies, 2006). Researchers have suggested that racism may have a lagged effect on physical outcomes, which is mediated by negative mental health outcomes (Myers et al., 2003). More research on the pathways by which racism influences physical health is needed.

As part of my evaluation, I compared responses to the Reactions to Race questions to other types of self-reported discrimination. The men in the study identified language, legal status, education and race as the most common sources of perceived discrimination. This was consistent with results from a recent national survey, in which Latinos cited language (46%), immigration status (22%), income and education (15%), and skin color (11%) as the most common causes of perceived discrimination (Pew Hispanic Center, 2007). However, rates in the current study (which ranged from 30 – 58%) were much higher than those found in previous studies, which may have been due to the fact that the population was primarily Spanish-speaking and all foreign-born (Trivedi & Ayanian, 2006).

Similar to other studies, those in lower income groups were more likely to report racial, language and legal status discrimination (Paradies, 2006). Younger men (ages 18 – 35) also tended to be less likely to report language and legal status discrimination than men 35 and older. Previous studies have shown inconsistent associations between age and

racial discrimination. Older men may have been more likely to report discrimination, because they have had increased exposure to discrimination over their lifetime. Perceived racism was associated with increased acculturation, but not length of residence in the US. Therefore, increased contact with U.S. mainstream culture, independent of length of residence in the US, put men at increased risk of racial discrimination. This is an important distinction given that some immigrants live largely racially and ethnically segregated lives, despite living in the US for many years.

This study is not without limitations. All measures were self-reported and thus, subject to recall and social desirability bias. Participants were asked to report their experiences with racism over the past year. Given the length of this time frame, their responses may have either underestimated their actual exposure to racism because of their inability to remember events over the past year, or overestimated the actual exposure because previous events were recalled as being within the past year time frame. Social desirability bias could have also resulted in an underreporting of perceived racism. Despite these limitations, the findings have important implications for future research.

Recommendations for Future Studies of Perceived Racism among Latino Immigrants

The study assessed several important dimensions of perceived racism for Latino immigrants, including frequency, time frame, setting, and target of the exposure. In addition, I was among the first to document Latino immigrant men's attitudes about racism, observations of racism towards others, and emotional and physical responses to unfair racial treatment. However, there were some limitations to the Reactions to Race questions. Based on the findings and previous research on racism among Latino immigrants, I recommend further research in several areas.

- **Exploring the relationships between racial, language, and legal status discrimination.** Discrimination due to language and legal status were cited almost twice as

often as racial discrimination. Theory and empirical evidence suggest that Latinos are discriminated against based on factors related to both their racial identity (such as skin color and facial features) and their ethnic identity (such as language use and country of origin). The social and political history of immigration to the US from Latin American influences prejudice and stereotypes of Latinos and Latino immigrants. Together these factors shape the oppression of Latinos. Prejudice towards and stereotypes about Latinos are often based on assumptions about what languages they speak and their legal status.

Future research on perceived racism should include items related to language and legal status. Qualitative methods, such as in-depth interviews with Latino immigrants, could shed light on the relationships between racial, ethnic, language and legal status discrimination and explore how Latinos identify and distinguish between different types of discrimination. New measures should assess specific aspects of language discrimination, such as whether it is prejudice about using English or Spanish, not knowing the English language, or speaking English with an accent. Future research on legal status discrimination should describe experiences among both documented and undocumented Latinos, as well as emotional responses to legal status discrimination, such as fear of deportation and hypervigilance.

- **Psychometric testing of new and existing measures of perceived racism.**

This study was conducted using secondary analysis of available data; therefore, I was unable to fully analyze of the psychometric properties of the Reactions to Race module. However, initial findings suggest that the measure could be improved to more fully capture Latino immigrants' experiences with perceived racism.

Future studies should further assess measures of perceived racism among Latino immigrants through test-retest reliability analysis and comparing results across measures of perceived racism. Newly developed measures should also be compared to those measures

that have been previously tested among Latino populations, such as the Experiences of Discrimination measure and the Schedule of Racist Events.

- **Identifying key types and settings of perceived racism.** Two aspects of perceived racism that were not adequately captured by the Reactions to Race questions were the type and setting of perceived racism. Previous research suggests that Latinos experiences several types of discrimination such as being treated with less respect than other people, being called names or insulted because of their race/ethnicity, and being the victim of hate crimes (Pew Hispanic Center & Kaiser Family Foundation, 2002). However, little is known about the prevalence of these different types of discrimination and whether they differentially impact health outcomes. Although there were low levels of perceived racism in work and health care settings reported in the study, I recommend that future studies continue to assess discrimination in these settings. Future research should focus on identifying additional settings where Latino immigrants are exposed to racism, such as restaurants or stores, government offices, and other public places (Lopez & Minushkin, 2008; Pew Hispanic Center, 2007).

- **Identifying relevant sociodemographic covariates of perceived racism.** In this study age, income, education, and acculturation were important sociodemographic covariates of perceived racism. The characteristics of the study sample limited comparisons of the prevalence of perceived racism by several other characteristics which have been associated with perceived racism in previous studies such as employment, nativity, and gender. Future studies should identify additional covariates in larger, more diverse samples. Racial, ethnic, language and legal status discrimination were each associated with different sociodemographic correlates; therefore, it may also be important to identify which covariates are related to different types of discrimination.

In conclusion, the Reactions to Race measure may be useful for identifying some aspects of perceived racism among Latino populations. However, efforts to develop new

valid and reliable self-report measures of perceived racism can help enhance future research on the health effects of racism among the growing population of Latino immigrants.

CHAPTER 6: PERCEIVED RACISM, COPING, AND SUBSTANCE USE AMONG LATINO IMMIGRANT MEN

Introduction

Increasing migration from Latin America has led to large demographic changes in the southeastern United States (Durand et al., 2005). In North Carolina (NC), the number of Latinos increased by almost 400% from 1990 to 2000, giving the state the fastest-growing Latino population in the US (U.S. Census, 2001). Latino immigrants face numerous stressors in their adaptation to life in the US, including exposure to racism. Racism has been associated with increased substance use among African Americans yet few studies have investigated the relationships between perceived racism and substance use among Latinos (Bianchi, Zea, Poppen, Reisen, & Echeverry, 2004; Edwards & Romero, 2008; Farley, Galves, Dickinson, & Diaz Perez, 2005; Finch et al., 2003; Landrine et al., 2006).

Heavy drinking is a serious health concern for Latino men living in the US. Reported rates of binge drinking among Latino men have not only been higher than rates for non-Latino White or African American men, but have been steadily increasing (American Cancer Society, 2006; Caetano & Clark, 1998; Naimi et al., 2003). A recent national survey reported that 23% of Latinos had participated in binge drinking in the past 30 days (Miller et al., 2004). Among Spanish-speaking Latinos in North Carolina, rates of binge drinking are similar to national rates and highest among all racial and ethnic groups in the state (North Carolina Center for Health Statistics, 2005). A study of Mexican immigrants living in rural eastern North Carolina found that 12% engaged in binge drinking on at least one day in the past month (Loury & Kulbok, 2007). Another study of recent Latino immigrant farmworkers in eastern North Carolina, found that 27% reported frequent binge drinking (two or more

times per month), and over half of those who consumed alcohol met criteria for alcohol dependence/abuse (Grzywacz et al., 2007).

