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Perceived Discrimination, Substance Use and Mental Health. A Study of Latinos in six U.S. communities and the Town of Tunkás, Yucatán, México.

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy

in

Public Health (Global Health)

by

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2013

The Dissertation of Hugo Salgado is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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2013

DEDICATION

This dissertation is dedicated to my beautiful daughter, Anaís Catalina Salgado Brennan, aka “La Taquita”. You mean the world to me.

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2) Bousman AC , Salgado H, Hendrix T, Fraga M, Cherner M. Assessing Neuropsychological Performance in a Migrant Farm Working Colonia in Baja California, Mexico: A Feasibility Study. Journal of Immigrant and Minority Health. 2010

3) Castañeda FS, Holscher J,. Mumman MK, Salgado H, Keir KB,. Foster-Fishman PG Talavera GA. Dimensions of Community and Organizational Readiness for Change. Progress in Community Health Partnerships: Research, Education, and Action Volume 6, Issue 2, Summer 2012

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FIELDS OF STUDY

Major Fields: Public Health (Health Promotion and Global Health)

Studies in mental health and risk factors of chronic disease.

ABSTRACT OF THE DISSERTATION

Perceived Discrimination, Substance Use and Mental Health. A Study of Latinos in six U.S. communities and the Town of Tunkás, Yucatán, México

by

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Doctor of Philosophy

in Public Health (Global Health)

University of California, San Diego, 2013

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Background: Evidence suggests that among Hispanic/Latino populations in the United States, perceived discrimination is a significant stressor that may be a risk factor for unhealthy behaviors such as alcohol use, smoking and negative health outcomes such as depression. However, the Hispanic/Latino population might have different susceptibilities to the stressors of discrimination based on

their specific heritage as they continue to be portrayed as a homogenous group while disregarding the unique heritage-specific attributes that constitute this larger ethnic population.

Aims: The aims of this dissertation were: (1) To examine whether self-reports of perceived discrimination across different Hispanic/Latino heritage groups were associated with alcohol use and abuse. (2) To determine whether reports of perceived discrimination across different Hispanic/Latino heritage groups were associated with smoking and (3) To assess the association between migration, discrimination and depressive symptoms among a population of indigenous Mayan migrants.

Methods: In Chapters 2 and 3, 16,415 individuals who self-identified as Hispanic/Latino and were between the ages of 18-74 were randomly selected, recruited and interviewed by the Hispanic Community Health Study/Study of Latinos in the communities of The Bronx, New York; Chicago, Illinois; San Diego, California and Miami, Florida. Perceived discrimination and its association with alcohol use and smoking were explored. In Chapter 4, a total of 650 individuals of *Tunkaseño* heritage (a community of indigenous Maya from the Mexican state of Yucatán) were recruited binationally in the town of Tunkás and the satellite communities of Anaheim and Inglewood, California by The Mexican Migration Field Research Program staff. We assessed the association between migration history, religiosity and perceived discrimination.

Results: Chapter 2 found that individuals of Cuban heritage who reported perceived discrimination were significantly more likely to report alcohol use. In Chapter 3 no significant association was found between those who reported perceived discrimination and smoking after controlling for identified psychosocial variables and alcohol use. Chapter 4 found that migration experience and current U.S. residence was associated with perceived discrimination, which in turn was associated with a higher risk for depressive symptoms, but this finding was not supported in gender-stratified analyses. Among women not living in the U.S, religiosity was associated with less discrimination. Also discrimination was found to be pervasive among male and female transnational and domestic migrants while religiosity served as a possible protective factor against discrimination for some women.

Conclusions: Results from these studies have important implications for the development and restructuring of programs designed to assist Hispanics/Latinos with substance abuse or depression. Public health programs should include perceived discrimination and migration history as a potential risk for substance use and negative mental health outcomes, and be tailored individually to Hispanic/Latino heritage

CHAPTER 1: INTRODUCTION

Anti-immigrant sentiment and the global economic crisis have undoubtedly exacerbated the rise of racial/ethnic-based discrimination against millions of migrants and minorities worldwide. Across the United States (U.S.), there are significant reports of the Hispanic/Latino population being ethnically discriminated against, while indigenous Latinos are know to be even more susceptible to prejudice due their language and non-European physical features. Perceived discrimination is a stressor that has been found to be associated with risk behaviors such as tobacco and alcohol use and may result in adverse mental health outcomes such as depression. Tobacco and alcohol use continue to be the leading causes of the death, disease and disability in the U.S., while depression is one of the leading causes of disease burden worldwide. Research observing discrimination as a potential risk for substance use and adverse mental health in the Hispanic/Latino population is scarce, however. Specifically among Mexican indigenous populations. Given these disparities in Latino health, the specific aims of this dissertation study are:

1. To examine whether reports of perceived discrimination across different Hispanic/Latino heritage groups are associated with alcohol use and abuse (Chapter 2),
2. To determine whether reports of perceived discrimination across different Hispanic/Latino heritage groups are associated with tobacco use (Chapter 3), and

3. To assess the association between migration, discrimination and depressive symptoms among a population of indigenous Mayan individuals from the Town of Tunkás, Yucatán, Mexico (Chapter 4).

OVERVIEW

This dissertation is comprised of five chapters, including the Introduction (Chapter 1) and the Discussion (Chapter 5). Chapters 2, 3 and 4 are comprised of manuscripts from original research based on the three aims presented above. The first manuscript (Chapter 2) "The Association Between Perceived Discrimination and Alcohol Use in a Hispanic Population: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)" and the second manuscript (Chapter 3) "The Association Between Perceived Discrimination and Tobacco Use: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)" use baseline data from The Hispanic Community Health Study/Study of Latinos. The study is a four-center community based cohort study of 16,415 Hispanics/Latinos in Chicago, Miami, The Bronx and San Diego. Chapters 2 and 3 examine the prevalence of perceived discrimination and its association with alcohol and tobacco use, respectively, across the different Hispanics/Latinos heritage groups[1] sampled among the four sites. The third manuscript (Chapter 4) "Perceived Discrimination and Religiosity as Potential Mediating Factors Between Migration and Depressive Symptoms: a

[1] In accordance with the rules established by the HCHS/SOL study, this dissertation utilizes the term background group to define the different categories of Latinos based on common culture or nationality.

Transnational Study of an Indigenous Maya population" uses original primary data, collected binationally among members of the migrant sending community of Tunkás, Yucatán, Mexico and the Tunkás satellite communities of Inglewood and Anaheim in Southern California.

Given that the three manuscripts presented in this dissertation are primarily tied together by perceived discrimination as a principal subject of interest, measurement of such is uniform across all three chapters. Measures assessing discrimination in the binational study among *Tunkaseños*[2] (Chapter 4) was constructed based on the questionnaire administered to the multi-city sample of Hispanic/Latinos (Chapters 2 and 3) and subsequently revised in an attempt to make them more culturally appropriate to the *Tunkaseño* population.

In Chapter 5, findings from the three manuscripts (Chapters 2, 3, and 4) can be applied to different heritage groups within the Hispanic/Latino population and are synthesized to produce global results that can be applied to the U.S. Hispanic/Latino community as a whole. Results for Chapters 2 & 3 are based on data collected among groups of Dominican, Puerto Rican, Cuban, Mexican and South American heritage while Chapter 4 identifies an indigenous *Tunkaseño* community in both Mexico and the U.S. The results of these studies are discussed and subsequently applied to inform both a targeted and generalized intervention development for the populations studied in this dissertation.

[2] Tunkaseño: A native person from the town of Tunkás, Yucatán, Mexico.

BACKGROUND AND SIGNIFICANCE

RACIAL/ETHNIC DISCRIMINATION

Racial/ethnic based discrimination is a frequent occurrence for minorities worldwide that is rooted in racism. Jones' (1997) definition of racism states: "racism results from the transformation of race prejudice and/or ethnocentrism through the exercise of power against a racial group defined as inferior, by individuals and institutions with the intentional and unintentional support of the entire culture" (pg. 59) [1]. The prevalence of perceived discrimination, defined in the literature as "self-reported everyday experiences of unfair treatment" [2] among the Hispanic/Latino population can be considered troubling. The most recent prevalence data from a national U.S. sample of Hispanics/Latinos indicates that as many as 30% report perceived discrimination on any given day [2]. Overall, discrimination data among all minorities is usually specific to large ethnic groups while undermining the specific attributes that make up heritage groups within the larger. Cultural customs and practices specific to these groups might be central to the different rates of perceptions of discrimination and should not be overlooked. Overall, however, reports of being treated unfairly due to ethnic background can be considered prevalent and concerning.

HISPANICS/LATINOS AND DISCRIMINATION IN THE U.S.

In the U.S., discrimination against minority groups has been widely documented [3-7]. Identified as a chronic stressor, perceived discrimination has

been associated with negative mental health outcomes such as depression [8-13] and with at risk behaviors such as the abuse of alcohol and tobacco [6,14-18]. Research on the negative impact of discrimination on the Hispanic/Latino population, the largest minority group in the US, is still lacking [19]. To date, discrimination research has either largely ignored the diversity of different heritage groups among the Hispanic/Latino population or has under-sampled the population groups other than those of Mexican origin.

One of the major limitations found in the discrimination research among the Hispanic/Latino population, is the aggregation of all heritage groups into one homogeneous category. This is particularly troubling as cultural differences across minority groups have been found to be relative to different health outcomes associated with stressors such as discrimination, while cultural differences have also been found to affect health behaviors, health care use, and self-assessed health perceptions [20]. Other studies also suggest that adaptation factors such as acculturation and language acquisition and their impact on health can significantly vary across groups [21]. Acculturation, defined as the process of cultural and psychological change that results following the meeting between cultures [22] varies significantly between heritage groups and is closely associated to adaptability. Adaptability in the context of discrimination has been known to impact the resilience against stressors associated to discrimination [5, 23].

The presence of discrimination (real or perceived) can also vary

significantly by space, locality and time. For example, Hispanics/Latinos reported experiencing more discrimination following the terrorist attacks of September 11 in 2001 due to subsequent anti-immigrant sentiment and prejudice [24]. Hispanics/Latinos have also been the target of policy initiatives such as California's Proposition 187 in 1994, designed to bar immigrant children from public schools and certain public benefits [25], and Arizona's Senate Bill 1070 in 2010, aimed at identifying, prosecuting and deporting undocumented immigrants [26]. December 2005 also marked the introduction of the Border Protection, Antiterrorism, and Illegal Immigration Control Act, HR 4437, a widely criticized bill that would make any undocumented immigrant or accomplice (regardless of legality) in the U.S. a felon [27]. It can be argued that initiatives such as these can lead to stereotyping and unfair treatment of immigrants and minorities and in turn heighten anti-immigrant sentiment.

As the largest and fastest growing ethnic minority in the U.S. [28], Hispanics/Latinos face unique risks for being discriminated against given their larger presence and high media profile compared to other minorities. For example, Gee and colleagues suggest that in the U.S. a larger presence of a particular non-dominant or non-White ethnic group within a community might increase the risk for discrimination [3]. Interestingly, however, known protective factors against discrimination (i.e. social networks, social support) [29] may be more easily attained in larger groups, especially in those groups that have been in the U.S. for longer generations [30]. Protective factors among different

heritage groups are not necessarily reliant on heritage group size, however. Urban planning scholars argue that the idea of why certain places and groups may integrate immigrants and minorities with greater ease than others has only begun to be understood [31]. As discussed, there are many possible factors that might explain why particular heritage groups might be more likely to perceive discrimination or be discriminated against. These literature-based presumptions, however, are based on data that has to this point included mostly non-indigenous populations.

HISPANIC/LATINO INDIGENOUS POPULATIONS AND DISCRIMINATION

Indigenous Hispanics/Latinos are more likely to suffer from discriminatory practices than their non-indigenous counterparts in the U.S. [32, 33] and in their own countries of origin [34]. In Latin America, Mexico continues to be the leading sending country of origin for indigenous migrants in the U.S. The top three immigrant sending states include Oaxaca, Chiapas, and Yucatán [35]. Even though indigenous Hispanics/Latinos continue to be treated homogenously as part of the larger population [32], they maintain particular individual customs, languages and social networks that may play an important role in the context of perceived and actual discrimination. For example cultural attributes that are found among indigenous populations such as the Maya of Yucatán, (e.g. dark skin, language other than Spanish) may lead to increased exclusion or discrimination as they may be considered to be different from larger non-indigenous groups [32]. This premise is supported by recent research that

incorporated results from the Mexican American Study Project compared with surveys administered to the children of the projects' participants, in which those with darker skin reported much more discrimination than their counterparts [36]. Research also suggests that indigenous immigrants are more likely to face discrimination in instances of domestic migration that may require adapting to urban-non Indigenous communities [37].

Indigenous individuals in Mexico have undergone decades of discrimination that have left them at the margins of society. This includes neglected schools, limited access to adequate health care and to precarious living conditions in isolated rural areas. Indigenous people adapting to urban-non Indigenous communities in Mexico, may be seen as outsiders and undeserving. According to an ethnographic study by Carmen Martinez [38], indigenous women street vendors in the city of Tijuana, Mexico, are highly discriminated against and stigmatized [38], even by those who may assume to not be doing so. Martinez argues that discrimination is present even among non-indigenous academics that are supportive of this population. She explains that due to the combination of society's paternalistic view of indigenous migrants in urban communities, and the push of academia towards defining a rigid indigenous definition, a phenomenon of "Social freezing of inequalities" exists in this population [38]. The phenomenon of discrediting individuals based on the eyes of others, or stigmatization [39], includes characteristics that can intrinsically devalue specific groups [40]. Discrimination and stigma are closely linked, a notion that is exemplified by the

interchangeability of the concepts of “perceived discrimination” and “felt stigma”. Felt stigma refers to the feelings experienced by an individual from real or imagined discrimination [40] and is comparable to perceived discrimination. Conclusively, even though the available literature is limited, there is evidence to believe that indigenous populations might be at a greater risk of discrimination, and that individual cultural attributes might mediate concerns pertaining to discrimination [41].

Overall, the following characteristics may be applied to the U.S. Hispanic/Latino population as a whole. More acculturated Hispanic/Latino individuals tend to report higher rates of discrimination as compared to less acculturated individuals. Reports of greater ethnic identity have also been found to act as a buffer towards the perception of discrimination [2], and educational status, age and gender have also been found to be associated with different rates of perceived discrimination [42]. Consequently, stressors associated to perceived discrimination that may ultimately lead to risky behaviors such as alcohol and smoking [16], and to negative mental health outcomes such as depression [10,43] might be mediated by individual characteristics found within Hispanic/Latino heritage groups.

DISCRIMINATION: A RISK FACTOR FOR TOBACCO/ALCOHOL AND DEPRESSION

The mechanisms through which perceived discrimination may affect health are poorly understood. Still, it has been established that persons may

cope with chronic stressors resulting from perceived discrimination through strategies that involve unhealthy behaviors such as alcohol consumption [44] and smoking [45]. A recent multi-ethnic study of a diverse sample of middle-aged and older adults found that after adjustment for potential confounding factors, reports of perceived discrimination were significantly associated with heavy drinking in blacks and Latinos [16]. Research has also shown that smoking is associated with the negative experiences of discrimination [19, 45]. Smoking is the leading cause of the death, disease and disability in the U.S. [46, 47] and the single greatest preventable cause of disease and death in the country [47]. Even though the overall smoking prevalence in the Hispanic/Latino community in the U.S. is lower than that of the general population [48], males have consistently shown considerably higher rates of lifetime cigarette use than their black non-Hispanic or white non-Hispanic counterparts [49]. Also, three of the four leading causes of death among Hispanics/Latinos are related to smoking (i.e. cancer, heart disease, and stroke) [50].

Depression has also been found to be associated with perceived discrimination [8, 51]. Characterized by loss of interest, feelings of sadness, low self-worth, poor appetite and trouble sleeping [52], depression is considered the leading cause of disability worldwide by the World Health Organization [52] and is the leading cause of mental health illness [53]. If left untreated, depression can impact mental health and all-around well-being and can also lead to engaging in high-risk behaviors such as substance use [54].

Overall, perceived discrimination has been associated with substance use and poor mental health among minorities. However, researchers have only begun to understand the risk factors associated with discriminatory experiences and depression [19].Thus, the following theories have been used in this study in order to evaluate these associations.

THEORETICAL AND ANALYTICAL FRAMEWORKS

As noted, studies have identified perceived discrimination as a significant stressor [11, 55-57]. Critical to understanding the potential negative effects of perceived discrimination are the possibility of chronic perceived discrimination among Hispanics/Latinos.

If an individual perceives discrimination on a regular or chronic basis, she might be at a greater likelihood of reaching a negative emotional state [11], that may eventually lead to a predominance of negative emotional conditions [58] and to a subsequent use of maladaptive coping mechanisms such as alcohol and smoking. The Transactional model of Stress and Coping by Lazarus (1984) (TMSC) [59] hypothesizes that coping tools such as the use of alcohol and tobacco can be used in order to ameliorate the negative impact of stressors such as perceived discrimination [60].

Transactional Model of Stress and Coping

For Chapters 2 and 3, this study relies specifically on the TMSC [59] (Figure 1.1.) in order to explore the use of tobacco and alcohol as a coping

mechanism to perceived discrimination. The TMSC posits that there are two main processes, cognitive appraisal and coping, that may act as mediators to the immediate and long-term outcomes of stressful demands [61] such as discrimination. Cognitive appraisal is the process through which an individual evaluates the demands put forward by a specific stressor and the relationship that this could have on her well-being [62].The theory states that during the primary appraisal of a stressor, an evaluation is made and potential risk is evaluated. For example, “Is this a threat to my well-being? what are the costs of this specific exchange? Are they beneficial or detrimental?” [63], whereas a secondary appraisal is an evaluation that can be seen as subsequent only if there is an actual risk perceived. Secondary appraisal is directly associated to the actual resources or coping resources that the individual possesses within her reach in order for a potential threat to be diminished. Coping is broadly defined as the person’s constantly changing cognitive and behavioral efforts to manage specific demands that might be exceeding an individual’s resources [59].

For the TMSC, it is mostly recognized that there are two main types of coping resources: problem focused and emotion focused. Also referred to as avoidance coping, emotion focused coping has been mostly associated with negative emotional outcomes [64] and may reduce symptoms while maintaining and strengthening disorders such as substance abuse.

Previous studies have found that coping strategies may include both problem and emotion focused resources [59], and there is ample support

suggesting that problem focused coping is strongly related to positive outcomes [65]. On the other hand, emotion focused coping is more likely to lead to maladaptive coping strategies such as alcohol and tobacco use.

Importantly, it is established that problem focused coping is necessary in order to take the required steps towards actually reducing or eliminating a stressor [59]. For instance, in the case of perceived discrimination and problem based coping, an individual can make an attempt to understand discrimination by learning about racism. She could also seek social support, or write a list of the steps that need to be taken to appropriately deal with the issue. On the other hand, emotion focused coping is said to motivate the individual towards changing her own emotional reaction to a stressor by disclaiming the event, accepting responsibility and exercising self-control and escape-avoidance [66]. Some of the maladaptive coping tools that can be used to deal with the stressors of perceived discrimination are the use of alcohol and tobacco with a potential to lead to their dependency [67, 68] (Figure 1.2). This hypothesis is also supported by recent studies [16, 69]. Therefore, the guiding theoretical framework of Chapters 1 and 2 rely heavily on the TMSC while applications of our results are also applied utilizing a theory-based interventions approach as discussed in Chapter 5.

Impact of Migration Experience among Indigenous Mayans: A Conceptual Model

There is a very limited exploration of the relationship between transnational migration, discrimination and mental health outcomes among the

indigenous population of Mexico. In order to fill this gap in the literature, we developed an analytical framework adapted from the model of stigma, migration and mental health [70] .The model by Li and colleagues (2006) hypothesizes that among migrants, perceived discrimination has the capacity to intensify feelings of loneliness and alienation in a receiving community, and that these can in turn produce negative mental health outcomes [70]. It has been found that religious practice may facilitate coping with migration related adversities through sociological pathways such as group identity and moral codes [71]. Based on these early findings, Li and colleagues adapted their model from the sociocultural model of mental health in gay and bisexual Latino men [72]. The model, created by Diaz and colleagues, hypothesizes that resiliency factors such as community involvement (i.e. religious service attendance) can ameliorate the negative impact of perceived discrimination on mental health. The proposed analytical model: Model of mental health in a context of migration among Tunkaseño individuals (Figure 1.3), tests the hypothesis stating that migration experience is associated with higher depressive symptoms while discrimination and religiosity mediate this relationship in a sample of an indigenous Mayan population.