Cigarette smoking is another common form of substance use among Latino men. In 2005, 23% of Latino males in the US were current smokers (American Cancer Society, 2005), similar rates were reported among White men and higher rates among African American men (Centers for Disease Control and Prevention, 2006; U.S. Department of Health and Human Services, 1998). According to the 2003 – 2005 North Carolina Behavioral Risk Factor Surveillance System, 17% of all Latinos in the state reported being current smokers (North Carolina Center for Health Statistics, 2006). A study of Mexican immigrants living in eastern North Carolina found similar rates (Loury & Kulbok, 2007). However, Latino men tend to be lighter smokers, smoking fewer cigarettes per day on average than White men (U.S. Department of Health and Human Services, 1998; Zhu et al., 2007).

Few studies have examined associations between substance use and perceived racism among Latinos (Finch et al., 2003; Landrine et al., 2006). Finch et al. (2003) found that among Mexican labor migrants in California, racial discrimination at work was significantly related to alcohol abuse/dependence in the past year after controlling for age, time in the US, family income, education, gender, employment status and marital status (Finch et al., 2003). In a study with a combined student and community sample (n=1569) that included Latinos, racial discrimination was significantly associated with increased odds of being a current smoker (Landrine et al., 2006).

To offer explanations for how perceived racism functions as a social determinant of substance use, three theoretical models focus on stress and coping. The Ecosocial Model describes multiple pathways through which perceived racism can harm health, one of which is through the stress of “socially inflicted trauma” (Krieger, 2000, 2005; Paradies, 2006). In addition to these pathways, the model conceptualizes two types of responses to the stress

of socially inflicted trauma that can influence health outcomes: responses that are protective and those that are harmful (Krieger, 2000). Substance use is an example of a potentially harmful response to racial discrimination.

The Biopsychosocial Model, developed by Clark and colleagues (1999), also conceptualizes perceived racism as a form of stress. According to the model, the appraisal of racism as a stressor leads to emotional and physical stress responses, which mediate the effect of perceived racism on health. The model also draws on the Stress and Coping Theory, which describes how different aspects of coping mediate or moderate the negative health effects of perceived racism (Lazarus & Folkman, 1984). According to the theory, health effects of racism result from the interaction of the stressor (perceived racism) and the coping resources of the individual (Folkman, 1984). Coping resources are the efforts and resources individuals use to manage the internal and external demands of stressful situations. Examples include coping behaviors - things people do reduce stress such as exercise or seeking social support - and a sense of mastery, the extent to which people feel they have control over the things that happen to them (Folkman, 1984; Folkman & Lazarus, 1980). Part of the variation in how individuals respond to stressful experiences is a function of their coping resources.

Few studies have tested the mediation and moderation pathways proposed by the Biopsychosocial Model and Stress and Coping Theory (Armstead et al., 1989; Krieger & Sidney, 1996; Moradi & Hasan, 2004; Noh & Kaspar, 2003; Paradies, 2006). Two studies have shown that stress mediates the relationships between perceived racism and health outcomes among African Americans and Latinos (Gibbons et al., 2004; Walters, 2004). Studies on coping resources offer mixed evidence of the impact on health in the presence of perceived racism. In their study of Korean immigrants living in Canada, Noh and Kaspar (2003) found that active coping was more effective in reducing the impact of discrimination on depression than avoidant coping. In contrast, a study of Southeast Asian refugees in

Canada found that avoidant coping strategies were associated with decreased depression (Noh et al., 1999). Avoidant coping strategies may be protective in environments where immigrants have few avenues for addressing or confronting perceived racism. Little is known about the stress and coping behaviors of Latino immigrant men and how they might influence the relationship between racism and substance use (Billings & Moos, 1981; Edwards & Romero, 2008; Farley et al., 2005; Yabiku & Farone, 2006).

The aim of the study was to address this gap in the literature by testing whether perceived racism was associated with increased binge drinking and cigarette smoking among Latino immigrant men living in rural North Carolina. In addition, I assessed whether emotional and physical responses to perceived racism mediated the association between perceived racism and substance use and whether coping resources mediated or moderated the relationship between perceived racism and binge drinking and cigarette smoking.

Methods

Data Source and Study Population

The data for this study come from the Men as Navigators (MAN) for Health and *Hombres Manteniendo Bienestar y Relaciones Saludables* (HoMBReS) studies, which evaluated a lay health advisor intervention targeting Latino men in central North Carolina (see Chapter 4 for a full description of the parent study). The current study used baseline data collected from 291 Latino immigrant men recruited in Chatham County, North Carolina. A non-probability purposive sampling strategy was used to recruit men to participate in the intervention and comparison groups. The project coordinator recruited 21 lay health advisors (Navigators) to participate in the intervention from an existing soccer league operated by and for Latino immigrant men. Each Navigator played with a different team and recruited up to 12 men from his team as Confidants, men with whom he would share health information. Comparison group men were recruited by the project coordinator from Latino

soccer teams in a neighboring community in the same county. To be eligible for participation in the parent study, the men had to: (1) self-identify as Latino or Hispanic; (2) be a member of a Hispanic soccer league in North Carolina; (3) be 18 years of age or older; (4) be literate in Spanish or English; and, (5) provide informed consent.

Data Collection and Measures

Baseline survey data were collected between the summers of 2005 and 2006. The baseline survey contained 194 items including measures of health behaviors, perceived racism, coping, and demographic characteristics. Prior to data collection, the survey was pilot-tested with community advisory group members and modifications made before the survey was translated into Spanish using standard procedures (Brislin, 1970). All men chose to complete the self-administered surveys in Spanish, which took approximately 30 minutes. Participants were read and given a copy of the consent brochure which they signed if they agreed to participate. Surveys were sealed in an envelope by the respondents before they were given to project staff in order to protect their confidentiality. The study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill.

Substance Use. I evaluated the relationship between perceived racism and two types of substance use, binge drinking and cigarette smoking. Participants were asked to report the number of times they had binge drank (had five or more drinks on one occasion) in the past 30 days. An indicator variable was created for those that binge drank at least one time in the past 30 days. Participants were asked if they currently smoked daily, occasionally or not at all. An indicator variable was created for those that reported current daily or occasional smoking. Language for both items were taken from the Spanish version of the CDC BRFSS questionnaire (Centers for Disease Control and Prevention, 2003).

Perceived Racism. Three dimensions of perceived racism were measured: type of

discrimination, racial consciousness, and unfair racial treatment in work and health care.

Type of discrimination. In order to assess exposure to different types of discrimination, participants were asked “In what ways, if any, do you differ from those with the greatest opportunity for success in this country?” Response options included a list of social factors on which they might differ from others, including race, ethnicity, language and legal status. Indicator variables were created for each of these factors.

Racial consciousness. This construct was measured using three items related to individuals’ awareness of race and racism in their everyday lives taken from the Reactions to Race module used by the Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS). The module has been administered in nine states and one urban area (Washington, D.C.) and has been previously used with Spanish-speaking Latino populations (Centers for Disease Control and Prevention, 2004). The first question asked how often the participant thought about their race with seven response options (never, once a year, once a month, once a week, once a day, once an hour, and constantly). The second item asked individuals how often they noticed other people treated unfairly based on their race/ethnicity with the same seven response options. The third question, “How big a problem do you think racism is in the US?” had six response options (not at all, very minor, minor, moderate, serious, and very serious). Factor analysis showed that these items all loaded highly onto the same factor (see Chapter 5). Therefore, responses to the items were summed to create a new variable that ranged from 0 to 21, with higher values indicating greater racial consciousness.