STUDY SETTING

Data for Chapters 2 and 3 was collected among self-identified Hispanics/Latinos in 4 different U.S. states. Data for Chapter 4 was collected among individuals of *Tunkaseño* heritage in the cities of Anaheim and Inglewood, California and Tunkás, located in the Mexican State of Yucatán.

For chapters 2 and 3, (Perceived discrimination, alcohol and tobacco use) data was collected between March 2008 and June 2011 by project staff in four major cities as part of the Hispanic community health study/Study of Latinos (HCHS/SOL). Sponsored by the National Heart, Lung, and Blood Institute (NHLBI) and six other institutes, centers, and offices of the National Institutes of Health (NIH), the centers were selected through a competitive process that considered the characteristics of a nationally representative sample, recruitment capabilities and institutional stature.

The centers are located at the Albert Einstein College of Medicine in The Bronx, New York; Northwestern University in Chicago, San Diego State University, the University of Miami and the Coordinating Center at UNC. Subsequently, each field center selected its own particular sampling locations in collaboration with the coordinating center based on demographic distributions available from the 2000 Decennial U.S. census as well as local neighborhood information. A two-stage probability sampling technique was then used to ensure an adequate representation from the five main background groups targeted.

HCHS/SOL is a multicenter-epidemiological study to determine the role of acculturation in the prevalence and development of disease, and to identify risk factors playing a protective or harmful role in Hispanics/Latinos. The population based study, which surpassed its recruitment goal of 16,000 participants (4000 per site) includes self-identified Hispanics/Latinos between the ages of 18 and 74 of Dominican, Mexican, Central American, South American and Cuban heritage

backgrounds. In order to provide a broad and diverse sample and to ensure target age distribution, a two-stage area probability sample of households was selected defined by groups of neighboring census tracks [73]. These strategies helped maximize participation rates [74].

Providing a diverse study sample of the Hispanic/Latino population in the U.S. is a complex phenomenon, due in large part to the more than 52 million individuals that make up this ethnic group [75]. According to the office of minority health, Hispanics/Latinos represent approximately 16.3% of the total U.S. population with those of Mexican heritage being the largest group (63% of the total U.S. Hispanic population). This group is followed by Central and South Americans (13.5 %), Puerto Ricans (9%) and Cubans (3.5%) [76]. This unprecedented growth has made people of Hispanic/Latino origin the largest ethnic race in the United States, after African Americans [77]. The diverse Hispanic/Latino population varies significantly by geographical region, size, cultural adaptability, social networks and political influence.

Even though Hispanics/Latinos of Mexican origin are a great majority in the U.S., the areas of Miami and New York do not reflect that. In Miami more than 54% of the Hispanic/Latino population is of Cuban descent, while in New York, Puerto Ricans are the largest group with 27% of the total Hispanic/Latino population, followed by Dominicans, who make up 21% of this population [78]. Identifying the difference in the prevalence of risk factors such as discrimination

among the Hispanic/Latino population, is critical to designing and implementing effective heritage tailored treatment programs.

Chicago, **Illinois**

The most recent estimates (2010) by the American Community Health Survey (ACS) show that out of the total population of Chicagoans, 28.9 percent are of Hispanic/Latino origin. Within this group, individuals of Mexican origin account for 21.4% followed by Puerto Ricans with 3.8 % of the Hispanic population. Cubans account for only 0.3% while Other Hispanics/Latinos[3] account for 3.3% of this population [79]. Although there is essentially little to no information on discrimination among the Hispanic/Latino population of Chicago, one study found that reports of perceived discrimination among Puerto Ricans and Mexican Americans in this city were associated with physical health problems. It is important to note, that the study also found that married Mexican Americans with higher perceived discrimination had fewer physical health problems than their unmarried counter parts, [80] suggesting that marriage is acting a buffering mechanism. The most recent estimates of smoking (current smoking and have smoked more than 100 cigarettes in their lifetime) among

[3] Composed of people whose origins are from the Dominican Republic, Spain, and Spanish-speaking Central or South American countries

adults in cook county in Chicago is 20%, while excessive drinking[4] is noted at 17 % [81].

The Bronx, New York

Hispanics/Latinos account for 53.5% of the total population of 1,385,108 in The Bronx. In this region only 5.1% of this population is of Mexican origin, while Puerto Ricans are a majority with 50.6%, and Dominicans 21%.Cubans occupy only 0.6% of the total Hispanic/Latino population. Other Hispanics/Latinos comprise 26.2% of the total group [79]. Current smoking among adults in Bronx County stands at 19% while excessive drinking can be found among 14% of the total county population [81]. There are no studies in the literature exploring the association of discrimination and alcohol and tobacco use among the Hispanic/Latino population in New York. However one study found that the association between perceived ethnic discrimination and poor mental health outcomes was significant among a diverse sample of Hispanics/Latinos and African Americans across four neighborhoods in New York [82].

Miami, Florida

Hispanics/Latinos in Miami-Dade County make up 65% of the total population with a majority of them of Cuban descent (34%). Puerto Ricans account for 3.7% of individuals and 2.1% are of Mexican heritage. However,

[4] Defined as consuming more than 4 (women) or 5 (men) alcoholic beverages on a single occasion in the past 30 days, or heavy drinking, defined as drinking more than 1 (women) or 2 (men) drinks per day on average.

"other Hispanics/Latinos make up 34.3% of the population. Overall smoking among the population in Miami-Dade county for 2013 was 14% with 13% reporting excessive drinking [81]. There is a gap in the literature concerning prevalence of reported perceived discrimination among the Miami Cuban population, however the National Latino and Asian American Study (NLAAS) reports that Cubans are considered to possess a stronger ethnic identity and are less likely to report perceived discrimination compared to other Hispanic/Latino heritage groups with lower ethnic identity [83].

San Diego, California

The Hispanic/Latino population of 991,348 accounts for 31% of the total county population. As expected for a metropolitan city bordering Mexico, the majority (28.1%) are of Mexican heritage followed by Puerto Ricans (0.7%) and Cubans (0.2 %). Other Hispanics/Latinos represent 3.1% of the total Hispanic/Latino population [79]. The most current estimates for smoking among the county are 13% while heavy drinkers are estimated at 17%. There is no available literature showing the prevalence of perceived discrimination among the Hispanic/Latino population of San Diego. Interestingly, substance abuse, (particularly alcohol use) in the San Diego region must be considered in the context of its proximity to the city of Tijuana, Mexico, a city known for its cross-border binge alcohol availability [84-86]. One study among Mexican Americans along border cities found that while comparing border and non-border cities, men

and women between the ages of 18 to 29 residing in border towns had a higher prevalence of alcohol consumption than the latter [87].

Tunkás, Yucatán, Mexico and Inglewood/Anaheim, CA

For chapter 4, data were collected in the migrant sending community of Tunkás in the state of Yucatán, Mexico and in the satellite communities of Inglewood and Anaheim, California between January 22 and March 18, 2012. Before this study, there was virtually no data concerning discrimination or mental health among the *Tunkaseño* population. Prior research in this community, predominantly done by Cornelius et. al. (2007) focused mainly on migration, and the *Tunkaseño* community's adaptability in a changing economy and political atmosphere [88]. Eligibility criteria for participation included individuals between ages18-65, the ability to understand Spanish or English, and self-identified as having *Tunkaseño* heritage (participant born in Tunkás and/or parents and/or grandparents from Tunkás). This study was conducted under the support of the Mexican Migration Field Research and Training Program (MMFRP), and by students of the program, including Salgado, who acted as a lead researcher and mentor to undergraduate and graduate students based at the University of California-San Diego. The latest population estimates of Hispanics/Latinos in Inglewood was 50% while Hispanics/Latinos represented 52% of the total population in Anaheim [89]. Data concerning *Tunkaseño* individuals residing in Anaheim and Inglewood are not available

AIMS AND HYPOTHESES

Based on the theoretical and conceptual frameworks described above and a review of the relevant literature on perceived discrimination, alcohol/tobacco use and migration status and depression among Hispanics/Latinos, this dissertation has the following aims and corresponding hypotheses:

Aim 1. To determine whether participants from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) who report perceived discrimination are more likely to report alcohol consumption and to explore if this likelihood varies across Hispanic/Latino heritage groups.

Hypothesis: Adjusting for Hispanic/Latino heritage group, self-reports of perceived discrimination among HCHS/SOL participants will be associated with current alcohol use.

Aim 1.1. To examine if reports of "at risk alcohol use" are more probable among individuals who report perceived discrimination by Hispanic/Latino heritage group.

Hypothesis: Adjusting for Hispanic/Latino heritage group, those who report being discriminated against will be more likely to report "at risk alcohol use".

Aim 2. To determine whether participants who report perceived discrimination display a higher likelihood of current cigarette use and to explore if this likelihood varies across Hispanic/Latino heritage groups.

Hypothesis: Adjusting for Hispanic/Latino heritage, those who report perceived discrimination will be more likely to report current cigarette use.

Aim 3. To assess the association between migration history and US residence and depressive symptoms, among a population of indigenous Mayan migrants.

Hypothesis 1: Indigenous individuals with a history of migration who report perceived discrimination will report greater depressive symptomology.

Hypothesis 2: Religious service attendance will mediate the relationship between perceived discrimination and depressive symptomology.

OVERVIEW OF RESEARCH METHODS

The three manuscripts presented in this dissertation utilize data from two separate studies. The study for Aims 1 and 2 (Chapters 2 and 3) is a multi-center/city (Bronx, Miami, Chicago, San Diego) population based cohort study of the US Latino population designed to evaluate risk factors of chronic diseases in the Latino population. The survey data for Aim 3 (Chapter 4) originates from a cross-sectional binational study of individuals of *Tunkaseño* indigenous heritage in the sending community of Tunkás, Yucatán México, and the satellite communities of Inglewood and Anaheim, California. This study was designed to assess specific risk and protective factors and outcomes among indigenous migrants and non-migrants. Research methods for all three chapters are abridged below, specific details can be found in each relevant chapter. For chapters 2 and 3, approval was obtained from institutional review boards at San Diego State University, University of Miami, Northwestern University in Chicago and Albert Einstein College of Medicine. For chapter 4, approval was obtained from the University of California at San Diego and the State of Yucatán, México's

Sistema para el Desarrollo Integral de la Familia (DIF) del Estado de Yucatán (System for the Integrated Development of the Family of the State of Yucatán)

CHAPTERS 2 and 3

Stressors such as discrimination have been found to be highly predictive of alcohol use and drinking problems [90], as well as tobacco use [91-93]. However, little is known about this association in the Latino population.

Data collection: Data were collected as part of the HCHS/SOL study, in which a total of 16,415 self-identified Latinos ages 18-75 were recruited between March 2008 and June 2011. Participants underwent an extensive clinic exam and a battery of assessments to determine baseline risk factors. Annual follow-up interviews will be conducted to determine health cardiovascular and pulmonary outcomes of interest.

Data analysis: Univariate logistic regression was used to explore for associations between perceived discrimination and covariate predictors of alcohol use and smoking prior to the employment of adjusted regression. Due to our multi-category nominal dependent variable in chapters 2 and 3 (e.g. never, former, and current) multinomial logistic regression [94] was used to explore associations between alcohol use and abuse (Chapter 2) and smoking status (Chapter 3)

CHAPTER 4:

Indigenous Mexican migrants are far more likely to suffer from discriminatory practices than non-indigenous migrants in the U.S. [32, 33] and during domestic rural- to -urban migration [95]. Participants were administered an extensive questionnaire that included a battery of health and migration related assessments.

Data collection: As part of UCSD's Mexican Migration Field Research Program, cross sectional data were collected between January 22 and February 4, 2012 in the migrant sending community of Tunkás in the state of Yucatán, Mexico and every weekend between February 17 and March 18, 2012 in the communities of Inglewood and Anaheim, California.

Participants underwent a computer-assisted, interviewer-administered baseline questionnaire that included demographics, the Center for Epidemiologic Depression Scale-20 (CES-D 20), religious attendance questions and perceived discrimination, among others (see Methods section of Chapter 4 for more information on these measures).

Data analysis: Through an adaptation of the stigma of migration and mental health framework created by Li et al. [70] an analysis was made of the influence of perceived discrimination, religiosity, gender, migration experience, and residence in the U.S. on depressive symptomatology. Path analysis [96] models were developed to assess the relationship between migration history and correlated variables, U.S. residency and depression risk, mediated by perceived discrimination and religious attendance [92]. Path analysis is an analytic tool

used to test theoretical models that specify direct and indirect effects of complex phenomena among observed variables [96].

FIGURES

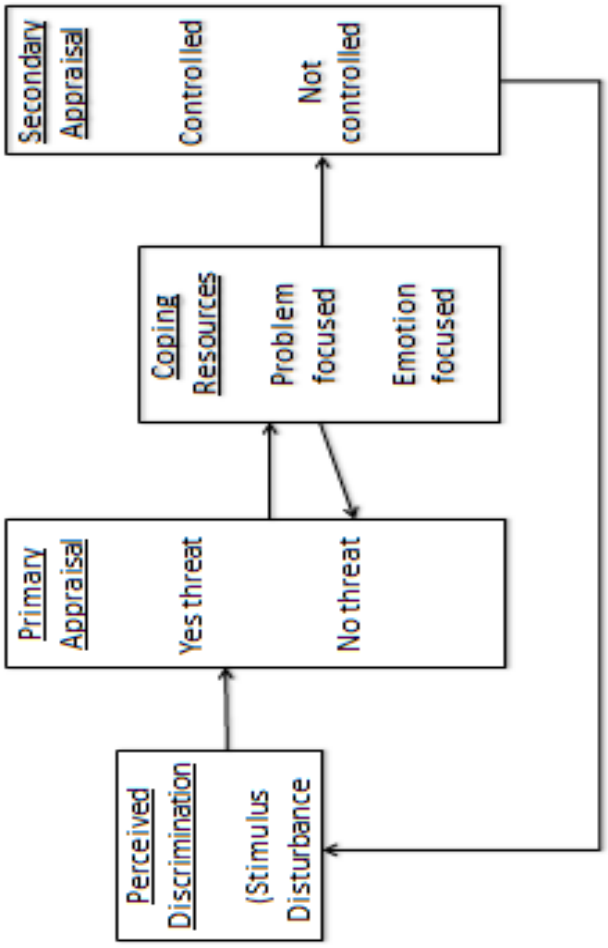

Figure 1.1: Transactional model of stress and coping as applied to Chapters 2 and 3

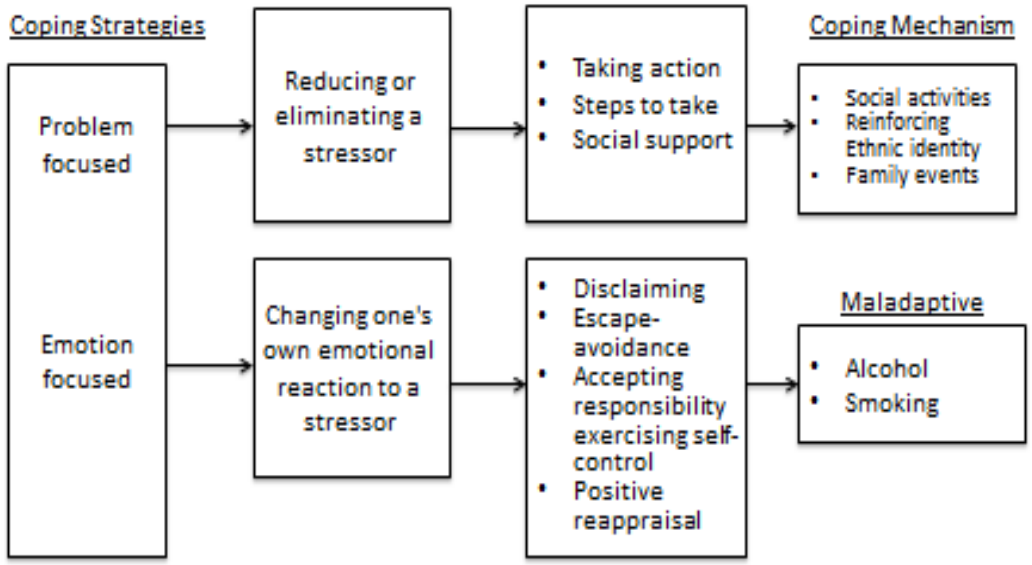

Figure 1.2: Adapted model from stress and coping to include alcohol and tobacco as maladaptive coping mechanisms as applied to Chapters 2 and 3

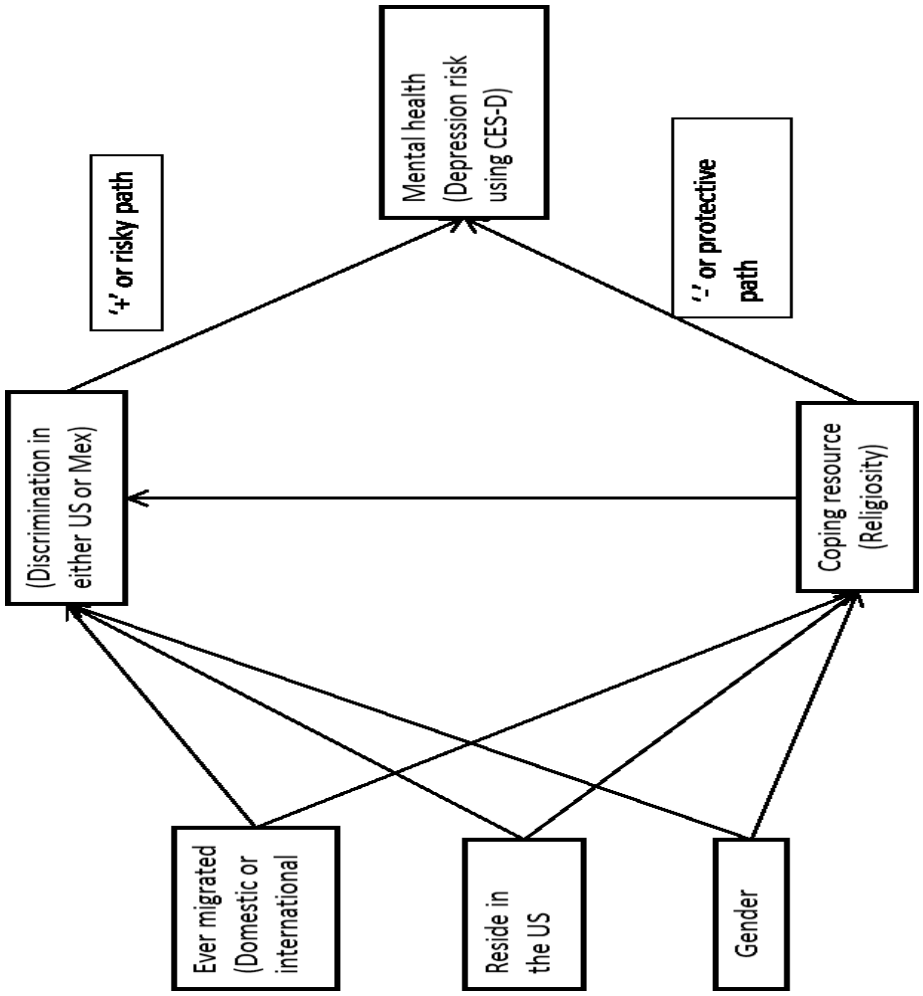

Figure 1.3: Model of mental health in a context of migration among Tunkaseño individuals as applied to Chapter 4.

References

1. Jones JM: Prejudice and racism 2nd ed. NY: McGraw Hill 1997

2. Perez D, Sribney W, Rodriguez M: Perceived Discrimination and Self-Reported Quality of Care Among Latinos in the United States. Journal of General Internal Medicine 2009:548-554

3. Gee GC, Ryan A, Laflamme DJ, Holt J: Self-reported discrimination and mental health status among African descendants, Mexican Americans, and other Latinos in the New Hampshire REACH 2010 Initiative: the added dimension of immigration. Journal Information 2006; 96

4. Basáñez T, Unger JB, Soto D, Crano W, Baezconde-Garbanati L: Perceived discrimination as a risk factor for depressive symptoms and substance use among Hispanic adolescents in Los Angeles. 2012

5. Torres L, Driscoll MW, Voell M: Discrimination, acculturation, acculturative stress, and Latino psychological distress: A moderated mediational model. Cultural Diversity and Ethnic Minority Psychology; Cultural Diversity and Ethnic Minority Psychology 2012; 18:17

6. Ahmed SR, Kia-Keating M, Tsai KH: A structural model of racial discrimination, acculturative stress, and cultural resources among Arab American adolescents. Am J Community Psychol 2011; 48:181-192

7. Araujo Dawson B, Panchanadeswaran S: Discrimination and Acculturative Stress Among First-Generation Dominicans. Hispanic Journal of Behavioral Sciences 2010; 32:216-231

8. Alegría M, Canino G, Shrout PE, Woo M, Duan N, Vila D, Torres M, Chen C, Meng X: Prevalence of Mental Illness in Immigrant and Non-Immigrant U.S. Latino Groups. Am J Psychiatry 2008; 165:359-369

9. Rogler LH, Cortes DE, Malgady RG: Acculturation and mental health status among Hispanics: Convergence and new directions for research. Am Psychol 1991; 46:585

10. Finch BK, Kolody B, Vega WA: Perceived discrimination and depression among Mexican-origin adults in California. J Health Soc Behav 2000:295-313

11. Pascoe EA, Smart Richman L: Perceived discrimination and health: A meta-analytic review. Psychological Bulletin 2009; 135:531-554

12. Cook B, Alegría M, Lin JY, Guo J: Pathways and correlates connecting Latinos' mental health with exposure to the United States. Journal Information 2009; 99

13. Williams D, Mohammed S: Discrimination and racial disparities in health: evidence and needed research. J Behav Med 2009; 32:20-47; 47

14. Whitbeck LB, Hoyt DR, McMorris BJ, Chen X, Stubben JD: Perceived discrimination and early substance abuse among American Indian children. J Health Soc Behav 2001:405-424

15. Stock ML, Gibbons FX, Walsh LA, Gerrard M: Racial Identification, Racial Discrimination, and Substance Use Vulnerability Among African American Young Adults. Person Soc Psychol Bull 2011; 37:1349-1361

16. Borrell LN, Diez Roux AV, Jacobs Jr. DR, Shea S, Jackson SA, Shrager S, Blumenthal RS: Perceived racial/ethnic discrimination, smoking and alcohol consumption in the Multi-Ethnic Study of Atherosclerosis (MESA). Prev Med 2010; 51:307-312

17. Kam JA, Cleveland MJ, Hecht ML: Applying General Strain Theory to Examine Perceived Discrimination's Indirect Relation to Mexican-Heritage Youth's Alcohol, Cigarette, and Marijuana Use. Prevention Science 2010; 11:397-410

18. Otiniano AD: Discrimination, Drugs, and Alcohol Among Latina/os in the United States 2012. Retrieved from ProQuest Dissertations and Theses. (Accession order No. AAT3493424)

19. Chae DH, Takeuchi DT, Barbeau EM, Bennett GG, Lindsey J, Krieger N: Unfair treatment, racial/ethnic discrimination, ethnic identification, and smoking among Asian Americans in the National Latino and Asian American Study. Am J Public Health 2008; 98:485

20. Lara M, Gamboa C, Kahramanian MI, Morales LS, Bautista DEH: Acculturation and Latino health in the United States. Race, Ethnicity, and Health: A Public Health Reader 2012:215

21. Lara M, Gamboa C, Kahramanian MI, Morales LS, Hayes Bautista DE: Acculturation and Latino health in the United States: a review of the literature and its sociopolitical context. Annu Rev Public Health 2005; 26:367-397

22. Sam DL, Berry JW: Acculturation When Individuals and Groups of Different Cultural Backgrounds Meet. Perspectives on Psychological Science 2010; 5:472-481

23. Lorenzo-Blanco EI, Unger JB, Ritt-Olson A, Soto D, Baezconde-Garbanati L: Acculturation, Gender, Depression, and Cigarette Smoking Among US Hispanic Youth: The Mediating Role of Perceived Discrimination. Journal of youth and adolescence 2011; 40:1519-1533

24. Who I: All Along the Watchtower: Acculturation Fear, Anti-Latino Affect, and Immigration. The Journal of Politics 2011; 73:664-679

25. Hing BO: Vigilante Racism: The De-Americanization of Immigrant America. Michigan Journal of Race and Law 2002; 7

26. Archibold CR: Arizoan Encats Stringent Law on Immigration. New York Times 2010

27. Huber LP, Lopez CB, Malagon MC, Velez V, Solorzano DG: Getting beyond the 'symptom,'acknowledging the 'disease': Theorizing racist nativism. Contemporary Justice Review 2008; 11:39-51

28. Juenke EG, Preuhs RR: Irreplaceable Legislators? Rethinking Minority Representatives in the New Century. Am J Polit Sci 2012; 56:705-715

29. Jasinskaja-Lahti I, Liebkind K, Jaakkola M, Reuter A: Perceived Discrimination, Social Support Networks, and Psychological Well-being Among Three Immigrant Groups. Journal of Cross-Cultural Psychology 2006; 37:293-311

30. Vega WA, Alegría M: Latino mental health and treatment in the United States. Health issues in the Latino community 2001; 8:179

31. Jaworsky BN, Levitt P, Cadge W, Hejtmanek J, Curran SR: New Perspectives on Immigrant Contexts of Reception. Nordic Journal of Migration Research 2012; 2:78-88

32. Montes J: Perceived Discrimination Among Indigenous and Non-indigenous Mexican-Americans Living in the United States 2010

33. Holmes SM: Structural vulnerability and hierarchies of ethnicity and citizenship on the farm. Med Anthropol 2011; 30:425-449

34. Fox J, Rivera-Salgado G: Building civil society among indigenous migrants. 2009

35. Weeks JR, Stoler J, Jankowski P: Who's crossing the border: new data on undocumented immigrants to the United States. Population, Space and Place 2011; 17:1-26

36. Ortiz V, Telles E: Racial Identity and Racial Treatment of Mexican Americans. Race and Social Problems 2012:1-16

37. Wang JL: Rural–urban differences in the prevalence of major depression and associated impairment. Soc Psychiatry Psychiatr Epidemiol 2004; 39:19-25

38. Novo CM: The ‘culture’of exclusion: representations of indigenous women street vendors in Tijuana, Mexico. Bulletin of Latin American Research 2003; 22:249-268

39. Goffman E: Stigma: Notes on the management of spoiled identity. Touchstone; 1963

40. Gilmore N, Somerville MA: Stigmatization, scapegoating and discrimination in sexually transmitted diseases: overcoming ‘them’and ‘us’. Soc Sci Med 1994; 39:1339-1358

41. Ortiz-Hernández L, Compeán-Dardón S, Verde-Flota E, Flores-Martínez MN: Racism and mental health among university students in Mexico City. salud pública de méxico 2011; 53:125-133

42. Mays VM, Cochran SD: Mental Health Correlates of Perceived Discrimination Among Lesbian, Gay, and Bisexual Adults in the United States. Am J Public Health 2001; 91:1869-1876

43. Flores E, Tschann JM, Dimas JM, Bachen EA, Pasch LA, de Groat CL: Perceived Discrimination, Perceived Stress, and Mental and Physical Health Among Mexican-Origin Adults. Hispanic Journal of Behavioral Sciences 2008; 30:401-424

44. Jackson JS, Knight KM, Rafferty JA: Race and unhealthy behaviors: chronic stress, the HPA axis, and physical and mental health disparities over the life course. Journal Information 2010; 100

45. Purnell JQ, Peppone LJ, Alcaraz K, McQueen A, Guido JJ, Carroll JK, Shacham E, Morrow GR: Perceived Discrimination, Psychological Distress, and Current Smoking Status: Results From the Behavioral Risk Factor Surveillance System Reactions to Race Module, 2004–2008. Journal Information 2012; 102

46. Jemal A, Thun M, Xue QY, Hartman AM, Cokkinides V, Center MM, Ross H, Ward EM: Changes in smoking prevalence among US adults by state and region: Estimates from the Tobacco Use Supplement to the Current Population Survey, 1992-2007. BMC Public Health 2011; 11:512

47. Ryan H, Trosclair A, Gfroerer J: Adult Current Smoking: Differences in Definitions and Prevalence Estimates; NHIS and NSDUH, 2008. Journal of Environmental and Public Health 2012; 2012

48. Garrett BE, Dube SR, Trosclair A, Caraballo RS, Pechacek TF: Cigarette Smoking—United States, 1965–2008. CDC Health Disparities and Inequalities Report—United States, 2011 2011; 60:109

49. Castro FG, Stein JA, Bentler PM: Ethnic pride, traditional family values, and acculturation in early cigarette and alcohol use among Latino adolescents. The journal of primary prevention 2009; 30:265-292

50. Centers for Disease Control and Prevention: Centers for Disease Control and Prevention. *National Center for Health Statistics*. Hayattsville (MD): Department Health Human Services. 2012; 2012

51. Noh S, Morton Beiser, Kaspar V, Hou F, Rummens J: Perceived Racial Discrimination, Depression, and Coping: A Study of Southeast Asian Refugees in Canada. J Health Soc Behav 1999; 40:pp. 193-207

52. World Health Organization: Mental health: strengthening our response. (Fact sheet No.220) 2011

53. Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B: Depression, chronic diseases, and decrements in health: results from the World Health Surveys. The Lancet 2007; 370:851-858

54. Berg CJ, Michelson SE, Safren SA: Behavioral aspects of HIV care: Adherence, depression, substance use, and HIV-transmission behaviors. Infect Dis Clin North Am 2007; 21:181-200

55. Clark R, Anderson NB, Clark VR, Williams DR: Racism as a stressor for African Americans. A biopsychosocial model. Am Psychol 1999; 54:805-816

56. Noh S, Kaspar V: Perceived discrimination and depression: Moderating effects of coping, acculturation, and ethnic support. Journal Information 2003; 93

57. Noh S, Morton Beiser, Kaspar V, Hou F, Rummens J: Perceived Racial Discrimination, Depression, and Coping: A Study of Southeast Asian Refugees in Canada. J Health Soc Behav 1999; 40:pp. 193-207

58. Van der Vloed G, Berentsen J: Measuring Emotional Wellbeing with a Non-intrusive Bed Sensor. Lecture Notes in Computer Science 2009; 5727: 908-911

59. Lazarus RS, Folkman S: Stress, appraisal, and coping.: Springer Publishing Company; 1984

60. Paradies Y: A systematic review of empirical research on self-reported racism and health. Int J Epidemiol 2006; 35:888-901

61. Folkman S, Lazarus RS, Dunkel-Schetter C, DeLongis A, Gruen RJ: Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. Journal of Personality and Social Psychology; Journal of Personality and Social Psychology 1986; 50:992

62. Folkman S, Lazarus RS: Coping as a mediator of emotion. J Pers Soc Psychol 1988; 54:466

63. Chang EC: Dispositional optimism and primary and secondary appraisal of a stressor: Controlling for confounding influences and relations to coping and psychological and physical adjustment. J Pers Soc Psychol 1998; 74:1109

64. Stanton AL, Kirk SB, Cameron CL, Danoff-Burg S: Coping through emotional approach: scale construction and validation. J Pers Soc Psychol 2000; 78:1150

65. Terry DJ, Hynes GJ: Adjustment to a low-control situation: Reexamining the role of coping responses. J Pers Soc Psychol 1998; 74:1078

66. Gonzalez VM, Goeppinger J, Lorig K: Four psychosocial theories and their application to patient education and clinical practice. Arthritis & Rheumatism 1990; 3:132-143

67. Yen lH, Ragland DR, Greiner BA, Fisher JM: Racial discrimination and alcohol-related behavior in urban transit operators: findings from the San Francisco Muni Health and Safety Study. Public Health Reports 1999; 114:448-458

68. Boyd MR, Berger KC, Baliko B, Tavakoli A: Predictors of alcohol and drug problems in rural African American women. Issues Ment Health Nurs 2009; 30:383-391

69. Chae DH, Takeuchi DT, Barbeau EM, Bennett GG, Lindsey JC, Stoddard AM, Krieger N: Alcohol disorders among Asian Americans: associations with unfair treatment, racial/ethnic discrimination, and ethnic identification (the national Latino and Asian Americans study, 2002–2003). J Epidemiol Community Health 2008; 62:973-979

70. Li X, Stanton B, Fang X, Lin D: Social stigma and mental health among rural-to-urban migrants in China: A conceptual framework and future research needs. World Health Popul 2006; 8:14-31

71. Braam A, Van den Eeden P, Prince M, Beekman A, Kivela S, Lawlor B, Birkhofer A, Fuhrer R, Lobo A, Magnusson H: Religion as a cross-cultural determinant of depression in elderly Europeans: results from the EURODEP collaboration. Psychol Med 2001; 31:803-814

72. Diaz RM, Ayala G, Bein E, Henne J, Marin BV: The impact of homophobia, poverty, and racism on the mental health of gay and bisexual Latino men: Findings from 3 US cities. Am J Public Health 2001; 91:927

73. LaVange LM, Kalsbeek WD, Sorlie PD, Avilés-Santa LM, Kaplan RC, Barnhart J, Liu K, Giachello A, Lee DJ, Ryan J: Sample design and cohort selection in the Hispanic Community Health Study/Study of Latinos. Ann Epidemiol 2010; 20:642-649

74. Daviglus ML, Talavera GA, Avilés-Santa ML, Allison M, Cai J, Criqui MH, Gellman M, Giachello AL, Gouskova N, Kaplan RC: Prevalence of Major Cardiovascular Risk Factors and Cardiovascular Diseases Among Hispanic/Latino Individuals of Diverse Backgrounds in the United States Cardiovascular Diseases and US Hispanics/Latinos. JAMA: The Journal of the American Medical Association 2012; 308:1775-1784

75. Bureau USC. The Hispanic Population: 2010.: 2012; 2013

76. The Office of Minority Health: Hispanic Latino/Profile. 2012; 2013

77. Wright R, Ellis M, Holloway SR, Wong S: Patterns of Racial Diversity and Segregation in the United States: 1990–2010. The Professional Geographer 2013

78. Pew Research Hispanic Center: Characteristics of the 60 largest metropolitan areas by Hispanic population. 2012; 2013

79. United States Census Bureau: Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data. 2010; 2012

80. Lee M, Ferraro KF: Perceived discrimination and health among Puerto Rican and Mexican Americans: Buffering effect of the Lazo matrimonial? Soc Sci Med 2006; 68:1966-1974

81. County Health Rankings and Roadmaps: 2013; 2013

82. Stuber J, Galea S, Ahern J, Blaney S, Fuller C: The Association between Multiple Domains of Discrimination and Self-assessed Health: A Multilevel Analysis of Latinos and Blacks in Four Low-Income New York City Neighborhoods. Health Serv Res 2003; 38:1735-1760

83. Pérez DJ, Fortuna L, Alegría M: Prevalence and correlates of everyday discrimination among US Latinos. J Community Psychol 2008; 36:421-433

84. Turrisi R, Ray AE: Sustained parenting and college drinking in first-year students. Dev Psychobiol 2010; 52:286-294

85. Caetano R, Mills BA, Vaeth PA: Alcohol use among Mexican American US–Mexico border residents: Differences between those who drink and who do not drink in Mexico. Addict Behav 2013

86. Mumford EA, Kelley-Baker T, Romano E: Sexual Assault Histories and Evening Drinking among Young American Men in a High-Risk Drinking Environment. J Sex Res 2010; 48:53-61

87. Vaeth PA, Caetano R, Mills BA, Rodriguez LA: Alcohol-related Social Problems among Mexican Americans Living in US-Mexico Border and Non-border Areas. Addict Behav 2012

88. Cornelius WA, Fitzgerald D: Mayan journeys: US-bound migration from a new sending community. : Center for Comparative Immigration; 2007

89. California Population: Census 2010 and 2000 Interactive Map, Demographics, Statistics, Quick Facts.

90. Cooper ML, Russell M, Skinner JB, Frone MR, Mudar P. Stress and alcohol use: Moderating effects of gender, coping, and alcohol expectancies. J Abnorm Psychol. 1992;101(1):139.

91. Sanders-Phillips K. Ethnic minority women, health behaviors, and drug abuse: A continuum of psychosocial risks. 1999.

92. Resnicow K, Soler RE, Braithwaite RL, Selassie MB, Smith M. Development of a racial and ethnic identity scale for African American adolescents: The survey of black life. J Black Psychol. 1999;25(2):171-88.

93. Landrine H, Klonoff EA, Corral I, Fernandez S, Roesch S. Conceptualizing and measuring ethnic discrimination in health research. J Behav Med. 2006;29(1):79-94.

94. Retherford RD, Choe MK. Multinomial logit regression. Statistical Models for Causal Analysis. 1993:151-65.

95. Pineda F: Racist Discourse in Mexico. Racism and discourse in Latin America 2009:217

96. Land KC: Principles of path analysis. Sociological methodology 1969; 1:3-37

CHAPTER 2:

The Association between Perceived Discrimination and Alcohol Use in a Hispanic Population: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)

Abbreviated Title (Length 40 characters): Perceived discrimination and alcohol use in Latinos

Keywords: Latinos, discrimination, alcohol, alcohol abuse

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Suggested running head: Hispanic/Latino discrimination and alcohol use

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Abstract

Evidence suggests that experiences of perceived discrimination among Hispanics/Latinos in the United Sates are associated with the use of maladaptive coping mechanisms such as alcohol use and abuse. We hypothesized that perceived discrimination would be associated to alcohol use and abuse among participants of the Hispanic Community Health Study/Study of Latinos regardless of heritage background. We applied multinomial logistic regression to test our hypothesis with a sample of individuals (n=16,415) ages 18-74 from diverse Latino ethnic backgrounds in four US communities (Chicago, San Diego, Miami, and The Bronx). Results indicated that after controlling for confounding factors associated with alcohol use, individuals of Cuban heritage who reported perceived discrimination were more likely to report alcohol use. We found no significant association between perceived discrimination and alcohol abuse among our population.

According to The National Latino and Asian American Study (NLAAS), at least 30% of Hispanic/Latinos report perceived ethnic discrimination on any given day [1, 2] Perceived discrimination is defined as a behavioral manifestation of a negative attitude, judgment, or unfair/differential treatment toward members of a group [3]. The act of discrimination can be considered a result of racism and used against individuals or members of groups defined as inferior by both individuals and societal establishments [4]. Discrimination is considered a stressor [5] that has been associated with mental health consequences in the US [6]. In addition, the perception of being discriminated against has also been found to contribute to negative health consequences such as high blood pressure [7].

Furthermore, the perception of feeling discriminated against may cause individuals to adopt unhealthy coping strategies such as alcohol use and abuse [8]. For example, a multi-ethnic study of a diverse sample of middle-aged and older adults found that after adjustment for potential confounding factors (i.e. age, gender, income) heavy drinking in African Americans and Hispanics/Latinos might have been used as a coping mechanism among those who reported greater perceived discrimination, yet the association remains unclear, and authors recommend additional research to address this hypothesis [9]. These results may differ due to the many psychosocial factors that confound the relationship between perceived discrimination and alcohol use. For example, previous research demonstrates that in racial/ethnic minorities these factors include: depressive symptoms, acculturative stress, and anxiety [10, 11].

Particularly for Hispanic/Latinos, the acculturation process has been known to act as a mediator to perceived discrimination [12, 13]. On the other hand, greater ethnic identity has been found to work as a protective mechanism against stressors specific to ethnic minority communities [14, 15].

The relationship between perceived discrimination and maladaptive behaviors is well established in the literature [16, 9, 13, 17]. Studies that have been done in the Hispanic/Latino population regarding this association have focused mostly in the Mexican population and have not looked at specific differences among the other Hispanic/Latino heritage groups [18]. Also lacking is a clear understanding of how alcohol use disorder consumption differs across Hispanic/Latinos groups in this context. The National Institute for Alcohol Abuse and Alcoholism (NIAAA) defines alcohol use disorder as consuming more than 7 drinks total per week for females and more than 14 drinks total per week for males.

In the available literature, the relationship between discrimination and alcohol use and abuse within the different heritage groups of the Hispanic/Latino population is unclear. Consequently, specific attention across Hispanic/Latino background groups is essential in identifying perceived discrimination as a risk factor for alcohol use and abuse. The aims of this study will allow us to explore different prevalence rates of discrimination across heritage groups, and to identify any associations between perceived discrimination and alcohol use and at a risk use independent of heritage group.