Unfair racial treatment. Two items from the same module were used to measure the frequency of perceived racism experienced in the past 12 months in work and health care settings. The questions stated “Within the past 12 months, [when seeking health care/work], do you feel your experiences were worse than, the same as, or better than for people of other races/ethnicities?” The six response options were: (1) worse than other

racas/ethnicities; (2) the same as other races/ethnicities; (3) better than other races/ethnicities; (4) worse than some, better than others; (5) only encountered people of the same race/ethnicity; and, (6) no health care sought/work during the past six months. Based on previous factor analysis (see Chapter 5), I created a variable which was scored “1” if the respondent experienced worse racial treatment in either work or health care in the past 12 months.

Sociodemographic Characteristics. Respondents were asked several questions about their sociodemographic characteristics. Age was reported in years and recoded into the following groups based on the distribution of the sample: 18 to 24, 25 to 29, 30 to 34, and 35 and older. The marital status of those who were single, divorced or widowed was coded as “single,” and those that were married (living with or without their family) or single but living with a partner were coded as “married or living as married.” Household size was measured as the number of people living in the respondents’ home, including themselves. Level of education was measured as the number of years of education the respondent had completed and was recoded into, those with a high school education, general equivalency degree (GED) or more education, and those with less than a high school education (or GED). Respondents were asked their total income before taxes in the past year and response options included ten categories ranging from less than \$10,000 to more than \$58,000. The income variable was recoded into five categories based on the distribution of responses. Respondents were asked to report the country in which they were born. Responses were grouped into those from Mexico and those from other countries. Length of residence in the US was measured as the number of months the respondent had lived in the US, which was recalculated in to years. Level of acculturation was measured with a ten-item scale ($\alpha = .92$) based on a previously published media-based acculturation scale (Ramirez et al., 1986). The scale included questions related to language preferences and the amount of contact with Latino and non-Latino persons, and was altered to provide

bidimensional response options (both Latino and Anglo preferences) (Marin & Gamba, 1996).

Emotional and Physical Stress Responses to Perceived Racism. Two items, also taken from the Reactions to Race module, measured the frequency of emotional and physical responses to perceived racism. The first item asked “Within the past 12 months on average, how often have you felt emotionally upset, for example angry, sad, or frustrated, as a result of how you were treated based on your race/ethnicity?” The second item asked, “Within the past 12 months on average, how often have you experienced any physical symptoms, for example a headache, an upset stomach, tensing of your muscles, or a pounding heart, as a result of how you were treated based on your race/ethnicity?” Both questions had seven response options (never, once a year, once a month, once a week, once a day, once an hour, and constantly). Because being emotionally upset as a result of unfair racial treatment was significantly correlated with physical symptoms as a result of unfair treatment ($r = .53, p < .0001$), one indicator variable was created based on the two items; those who reported emotional or physical health symptoms at least once a year were coded as “1.”

Coping Resources. Two types of coping resources were measured: coping type and sense of mastery. Coping Type. Coping type was measured by a 19-item scale of coping responses developed by Billings and Moos (Billings & Moos, 1981). Three additional items were added to the scale for the MAN for Health study and response options were altered. Variables were created for each of the three coping type subscales: active behavioral (7 items, $\alpha = .82$), active cognitive (6 items, $\alpha = .75$), and avoidant coping (7 items, $\alpha = .75$) types. Responses for subscales (not like me, somewhat like me, a lot like me) were summed with higher scores indicating a higher likelihood of using the coping type. When subscales were missing less than 30% of the items, means from the other items in the

subscale were substituted for missing values; otherwise, the score for the subscale was coded as missing.

Sense of Mastery. The items measuring sense of mastery were from a seven item scale developed to assess how much control an individual feels over events in their life (Pearlin et al., 1981). Responses to the items ranged from 1 (strongly disagree) to 4 (strongly agree), and item values were averaged to create a summary score with higher scores indicating increased sense of mastery. Two reverse scored items were dropped, because factor analysis revealed that they represented a distinct factor. The alpha coefficient for the 5-item scale was .77.

Data Analysis

Descriptive statistics were used to describe the study sample and the patterns of perceived racism, coping and substance use. Sixteen cases were dropped from the descriptive analyses due to missing data on several sociodemographic characteristics and/or substance use; additional cases with missing data on perceived racism and coping were dropped from the logistic regression analyses (final *ns* are reported on all tables). I tested for significant associations between sociodemographic characteristics and binge drinking and substance use using chi-square tests and logistic regression. Logistic regression models were used to estimate the crude odds of binge drinking and cigarette smoking. Adjusted models contained only those sociodemographic characteristics that were significantly associated with either perceived racism or substance use.

When there were significant associations between perceived racism and substance use, I tested whether responses to unfair racial treatment mediated this relationship. Mediation effects were considered significant if the following criteria were met: perceived racism was significantly associated with substance use; perceived racism was significantly associated with the mediator; the mediator was significantly associated with substance use

when controlling for perceived racism; and, the effect of perceived racism on substance use was significantly attenuated when the mediator was added to the model (Baron & Kenny, 1986; Frazier et al., 2004). I used the same criteria to test for mediation due to coping resources (coping type and sense of mastery). Because of the potential suppression effects of coping on the relationship between perceived racism and substance use, the mediation effects of coping were tested even if there was not a significant relationship between perceived racism and substance use (MacKinnon et al., 2000).

When there were significant associations between perceived racism and substance use, I also tested for potential moderation effects of coping. Moderator variables (coping type and sense of mastery) were centered to avoid multicollinearity when both variables and their product term were added to regression models. Logistic regression models estimating the odds of binge drinking and cigarette smoking included the independent variable (perceived racism), the moderator variable (coping type or sense of mastery), the product term, and covariates. Moderation effects were considered significant when the alpha level for the product term was equal to or less than .05.

Because the data were clustered (Confidants recruited by the same Navigator), intra-class correlation coefficients were computed to assess the amount of variability within and between clusters. The intra-class correlation coefficients were .16 for binge drinking and .21 for cigarette smoking. To account for the correlation within clusters, all models were calculated using the SAS Version 9.1 procedures for generalized estimating equations (GEE) with an independent correlation structure and robust standard errors. Statistical tests were considered significant at an alpha level of .05.

Table 6.1 Sociodemographic Characteristics of the Study Sample by Substance Use

	Total Sample (n=275) ^a		Binge Drinking (n=120) ^a		Cigarette Smoking (n=99) ^a	
	Number	Percent	Number	Percent	Number	Percent
Age (years)						
18 - 24	79	29.4%	37	30.8%	34	33.7%
25 - 29	76	28.2%	38	31.7%	32	32.7%
30 - 34	52	19.3%	27	22.5%	16	15.8%
35+	62	23.1%	18	15.0%	19	18.8%
Marital Status						
Single	90	33.3%	38	32.5%	33	32.7%
Married or living as married	180	66.6%	79	67.5%	68	67.3%
Education						
Less than High School/GED	169	62.4%	74	62.7%	76	74.5%
High School/GED or greater	102	37.6%	44	37.3%	26	25.5%
Income						
Less than \$10,000	45	17.2%	24	20.3%	19	19.6%
\$10,000 - \$16,000	71	27.1%	36	30.5%	28	28.9%
\$16,001 - \$22,000	61	23.3%	25	21.2%	26	26.8%
\$22,001 - \$28,000	43	16.4%	19	16.1%	14	14.4%
\$28,001 or more	42	16.0%	14	11.9%	10	10.3%
Country of Origin						
Mexico	191	69.4%	88	74.2%	75	72.8%
Other country	76	27.6%	31	25.8%	26	25.2%
Mean number of years lived in the U.S. (S.D.)	8.0	(6.9)	7.4	(4.7)	7.7	(6.1)
Mean level of acculturation (S.D.)	1.8	(0.7)	1.8	(0.7)	1.7	(0.7)

^a Numbers do not sum to total n in some categories, due to missing values

Results

The sociodemographic characteristics of the total study sample, those who had engaged in binge drinking in the past month, and current cigarette smokers are presented in Table 6.1. The average age was 29.4. Most men were married, had less than a high school education or GED, were low income and from Mexico. Among the study sample, 44% of the men had engaged in binge drinking in the past month and 36% were current cigarette smokers. Among the smokers, most smoked less than one cigarette per day (72%). Younger age was significantly associated with increased odds of binge drinking. Having

less than a high school education or GED and lower income levels were associated with increased odds of being a current cigarette smoker.

Table 6.2 shows the descriptive statistics for the perceived racism and coping variables. Language was cited as the most common source of discrimination, followed by legal status, race and ethnicity (in that order). The average level of racial consciousness was 10.4. More than 40% of the sample thought about their race constantly. Nearly half observed racism towards others at least once a month and 54% thought racism was a serious problem in the US. Only 8% of the men reported unfair racial treatment at work in the past year. Six percent had experienced unfair racial treatment in health care settings and 11% had experienced unfair racial treatment in at work or in health care settings. More than a third of the men reported being emotionally upset because of unfair treatment at least once a month and 25% reported physical symptoms at least once a month. Sixty-five percent of the sample had experienced either emotional or physical responses to unfair treatment in the past year.

Average scores for the coping type subscales ranged from 10.2 to 15.0 and the mean level of sense of mastery was 2.2. Use of active cognitive coping was significantly associated with increased acculturation. Active behavioral coping and avoidant coping had no significant sociodemographic covariates. Increased sense of mastery was associated with having a lower income (see Appendix A, Table A.1 for full results).

I estimated logistic regression models using GEE to test the association between perceived racism and substance use. Separate models were calculated for racial, ethnic, language and legal status discrimination; racial consciousness, and unfair racial treatment. Table 6.3 shows crude odds ratios for binge drinking and cigarette smoking. Ethnic discrimination, language discrimination and legal status were all associated with increased odds of binge drinking. None of the perceived racism variables were associated with being

a current smoker in the crude models. While not significant, the odds ratios for racial discrimination and unfair racial treatment were in the expected direction.

Fully adjusted models of the odds of binge drinking are presented in Table 6.4. Ethnic discrimination, language discrimination and legal status discrimination continued to be associated with at least a two-fold increase in the odds of binge drinking after adjusting for age, income and acculturation. Ethnic and language discrimination remained significant when all three types of discrimination were entered into the model. Although not significant in the crude model, ethnic discrimination was associated with increased odds of cigarette smoking in an adjusted model including high school education or GED and income (OR = 2.53, 95% CI: 1.13, 5.66, $p = .02$; results not shown in table).

Table 6.2 Descriptive Statistics for Perceived Racism and Coping Variables (n = 275)

<i>Types of Discrimination</i>	Number	Percent	Missing
Language	162	59%	
Legal Status	143	52%	
Race	84	31%	
Ethnicity	33	12%	
<i>Racial consciousness</i>			
Think about my race constantly	115	43%	7
Observe racism towards others at least once/month	128	47%	2
Racism is a serious problem in the U.S. today	148	54%	1
Mean level of racial consciousness (S.D.)	10.4	(5.0)	
<i>Unfair racial treatment</i>			
At work	22	8%	2
In health care	17	6%	7
Either work or health care	31	11%	7
<i>Emotional and physical stress responses</i>			
Emotionally upset at least once/month	89	34%	6
Physical symptoms at least once/month	67	25%	7
Emotional or physical responses in past 12 months	180	65%	4
<i>Coping</i>			
	Mean	S.D.	Missing
Active cognitive coping (range 6 - 18)	12.3	(2.7)	9
Active behavioral coping (range 7 - 21)	15.0	(3.2)	5
Avoidant coping (range 7 - 21)	10.2	(2.5)	5
Sense of mastery (range 1 - 5)	2.2	(0.6)	

Table 6.3 Crude Odds Ratios for Binge Drinking and Cigarette Smoking (n=264)

	Binge Drinking			Cigarette Smoking	
	OR	95% CI		OR	95% CI
Racial discrimination	1.47	(0.89 - 2.43)		2.09	(0.64 - 1.87)
Ethnic discrimination	2.91	(1.48 - 5.70)	**	1.84	(0.78 - 4.34)
Language discrimination	2.69	(1.56 - 4.64)	***	0.94	(0.59 - 1.48)
Legal status discrimination	2.05	(1.20 - 3.49)	**	1.08	(0.69 - 1.67)
Racial consciousness	1.05	(0.99 - 1.12)		0.96	(0.92 - 1.01)
Unfair racial treatment at work or health care	1.05	(0.48 - 2.31)		0.85	(0.33 - 2.13)

** $p \leq .01$, *** $p \leq .001$

I hypothesized that emotional and physical stress responses would mediate any significant relationships between perceived racism and substance use. I tested whether responses to racial treatment mediated the relationship between ethnic discrimination, language discrimination, and legal status discrimination and binge drinking. I also tested for mediation of the association between ethnic discrimination and cigarette smoking. There was no evidence of mediation based on all criteria. Of all the independent variables, only perceived language discrimination (OR = 1.74, 95% CI: .98, 3.07, $p = .06$) was borderline significantly associated with increased responses to perceived racism. However, responses to perceived racism were not associated with the binge drinking or cigarette smoking.

I also examined whether coping resources would mediate and/or moderate the relationship between perceived racism and substance use. I did not restrict tests of mediation to only significant associations between perceived racism and substance use because coping resources could suppress a significant association. The analysis revealed no evidence of mediation or suppression based on all criteria. However, there were significant associations between the independent variables and the mediators (see full results in Appendix A, Table A.2), and the mediators and the dependent variables. Avoidant coping, but no other types of coping or sense of mastery, was associated with increased odds of cigarette smoking (OR = 1.13, 95% CI: 1.01, 1.27, $p = .03$). Racial consciousness was positively associated with active cognitive coping and active behavioral coping.

Table 6.4 Adjusted Odds Ratios for Binge Drinking (n=262)

	Ethnic		Language		Legal Status	
	Discrimination		Discrimination		Discrimination	
	OR	95% CI	OR	95% CI	OR	95% CI
Intercept	0.94	(0.44 - 2.02)	0.45	(0.17 - 1.17)	0.69	(0.28 - 1.68)
Age group ^a						
18 - 24	2.10	(1.02 - 4.31) *	2.79	(1.34 - 5.79) **	2.33	(1.13 - 4.76) *
25 - 29	2.66	(1.36 - 5.22) **	3.23	(1.63 - 6.42) ***	3.09	(1.62 - 5.90) ***
30 - 34	2.91	(1.24 - 6.83) *	3.23	(1.39 - 7.49) **	3.05	(1.27 - 7.31) **
Income ^b						
Less than \$10,000	2.26	(0.85 - 6.03)	1.81	(0.65 - 5.02)	1.84	(0.68 - 5.01)
\$10,000 - \$16,000	1.85	(0.74 - 4.64)	1.29	(0.48 - 3.47)	1.27	(0.49 - 3.31)
\$16,001 - \$22,000	1.21	(0.51 - 2.92)	1.08	(0.43 - 3.46)	1.03	(0.43 - 2.48)
\$22,001 - \$28,000	1.49	(0.57 - 3.95)	1.33	(0.49 - 3.59)	1.39	(0.51 - 3.85)
Acculturation	0.86	(0.60 - 1.23)	0.96	(0.66 - 1.42)	0.88	(0.61 - 1.28)
Ethnic Discrimination	3.08	(1.60 - 5.91) ***				
Language Discrimination			3.08	(1.78 - 5.33) ***		
Legal Status Discrimination					2.12	(1.22 - 3.91) **
Full Model						0.45 (0.17 - 1.23)

^a Reference group is 35 years and older

^b Reference group is more than \$28,000

* p ≤ .05, ** p ≤ .01, *** p ≤ .001

Unfair racial treatment and racial discrimination were positively associated with avoidant coping. Ethnic discrimination was positively associated with active behavioral coping.