Aim 1. To determine the prevalence of perceived discrimination across different Hispanic/Latino heritage groups.

Aim 2. To determine whether participants from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) who report perceived discrimination display a higher likelihood of current alcohol consumption and to determine whether this association varies across different Hispanic/Latino heritage groups.

Hypothesis: Perceived discrimination will be associated with current alcohol use among HCHS/SOL participants across Hispanic/Latino heritage groups.

Aim 3. To examine if reports of current "at risk alcohol use" are more probable among individuals who report perceived discrimination by Hispanic/Latino heritage group.

Hypothesis 2: Perceived discrimination will be associated with "at risk" alcohol use among HCHS/SOL participants across all Hispanic/Latino heritage groups.

Methods

Participants and settings

The landmark Hispanic Community Health Study/Study of Latinos (HCHS/SOL) is a multicenter-epidemiological study that attempts to examine how the process of acculturation is associated with risk and protective factors that influence the prevalence of disease among Latinos. Between March 2008 and June 2011, 16, 415 individuals who self-identified as Hispanic/Latino and

were between the ages of 18-74, were recruited from randomly selected households in the communities of the Bronx, New York; Chicago, Illinois; San Diego, California and Miami, Florida. The population based study, includes Latinos of Dominican, Mexican, Central American, Puerto Rican, Cuban and South American backgrounds [19]. Sampling of all participants was done in each community and then defined by a group of neighboring census tracks that ensured ethnic background diversity. Details of the specific sampling methods have been published elsewhere [20, 21]. The HCHS/SOL project was sponsored by the National Heart, Lung, and Blood Institute (NHLBI) and the offices of the National Institutes of Health (NIH).

Instruments

The instruments used in this study were part of the baseline examination questionnaire for project HCHS/SOL. The questionnaire was developed primarily to determine the role of acculturation in the prevalence and development of disease [19]. Selected variables included were:

Demographic Information. Variables used were age as a continuous variable ranging from 18-74, gender, US-born *(yes, no)*, socioeconomic status included income and education variables categorized into three distinct groups: 0= “<$20,000”, 1=”$20,001-50,000” and 2=”>$50,000”. Education was categorized as 1=<high school, 2=high school grad, 3=above high school.

Cultural Variables of interest: Hispanic/Latino heritage included in the analysis were self-reported as 0=Dominican 1=Central American. 2=Cuban, 3=Mexican, 4= Puerto Rican, 6=South American, and 7=More than one heritage; For Ethnic Identity the following questions were used “I have a strong sense of belonging to my own ethnic group” and “I have a lot of pride in my ethnic group” in a 4-point likert-type scale method ranging from 1 (*strongly disagree*) to 4 (*strongly agre*e); The average of the 2 questions indicate the degree of ethnic identity. Acculturation was measured using a language subscale of the 12 item Short Acculturation Scale for Hispanics (SASH) originally included in the questionnaire in the Development of a Short Acculturation Scale by Marin et al. [22].The 5-itemSASH contains language based questions that are assigned a 5-point likert-style scale that ranges from 1 (*only Spanish*) to 5 (*only English*). An average of the 5 questions indicates the degree of language acculturation.

Well-being variables of interest: The 10-item Center for Epidemiologic Studies Depression Scale (CES-D 10) was used to measure depressive symptomology [23]. Participants were asked to rate each item on a 4-point likert-style on the basis of “how often have you felt this way during the past week” ranging from 1 (*rarely or none of the time [0-1 day]*) to 4 (*most or all of the time [5–7 days]*), Higher scores indicated a higher likelihood of depression [24]. The 10 item Spielberger Trait Anxiety Scale (STAI 10) was used to measure the intensity of anxiety with a 1-4 likert-style response format ranging from 0

(sometimes) to 3 (*always*) with higher scores indicate a higher risk for anxiety [25].

Perceived Discrimination: The question "How often do people treat you unfairly because you are Hispanic/Latino?" was used with a 1-4 likert-style response format ranging from 1 (*never*) to 4 (*always*). A dichotomous category (0 = no level of discrimination reported and 1= yes any level of perceived discrimination) was created and included in our statistical analysis. The question how often have you seen friends treated unfairly because they are Hispanic/Latino was used in the same format and variable category, responses for this question were used only for descriptive purposes.

Alcohol Use variables were derived from two source variables in the HCHC/SOL questionnaire: 1) Do you presently drink alcoholic beverages? And 2) Did you ever drink alcohol? These were categorized into three distinct groups of alcohol drinkers: 1=Never drinker, 2=Former drinker, 3= Current drinker *Alcohol Use Disorder* was measured by the total drinks per week specific for females and males established by the National Institute for Alcohol Abuse and Alcoholism guidelines (NIAAA) more than 7 drinks total per week for females and more than14 drinks total per week for males. Total drinks were measure by the questions 1) How many glasses of red wine do you usually have per week? 2) How many glasses of white wine do you usually have per week? 3) How many cans, bottles, or glasses of beer do you usually have per week? And 4) How many drinks of liquor, spirits, or mixed drinks do you usually have per week? Serving sizes for alcohol use were measured in "standard drink" units as follows:

Beer = 12oz. glass or 355ml bottle; Wine = 3.5oz glass, 1 bottle =750ml= 8 glasses; Hard spirits = 1.5oz. or 1 shot. Response formats were as follows 1= non-drinker 2=low risk drinker 3= at-risk drinker.

Procedure

Institutional review board approvals were obtained by each of the four participating institutions (University of Miami, San Diego State University, Northwestern University in Chicago and Albert Einstein College of Medicine in the Bronx area of New York). Participants at all four sites were asked to abstain from smoking and to fast for at least 12 hours prior to their scheduled meeting and to avoid physical activity that morning [19]. Upon arrival, participants were presented with detailed information about the study including their options for terminating their participation at will. After voluntary and informed consent was obtained by staff, specific clinical procedures and assessments were done (e.g. body mass index, blood pressure measurement, plasma glucose, total serum cholesterol) prior to the administration of the HCHC/SOL questionnaire.

Statistical Methods and Design

All data was analyzed using SAS 9.2 statistical programming software. In order to facilitate the generalizability of analysis, data was weighted using procedures recommended by the HCHS/SOL coordinating center and adjusted for population weights for the 2010 census population. Data was coded based on the derived variables from HCHS/SOL codebook. Descriptive statistics were produced and all variables were checked for diversions from normality. Chi-square analysis was used to explore univariate associations with a minimum

significance of alpha level 0.05. Additionally, through univariate logistic regression, we explored for associations between perceived discrimination and all covariate predictors of alcohol use prior to employing the adjusted regression. Multivariate multinomial logistic regression explored the associations between alcohol use and alcohol disorder while controlling for acculturation, Hispanic/Latino background, and demographic covariates. To control for demographic variables, all proposed socio-demographic variables were included in the multi-variable models (Tables 2 and 3).

Results

As presented in Table 1, 53% of participants were female and the mean age was approximately 41 years (range of 18-76 years of age). (See table 1) A higher percentage of Mexican women participated (38.1%) than in any other background group, with South American women being the lowest (5.2%). A higher percentage of those of Mexican heritage reported income in both the medium and high brackets with 45.1% and 15.6%, respectively. Those of South American heritage had the second highest percentage in the middle income group (43.9%) and those with Dominican heritage had a higher percentage in in the lowest income bracket (54.3%). The prevalence of perceived discrimination by each background group are also presented in Table 1: approximately half of all participants in the study population reported being discriminated against while 66% reported seeing friends treated unfairly because they were Hispanic/Latino.

A higher percentage (55.6%) of Mexicans reported any level (i.e. often, sometimes, always) of perceived discrimination, followed by Puerto Ricans (54.0%), Dominicans (53.7 %), Central Americans (50.0 %), and South Americans (48.5%), with Cubans reporting the lowest percentage of 30.3 %. Dominicans reported the highest percentage of alcohol use (53.3%), while Central Americans reported the lowest (43.7%). It was calculated that those of Puerto Rican heritage report more alcohol use disorder (10.4%), while South Americans reported the lowest (4.2%).

Unadjusted models for alcohol use (Table 2) show that discrimination was associated with current alcohol use among Central Americans but was not associated with former alcohol use. The same trend was found for Puerto Ricans relating current alcohol use with perceived discrimination. For Cuban participants, on the other hand, reports of discrimination are positively associated with both former and current alcohol use. In model 1, after adjusting for age and gender, Central American participants who reported discrimination had 33% greater odds of reporting current alcohol use than their counterpart (95% CI: 1.01-1.75). For Cubans who reported discrimination, greater odds of former and current alcohol use remained significant with OR 1.85 (95% CI: 1.34-2.56) and 1.44 (95% CI:1.16-1.79), respectively. In our final model (Model 2), after adjusting for possible confounding variables: income, education, US born status, anxiety, acculturation score, depression and ethnic identity, greater odds of alcohol use remained significant among Cubans OR 1.34 (95% CI:1.05-1.70).

The association between alcohol use disorder and discrimination was significant only in models adjusted for age and gender among Cubans but was not significant in models controlling for psychosocial variables (Table 3).

Discussion

The current study explored the association between perceived discrimination and alcohol use and abuse among a sample of Hispanic/Latinos with ages ranging from 18—74 years of age in four major US cities. Results indicate that half of our sample population perceived at least some level of discrimination (i.e. sometimes, often, always) based on their Hispanic/Latino heritage. Those of Mexican heritage reported a higher percentage of discrimination while those of Cuban heritage reported the lowest percentage than any other group, a view that is consistent with the most current literature [2]. Our hypothesis was partially supported as we found that after adjusting for possible confounding variables, reports of discrimination were significantly associated with alcohol use in those of Cuban. Central American and Puerto Rican heritage reported similar trends, although these did not reach statistical significance after controlling for possible confounding variables.

This study is consistent with previous research as we found a high prevalence of discrimination within the Hispanic/Latino population in the US [16, 2], and the nature of perceived discrimination as a significant factor [27]. Other studies have identified the use of alcohol as a possible coping mechanism [28] to

lessen the negative effects associated with perceived discrimination in the Hispanic/Latino population [9, 29, 27]. However, unlike previous studies exploring this association we were able to look at this relationship in a multi-heritage sample that included participants of Dominican, Central American, Cuban, Mexican, Puerto Rican and South American backgrounds.

To our knowledge, there are no studies that have investigated the association between alcohol use and discrimination among Puerto Ricans, Central Americans and/or Cubans. There is at least one study however, that found a significant association between the negative effects of discrimination and detrimental health in mainland Puerto Ricans after controlling for covariates [30]. Another current study found that Puerto Ricans tended to report a more negative health profile and more health disparities than other Hispanic/Latinos groups [31]. This pattern suggests that Puerto Ricans might be at higher risk for the negative effects associated with their environments, which could eventually lead to the use of maladaptive coping mechanisms [32] such as alcohol. In our study and established in the literature, Cubans tend to report the lowest prevalence of discrimination possibly due to the protection facilitated by their ethnic enclaves such as those found in Miami [2]. Cubans in Miami represent a Hispanic/Latino majority, while some hold prominent seats of political and economic power. These elements have been shown to act as a buffering mechanism and might lessen the perception of discrimination [33]. Interestingly, Cubans who felt discriminated against reported a higher likelihood of alcohol use, a finding that is

in line with an up-to-date meta-analysis study that reports Cubans as having the lowest prevalence of perceived discrimination, but a significant association between discrimination and psychological distress, while Dominicans and Puerto Ricans did not [33].

Our analysis was limited by several factors that should be considered in the interpretation of our results. First, the cross-sectional nature of this study prevents us from drawing a causal conclusion about these associations. Second, perceived discrimination was measured by the use of a one-item question that could have led to an underreporting of discriminative events due to poor English language skills and undocumented status [1] and other domains related to discrimination. Third, our discrimination and alcohol use questions were not time-specific making it more difficult to establish causality. Fourth, our alcohol use disorder question was conditional on current versus never alcohol use status. In other words, some former drinkers who might have recently quit drinking were not assessed for possible high risk drinking patterns in the past.

Notwithstanding these identified limitations and based on the available literature, we found that Cubans might be using alcohol as a coping mechanism for the deleterious effects of perceived discrimination. This is an essential contribution to the available literature on discrimination, racism and substance abuse among the different groups found within the Hispanic/Latino population. As noted earlier there is a dearth of information on the propensity of alcohol use among these groups in the context of perceived discrimination. Given the

prevalence of perceived discrimination presented in this study and the plausible increased susceptibility of Cubans, Puerto Ricans and Central Americans to the stressors of discrimination, service providers should distinguish the need to create interventions tailored specifically by background group. They can also understand the importance of correctly evaluating alcohol interventions and programs specific to different to groups such as Cubans and Puerto Ricans. Prospective studies should study the important questions that this study raises regarding the possible cultural factors that may have alleviated the stressors of discrimination in groups that reported high levels of discrimination but that did not report an association between alcohol use and discrimination.

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Table 2.1: Demographic characteristics of study participants by Hispanic/Latino Group (Age standardized)[a] *

Characteristic	(n=1473) %	(n=1732) %	(n=2348) %	(n=6472) %	(n= 1072) %	(n=1072) %	(n=503) %
Women	11.5	7.5	18.3	38.1	15.3	5.2	4.0
Age, Mean	39.2	39.7	46.5	38.5	42.9	42.4	34.4
Perceived discrimination (yes)	53.7	50.0	30.3	55.6	54.0	48.5	53.9
Education							
High school or GED	36.7	38.4	22.6	36.3	36.6	21.9	20.4
High school grad	23.6	26.4	29.8	30.1	28.0	27.5	23.0
Above high school	39.6	35.1	47.5	33.4	35.2	50.4	56.5
Income							
<$20,000	54.3	53.5	54.6	39.1	49.6.4	44.2	32.2
$20,000-$49,999	37.5	38.5	36.3	45.1	36.0	43.9	46.8
≥$50,000	8.1	7.8	9.0	15.6	14.2	11.2	20.8
Alcohol Use							
Never	10	28.7	34.1	12.8	12.7	19.6	13.4
Former	34.5	27.8	18.8	32.6	37.2	29.3	24.2
Current	55.3	43.7	47.0	54.4	50.0	51.0	62.2

[a] Values are weighted for study design and nonresponse and age standards to census 2010 census population

Table 2.2: Odds ratios (95% confidence intervals) of alcohol use for those reporting perceived discrimination across Hispanic/Latino heritage groups

Dependent variable	Crude	Model 1 †	Model 2
Smoking status	Crude	Model 1	Model 2
Dominican			
Never	1.00	1.00	1.00
Former	1.2 (0.75-1.97)	1.16 (0.71-1.89)	1.24 (0.74-2.08)
Current	1.2 (0.74-1.68)	1.10 (0.69-1.73)	1.03 (0.63-1.68)
Central American			
Never	1.00	1.00	1.00
Former	1.33 (0.98-1.82)	1.36 (0.98-1.87)	1.36(0.96-1.94)
Current	**1.36 (1.05-1.75)***	**1.33 (1.01-1.75)***	1.18(0.83-1.67)
Cuban			
Never	1.00	1.00	1.00
Former	**1.87 (1.35-2.58)****	**1.85(1.34-2.56)*****	**1.71(1.22-2.39)****
Current	**1.55 (1.25-1.91)****	**1.44(1.16-1.79)*****	**1.34(1.05-1.70)***
Mexican			
Never	1.00	1.00	1.00
Former	1.24 (0.93-1.65)	1.21 (0.91-1.60)	1.2 (0.90-1.65)
Current	1.24 (0.97-1.59)	1.17 (0.90-1.52)	1.16 (0.87-1.53)
Puerto Rican			
Never	1.00	1.00	1.00
Former	1.35 (0.90-2.02)	1.28(0.86-1.91)	1.33 (0.85-2.08)
Current	**1.64 (1.10-2.43)***	1.49(0.99-2.24)	1.53 (0.98-2.40)
South American			
Never	1.00	1.00	1.00
Former	1.03 (0.66-1.58)	0.97 (0.63-1.50)	0.93 (0.56-1.55)
Current	1.31 (0.89-1.93)	1.19 (0.81-1.76)	1.11 (0.69-1.77)

*P< 0.05; **P < 0.01; ***P<0.001

† Odds ratio adjusted for gender and age for (model 1); and additionally adjusted for income, education, US born, anxiety, acculturation score depression and ethnic identity (model 2)

Table 2.3: Odds ratios (95% confidence intervals) for alcohol use disorder for those reporting perceived discrimination across Hispanic/Latino heritage groups

Dependent variable	Crude	Model 1 †	Model 2
Smoking status	Crude	Model 1	Model 2
Dominican			
Never	1.00	1.00	1.00
Former	1.09 (0.72-1.66)	1.07 (0.66-1.73)	1.07 (064-1.78)
Current	1.33 (0.73-2.39)	1.35 (0.77-2.51)	1.00 (0.46-2.19)
Central American			
Never	1.00	1.00	1.00
Former	**1.45 (1.11-1.90)****	1.33 (0.99-1.80)*	1.13 (0.77-1.67)
Current	0.82(0.44-1.51)	0.73 (0.39-1.36)	0.59 (0.29-1.22)
Cuban			
Never	1.00	1.00	1.00
Former	**1.52 (1.23-1.88)*****	**1.40 (1.12-1.76)****	**1.30 (1.01-1.68)***
Current	**1.78 (1.08-2.96)***	1.57 (0.94-2.62)	1.19 (0.71-1.98)
Mexican			
Never	1.00	1.00	1.00
Former	1.24 (0.96-1.60)	1.20 (0.92-1.58)	1.22 (0.91-1.64)
Current	1.20 (0.81-1.76)	1.16 (0.77-1.75)	1.15 (0.75-1.78)
Puerto Rican			
Never	1.00	1.00	1.00
Former	**1.64 (1.10-2.43)***	1.41 (0.94-2.13)	1.35 (0.88-2.08)
Current	1.64 (0.92-2.94)	1.34 (0.73-2.44)	1.33 (0.72-2.44)
South American			
Never	1.00	1.00	1.00
Former	1.35 (0.90-2.01)	1.26 (0.84-1.88)	1.18 (0.71-1.97)
Current	0.88 (0.37-2.08)	0.81 (0.33-1.96)	0.71 (0.27-1.85)

*P< 0.05; **P < 0.01; ***P<0.001

† Odds ratio adjusted for gender and age for (model 1); and additionally adjusted for income, education, US born, anxiety, acculturation score depression and ethnic identity (model 2)

References

1. Ornelas IJ, Perreira KM: The role of migration in the development of depressive symptoms among Latino immigrant parents in the USA. Soc Sci Med 2011

2. Pérez DJ, Fortuna L, Alegria M: Prevalence and correlates of everyday discrimination among US Latinos. J Community Psychol 2008; 36:421-433

3. Harris R, Tobias M, Jeffreys M, Waldegrave K, Karlsen S, Nazroo J: Racism and health: the relationship between experience of racial discrimination and health in New Zealand. Soc Sci Med 2006; 63:1428-1441

4. Williams D, Mohammed S: Discrimination and racial disparities in health: evidence and needed research. J Behav Med 2009; 32:20-47; 4

5. Clark R, Anderson NB, Clark VR, Williams DR: Racism as a stressor for African Americans: A biopsychosocial model. Am Psychol 1999; 54:805

6. Williams DR, Haile R, Mohammed SA, Herman A, Sonnega J, Jackson JS, Stein DJ: Perceived discrimination and psychological well-being in the USA and South Africa. Ethn Health 2012; 17:111-133

7. Williams DR, Neighbors HW, Jackson JS: Racial/ethnic discrimination and health: findings from community studies. Am J Public Health 2008; 98:S29

8. Jackson JS, Knight KM, Rafferty JA: Race and unhealthy behaviors: chronic stress, the HPA axis, and physical and mental health disparities over the life course. Journal Information 2010; 100

9. Borrell LN, Diez Roux AV, Jacobs Jr. DR, Shea S, Jackson SA, Shrager S, Blumenthal RS: Perceived racial/ethnic discrimination, smoking and alcohol consumption in the Multi-Ethnic Study of Atherosclerosis (MESA). Prev Med 2010; 51:307-312