Finally, I tested whether coping resources moderated any of the significant associations between perceived racism and substance use using logistic regression. Interaction terms for each coping type and sense of mastery were added to adjusted models of binge drinking regressed on ethnic discrimination, language and racial consciousness as well as cigarette smoking regressed on ethnic discrimination. There were no significant interactions in any of the models.

Discussion

Perceived Racism and Substance Use

The purpose of the study was to assess the relationship between perceived racism and substance use among Latino immigrant men. The study builds upon previous research in several ways. First, the sample reflected an understudied population, recently immigrated Latino men living in rural North Carolina. Second, I was able to measure several domains of perceived racism, including discrimination based race, ethnicity, language and legal status. Third, the study assessed theoretically supported, but empirically untested, mediators and moderators of the relationship between perceived racism and substance use.

There was a strong and consistent relationship between Latino men's perceptions of ethnic, language and legal status discrimination and their binge drinking. The strength of these associations was similar to previous studies of perceived racism among African Americans (Borrell et al., 2007; Martin et al., 2003), but stronger than the association found in a previous study among Latinos (Finch et al., 2003). The fact that I observed such a strong relationship using relatively simple, one-item measures for perceived ethnic, language and legal status discrimination, respectively, suggests that these sources of

perceived discrimination are an important determinant of health-damaging behaviors for this population. The findings may also represent the rates of binge drinking in the sample, which were twice as high as rates previously reported among Latinos in North Carolina (North Carolina Center for Health Statistics, 2005).

I was surprised to find that perceived racial discrimination was not as strongly associated with increased odds of binge drinking as perceived ethnic discrimination. Although being Latino refers to an ethnic identity rather than a racial identity, it is not clear whether the men were aware of this distinction, and why racial and ethnic discrimination would have a differential impact on binge drinking. Future studies should examine these associations using more sophisticated multi-item measures. More research is needed to understand the complex relationship between racial, ethnic, language and legal status discrimination among Latino immigrant populations.

Neither racial consciousness nor unfair racial treatment was associated with increased odds of binge drinking. The racial consciousness measure included items about how often the men thought about their race, observed racism towards others, and the extent to which racism is a problem in the US. While these items assessed important aspects of racial climate, they reflect indirect exposures to perceived racism, which may have had less of an impact on health behaviors. Theory suggests that observing racism towards other group members can serve as a vicarious stressor; however, no studies have shown an association between observed racism and health behaviors (Miller & Kaiser, 2001).

The lack of a relationship between unfair racial treatment and binge drinking may have been due to rates of unfair racial treatment being relatively low in the settings I measured. Work and health care settings may not be the most relevant settings for experiencing perceived racism in this population. Many of the men reported only encountering people of the same race/ethnicity at work or had not sought health care in the past 12 months. Interestingly, a recent study using national BRFSS data found that Latinos

reporting unfair racial treatment at work had increased odds of fair or poor self-rated health status, and more days in poor mental and physical health (Fujishoro, 2009). Therefore, future research among Latinos should continue to examine the health effects of racism in work settings.

Perceived racism was not associated with cigarette smoking in the sample. Although not significant, the odds ratios for racial and ethnic discrimination were in the expected direction and similar in size to the findings for binge drinking. If the study had a larger sample size, I may have had more power to detect significant associations. Another possible explanation for this finding is the pattern of light cigarette smoking in this population. Patterns of light smoking among Latino men have been observed in previous studies; however further research is needed to understand the relationship between smoking and stress in this population (Fagan, Brook, Rubenstone, Zhang, & Brook, 2009; Reitzel et al., 2009; Trinidad et al., 2009). The men in the sample may not have used tobacco to cope with stress, and therefore were unlikely to initiate or increase tobacco use in response to perceived racism.

In the adjusted models, the strength of the relationship between ethnic, language and legal status discrimination and binge drinking remained significant after controlling for age, income and acculturation. Results for the full model showed that ethnic and language discrimination also remained significant even after controlling for legal status discrimination. A recent study examining racial and language discrimination among Asian American immigrants found similar results (Yoo, Gee, & Takeuchi, 2009). In the study, language discrimination was significantly associated with an increased number of chronic conditions, after controlling for sociodemographic covariates and racial discrimination (Yoo et al., 2009). Together, these findings suggest that language discrimination may be a particularly health-damaging source of discrimination for immigrant populations.

Mediators and Moderators of Perceived Racism and Substance Use

The findings provide only limited support for the mediation and moderation pathways I hypothesized. The Biopsychosocial Model asserts that the relationship between perceived racism and health is mediated by emotional and physical stress responses. Emotional and physical responses to racism did not mediate the relationship between perceived racism and binge drinking in the study. There are several possible explanations for this finding. The Biopsychosocial Model was developed to explain the health effects of racism among African Americans. These relationships may operate differently among Latino immigrant men. It is also possible that the measure of emotional and physical responses did not accurately reflect the construct identified in the Biopsychosocial Model. According to Clark et al. (1999), examples of psychological stress responses include anger, paranoia, anxiety and fear, whereas physiological stress responses refer to reactions with the immune, neuroendocrine, and cardiovascular systems. While the measure for emotional responses listed many of the same examples identified by Clark et al. (1999), the measure referred to symptoms, as opposed to physiological reactions, within the body. To further assess the extent to which these items mapped well with the theory, I performed independent tests of mediation for each measure (emotional and physical); however, in these analyses neither measure met the full criteria for mediation. The Biopsychosocial model also stipulates that stress responses mediate the relationship between perceived racism and health outcomes, not health behaviors, which would explain why I did not observe a relationship between responses and substance use behaviors.

The study was one of the first to describe coping and its relationship to perceived racism and substance use among Latino immigrant men. Stress and coping theory suggests that coping resources can serve as either a mediator or moderator of the relationship between perceived racism and substance use; therefore, I tested both potential pathways (Billings & Moos, 1981; Lazarus & Folkman, 1984). While neither coping type nor

sense of mastery met the full criteria for mediation; there was evidence that coping was associated with different types of perceived racism. This finding was consistent with previous research among Mexican American youth which showed that higher levels of discrimination stress were associated with higher levels of both active and avoidant coping (Edwards & Romero, 2008). Despite the relationship between coping and perceived racism, neither coping type nor sense of mastery was associated with binge drinking in the study.

The coping resources I evaluated may not have been effective in ameliorating the stresses associated with perceived racism. Therefore, despite Latino immigrant men's efforts to cope with perceived racism, they still turned to binge drinking to relieve their stress. The measures for coping type asked about coping behaviors in general, not those related to racism specifically. Thus, the men in the study may have used the coping resources I measured for stressors other than perceived racism, which would explain why they did not mediate or moderate the relationship with substance use.

There was limited evidence that having a high sense of mastery protected against the negative effects of perceived racism. Previous research among gay Latino men has suggested that experiences of discrimination, oppression, and poverty limit a person's ability to shape their own life, which leads to powerlessness, fatalism and a low sense of mastery (Diaz, 1998; Diaz et al., 2001). These psychosocial characteristics can then lead to more passive forms of coping, which can result in maladaptive behaviors such as substance use (Meyer et al., 2008). However, none of the measures of perceived racism were associated with low sense of mastery, nor was low sense of mastery associated with increased substance use. In fact, perceived racial discrimination and perceived unfair racial treatment in work and health care were both positively associated with sense of mastery. Furthermore, sense of mastery was unexpectedly associated with having a lower income. These findings suggest that sense of mastery may be an indicator of resilience among the

men in the study. Future studies should continue to explore whether sense of mastery can protect against the negative health effects of perceived racism.

Limitations

The findings must be interpreted in light of several study limitations. Because the data was cross-sectional, I was unable to draw causal inferences about the associations between perceived racism and binge drinking. This was a particular limitation of the mediation analyses, which would have been strengthened by measuring the mediators and dependent variables at separate time points following the measurement of the independent variables. However, I can infer that the observed significant associations were in the expected direction based on theory and the language of the survey. Some of the measures of perceived racism asked participants to report on events in the past 12 months; their exposure to discrimination, therefore, would largely precede their reports of binge drinking in the past 30 days.

The homogeneity within the sample prevented me from fully assessing the impact of several sociodemographic characteristics on perceived racism and substance use. The men in the study were relatively similar in terms of their length of residence in the US, their levels of income and acculturation. While this prevented me from being able to detect differences based on these characteristics, it also reduced the potential threat of bias due to confounding on these factors.

There were also limitations due the measurement of the study variables. All of the data were based on self-report, which is subject to recall and social desirability bias. Investigators of the parent studies attempted to reduce social desirability bias by having the surveys administered by bilingual, bicultural staff and the lay health advisors themselves. As previously mentioned, some domains of perceived racism were measured with single items, which may have reduced the variability and reliability of the measures. Despite this

limitation, I was still able to detect strong associations using these measures. Measures of perceived racism are also inherently subjective; interpretations of discriminatory experiences may vary among individuals. This type of variation may lead to overestimates if the questions themselves lead to increased reactivity or sensitivity to perceived exposure to racism. Finally, because this was a secondary data analysis, I was unable to include measures for all the potential confounders in the study. Unmeasured psychosocial characteristics such as self-esteem, risk-taking personality, or perceived stress may have biased the results because of their potential influence on both perceived racism and substance use.

Conclusion

Despite these limitations, the study represents an important contribution to research on the health effects of perceived racism. The study was one of the first to document the effect of perceived racism, including discrimination based on ethnicity, language and legal status, on binge drinking among Latino immigrant men living in the US. Future research should continue to explore the health impact of different forms of discrimination among Latinos as well as the complex relationships between perceived racism, stress, coping and substance use.

CHAPTER 7: DISCUSSION

The goal of this dissertation study was to examine the relationship between perceived racism and substance use among Latino immigrant men living in central North Carolina. The findings from the study advance the literature on the conceptualization and measurement of perceived racism among Latinos; contribute to the growing body of research on the health effects of perceived racism among Latinos; and inform emerging theories on the mediation and moderation pathways between perceived racism and health outcomes. In this chapter, I synthesize the findings for each study aim, address the methodological limitations, and discuss the implications of the findings for future research and public health practice.

Study Aims

Aim 1: To evaluate the utility of the Reactions to Race items as a measure of perceived racism among Latino immigrant men.

As part of the growing literature on racism and health, several measures have been developed to assess perceived racism among racial and ethnic minorities. However, most have been based on the experiences of African Americans and few have been tested among Latino populations. The purpose of this aim was to assess the utility of an existing measure of perceived racism among Latino immigrant men. Using correlations and factor analysis, I assessed the internal consistency and reliability of the Reactions and Race measure. I also examined patterns of perceived racism among Latino immigrant men based on the measure, and compared the results to other measures of discrimination to assess its

validity. The analysis revealed little evidence to support using the Reactions to Race items as a comprehensive scale of perceived racism in this population. The items measured three key dimensions of perceived racism: racial consciousness, unfair racial treatment in work and health care settings, and responses to unfair racial treatment. However, the measure did not capture the dimensions of language and legal status discrimination, which were cited by study participants as important barriers to opportunity.

The study was among the first to document patterns of perceived racism among rural Latino immigrant men living in the southeastern United States. Over 40% of the men thought about their race constantly; 20% observed unfair racial treatment towards others constantly; and over 50% considered racism to be a serious problem in the US. Rates of perceived racism in work and health care settings were lower than rates reported in previous studies (Blankenau et al., 2000; Finch et al., 2003; Friedman et al., 2005; Pew Hispanic Center, 2007; Pew Hispanic Center & Kaiser Family Foundation, 2002). However, despite the low levels of discrimination reported in work and health care settings in the study, the men reported frequent emotional and physical responses to unfair racial treatment, supporting previous research on the harmful effects of racism on the emotional and physical health of Latino immigrants (Diaz et al., 2001; Finch et al., 2001; Finch et al., 2000; Krieger et al., 2005; Ryan et al., 2003; Stuber et al., 2003).

Aim 2: To examine the relationship between perceived racism and substance use behaviors among Latino immigrant men.

After evaluating the conceptualization and measurement of perceived racism in the study sample, I turned to the main purpose of the study, which was to examine the relationship between perceived racism and substance use among Latino immigrant men. Using logistic regression models, I tested the hypothesis that perceived racism was associated with binge drinking and cigarette smoking. I found a strong and consistent

relationship between ethnic, language and legal status discrimination and odds of binge drinking in the past 30 days in both crude models and models adjusted for age, income and acculturation. Ethnic and language discrimination remained significant even after controlling for legal status discrimination and sociodemographic characteristics. The strength of these associations was similar to previous studies of racial discrimination among African Americans (Borrell et al., 2007; Martin et al., 2003), but stronger than the association found in a previous study among Latinos (Finch et al., 2003).

Perceived racism was not significantly associated with cigarette smoking in the study. However, the odds ratios for racial and ethnic discrimination were in the expected direction and similar in strength to the findings for binge drinking. Therefore, I may not have had enough power to detect significant associations due to the small sample size. Alternatively, the lack of an association may have been due to light cigarette smoking in this population. Men in the study may not have used tobacco to cope with stress, and were therefore unlikely to initiate or increase tobacco use in response to perceived racism.

Still, the study represents an important contribution to the literature on perceived racism and alcohol use. I was able to replicate previously observed associations among African Americans in an understudied population of recently immigrated Latino men living in rural North Carolina. I also evaluated the respective impact of several domains of perceived racism, including discrimination based on race, ethnicity, language and legal status. This reflects a more sophisticated and nuanced conceptualization and measurement of perceived racism than previous studies.

Aim 3: To examine whether the relationship between perceived racism and substance use is mediated by emotional and physical stress responses to perceived racism among Latino immigrant men.

For Aim 3, I tested the hypothesis that the relationship between perceived racism and substance use was mediated by emotional and physical stress responses. Emotional and physical responses to racism did not mediate the relationship between perceived racism and binge drinking; therefore, the results did not support the relationship purported by the Biopsychosocial model (Clark et al., 1999). There was evidence that language discrimination was associated increased stress responses to perceived racism, but stress responses to perceived racism were not associated with increased substance use. The conceptual model for the study may not accurately reflect the constructs and relationships identified in the Biopsychosocial Model. According to Clark et al. (1999), stress responses mediate the relationship between perceived racism and health outcomes, not health behaviors; which would explain why I did not observe a relationship between responses and substance use behaviors. To my knowledge, no other study has tested this mediation pathway in a Latino sample.