10 Caetano R, Mills BA, Vaeth PA: Raul Caetano, Britain A. Mills, Patrice AC Vaeth. Addict Behav 2013

11. Okamoto J, Ritt-Olson A, Soto D, Baezconde-Garbanati L, Unger JB: Perceived discrimination and substance use among Latino adolescents. Am J Health Behav 2009; 33:718-727

12. Lorenzo-Blanco EI, Unger JB, Ritt-Olson A, Soto D, Baezconde-Garbanati L: Acculturation, Gender, Depression, and Cigarette Smoking Among US Hispanic

Youth: The Mediating Role of Perceived Discrimination. Journal of youth and adolescence 2011; 40:1519-1533

13. Torres L, Driscoll MW, Voell M: Discrimination, acculturation, acculturative stress, and Latino psychological distress: A moderated mediational model. Cultural Diversity and Ethnic Minority Psychology; Cultural Diversity and Ethnic Minority Psychology 2012; 18:17

14. Chae DH, Takeuchi DT, Barbeau EM, Bennett GG, Lindsey J, Krieger N: Unfair treatment, racial/ethnic discrimination, ethnic identification, and smoking among Asian Americans in the National Latino and Asian American Study. Am J Public Health 2008; 98:485

15. French SE, Chavez NR: The relationship of ethnicity-related stressors and Latino ethnic identity to well-being. Hispanic Journal of Behavioral Sciences 2010; 32:410-428

16. Araujo BY, Borrell LN: Understanding the Link Between Discrimination, Mental Health Outcomes, and Life Chances Among Latinos. Hispanic Journal of Behavioral Sciences 2006:245-266

17. Kam JA, Cleveland MJ, Hecht ML: Applying General Strain Theory to Examine Perceived Discrimination's Indirect Relation to Mexican-Heritage Youth's Alcohol, Cigarette, and Marijuana Use. Prevention Science 2010; 11:397-410

18. Rosa DL, Sanchez M, Dillon F, Ruffin B, Blackson T, Schwartz S: Alcohol Use Among Latinos: A Comparison of Pre-Immigration, Post-Immigration, and US Born Latinos. Journal of Immigrant and Minority Health :1-8

19. Daviglus ML, Talavera GA, Avilés-Santa ML, Allison M, Cai J, Criqui MH, Gellman M, Giachello AL, Gouskova N, Kaplan RC: Prevalence of Major Cardiovascular Risk Factors and Cardiovascular Diseases Among Hispanic/Latino Individuals of Diverse Backgrounds in the United StatesCardiovascular Diseases and US Hispanics/Latinos. JAMA: The Journal of the American Medical Association 2012; 308:1775-1784

20. Derby CA, Wildman RP, McGinn AP, Green RR, Polotsky AJ, Ram KT, Barnhart J, Weiss G, Santoro N: Cardiovascular risk factor variation within a Hispanic cohort: SWAN, the Study of Women's Health Across the Nation. Ethn Dis 2010; 20:396

21. LaVange LM, Kalsbeek WD, Sorlie PD, Avilés-Santa LM, Kaplan RC, Barnhart J, Liu K, Giachello A, Lee DJ, Ryan J: Sample design and cohort selection in the Hispanic Community Health Study/Study of Latinos. Ann Epidemiol 2010; 20:642-649

22. Marin G, Sabogal F, Marin BV, Otero-Sabogal R, Perez-Stable EJ: Development of a short acculturation scale for Hispanics. Hispanic Journal of Behavioral Sciences 1987; 9:183-205

23. Radloff LS: the Ces-D scale. Applied psychological measurement 1977; 1:385-401

24. Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J: Two shorter forms of the CES-D depression symptoms index. J Aging Health 1993; 5:179-193

25. Spielberger CD: State-Trait Anxiety Inventory. Corsini Encyclopedia of Psychology 1996

26. Gee GC, Spencer MS, Chen J, Takeuchi D: A Nationwide Study of Discrimination and Chronic Health Conditions Among Asian Americans. Am J Public Health 2007; 97:1275-1282

27. Trail TE, Goff PA, Bradbury TN, Karney BR: The Costs of Racism for Marriage How Racial Discrimination Hurts, and Ethnic Identity Protects, Newlywed Marriages Among Latinos. Person Soc Psychol Bull 2012; 38:454-465

28. Cooper ML, Russell M, Skinner JB, Frone MR, Mudar P: Stress and alcohol use: moderating effects of gender, coping, and alcohol expectancies. J Abnorm Psychol 1992; 101:139

29. Otiniano AD: Discrimination, Drugs, and Alcohol Among Latina/os in the United States 2012

30. Lee MA, Ferraro KF: Perceived discrimination and health among Puerto Rican and Mexican Americans: Buffering effect of the Lazo matrimonial? Soc Sci Med 2009; 68:1966-1974

31. Zsembik BA, Fennell D: Ethnic variation in health and the determinants of health among Latinos. Soc Sci Med 2005; 61:53-63

32. Folkman S, Lazarus RS: Coping as a mediator of emotion. J Pers Soc Psychol 1988; 54:466

33. Lee DL, Ahn S: Discrimination Against Latina/os A Meta-Analysis of Individual-Level Resources and Outcomes. The Counseling Psychologist 2012; 40:28-65

CHAPTER 3:

The Association between Perceived Discrimination and Tobacco Use: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL)

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Abstract

Perceived discrimination is considered a stressor that is known to be prevalent among the Hispanic/Latino population in the United States and could be a risk factor for smoking. However, little is known about this association, specifically among the different heritage groups that make up the Hispanic/Latino population. We hypothesized that perceived discrimination would be associated with smoking across different heritage backgrounds. In order to test our hypothesis, we applied multinomial logistic to baseline data from the Hispanic Community Health Study/Study of Latinos (n=16,415) ages 18-74 from diverse backgrounds in four US communities (Chicago, San Diego, Miami, and The Bronx). Results indicate that after controlling for sex and gender, perceived discrimination was associated with an increased risk of being a current smoker for participants of Cuban and Puerto Rican heritage and with increased risk of being a former smoker for participants of Mexican heritage.

Background

The leading cause of death, disease and disability in the United States continues to be related to smoking [1,2]. Smoking also continues to be the single greatest preventable cause of disease and death in the country [1]. According to the National Health Interview, in the US, more than 21% of adults aged 18 years or older are current smokers [3]. Smoking in the Hispanic/Latino community in the US can be considered relatively low compared to other ethnicities [4]. However, Hispanic/Latinos face specific challenges such as perceived discrimination that have been found to be adversely related to unhealthy behaviors such as smoking [5]. Discrimination can be a result of racism and is common among individuals or members of groups considered by some as inferior [6]. Recent data from the National Latino and Asian American Study (NLAAS) suggests that at least 30% of Hispanic/Latinos report perceived discrimination on any given day [7, 8]. Perceived discrimination is a stressor [9] that has been primarily associated with internalizing behaviors [5] such as depression and psychological distress [10,11]. It has also been associated with acculturative stress (defined as the stressors encountered when a group or individuals come in contact with a receiving culture) [12]. In addition, perceived discrimination has been found to negatively influence quality of life and is associated with psychiatric morbidity [13]. Few studies however, have looked at perceived discrimination as a risk factor for externalizing behaviors such as smoking. Those that have been conducted include mostly African American and Asian populations [14, 15] with results indicating that being discriminated against

can lead to unhealthy coping mechanisms such as smoking. According to the stress and coping theory, a coping mechanism is defined as a process by which an individual attempts to manage and cope with stressful events [16]. Along these lines, some studies suggest that patterns of smoking among Asian Americans may be explained by differences in exposure to unfair treatment and discrimination as a means of managing and coping with stress [17-19]. One study of a nationally representative sample of Asian Americans found that tobacco use and abuse was a significant negative consequence of the harmful experiences of discrimination [19].

The relationship between discrimination and smoking is poorly understood among the Hispanic Latino/population. Particularly scarce are studies exploring this association among the different Hispanic/Latino heritage groups [5, 20]. Even though notable exception exist [21, 22], studies exploring discrimination as a risk factor for substance use has been done mostly in the Mexican American population. Therefore, the aim of our study is to determine the prevalence of self-reported perceived discrimination across different Hispanic/Latino heritage groups and to assess the association between perceived discrimination and cigarette use among 6 different Hispanic/Latino heritage groups (Dominican, Central American, Cuban, Mexican, Puerto Rican, and South American). We hypothesized that reports of self-perceived discrimination would be associated with current smoking across all the Hispanic/Latino heritage groups.

Methods

Participants and Setting

This study used baseline data from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). The study is a multicenter-epidemiological study designed to study the risk and protective factors for chronic disease in the Hispanic/Latino population [23]. Pre-approval was obtained from institutional review boards at San Diego State University, University of Miami, Northwestern University in Chicago and Albert Einstein College of Medicine. Data were collected in a sample of 16,415 participants of different Hispanic/Latino heritage (Dominican, Central American, Cuban, Mexican, Puerto Rican, South American) between March 2008 and June 2011 by project staff in four major US communities (Bronx, New York; Miami, Florida; Chicago, Illinois; San Diego, California). Participants were recruited in randomly selected households using a stratified 2-stage area probability sample design [24]. After households were selected based on eligibility, participants who agreed to participate were recruited, persons ages 45 to 74 were selected at higher proportions [23]. Specific details of sampling methods have been published elsewhere [24, 25]. The study was described in detail to all participants and informed consent was obtained.

Measures

Our cigarette use variable was derived from two source variables in the Project HCHS/SOL questionnaire: 1) *Have you ever smoked at least 100 cigarettes in your entire life?* And *2) Do you now smoke daily, some days or not at all?* These were then categorized into three distinct groups of smokers: 1=Never smoked, 2=Former Smoker, 3= Current Smoker. If the participant did not ever smoke at least 100 cigarettes in their lifetime they were categorized as "Never" smokers. If the participant smoked at least 100 cigarettes in their lifetime but they answered "not at all" for the questions "Do you now smoke daily, some day or not at all?" they were coded as "Former" smokers. If the participant smoked at least 100 cigarettes in their lifetime and smoked either daily or some days currently, they were coded as "current" smokers.

Independent variables

Perceived discrimination was measured by the question how often do people treat you unfairly because you are Hispanic/Latino? A 1-4 likert-style response format ranging from 1 (never) to 4 (always) was used and dichotomized into the categories 0 = no level of discrimination reported and 1= yes any level of perceived discrimination. The question how often have you seen friends treated unfairly because they are Hispanic/Latino was used in the same format and variable category, responses for this question were used only for descriptive purposes.

Hispanic/Latino ethnic heritage included in the analysis were self-reported as 1=Central 2=South American, 3=Cuban, 4=Dominican, 5= Mexican, 6=Puerto Rican, and 7=individuals from multiple H/L background. Ethnic Identity was measured using the following questions: “I have a strong sense of belonging to my own ethnic group” and “I have a lot of pride in my ethnic group”. Responses were presented in 4-point likert-type scale ranging from 1 (strongly disagree) to 4 (strongly agree). The average of the 2 questions indicated the degree of ethnic identity. Acculturation was measured using the language subscale of the 12 item Short Acculturation Scale for Hispanics (SASH) originally included in the questionnaire in the Development of a Short Acculturation Scale by Marin et al. [26]. The 5-itemSASH contains language based questions with a 5-point likert-style response that ranges from 1(only Spanish) to 5 (only English). An average of the 5 questions indicates the degree of language acculturation. The 10-item Center for Epidemiologic Studies Depression Scale (CES-D 10) was used to measure depressive symptomologies [27]. Participants were asked to rate each item on a 4-point likert-style that ranges on the basis of “how often have you felt this way during the past week” ranging from 1 (rarely or none of the time [0-1 day]) to 4 (most or all of the time [5–7 days]). CES-D scores were calculated by summing all scorers with a range from 0 to 30 [28]. The 10 item Spielberger Trait Anxiety Scale (STAI 10) was used to measure the intensity of feelings of anxiety with a 1-4 likert-style response format ranging from 0 (Sometimes) to 3 (always) with higher scores indicate a higher risk for anxiety [29].

Statistical Analysis

Data was analyzed using SAS 9.2 statistical programming software. In order to facilitate the generalizability of analysis, data was weighted using procedures recommended by the HCHS/SOL coordinating center to adjust for population weights. Data were coded based on the derived variables from the HCHS/SOL codebook. Descriptive statistics were produced and all data was checked for diversions from normality. Through Chi-square analysis we explored univariate associations with a minimum significance of alpha level of 0.05. Prevalence point estimates and confidence intervals were calculated for the entire sample as well as separately by ethnicity. Additionally, univariate logistic regression was used to explore for associations between perceived discrimination and all covariate predictors of smoking variables at the $P < .05$ level prior to employing the adjusted regression Multivariate multinomial logistic regression was used to explore for associations between tobacco use, and perceived discrimination while controlling for psychosocial and demographic covariates. All proposed variables were included in the multi-variable model in Table 3.

Results

In table 1, out of 16,415 participants the mean age was approximately 41 years of age (range 18- 74 years of age) with a majority of participants being female (53%). A higher percentage of female individuals of Mexican heritage participated (38.1%) than in any other heritage group. Overall, half of our sample

reported being discriminated against, while 66 % reported feeling that a friend had been discriminated against for being Hispanic/Latino. According to each Hispanic/Latino heritage group a higher percentage (72.2 %) of individuals of Mexican heritage reported any level (i.e. often, sometimes, always) of perceived discrimination for their friends, while those of Cuban heritage reported the lowest percentage of 42.2%. Participants of Mexican heritage reported the highest percentage of "self" perceived discrimination (55.6%) while only 30% of individuals of Cuban heritage reported any level of discrimination in this category. A higher percentage (15.6%) of individuals of Mexican heritage reported income in the ≥ $50,000 bracket. Those of Cuban and Dominican heritage reported the highest percentage (54%) of participants in the lowest bracket of ≤ 20,000. As expected [30], those of Cuban and Puerto Rican heritage had the highest levels of current smoking than any other Hispanic/Latino group, 26.7% and 33.8% respectively. In table 2, prevalence of discrimination by specific characteristics is presented. It shows that across all groups a higher percentage of reported discrimination was more likely among those ages 35-55, and decreased in the > 55 group. Discrimination also tended to decrease with higher education, except with those of Mexican and South American heritage. Interestingly, the non-US born groups that reported a higher prevalence of discrimination were Cubans and Central Americans. It is important to note that reports of discrimination were highest for current smokers and lowest in former and never smokers of Cuban heritage. This trend was also apparent among those of Puerto Rican heritage, although results were not significant.

In our logistic regression models (Table 3), unadjusted models for smoking show that perceived discrimination was associated with current smoking among for those of Cuban and Puerto Rican heritage and among former smokers of Mexican heritage. Statistical significance for this association carried over while controlling for age and gender: Those of Cuban heritage had 1.34 greater odds (95% CI: 1.07-1.68); while those of Puerto Rican heritage had 26% greater odds (CI: 0.98-1.64) of being current smokers among those who reported perceived discrimination. Those of Mexican heritage reported greater odds of having been smokers in the past if they reported discrimination OR: 1.31 (CI: 1.06-1.63). However, after controlling for psychosocial and socio-economic variables, including alcohol, statistical significance was lost.

Discussion

Studies have found that individuals who report perceived discrimination have a greater likelihood of being smokers [17-19]. Based on these findings we explored the association between perceived discrimination and smoking status across a sample of diverse Hispanic/Latinos in the US. We identified 4 significant findings. 1) An average of 50% of individuals across all heritage groups reported being discriminated against as opposed to 30% of those identified as having Cuban heritage. 2) 66% of participants reported perceived discrimination in someone they knew as opposed to self-perception (50%). 3) Those of Cuban heritage who are current smokers report a higher rate of discrimination than their counterparts. 4) In models adjusted for age and gender, those of Cuban, Puerto

Rican and Mexican heritage appear to have a greater likelihood of being smokers if they reported perceived discrimination.

Our results indicating that those of Cuban heritage reported less perceived discrimination as compared to other groups were expected and consistent with the most recent available literature [21,31]. Hispanic/Latinos of Cuban heritage tend to report the lowest levels of perceived discrimination possibly due to the possible levels of economic and political power that the respondents may have had [31]. The similarity between rates among all other heritage groups is consistent with a recent study among Latinos in California [22]. Nevertheless, a slightly higher prevalence among those of Mexican heritage is reported and is similar to the available literature [21]. Still, the explanations for this phenomenon are not quite understood. Some scholars suggest that because those of Mexican heritage have been submitted to a greater historical treatment of discrimination they are more likely than Cubans to feel discriminated against [32].

Overall, our sample reported a 50% prevalence of self-perceived discrimination. These results are greater than the most recent prevalence data from the National Latino and Asian American Study (NLAAS) conducted between 2002-2003 [21]. Even though our study is not fully comparable with the before mentioned study (i.e. measurement for perceived discrimination), the magnitude of socio-political events that have transpired posterior to the NLAAS study have had an increase in the perception of discrimination among Hispanic/Latinos [33]. For example, there is evidence to believe that 2006 was a turning point for

millions of Hispanic/Latinos as protests against proposed legislatures reached an international stage. More than one million Hispanic/Latinos in the US took to the streets in protest of James Sensenbrenner's (R-Wisconsin) H.R. 4437 bill as it was widely considered anti-immigrant and anti-Hispanic/Latino [34]. More recently, Arizona's SB 1070 in 2010 was also seen as a predominantly anti-Hispanic/Latino as it aimed at identifying, prosecuting and deporting undocumented immigrants in Arizona [35]. We argue that these events have heightened the perception of discrimination among Hispanic/Latinos in the US across all heritage groups. The finding that participants tended to report greater perceived discrimination among people they knew as opposed to themselves might be due to what Stephen Wright refers to as the "personal/group discrimination discrepancy" where people can acknowledge that their group faces discrimination but tend to report less personal discrimination [36], possibly in order to maintain self-esteem and sense of control over their lives [37]. In addition, our findings indicating that increased reports of perceived discrimination among those of Dominican, Central American and Puerto Rican heritage is correlated with higher education is consistent with the literature [21, 38]. Pérez and colleagues argue that levels of exposure to U.S. culture and human capital vary among different Hispanic/Latino groups and that this may influence levels of perceived discrimination [21].

Our multinomial logistic analysis indicated that the association between perceived discrimination and tobacco use among those of Cuban and Puerto

Rican heritage appears to be independent of gender and age [39]. In other words, among these two groups, after adjusting for age and gender, those that have reported discrimination appear to have a greater likelihood of being smokers. However, these results are no longer significant after adjusting for depression, acculturation, education, income, ethnic identity, anxiety, US born status and alcohol use. In other words, the association between perceived discrimination and tobacco use appears to be confounded by one of these factors and not an independent risk factor of perceived discrimination.

This study presents a large Hispanic/Latino mutli-heritage sample that serves as a major strength. Nevertheless this study was limited by factors that are important to consider. First, there are reliability issues concerning our one-question discrimination measure. Studies have concluded that the use of a single item discrimination measure may not completely capture the full range of discrimination experiences. For example a lack of English language skills or having an undocumented status [7] and other domains related to discrimination which could lead to underreporting. Second, the cross-sectional nature of this study impedes that we draw a causal conclusion about these associations. Third, our discrimination and tobacco use questions were not time-specific and while likely, it is difficult to establish causality. Fourth, even though or sample was diverse and considerably large, recruitment was conducted in 4 specific sites in the US and cannot be generalized to the rest of the US Hispanic/Latino population.

Notwithstanding our identified limitations, this study shows that smoking is correlated with perceived discrimination among current smokers of Cuban and Puerto Rican heritage and former smokers of Mexican heritage. However, this association is not clear after controlling for correlates that have been associated to both smoking and perceived discrimination. This suggests that additional work is needed in order to determine if there is an independent association of smoking and perceived discrimination in the before mentioned heritage groups. If confirmed, the heritage group-specific results in our study suggest that evidence based smoking interventions must be appropriately designed among specific Hispanic/Latino heritage groups.