Aim 4: To examine whether the relationship between perceived racism and substance use is mediated or moderated by coping among Latino immigrant men.

Stress and coping theory suggests that coping resources can serve as either a mediator or moderator of the relationship between perceived racism and substance; therefore, for this aim I tested both potential pathways (Billings & Moos, 1981; Lazarus & Folkman, 1984). Because of the lack of research on coping among Latino immigrant men, I first described the patterns of coping in the study sample. Then, using multivariate regression, I assessed whether coping mediated or moderated the relationship between perceived racism and substance use. While neither coping type nor sense of mastery met the full criteria for mediation; there was evidence that different types of coping were associated with different domains of perceived racism.

In contrast to previous studies, coping resources did not moderate the association between perceived racism and substance use (Noh et al., 1999; Noh & Kaspar, 2003). The coping resources I evaluated may not have been effective in ameliorating the stresses associated with perceived racism. The measures for coping type and sense of mastery asked about coping behaviors in general, not those related to racism specifically. Thus, the men in the study may have used the coping resources I measured for stressors other than perceived racism.

Study Limitations

Although an important contribution to the literature, the study was not without limitations. Potential threats to the internal validity of the study included history and instrumentation. The study took place during the immigration policy debate at the federal level, which along with increasing immigration enforcement prompted protests and marches in Latino communities throughout the country, including Chatham County (Capps et al., 2007; Rocha & Maguire, 2006). Displays of community activism were met with increasing anti-immigrant sentiment (Collins, 2007). The social and political environment in Chatham County may have lead to increased substance use in response to immigration-related stressors other than perceived racism, thereby confounding observed associations. Based on the results, I argue that anti-immigrant sentiment is actually a form of racism; however, the anti-immigrant climate could have lead to other non-measured factors that influenced substance use such as employment-related stress. Further research is needed evaluate the relationship between perceived racism and substance use in other settings.

Another potential threat to the internal validity of the study is instrumentation, which refers to unwanted differences in the measurement procedures. The surveys used to collect the data in the study were self-administered and the identity of the participants was kept confidential; however, Navigators and comparison group men conducted the surveys in the

presence of project staff, and Confidants conducted their surveys with their respective Navigators. These differences in instrumentation may have biased estimates of observed associations, particularly because of participants' desire to provide socially acceptable responses. Social desirability bias has been shown to influence self-reported substance use in previous studies (Johnson & Bowman, 2003; Johnson & Fendrich, 2005). Latino men participating in MAN for Health and HoMBReS may have under-reported their binge drinking and cigarette smoking to appear more socially acceptable in eyes of their peers, Navigators, or project staff. This bias may have varied across participants depending on who was present during the surveys, resulting in reduced validity of the dependent variables, and making significant associations more difficult to detect. The fact that I still observed significant associations between perceived racism and binge drinking suggests this was not a critical factor.

There were limitations to the external validity of the study due to the sampling strategy. The parent studies used a non-randomized purposive sampling to recruit participants; an approach that was necessary to recruit men that would be willing to serve as either Navigators or Confidants. The men in the study were similar in terms of their length of residence in the US, their income, and levels of acculturation. The homogeneity within the sample prevented me from fully assessing the impact of several sociodemographic characteristics on perceived racism and substance use, but it also reduced the potential threat of bias due to confounding of these factors. Another consequence of the sampling strategy is that I cannot generalize the results to populations beyond the Latino immigrant men that participated in the study. I still hope that the findings can inform future research and public health practice in similar Latino immigrant communities.

Another potential bias within the sample was that substance use behaviors among Latino men who had agreed to participate in the MAN for Health lay health advisor intervention (especially Navigators) may have been different from those who agreed to

serve as a comparison group with HoMBReS. To assess this, I tested for intervention and comparison group differences, and found there were no significant differences in binge drinking [$\chi^2(1, N = 283) = .14, p = .71$] or cigarette smoking [$\chi^2(1, N = 284) = .01, p = .93$].

Lastly, because of the cross-sectional design of the study I was unable to assess the direction of observed associations. This was a particular limitation for the mediation analyses, which would have been strengthened by measuring the mediators and dependent variables at separate time points following the measurement of the independent variables. Based on the theoretical framework, I assumed that perceived racism predicts binge drinking. However, it is possible that the observed association operated in the reverse direction and that binge drinking puts men at increased risk of perceived racism. Another limitation of using cross-sectional data was that I had no information about the men's substance use prior to immigration to the United States. Theory and empirical evidence suggest that exposure to racism after immigrating to the US predicted binge drinking; however, it is possible that the men also had high rates of binge drinking prior to living in the United States.

Implications for Future Research

Measuring Perceived Racism among Latino Immigrants

Based on the findings, several topics merit further research. The first is the conceptualization and measurement of perceived racism among Latinos. Qualitative methods, such as in-depth interviews with Latino immigrants, could shed light on the relationships between racial, ethnic, language and legal status discrimination. For example, how and whether immigrants distinguish between different types of discrimination, the stress associated with each type and the strategies they use to cope with these stressors.

New measures of perceived racism could then be developed that appropriately address all aspects of Latinos' ethnic and cultural identity. Once developed, these

measures should be tested for their reliability and validity in large and diverse Latino samples. With more accurate measures, I can better assess patterns of perceived racism within Latino communities, including which populations are at greatest risk. In the study, being younger age, low income, having less than a high school education, and having higher levels of acculturation were associated with increased levels of perceived racism. Future research is needed to understand how perceived racism varies by these factors, as well as length of residence in the US, generation status, country of origin and gender. For example, it is unclear whether recent immigrants with relatively low levels of exposure to mainstream culture are protected from racism or are at increased risk of exposure because their perceived language use and legal status represent barriers to acculturation.

Perceived Racism and Health among Latino Immigrants

In addition to understanding patterns of perceived racism, there is still more to learn about its effect on substance use and other health outcomes. Many of the limitations of this study could be addressed by testing similar hypotheses in a larger longitudinal study with a more diverse sample and improved measures. Identifying potential mediators and moderators of the pathways between perceived racism and health is essential for identifying points at which public health practitioners can intervene. Future studies should work to identify additional coping resources, such as social support provided by family and ethnic enclaves, which may reduce the negative effects of perceived racism on binge drinking.

The study showed an association between perceived racism and one health risk behavior, binge drinking, among Latino immigrants. Previous studies have shown that perceived racism is associated with many other health behaviors and health outcomes in other racial/ethnic groups (Karlsen & Nazroo, 2006; Paradies, 2006; Williams et al., 2003). These studies should be replicated in Latino communities to identify additional health consequences of perceived racism for Latino immigrants.

Implications for Public Health Practice

Substance Use among Latino Immigrant Men

The findings revealed that substance use is an important health issue for Latino immigrant men in Chatham County. Rates of binge drinking in the study sample were higher than those previously reported among Latino immigrant populations in North Carolina and twice as high as rates reported among Latinos in the US (Grzywacz et al., 2007; Lounsbury & Kulbok, 2007). The percentage of current cigarette smokers was also higher than rates reported in previous studies of Latinos in North Carolina (Lounsbury & Kulbok, 2007; North Carolina Center for Health Statistics, 2006).