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Table 3.1: Descriptive statistics of selected characteristics according to ethnic background: the HCHS/SOL study 2008-2011a*

Characteristic	Dominican (n=1473) % (95 CI)	Central American (n=1732) % (95 CI)	Cuban (n=2348) % (95 CI)	Mexican (n=6472) % (95 CI)	Puerto Rican (n= 2728) % (95 CI)	South American (n=1072) % (95 CI)
Age (Mean)	39.2 (37.9-40.5)	39.7 (38.8-40.5)	46.5 (45.5-47.6)	38.5(37.8-39.2)	42.9 (40.9-43.8)	42.4(40.9-43.8)
Gender (f)	11.5 (9.9-13.1)	7.5 (6.3-8.6)	18.3 (15.1-21.4)	38.1 (34.8-41.3)	15.3 (13.6-16.9)	5.2 (4.4-5.9)
Education						
High school	36.7 (33.3-40.2)	38.4 (35.2-41.6)	22.6 (20.4-24.7)	36.3 (33.7-38.1)	36.6 (33.5-39.8)	21.9 (18.2-25.7)
High school grad	23.6 (19.1-27.2)	26.4 (23.5-29.3)	29.8 (27.1-32.5)	30.1 (28.1-32.0)	28.0 (25.6-30.4)	27.5 (23.9-31.2)
> High school	39.6 (36.1-43.0)	35.1 (31.9-38.2)	47.5 (44.6-50.4)	33.4 (30.4-36.4)	35.2 (32.138.3)	50.4 (46.2-54.6)
Income						
<$20,000	54.3 (50.0-58.6)	53.5 (49.3-57.7)	54.6 (51.3-57.9)	39.1 (35.9-42.3)	49.6 (46.0-53.2)	44.2 (39.9-48.4)
$20,000-$49,999	37.5 (33.2-41.2)	38.5 (34.7-42.3)	36.3 (33.2-39.3)	45.1 (42.9-47.4)	36.0 (32.5-39.4)	43.9 (39.9-47.9)
≥$50,000	8.15 (5.9-10.8)	7.8 (5.6-10.0)	9.0 (6.8-11.18)	15.6 (12.7-18.6)	14.2 (11.9-16.6)	11.2 (8.9-14.7)
Smoking						
Never	77.7 (74.4-80.9)	70.5 (67.4-73.7)	54.1 (51.0-57.1)	63.9 (61.8-66.0)	49.3 (46.4-52.3)	64.9 (60.6-69.1)
Former	10.7 (8.6-12.9)	14.7 (12.4-16.9)	19.1 (17.3-21.0)	18.3 (16.7-19.9	16.7 (14.4-18.9)	21.7 (18.6-24.8)
Current	11.4 (8.6-14.3)	12.4 (14.7-17.0)	26.7 (24.1-29.5)	17.6 (15.9-19.4)	33.8 (31.1-36.5)	13.3 (10.3-16.2)
Alcohol Use						
Never	10.0 (8.2-11.8)	28.7 (25.5-31.8)	34.1 (31.5-36.6)	12.8 (11.3-14.2)	12.7 (10.4-14.9)	19.6 (15.9-23.3)
Former	34.5 (30.8-38.3)	27.8 (25.0-30.7)	18.8 (16.9-20.8)	32.6 (30.5-34.7)	37.2 (34.4-40.1)	29.3 (25.7-33.0)
Current	55.3 (51.5-59.2)	43.7 (40.2-46.4)	47.0 (44.2-49.7)	54.4 (51.9-57.0)	50.0 (47.2-52.7)	51.0 (46.6-55.3)

[a] Values are weighted for study design and nonresponse and age standards to census 2010 census population

Table 3.2: Prevalence (%) of perceived discrimination for selected characteristics

Characteristic	Dominican (n=1466) %	Central American (n=1719) %	Cuban (n=2339) %	Mexican (n=6442) %	Puerto Rican (n= 2713) %	South American (n=1067) %
Age						
<35	**51.2***	53.0	**29.8*****	**55.4****	**54.93***	48.9
35-55	**58.9***	50.1	**36.8*****	**58.8****	**57.93***	50.6
55+	**48.5***	42.8	**22.3*****	**47.5****	**46.84***	43.5
Gender						
Male	54.2	51.2	**32.9****	57.3	**57.9****	51.5
Female	53.3	48.9	**27.5****	54.1	**50.0****	46.0
Education						
High school	**47.8***	**44.0***	25.9	58.1	**48.3***	51.4
High school grad	**58.5***	**50.2***	31.5	55.5	**54.4***	46.9
> High school	**55.9***	**56.2***	31.0	53.3	**58.6***	49.1
Income						
<$20,000	55.5	51.6	31.2	57.8	55.0	49.8
$20,000-$49,999	57.4	49.6	34.9	55.7	56.0	51.8
≥$50,000	51.4	63.1	33.6	52.7	50.6	39.2
US Born (yes)	53.5	**33.1***	**40.2***	53.1	55.8	55.9
Smoking						
Never	52.2	50.3	**28.8***	54.6	50.7	50.3
Former	57.9	53.4	**28.2***	60.6	55.5	42.9
Current	59.3	45.7	**35.3***	54.1	57.4	48.3
Alcohol Use						
Never	50.4	**44.7***	**23.7*****	50.8	**45.0***	44.8
Former	55.2	**52.0***	**36.2*****	56.3	**52.6***	45.5
Current	53.2	**52.4***	**32.6*****	56.3	**57.4***	51.6

Note *P< 0.05; **P < 0.01; ***P<0.001

Values are weighted for study design and nonresponse and age standards to census 2010

Table 3.3: Odds ratios (95% confidence intervals) of smoking for those reporting perceived discrimination of "Self" across Hispanic/Latino heritage groups

Dependent variable Smoking status	Crude	Model 1	Model 2
All			
Never	1.00	1.00	1.00
Former	1.05 (09.3-1.19)	**1.14 (1.01-1.30)***	1.05 (0.92-1.21)
Current	1.06 (0.93-1.20)	1.04 (0.91-1.18)	0.89 (0.77-1.02)
Dominican			
Never	1.00	1.00	1.00
Former	1.26 (0.92-1.72)	1.24 (0.88-1.74)	1.08 (0.74-1.59)
Current	1.33 (0.76-2.32)	1.32 (0.75-2.32)	1.18 (0.71-1.98)
Central American			
Never	1.00	1.00	1.00
Former	1.13 (0.81-1.57)	1.21 (0.84-1.74)	1.01 (0.69-1.47)
Current	0.83 (0.56-1.22)	0.80 (0.53-1.19)	**0.65 (0.43-1.00)***
Cuban			
Never	1.00	1.00	1.00
Former	0.97 (0.74-1.27)	1.06 (0.80-1.40)	1.08 (0.80-1.47)
Current	**1.34 (1.08-1.68)***	**1.34 (1.07-1.68)***	1.14 (0.89-1.47)
Mexican			
Never	1.00	1.00	1.00
Former	**1.28(1.04-1.57) ***	**1.31 (1.06-1.63)***	1.22 (0.97-1.53)
Current	0.98(0.77-1.23)	0.94 (0.74-1.20)	0.84 (0.65-1.08)
Puerto Rican			
Never	1.00	1.00	1.00
Former	1.21 (0.89-1.64)	1.26 (0.91-1.74)	1.19 (0.83-1.70)
Current	**1.30 (1.01-1.69) ***	**1.26 (0.98-1.64)***	1.18 (0.86-1.61)
South American			
Never	1.00	1.00	1.00
Former	0.74 (0.49-1.10)	0.70 (0.45-1.10)	0.74 (0.45-1.20)
Current	0.92 (0.58-1.45)	0.88 (0.55-1.41)	0.86 (0.52-1.43)

Note: *P<0.05

Values are weighted for study design and nonresponse and age standards to census 2010 census population

References

1. Ryan H, Trosclair A, Gfroerer J: Adult Current Smoking: Differences in Definitions and Prevalence Estimates. NHIS and NSDUH, 2008. Journal of Environmental and Public Health 2012; 2012

2. Jemal A, Thun M, Xue QY, Hartman AM, Cokkinides V, Center MM, Ross H, Ward EM: Changes in smoking prevalence among US adults by state and region: Estimates from the Tobacco Use Supplement to the Current Population Survey, 1992-2007. BMC Public Health 2011; 11:512

3. Pleis JR, Lucas JW, Ward BW: Summary health statistics for US adults: National health interview survey, 2008. National Center for Health Statistics. Vital Health Stat 2009; 10:1-167

4. Centers for Disease Control and Prevention: Cigarette smoking among adults and trends in smoking cessation in the United States. 2009; 2013

5. Okamoto J, Ritt-Olson A, Soto D, Baezconde-Garbanati L, Unger JB: Perceived discrimination and substance use among Latino adolescents. Am J Health Behav 2009; 33:718-727

6. Williams DR: Race, socioeconomic status, and health the added effects of racism and discrimination. Ann N Y Acad Sci 1999; 896:173-188

7. Ornelas IJ, Eng E, Perreira KM: Perceived barriers to opportunity and their relation to substance use among Latino immigrant men. J Behav Med 2011; 34:182-191

8. Paradies Y: A systematic review of empirical research on self-reported racism and health. Int J Epidemiol 2006; 35:888-901

9. Pascoe EA, Smart Richman L: Perceived discrimination and health: A meta-analytic review. Psychological Bulletin 2009; 135:531-554

10. Williams DR, Williams-Morris R: Racism and mental health: the African American experience. Ethnicity and Health 2000; 5:243-268

11. Moradi B, Risco C: Perceived discrimination experiences and mental health of Latina/o American persons. Journal of Counseling Psychology 2006; 53:411

12. Williams CL, Berry JW: Primary prevention of acculturative stress among refugees: Application of psychological theory and practice. Am Psychol 1991; 46:632
13. Mays VM, Cochran SD: Mental Health Correlates of Perceived Discrimination Among Lesbian, Gay, and Bisexual Adults in the United States. Am J Public Health 2001; 91:1869-1876

14. Resnicow K, Soler RE, Braithwaite RL, Selassie MB, Smith M: Development of a racial and ethnic identity scale for African American adolescents: The Survey of Black Life. J Black Psychol 1999; 25:171-188

15. Landrine H, Klonoff EA, Corral I, Fernandez S, Roesch S: Conceptualizing and measuring ethnic discrimination in health research. J Behav Med 2006; 29:79-94

16. Lazarus RS, Folkman S: Stress, appraisal, and coping. : Springer Publishing Company; 1984

17. Martin JK, Tuch SA, Roman PM: Problem drinking patterns among African Americans: the impacts of reports of discrimination, perceptions of prejudice, and" risky" coping strategies. J Health Soc Behav 2003:408-425

18. Chae DH, Takeuchi DT, Barbeau EM, Bennett GG, Lindsey J, Krieger N: Unfair treatment, racial/ethnic discrimination, ethnic identification, and smoking among Asian Americans in the National Latino and Asian American Study. Am J Public Health 2008; 98:485

19. Gee GC, Spencer MS, Chen J, Takeuchi D: A Nationwide Study of Discrimination and Chronic Health Conditions Among Asian Americans. Am J Public Health 2007; 97:1275-1282

20. Basáñez T, Unger JB, Soto D, Crano W, Baezconde-Garbanati L: Perceived discrimination as a risk factor for depressive symptoms and substance use among Hispanic adolescents in Los Angeles. 2012

21. Pérez DJ, Fortuna L, Alegria M: Prevalence and correlates of everyday discrimination among US Latinos. J Community Psychol 2008; 36:421-433

22. Otiniano AD, Gee GC: Self-reported discrimination and health-related quality of life among Whites, Blacks, Mexicans and Central Americans. Journal of Immigrant and Minority Health 2012; 14:189-197

23. Daviglus ML, Talavera GA, Avilés-Santa ML, Allison M, Cai J, Criqui MH, Gellman M, Giachello AL, Gouskova N, Kaplan RC: Prevalence of Major Cardiovascular Risk Factors and Cardiovascular Diseases Among

Hispanic/Latino Individuals of Diverse Backgrounds in the United States Cardiovascular Diseases and US Hispanics/Latinos. JAMA: The Journal of the American Medical Association 2012; 308:1775-1784
24. LaVange LM, Kalsbeek WD, Sorlie PD, Avilés-Santa LM, Kaplan RC, Barnhart J, Liu K, Giachello A, Lee DJ, Ryan J: Sample design and cohort selection in the Hispanic Community Health Study/Study of Latinos. Ann Epidemiol 2010; 20:642-649

25. Sorlie PD, Avilés-Santa LM, Wassertheil-Smoller S, Kaplan RC, Daviglus ML, Giachello AL, Schneiderman N, Raij L, Talavera G, Allison M: Design and implementation of the Hispanic Community Health Study/Study of Latinos. Ann Epidemiol 2010; 20:629-641

26. Marin G, Sabogal F, Marin BV, Otero-Sabogal R, Perez-Stable EJ: Development of a short acculturation scale for Hispanics. Hispanic Journal of Behavioral Sciences 1987; 9:183-205

27. Radloff LS: the Ces-D scale. Applied psychological measurement 1977; 1:385-401

28. Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J: Two shorter forms of the CES-D depression symptoms index. J Aging Health 1993; 5:179-193

29. Spielberger CD, Gorsuch RL, Lushene RE: The state-trait anxiety inventory. Palo Alto, Calif: Consulting Psychologists Press Inc 1970

30. Cokkinides VE, Bandi P, Siegel RL, Jemal A: Cancer-related risk factors and preventive measures in US Hispanics/Latinos. CA: A Cancer Journal for Clinicians 2012

31. Lee DL, Ahn S: Discrimination Against Latina/os A Meta-Analysis of Individual-Level Resources and Outcomes. The Counseling Psychologist 2012; 40:28-65

32. Stokes AK: Latino group consciousness and political participation. American Politics Research 2003; 31:361-378

33. Lazos SR: Latino Voters 2012 and Beyond: Will the Fastest Growing and Evolving Electoral Group Shape US Politics? Election Law Journal 2012; 11:118-128

34. Pulido L: A day without immigrants: The racial and class politics of immigrant exclusion. Antipode 2007; 39:1-7

35. Archibold CR: Arizoan Encats Stringent Law on Immigration. New York Times 2010

36. Wright SC: Dimensions of perceived discrimination: The personal/group discrimination discrepancy. 1993; 7:233

37. Schuster MA, Collins R, Cunningham WE, Morton SC, Zierler S, Wong M, Tu W, Kanouse DE: Perceived Discrimination in Clinical Care in a Nationally Representative Sample of HIV-Infected Adults Receiving Health Care. Journal of general internal medicine 2005; 20:807-813

38. Finch BK, Kolody B, Vega WA: Perceived discrimination and depression among Mexican-origin adults in California. J Health Soc Behav 2000:295-313

39. Rahilly CR, Farwell WR: Prevalence of smoking in the United States: a focus on age, sex, ethnicity, and geographic patterns. Current Cardiovascular Risk Reports 2007; 1:379

CHAPTER 4:

Perceived Discrimination and Religiosity as Potential Mediating Factor Between Migration and Depressive Symptoms: a Transnational Study of an Indigenous Maya Population

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Abstract

Evidence suggests that perceived discrimination among Mexican individuals is associated with depressive symptoms, and that religiosity could serve as a mediating factor in the context of migration experience. We hypothesized that migration experience is associated with higher depressive symptoms and that discrimination and religiosity mediate this relationship in a binational (U.S. and Mexican) sample of indigenous Mexican migrants. We applied path analysis modeling to test our hypotheses with a sample of 650 indigenous individuals (n=583 in Mexico; n=67 in US). Results indicated that migration experience and current U.S. residence were associated with perceived discrimination, which in turn were associated with a higher risk for depressive symptoms. Among women not living in the U.S, religiosity was associated with less discrimination. Discrimination is pervasive among male and female transnational and domestic migrants and religiosity may serve as a protective factor against discrimination for some women.

Keywords Migration, Mental health, Discrimination, Maya, Religiosity, Social support

Background

Depression is one of the leading causes of disability worldwide [1] and the leading cause of mental health illness [2]. Depression is characterized by loss of interest, feelings of sadness, low self-worth, poor appetite and trouble sleeping [1]. If left untreated, depression can not only impact mental health, but also physical health and may lead to engaging in high-risk behaviors such as substance use or unprotected sex [3]. Studies have also shown that, even after controlling for other risk factors, depression can lead to negative health outcomes such as cardiovascular diseases [4]. Prior research has demonstrated that individuals with domestic (i.e. within-country) [5] and/or transnational (i.e. between two nations) migration experience may be at a higher risk for developing depression [6].

Latino migrants to the U.S. comprise 16.3 % of the total US population, of which more than 12 million are Mexican born [6]. The Mexican migrant community in the US is comprised of individuals with different types of migration experiences, including domestic rural- to- rural migration and rural- to- urban migration, and transnational rural -to -rural or rural -to -urban [7]. There are approximately 57 different ethnic indigenous groups from Mexico in the US including Maya from the town of Tunkás in the state of Yucatán. *Tunkaseño* men and women are known to migrate both internally and domestically. Previous research indicates that married individuals are 17% less likely than non-married individuals to migrate to the US and as a whole, Tunkaseño women are 10% less likely to migrate to the U.S. than males [8].

Perceived discrimination, defined as “self-reported everyday experiences of unfair treatment” [9], has been identified as a chronic stressor in the migration process and has been shown to be associated with depression [10,11]. Although the impact of discrimination has been associated with negative health implications researchers have only begun to understand the risk factors associated with discriminatory experiences on the lives of migrants [12].

The most recent U.S. national data reported show that at least 30% of Latinos have experienced perceived discrimination on any given day compared to non-Hispanic whites [13,14]. Indigenous Mexican migrants are also far more likely to suffer from discriminatory practices than non-indigenous migrants in the U.S. [15] and during domestic rural-to -urban migration [16].

Earlier studies have brought to light the association between discrimination and religiosity. Religiosity is a complex construct that incorporates different dimensions of religious involvement such as affiliation [17] and devotion to a specific set of religious beliefs [18] that may provide an individual with meaning and purpose in life [19]. Religiosity, in and of itself and as part of a broader constellation of cultural values, has been implicated in increased resilience to depression [20] and discrimination, either by increasing one’s ability to cope with adversity and discrimination or decrease stressors associated with discrimination [21-22].

To date, most studies on discrimination, coping mechanisms and mental health have only focused on non-indigenous Latinos residing in the U.S. Therefore, the aim of the present study is to empirically test this association

among a transnational population of *Tunkaseños* recruited in the Yucatán municipality of Tunkás and the Southern California cities of Inglewood and Anaheim. We hypothesize that Tunkaseños with any migration history or who currently reside in the U.S. are more likely to report perceived discrimination, and that these individuals, in turn, are more likely to report depressive symptoms. Religious service attendance is hypothesized to serve as a protective mediator of perceived discrimination, and we hypothesize that individuals reporting religious service attendance are in turn, *less* likely to report depressive symptoms. This study fills a gap in knowledge about perceived discrimination and mental health among indigenous migrants and can be used to inform future research on mental health with indigenous and other migrants.

Methods

Participants and Setting

This cross-sectional study was reviewed and approved by the University of California at San Diego Institutional Review Board (IRB), the University of California, San Diego Human Research Protection Program and the State of Yucatán, México's *Sistema para el Desarrollo Integral de la Familia (DIF) del Estado de Yucatán* (System for the Integrated Development of the Family of the State of Yucatán). This study was conducted with a sample of 650 participants of Tunkaseño heritage, using computer-assisted personal interview (CAPI).

Data were collected between January 22 and February 4, 2012 in the migrant sending community of Tunkás in the state of Yucatán, Mexico and every weekend between February 17 and March 18, 2012 in the communities of

Inglewood and Anaheim, California. Eligibility criteria were (a) age 18-65 (b) ability to understand Spanish or English, (c) Tunkaseño heritage (participant born in Tunkás and/or parents and/or grandparents from Tunkás) and (d) willingness to complete the survey questionnaire. The study was described to potential participants, and a verbal informed consent was requested from all participants. Highly trained recruitment staff read (in English or Spanish) and gave participants a consent form with IRB information and reassured participants of confidentiality. A unique identifier was assigned to each participant.

A total of 650 quantitative survey interviews were conducted with indigenous Mayans (583 in Mexico and 67 in the United States). Importantly, the number of U.S. residents includes twenty three individuals who were recruited in Tunkás who were U.S. residents at the time of the survey and were only visiting family during the town fiestas in Tunkás. For purposes of this study, these individuals are considered U.S. residents and not return-migrants. Participants in Mexico and in the U.S. were recruited at their place of residence or in a public area, where the participant's privacy was protected based on the field researcher's discretion. In Mexico, field researchers used a town map of the Tunkás community to find potential participants. In California, participants were recruited using snowball sampling with contacts made in Tunkás and with U.S.-based Tunkaseños voluntarily assisting in identifying other Tunkaseños residing in the U.S. This binational approach has been used in prior research [23, 24].

Analytical Framework

In order to test our hypothesis, we created an analytical framework adapted from the model of stigma of migration and mental health [25]. The model by Li and colleagues (2006) hypothesizes that among migrants in a receiving community, perceived discrimination has the capacity to intensify feelings of loneliness and alienation and produce negative mental health outcomes [25]. The model was previously adapted from the sociocultural model of mental health in gay and bisexual Latino men by Diaz et al. [26]. Diaz and colleagues hypothesize that discrimination can have an adverse effect on mental health, and that resiliency factors such as community involvement (e.g. participation in religious services) can ameliorate the negative impact of perceived discrimination on mental health [26]. Given the greater likelihood that women would report depressive symptoms as compared to men [27], and our limited knowledge of female migration among the Maya population, we stratified our proposed models by gender in order to explore these differences.

Measures

Dependent Variable

The 20-item Center for Epidemiologic Studies Depression Scale (CES-D 20) was used to measure depressive symptomologies [28]. The Spanish version of the CES-D 20 has been administered in a study among a Mexican sample with reliable and valid results [29]. Participants were asked to rate each item on a scale from 0 to 3 on the basis of "how often have you felt this way during the past week": 0 = rarely or none of the time (less than 1 day), 1 = some or a little of the

time (1–2 days), 2 = occasionally or a moderate amount of time (3–4 days), and 3 = most or all of the time (5–7 days). Possible scores for the CES-D range from 0 to 60. Higher scores indicate more severe depressive symptoms, with a cutoff score of 16 or higher identified subjects as at risk of depression [30].

Independent Variables

Migration history and current residence in the United States: Migration history information was ascertained with two questions: 1) *"Have you ever been outside of Tunkás to live or work in another part of Mexico?"* and 2) *"Have you ever been to the U.S. to live or work?"* Respondents who answered, "yes," were categorized into "yes, ever migrated" or "no migration." Participants' current residence was asked in the survey, and those who reside in U.S. cities were classified as "U.S. resident."

Mediating factors included variables representing the perception of discrimination and coping resources. Perceived discrimination was measured by two binary questions that asked whether participants had ever suffered from discrimination "While in the United States" and "While in Mexico": yes =1, no= 2. If affirmative, participants were asked to rate the frequency of discrimination: "How often did you feel you discriminated against?" 1= sometimes, 2=many times, 3= always. Discrimination experience was measured by using a Likert-style question with answer options of ethnicity, race, gender, age, legal status, and other. For coping resources, we used regular religious service attendance as a measure for religiosity. Measures of religiosity by church attendance have been found to be reliable among Latino populations in the past [6], and provide a

quantifiable indicator of cultural values associated with resilience to depression [20]. We measured religiosity by asking the following question: In the past month, how often did you attend religious services. Subsequently, due to high skewedness of the data and the expectation that Catholics should attend mass every Sunday, or 4 times a month [31], our responses were later dichotomized into '1' referring to a regular religious service attender who participated in four or more religious services within the past month, and '0' referring to a non-regular religious service attender of fewer than four religious services within the past month.

Statistical Analysis

This analysis included a total of 650 individuals who responded to interviews in Mexico and the U.S. Statistical analyses were conducted using SAS (9.2; Cary, NC) and SAS PROC CALIS for path analyses. Descriptive statistics included means and frequencies. Path analysis models were developed to assess the relationship between migration history and correlated variables, U.S. residency and depression risk, mediated by perceived discrimination and religious coping resources [32]. Path analysis is an analytic tool to test theoretical models that specify direct and indirect effects of complex phenomena among observed variables. This approach allows for testing the indirect association between variables of interest and outcome via mediation. We first conducted path analysis with the entire sample and then repeated path analysis stratified by gender in order to observe gender-specific associations. Standardized regression coefficients and t-statistics were used to describe the final model. t-values> 1.96

were statistically significant. Model fit was tested using the chi-square statistic (X^2; $p>0.05$). Goodness of fit indices included the root mean square error of approximation (RMSEA <. 06), comparative fit index (CFI>0.95), and standardized root mean square residual (SRMR<0.03).

Results

Sample characteristics

In Table 1, of 575 participants, 48% of our study population was male and 52% female and the mean age was approximately 40 years (range of 18-65 years of age). Forty-two percent of our total sample reported having domestic migration experience, 47% of whom were male. A higher percentage (41%) of individuals with "any U.S. migration experience" reported perceived discrimination, while 20% of those with only "domestic migration experience" and 13% with "no migration experience" reported being discriminated against. Only 7% of our study sample screened positive for depression (i.e. cut off score ≥ 16). Among participants with history of U.S. migration, 6% (n=176) screened positive for depression, while 9% (n= 188) of those with exclusively domestic migration experience screened positive for depression. Seven percent (n=286) of those with no migration experience screened positive for depression. Sociodemographic information is detailed in Table 1.

Path analyses

Path analysis models depicting the relationship of migration experience, current residence in the U.S., and gender on depressive symptomatology, with perceived discrimination and religiosity as independent mediators are found in

Figure 1. Solid arrows indicate paths with standardized regression weights significant at P ≤0.05.

Figure 1 shows standardized path coefficients and respective t-values for the tested model with data from males and females. All paths shown have statistically significant associations. Fit indices indicated a good model fit (RMSEA<0.06, CFI>0.95, and SRMR<0.03). Being male was positively associated with perceived discrimination (B=0.14, p<0.05), which in turn, had a positive association with depressive symptoms (B=0.12, p<0.05). However, being male had a direct negative association with religiosity (B=-0.11, p<0.05) and a negative association with depressive symptoms (B= -0.15, p<0.05). Both migration history and U.S. residence were positively associated with perceived discrimination (B=0.13, p<0.05; B=0.19, p<0.05). Men living in the U.S. were also less likely to report regular church attendance, (B=-0.13, p<0.05), but no direct association was observed with depressive symptoms.

For female respondents, (Figure 2) migration history and religiosity were indirectly associated with the risk of depressive symptoms. In other words, migration history was positively associated with perceived discrimination (B=0.21, p<0.05), which in turn was positively associated with depressive symptoms (B=0.13, p<0.05), and U.S. residence was negatively associated with religiosity (B=-0.12, p<0.05), this, in turn, showed a negative association with perceived discrimination (B=-0.12, p<0.05) and a positive association with depressive symptoms (B=0.13, p<0.05). Thus perceived discrimination was mediated by religious service attendance among women who were not U.S. residents.

For male respondents (Figure 3), neither migration history nor religiosity was associated with depressive symptoms. Residence in the U.S. was negatively associated with religiosity (B= -0.15, $p<0.05$) and positively associated with discrimination (B=0.30, $p<0.05$). Perceived discrimination was positively associated with depressive symptoms with marginal significance (B=0.13, $p<0.10$).

Discussion

There are four significant findings in our study of migration and mental health among Latinos: (1) Migration history (domestic or international) is not directly associated with higher risk of depressive symptoms. However, (2) migration history and living in the U.S. are associated with higher levels of perceived discrimination for men and women combined, which in turn is associated with higher risk for depressive symptoms. (3) For women, the risks for depressive symptoms are higher than for male. (4) Religious service attendance for women was a protective factor against discrimination, which was positively associated with depressive symptomatology.

Overall, individuals with migration history report higher rates of perceived discrimination. In our main model (Figure 1), with data for both males and females combined, our hypothesis was partially supported as we found that the discrimination experienced by migrants was positively associated with the risk of depressive symptoms.

In our gender specific models (Figure 2, Figure 3), we found that migration experience was positively associated with discrimination. While religious service

attendance was only protective against depression among women who did not live in the U.S.

Higher levels of depressive symptomatology among women coincides with the literature that women are more likely to report depression than men [27]. Interestingly, women who have migration experience report higher rates of perceived discrimination than women without migration experience, while at the same time men with migration experience did not show a significant association with perceived discrimination. Our results indicate that among women, regular religious service attendance may serve as a protective factor against discrimination, however, women residing in the U.S. are less likely to attend religious services than those in Mexico. Higher levels of discrimination in our participants with migration history are in line with the mounting evidence concerning discrimination against Latinos, particularly those of indigenous origin [15]. Recent research indicates that discrimination against Latinos has been fueled by anti-immigrant sentiment following the terrorist attacks in the U.S. on September 11, 2001 [33].

Our analysis was limited by the difficulty in measuring discrimination. Although the investigators made an effort to develop a culturally relevant definition of discrimination for respondents during the initial phase of recruitment in Tunkás, we believe that some Tunkaseños may not have fully understood the concept of discrimination. Future surveys with indigenous migrant population should consider conducting formative research such as field testing and focus groups in order to develop accurate assessments of discrimination. Only 7% of

our study population screened positive for risk of depression, which is lower than CES–D normative data (21%, Radloff, 1977) [28], we suspect that depressive symptoms may have been underreported since prior studies have found that some Latinos are not comfortable discussing their emotional status and mental health struggles that may include depression [34].

Another possibility is that the CES-D may not be culturally appropriate in this population, although the measure has been used widely in Mexico. Gender bias may have also posed a problem in obtaining accurate depression and discrimination values since Latino men have been known to be more likely to report symptoms of fatigue and irritability, rather than common depressive symptoms like sadness and worthlessness [35]. Furthermore, our proposed framework while it tests our hypothesis, it does not include possible predisposing or confounding variables associated with a greater likelihood of depression. These factors include history of substance abuse, failed migration attempts, and other negative experiences associated with migration. The cross-sectional nature of this study limits our ability to determine causality, and future studies with indigenous migrants may benefit from a longitudinal design. Future studies will also benefit from more ethnically-relevant measures of discrimination and stigmatizing attitudes held by migrants themselves. Inclusion of qualitative interviews about how discrimination may be experienced would allow for a more in-depth assessment of perceived discrimination and how the migrant may internalize this experience.

The role of perceived discrimination in poor mental health outcomes is well established. This is the first transnational study to examine the association between migration experience and depressive symptoms with an exploration of potential mediators of this complex phenomenon.

Our attention to potential differences in gender is also novel in the field of transnational research. That religiosity might serve as a protective factor against discrimination for some women may inform future intervention research on the protective health effects of social support among migrant women. Our finding that perceived discrimination is much higher among domestic and international migrants indicates that discrimination is pervasive in the migration experience and as such remains an important public health topic worthy of future transnational intervention research.

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Chapter 4, in full, is a reprint of the material as it was submitted for publication to The Journal of Immigrant and Minority Health: Salgado H, Haviland I, Hernandez M, Lozano M, Osoria R, Keyes D, Kang E, Zuñiga ML. Perceived Discrimination and Religiosity as Potential Mediating Factors Between Migration and Depressive Symptoms: a Transnational Study of an Indigenous Maya Population. Hugo Salgado was the primary investigator and author of this paper.

Table 4.1: Participant socio-demographic, perceived discrimination and depressive symptoms data

Characteristic	All %	Any US migration (N=176) %	Exclusive domestic migration (N=188) %	No migration (N=286) %	p
Male	47.7	76.7	47	30.4	*
Duration of domestic migration					*
None	58.2	52.3	0	0	
1-60 months	8.5	12.5	17.6	0	
60+ months	33.4	35.2	82.4	0	
International migration experience					*
None	72.9	0	0	0	
1-60 months	13.5	50	0	0	
60+ months	13.5	50	0	0	
Birthplace					NS
Tunkás	80.9	85.8	78.2	79.7	
Other parts in Mexico	16.6	12.5	21.8	15.7	
US	2.5	1.7	0	4.5	
Religiosity (yes)	36.9	32	32	43.0	*
Marital status					NS
Single	22.3	14.6	33.5	19.6	
Married	62.3	67.6	54.3	64.3	
Else	15.4	17.6	12.2	16.1	
Perceived Disc	22.7	41	20	13	*
CES-D Score ≥ 16	7.4	5.6	9.4	7.3	*

NS= not significant; * $p<0.05$; Score ≥16 indicates presence of depressive symptoms

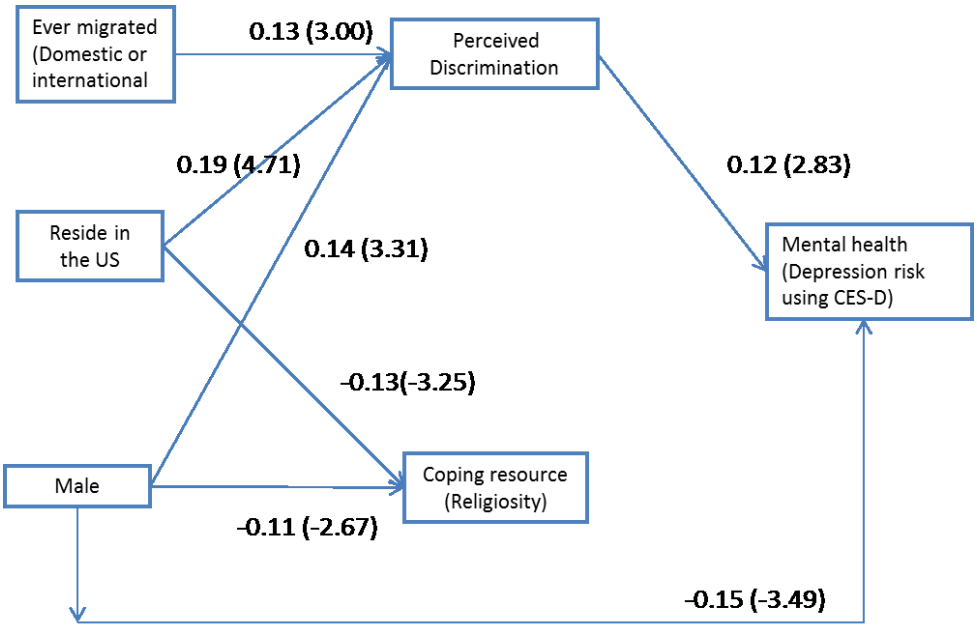

Figure 4.1: Combined male and female path model indicating path between "Ever Migrated" and "Depression risk", mediated by "Perceived Discrimination" and "Religiosity"*

* path coefficients are indicated with corresponding t-value, only statistically significant path values shown, indicating a positive or negative (protective) association between variables ($p<.05$).

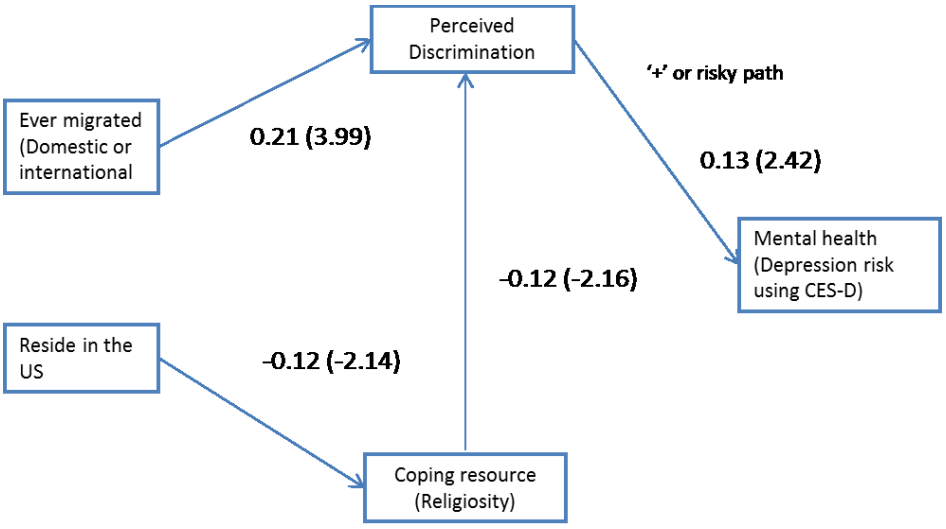

Figure 4.2: Female path model indicating path between "Perceived Discrimination" and "Depression risk", mediated by "Ever migrated" and "Religiosity"*

* path coefficients are indicated with corresponding t-value, only statistically significant path values shown, indicating a positive or negative (protective) association between variables ($p<.05$)

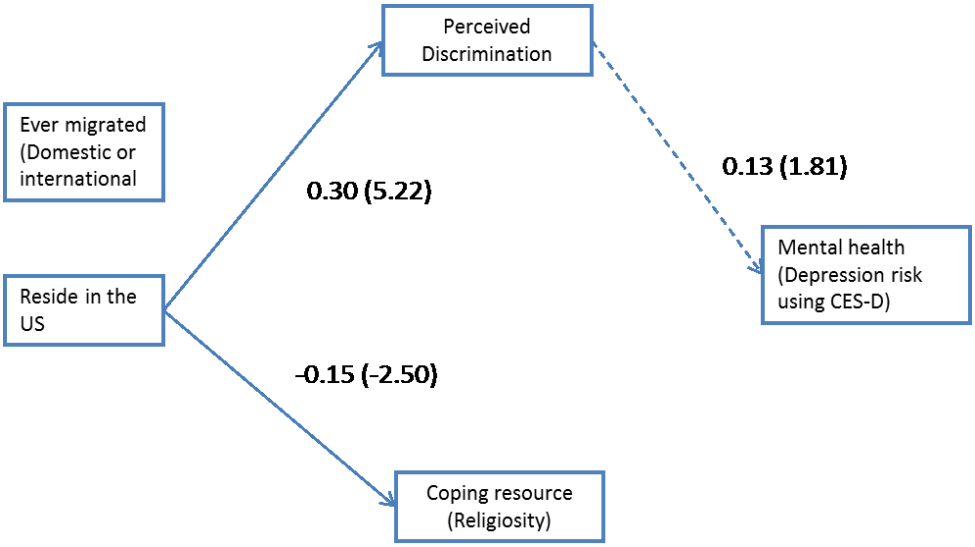

Figure 4.3: Male path model indicating path between "Ever migrated" and "Depression risk", mediated by "Perceived discrimination" and "Religiosity".