Substance use is associated with many negative health consequences, including increased rates of injury, violence, sexually transmitted diseases, and chronic disease (Mokdad et al., 2004; U.S. Department of Health and Human Services, 1998). Alcohol and tobacco use are also risk factors for the leading causes of death for Latinos in North Carolina, which are motor vehicle injuries, cancer and cardiovascular disease (Jones-Vessey et al., 2007). Given that Latino immigrants are one of the fastest growing segments of the population, efforts to reduce substance use among Latino immigrants could have an enormous public health impact.

Public health practitioners in rural communities similar to Chatham County should monitor substance use among Latino immigrant populations so that substance abuse prevention can be prioritized as needed. Several interventions have been designed to prevent or reduce alcohol and tobacco use among Latinos; however, most focus on youth and pregnant women (Castro et al., 2006; Dornelas EA et al., 2006). Few interventions have been effective at reducing alcohol and tobacco use among Latino immigrant men. Therefore, additional formative research may be needed to identify potential intervention strategies for preventing substance abuse in this population. One potential approach would

be to adapt existing interventions to fit the needs of Latino immigrant men (Resnicow, Soler, Braithwaite, Ahluwalia, & Burler, 2000). The MAN for Health/HoMBReS intervention was successful in increasing health care utilization and STD/HIV screening among the men in this study through the use of lay health advisors, an approach that has been effective among Latino immigrant women (Eng, 2007). Findings from the MAN for Health/HoMBReS intervention suggest that lay health advisors may also be effective in addressing substance use behaviors among Latino immigrant men.

The study findings also have implications for the health care system. Despite being a young and relatively healthy population, many men in the study did report seeking health care services. Health care providers should capitalize on clinical encounters with Latino immigrant men by screening them for mental health and substance abuse problems. Health care providers in new immigrant destinations may need to increase access to Spanish language mental health and substance abuse treatment services to serve this growing population. Given the prevalence of perceived racism in health care observed in the study, health care providers may also need to reach out to these populations to overcome men's fear and mistrust of the health care system.

Finally, intervention at the community and policy level may also be effective in reducing alcohol and tobacco use (Task Force on Community Preventive Services, Zaza, Briss, & Harris, 2005). Interventions to reduce alcohol use include regulating the density of outlets selling alcohol products, maintaining current policies limiting the days and times that alcohol is sold, and increasing alcohol taxes. Evidence based interventions to reduce tobacco use include increasing the price of tobacco products, increasing access to smoking cessation therapies, and smoke free policies in worksites. Communities with Latino immigrant residents should work to enact these policies if they are not already in place.

Reducing the Negative Health Effects of Perceived Racism among Latino Immigrants

The findings suggest that perceived racism is a determinant of at least one health-damaging behavior among Latino immigrant men, binge drinking. Therefore, it is likely that perceived racism leads to other risky health behaviors and poor health outcomes in this population. Public health practitioners should look towards developing interventions that reduce the negative health effects of perceived racism among Latino immigrants.

One important approach to reducing the negative health effects of perceived racism is to reduce racism in health care and public health institutions (Smedley et al., 2003). Men in the study identified discrimination based on language and legal status as important barriers to their social mobility, barriers that they are likely to encounter when trying to access health care and public health services. In addition to using lay health advisors, part of the MAN for Health/HoMBReS intervention was to provide anti-institutional racism training and support for county health departments in each project site. Findings from the evaluation in Chatham County indicated that health care utilization among Latino immigrant men increased after the intervention, including seeking health services at the local health department (Eng, 2007). Further research is needed to determine whether interventions to reduce racism within health institutions can improve health behaviors or health outcomes. However, the findings from this study and the MAN for Health/HoMBReS evaluation suggest that public health practitioners consider efforts to address racism within health institutions when designing health promotion interventions for Latino immigrant populations.

If empirical evidence confirms existing theories about racism as a determinant of health, public health practitioners will also need to look to structural interventions that address pervasive inequalities for Latino immigrants living in the United States. The World Health Organization Commission on Social Determinants of Health outlines several strategies for taking action on social determinants of health, including racism (Commission on Social Determinants of Health, 2007). Approaches include creating policies that reduce

oppressed groups' vulnerability to the health effects of social inequality and prevent the unequal health consequences of social inequality. Strategies that use this approach might involve increasing Latino immigrants' resources to deal with immigration stressors, as well as increasing Latino immigrants' access to mental health and substance abuse services. In the case of perceived racism and binge drinking, more research is needed on which coping resources can effectively mitigate this relationship. Once intermediary factors are identified, they can be enhanced through health behavior interventions focused on stress management or coping skills.

In summation, efforts to decrease substance use and address the health effects of perceived racism must work towards creating a more supportive context of reception for Latino immigrants. Public health approaches can help address immigration-related stressors for Latino immigrant men, so that they can maintain their health and contribute fully to society.

APPENDIX A: Additional Tables

Table A.1 Sociodemographic Characteristics Associated with Coping (n=256)

	Active Cognitive Coping		Active Behavioral Coping		Avoidant Coping		Sense of Mastery	
	B	SE	B	SE	B	SE	B	SE
	Intercept	11.05	1.00 ***	13.49	1.24 ***	10.33	1.45 ***	1.90
Age group ^a								
18 - 24	-0.66	0.53	-0.43	0.62	-0.81	0.64	0.03	0.11
25 - 29	-0.02	0.48	0.05	0.63	-0.10	0.68	0.13	0.12
30 - 34	-0.59	0.51	-0.99	0.65	-1.01	0.65	0.06	0.10
Married	-0.46	0.37	-0.05	0.41	-0.16	0.38	0.06	0.08
High school education	0.78	0.41	0.82	0.43	0.16	0.44	-0.09	0.09
Income ^b								
Less than \$10,000	0.17	0.57	-0.07	0.66	0.66	0.65	0.41	0.14 **
\$10,000 - \$16,000	0.37	0.56	0.76	0.62	0.79	0.59	0.34	0.11 **
\$16,001 - \$22,000	0.23	0.53	0.52	0.61	0.18	0.58	0.35	0.12 **
\$22,001 - \$28,000	0.54	0.65	1.25	0.85	0.62	0.58	0.26	0.13 *
Years in the U.S.	0.03	0.03	0.04	0.03	0.01	0.03	0.01	0.01
Acculturation	0.60	0.27 *	0.32	0.35	-0.10	0.29	-0.04	0.06

^a Reference group is 35 years and older

^b Reference group is \$28,000 or more

*p ≤ .05, ** p ≤ .01, *** p ≤ .001

Table A.2 Associations between Perceived Racism and Coping (n=263)

	Active Cognitive Coping		Active Behavioral Coping		Avoidant Coping		Sense of Mastery	
	B	SE	B	SE	B	SE	B	SE
Racial discrimination	0.10	0.33	0.34	0.33	0.70	0.29 *	0.15	0.08
Ethnic discrimination	0.31	0.79	1.24	0.47 **	0.30	0.58	0.03	0.09
Language discrimination	0.31	0.30	0.13	0.38	0.00	0.33	0.12	0.08
Legal status discrimination	0.10	0.38	0.41	0.39	-0.14	0.29	-0.07	0.08
Racial consciousness	0.11	0.04 **	0.11	0.04 **	0.05	0.04	0.00	0.01
Unfair racial treatment at work or health care	-0.39	0.43	-0.36	0.61	1.87	0.71 **	0.40	0.12
Responses to unfair racial treatment	-0.29	0.35	-0.91	0.44 *	0.24	0.34	0.13	0.08

*p ≤ .05, ** p ≤ .01, *** p ≤ .001

Note: All models adjusted for age, income and acculturation

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