* path coefficients are indicated with corresponding t-value, only statistically significant path values shown, indicating a positive or negative (protective) association between variables ($p<.05$), dotted line indicates weak association

References

1. WHO: Mental health: strengthening our response. http://www.who.int/mediacentre/factsheets/fs220/en/; 2011

2. Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B: Depression, chronic diseases, and decrements in health: results from the World Health Surveys. The Lancet 2007; 370:851-858

3. Berg CJ, Michelson SE, Safren SA: Behavioral aspects of HIV care: Adherence, depression, substance use, and HIV-transmission behaviors. Infect Dis Clin North Am 2007; 21:181-200

4. Hemingway H, Marmot M: Psychosocial Factors in the Actiology and Prognosis of Coronary Heart Disease: Systematic Review of Prospective Cohort Studies. Britist Medical Journal 1999:1460-1467

5. Wang JL: Rural–urban differences in the prevalence of major depression and associated impairment. Soc Psychiatry Psychiatr Epidemiol 2004; 39:19-25

6. Hovey JD: Acculturative stress, depression, and suicidal ideation in Mexican immigrants. Cultural Diversity and Ethnic Minority Psychology 2000; 6:134

7. Davis B, Stecklov G, Winters P: Domestic and international migration from rural Mexico: Disaggregating the effects of network structure and composition. Population Studies 2002; 56:291-309

8. Cornelius WA, Salehyan I: Does border enforcement deter unauthorized immigration? The case of Mexican migration to the United States of America. Regulation & Governance 2007; 1:139-153

9. Pérez DJ, Fortuna L, Algeria M: Prevalence and correlates of everyday discrimination among US Latinos. J Community Psychol 2008; 36:421-433

10. Algeria M, Canino G, Shrout PE, Woo M, Duan N, Vila D, Torres M, Chen C, Meng X: Prevalence of Mental Illness in Immigrant and Non-Immigrant U.S. Latino Groups. Am J Psychiatry 2008; 165:359-369

11. Noh S, Morton Beiser, Kaspar V, Hou F, Rummens J: Perceived Racial Discrimination, Depression, and Coping: A Study of Southeast Asian Refugees in Canada. J Health Soc Behav 1999; 40:pp. 193-207

12. Chae DH, Takeuchi DT, Barbeau EM, Bennett GG, Lindsey J, Krieger N: Unfair treatment, racial/ethnic discrimination, ethnic identification, and smoking among Asian Americans in the National Latino and Asian American Study. Am J Public Health 2008; 98:485

13. Ornelas IJ, Eng E, Perreira KM: Perceived barriers to opportunity and their relation to substance use among Latino immigrant men. J Behav Med 2011; 34:182-191

14. Paradies Y: A systematic review of empirical research on self-reported racism and health. Int J Epidemiol 2006; 35:888-901

15. Montes J: Perceived Discrimination Among Indigenous and Non-indigenous Mexican-Americans Living in the United States 2010
16. Pineda F: Racist Discourse in Mexico. Racism and discourse in Latin America 2009:217

17. Bjarnason D: Concept analysis of religiosity. Home Health Care Management & Practice 2007; 19:350-355

18. Cottone J, Drucker P, Javier RA: Predictors of moral reasoning: Components of executive functioning and aspects of religiosity. Journal for the scientific study of religion 2007; 46:37-53

19. Chamberlain K, Zika S: Religiosity, meaning in life, and psychological well-being. Religion and mental health 1992:138-148

20. Braam A, Van den Eeden P, Prince M, Beekman A, Kivela S, Lawlor B, Birkhofer A, Fuhrer R, Lobo A, Magnusson H: Religion as a cross-cultural determinant of depression in elderly Europeans: results from the EURODEP collaboration. Psychol Med 2001; 31:803-814

21. Brittian AS, O'Donnell M, Knight GP, Carlo G, Umaña-Taylor AJ, Roosa MW: Associations Between Adolescents' Perceived Discrimination and Prosocial Tendencies: The Mediating Role of Mexican American Values. Journal of youth and adolescence 2013; 42:328-341

22. Bierman A: Does religion buffer the effects of discrimination on mental health? Differing effects by race. Journal for the Scientific Study of Religion 2006; 45:551-565

23. Nevins J, Wayne A. Cornelius, David Fitzgerald, Jorge Hernández-Díaz and Scott Borger (eds.), Migration from the Mexican Mixteca: Transnational Community in Oax. Journal of Latin American Studies 2011; 43:407-411

24. Cornelius WA, FitzGerald DS, Hernández-Díaz J, Borger S: Migration from the Mexican Mixteca: A Transnational Community in Oaxaca and California. 2009; 1

25. Li X, Stanton B, Fang X, Lin D: Social stigma and mental health among rural-to-urban migrants in China: A conceptual framework and future research needs. World Health Popul 2006; 8:14-31

26. Diaz RM, Ayala G, Bein E, Henne J, Marin BV: The impact of homophobia, poverty, and racism on the mental health of gay and bisexual Latino men: Findings from 3 US cities. Am J Public Health 2001; 91:927

27. Parker G, Brotchie H: Gender differences in depression. International Review of Psychiatry 2010; 22:429-436

28. Radloff LS: the Ces-D scale. Applied psychological measurement 1977; 1:385-401

29. Bojorquez Chapela I, Salgado de Snyder N: Características psicométricas de la Escala Center for Epidemiological Studies-depression (CES-D), versiones de 20 y 10 reactivos, en mujeres de una zona rural mexicana. Salud mental 2009; 32:299-307

30. Kohout FJ, Berkman LF, Evans DA, Cornoni-Huntley J: Two shorter forms of the CES-D depression symptoms index. J Aging Health 1993; 5:179-193

31. Tuttle J: Observing the Effects of Race, Gender, and Socioeconomic Status on Roman Catholic Religiosity 2011

32. Land KC: Principles of path analysis. Sociological methodology 1969:3-37

33. Who I: All Along the Watchtower: Acculturation Fear, Anti-Latino Affect, and Immigration. The Journal of Politics 2011; 73:664-679

34. Nicolaidis C, Perez M, Mejia A, Alvarado A, Celaya-Alston R, Galian H, Hilde A: “Guardarse Las Cosas Adentro”(Keeping Things Inside): Latina Violence Survivors’ Perceptions of Depression. Journal of general internal medicine 2011:1-7

35. Cochran SV, Rabinowitz FE: Gender-sensitive recommendations for assessment and treatment of depression in men. Professional Psychology: Research and Practice 2003; 34:132

CHAPTER 5: DISCUSSION

Results presented in Chapters 2 and 3 contain findings from the Hispanic Community Health Study/Study of Latinos, a multi-center study in four U.S. cities (The Bronx, New York; San Diego, California; Miami, Florida and Chicago, Illinois). Chapter 4 presents results from the Mexican Migration Field Research Program, a study among *Tunkaseño* individuals in the high-migration sending community of Tunkás, Yucatán, Mexico, and its satellite communities of Anaheim and Inglewood, California.

Chapter 2 examined the relationship between alcohol and perceived discrimination while Chapter 3 explored the association between smoking and perceived discrimination. Descriptive results for Chapters 2 and 3 indicate that among the entire sample of participants, an estimated 50% of individuals reported being treated unfairly across all Hispanic/Latino heritage groups. Those who identified as having Cuban heritage reported an estimated prevalence of 30%, however. In addition, among those that reported perceived discrimination only those of Cuban heritage were more likely to report alcohol use than their counterparts. In Chapter 3, it was found that perceived discrimination was associated with current smoking in those of Cuban and Puerto Rican heritage and in former smokers of Mexican heritage after adjusting for age and gender. However, statistical significance was lost after adjusting for all other covariates associated with smoking, including alcohol use. Results for Chapters 2 and 3 suggest three things: (1) Hispanics/Latinos of specific heritage

groups might be at different risks of perceiving discrimination, (2) the negative effects of discrimination could eventually lead to the use of maladaptive coping mechanisms [1] such as alcohol and smoking, depending on an individual's heritage, (3) in order to identify appropriate interventions, researchers and practitioners must be cognizant of the differences in which different heritage groups might respond to discrimination and other stressors, (4) researchers must identify other possible correlates associated to smoking and alcohol use when modeling studies in the context of discrimination and substance use. Following these suggestions can assist future studies and service providers that seek to understand the relationship between discrimination and substance use.

Chapter 4 examined the relationship between migration history and depression. Results show that individuals of *Tunkaseño* heritage with a history of migration and living in the U.S. were more likely to report perceived discrimination than their counterparts. Moreover, those that reported perceived discrimination were at a higher risk for depressive symptomology. Lastly, religious service attendance for women not living in the U.S. mediated this relationship and possibly worked as a protective factor against discrimination and depression. Our findings suggest that religiosity may act as a buffering mechanism against stressors associated with migration among women. Although these findings are not particularly novel [2, 3], they are unique in a binational study context of indigenous individuals. In addition, they offer an important insight into the role that gender might play in the relationship between religiosity and

depression. In particular, further research may yield important information of the mechanisms through which religiosity might work as a protective element in this context and eventually facilitate program and intervention development. Findings also indicate that perceived discrimination is higher among domestic and international migrants, signifying that discrimination is pervasive in the migration experience and as such, remains an important public health topic that requires awareness and future research.

As noted, all three Chapters in this dissertation are related to each other by looking at perceived discrimination as a potential risk factor that can negatively affect wellbeing and quality of life [4]. Each Chapter is able to independently contribute to the scientific literature and can also complement each other and contribute as a whole. For instance, results in Chapters 2 and 3 are unique as they explore perceived discrimination as a risk factor on a large sample and individually by heritage group. This strategy allowed Chapters 2 and 3 to explore the difference in prevalence among heritage groups and questions if this can in turn lead to disparities in maladaptive coping behaviors [1] among heritage groups. Results in Chapters 2 and 3 however, did not identify populations that might have been at a greater risk for discrimination such as indigenous Hispanics/Latinos and did not take into account migration history as a possible risk factor in the context of perceived discrimination [5]. Furthermore, Chapters 2 and 3 did not identify variables that may be acting as mediators between the relationship of perceived discrimination and negative health

outcomes or risk factors. On the other hand, Chapter 4 focused exclusively on an indigenous population while exploring history of migration as a risk factor for depressive symptoms and the possibility that perceived discrimination and support systems such as religiosity [6] may act as mediating factors. Chapters 2-4 when synthesized fill an important gap in the literature that has to this point, with notable exceptions [7-10], looked at perceived discrimination in the Hispanic/Latino population mostly as a homogenous group, while also excluding indigenous populations [5].

SUMMARY OF STUDIES AND MAJOR FINDINGS

The following section summarizes the combined results of Chapters 2 and 3 due to their analogous statistical methods as applied to the HCHS/SOL data. Subsequently a summary of Chapter 4 is presented based on the available literature and guiding theoretical frameworks. Following this section, this Chapter provides specific strengths and limitations of chapters 2-4, possible implications for public health, recommended interventions and directions for future research.

Chapters 2 and 3: The Association between Perceived Discrimination and Alcohol Use and Smoking in a Hispanic Population. Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL).

Chapters 2 and 3 of this dissertation used quantitative methods to assess the prevalence of perceived discrimination among a large sample of different Hispanic/Latino heritage groups across 4 sites in the U.S. In addition, it was

hypothesized that reports of perceived discrimination would be associated with alcohol use (Chapter 2) and smoking (Chapter 3) specific to each heritage group. This hypothesis was based on an evaluation of the processes of maladaptive coping mechanisms and stressful events as posited by the Transactional Theory of Stress and Coping [1]. Analysis included descriptive statistics and multinomial regression models adjusted for ager and gender in models 1 and subsequently adjusted for psychosocial covariates in models 2. Selected psychosocial and demographic covariates have been found to be associated with perceived discrimination [11, 12], and as possible predisposing factors toward alcohol and substance use in Hispanic/Latino adolescents [13].

Descriptive results showed that an average of 50% of our entire sample reported being treated unfairly for being Hispanic/Latino. Interestingly, a higher percentage (66%) reported feeling that someone they knew had been discriminated against for being Hispanic/Latino. High reports of discrimination in the present study are in contrast with the most up-to-date data from the National Latino and Asian American Study (NLAAS) as reported by Pérez et al. [14]. Although the two studies are not fully comparable, the difference in percentages may be clarified by a few points: We contend that as opposed to the data presented by Pérez and colleagues (Collected between 2002-2003), Hispanics/Latinos in the U.S. might be more exposed and thus more likely to report perception of discrimination as compared to data compiled 10 years ago. For example, the Southern Poverty Law Center reports a current 69% increase in

hate groups since the year 2000. According to the Center “This surge has been fueled by anger and fear over the nation’s ailing economy, an influx of non-white immigrants, and the diminishing white majority, as symbolized by the election of the nation’s first African-American president” [15]. In addition, Chapter 3 discusses that a national Hispanic/Latino political movement was ignited as a result of the James Sensenbrenner’s (R-Wisconsin) H.R. 4437 bill in 2005. The bill, widely considered as anti-immigrant and anti-Hispanic/Latino [16], is known to have initiated a movement across U.S. cities that included millions of people [17]. Arizona’s senate bill 1070 in 2010 was also seen as predominantly anti-Hispanic/Latino as it aimed at identifying, prosecuting and deporting undocumented immigrants in Arizona [18]. It has been documented that anti-immigrant sentiment rises in relation to policies such as H.R 4437 [19], economic downturns, high unemployment rates and negative anti-immigrant political rhetoric [20-23].

An examination of the prevalence of perceived discrimination by Hispanic/Latino heritage group also revealed some interesting contrasts. As demonstrated in the available literature, those of Mexican heritage tend to report higher rates of discrimination while those of Cuban heritage report the lowest [14, 24]. It is not surprising then, to find similar results in this study among those of Cuban heritage. Studies that report similar results [14, 24] suggest that social support [12] and greater ethnic identity [14] among those of Cuban heritage, may act as protective mechanisms against discrimination. Social support is defined as

the information leading a subject to believe that he is cared for and loved, esteemed, and a member of a network of mutual obligations [25]. The social support theory posits that this kind of support may be protective against the negative effects of stressors like discrimination by leading an individual to interpret stressful occasions less negatively [26]. In turn, social support may be more readily available among those who are a majority, including those of Cuban heritage in Miami [27]. Similarly, strong ethnic identity may also be more predominant among majority groups. Described as a psychological attachment to an ethnic or heritage group [28], ethnic identity has been found to be protective against perceived discrimination. Nevertheless, ethnic identity is known to be a multidimensional construct [29] that may vary across social contexts [30] and have subcultural differences within ethnic groups [28]. In other words, studies should use caution when assuming that a population with reports of high ethnic identity is innately protected against specific stressors. For example, Chapter 2 reported a lower prevalence of perceived discrimination among those of Cuban origin, however, our findings also suggest that those of Cuban origin showed a greater likelihood of alcohol use as a possible coping mechanism to perceived discrimination. This contrasting view is supported by a study among Hispanic/Latinos suggesting that those who viewed their cultural traits as consistent with their ethnic group reported more drug use and exposure, while those reporting a strong sense of ethnic pride reported less drug use [31].

Interestingly, rates of discrimination were reported higher among participants when asked if they had knew someone who had been discrimination against as opposed to themselves. Participants willing to report discrimination in others of their same ethnic group as opposed to themselves has been found to be a way to cognitively minimize negative feelings and to maintain a sense of control [32]. This response discrepancy has been noted in recent studies [32, 33] and is referred to as the "personal/group discrimination discrepancy" [34]. These findings reinforce the view that perceived discrimination might have negative emotional effects. It also strengthens the need to utilize perceived discrimination measurements that address self-report response bias. Finally, prevalence of discrimination was highest among those 35-55 years of age and decreased in the > 55 group across all heritage groups. Relativity of age and reports of discrimination are unclear in the literature, however.

In conclusion, these findings, suggest that ethnic discrimination, real or perceived might be heightened as a result of anti-immigrant policies and rhetoric. In addition, the use of alcohol use/smoking as a coping mechanism to perceived discrimination may be influenced by specific cultural attributes found within heritage groups and individuals. These findings partially support the hypothesis of chapter 2, as reports of perceived discrimination increased the likelihood that individuals of Cuban heritage may be using alcohol as a coping mechanism [1].

Chapter 4: Perceived Discrimination and Religiosity as Potential Mediating Factor between Migration and Depressive Symptoms: a Transnational Study of an Indigenous Maya Population

Chapter 4 of this dissertation used quantitative methods to determine if migration history was associated with depressive symptomology and explored whether perceived discrimination and coping resources (i.e. religious attendance) mediated this relationship. Chapter 4 hypothesized that migration was a risk factor for depressive symptoms and that religiosity and perceived discrimination mediated this relationship. Using path analysis, this hypothesis was tested by using a model adapted from the Stigma of Migration and Mental Health by Li et al. 2006 [35]. Li and colleagues created their framework by modeling it after the Sociocultural Model of Mental Health among gay and bisexual Hispanic/Latino men by Diaz and colleagues (2001) [36]. Furthermore, Diaz and colleagues hypothesized that resiliency factors such as greater social community involvement (e.g. church attendance) are associated with lesser psychological outcomes in terms of discrimination. In addition, given the greater likelihood that women would report higher depressive symptoms as compared to men [37], models were stratified by gender in order to explore these differences.

The available literature supports our results indicating that individuals with a history of migration (international or domestic) might be at a higher risk for perceiving discrimination [38-41]. Those with U.S. migration experience also reported a higher percentage (41%) of perceived discrimination in contrast to

those who had only domestic migration experience (20%) and 13% with no migration experience. Overall, 23% reported perceived discrimination, regardless of migration history. The differences in these results are also supported by the foundational theory presented in this dissertation suggesting that individuals who migrate from rural to urban areas are at higher risks for being stigmatized or discriminated against [5, 35, 42].

Interestingly, women who reported any type of migration experience reported higher rates of perceived discrimination than women without any migration experience, while men with migration experience did not show this association. The mediating effects of gender on perceived discrimination appear unclear in the literature [43]. Nonetheless, women residing in the U.S. were less likely to attend religious services than women residing in Tunkás. Those women in turn showed a higher likelihood of reporting perceived discrimination and an association to depressive symptoms. As supported in the literature [39, 44, 45], these findings suggest that for Tunkaseño women, attending religious events might act as a protective mechanism against the negative effects of perceived discrimination. It is important to note that our measurement of religiosity may be indicative of two or more distinct domains within the construct of religiosity. For example, it may embrace the availability of community involvement [36] and social support [25] due networking within the congregation. On the other hand, it may also indicate that the strength of an individual's conviction and behavior as outlined by that specific religion or faith [46, 47] may have a positive effect in this

context. Overall, studies suggest that religion might be as important for the overall health of those of Mexican origin [23] than networks of friends and social support [3].

STRENGTHS AND LIMITATIONS

Our analysis was limited by several factors that should be considered in the interpretation of these results.

Causality

Chapters 2, 3 and 4 in this dissertation analyzed data collected in a cross sectional fashion. Therefore, although these data can be considered significantly rich, it is difficult to draw conclusions of causality. For example, even though results in chapter 2 reveal that those of Cuban heritage that reported perceived discrimination were more likely to report current consumption of alcohol as opposed to their counterparts, it cannot be inferred that the likelihood of consuming alcohol among these individuals is conditional upon the perception of being discriminated. In addition, Chapter 2 measured alcohol use disorder by using a skip pattern format that was conditional on current alcohol use. In other words, some former drinkers who might have recently quit drinking were not assessed for possible high risk drinking patterns in the past. Furthermore, Chapter 4 showed that migration experience and current U.S. residence among *Tunkaseño* individuals were associated with perceived discrimination, which in turn were associated with a higher risk for depressive symptoms. Even though

these results are supported by other studies, [3, 5, 48-50] we cannot infer causality given the cross-sectional nature of our study. Similarly, it is impossible to determine if perception of discrimination precluded depressive symptomology and if indeed religiosity had a protective effect against the negative effects of discrimination in *Tunkaseño* individuals. For example, there are studies that imply that those who suffer from depression are more likely to report perceived discrimination [51] than their counterparts, suggesting the possibility of depressive symptoms preceding perceived discrimination and acting as a possible risk factor (reverse causality) [52].

Perceived discrimination

Chapters 2 and 3 measured perceived discrimination by the use of a one-item question. This could have led to the following: 1) a lack of specific examples of discrimination read to each participant may have led an underreporting of discriminative events such as those produced by poor English language skills and undocumented status [53], 2) questions regarding events of perception of discrimination were not time-specific, meaning that discriminatory experiences that might have happened a longtime ago could have been difficult to recall [51] and 3) the "personal/group discrimination discrepancy theory" or the likelihood to report discrimination of others of their same ethnic groups as opposed to themselves [34] can be observed by the higher prevalence reports among those reporting discrimination among their friends as opposed to self [32, 33] and thus cause underreporting. In chapter 4, even though efforts to develop a culturally

appropriate definition of discrimination were made (based on reports by investigators during the initial phase of recruitment), some *Tunkaseños* may not have fully understood the concept of discrimination entirely and thus responses may have been subjected to response biases mentioned above.

Depression

In Chapter 4 depression was measured by administering the 20-item Center for Epidemiologic Studies Depression Scale (CES-D 20) [54]. Even though this version (Spanish) of the CES-D 20 has been widely administered among Mexican individuals with good psychometric results [55, 56], it might have not been culturally appropriate in this sample. Based on the unique cultural identity and historical experience of *Tunkaseño* individuals, a conceptualization and understanding of depression might be different than in non-indigenous individuals [57, 58]. For example, in some indigenous cultures the term *nervios* ("Nerves") and *susto* ("fright") are two folk illnesses associated with psychological distress [59, 60] that may be more familiar to an indigenous population. Furthermore, even though some of the individual items of the CES-D measure symptoms associated with nervios and susto (e.g. grief) [61], measures specific to these constructs might provide a more accurate and culturally appropriate measurement of psychological distress than the CES-D.

Gender response bias among individuals of indigenous heritage may have also posed a problem in obtaining an accurate measurement of depression. Hispanic/Latino men have been known to be more likely to report symptoms of fatigue and irritability, rather than depressive symptoms like sadness and worthlessness [62] which are included in the CES-D. Furthermore, our proposed framework did not include possible predisposing or confounding variables associated with a greater likelihood of depression. These factors include a history of substance abuse, failed migration attempts, and other negative experiences associated with migration.

Religiosity

Religiosity in Chapter 4 was measured by the total sum of religious attendance within a month. Since most of the Mexican population is considered to be Catholic (82.7%) [63], Catholicism was used as foundation to develop our measurement of religiosity. Catholics are required or expected to attend mass every Sunday [64] and since there are at least four Sundays in every month, we dichotomized our results between those that attended mass less than four times the past month as opposed to those that did not. Although measuring religiosity by church attendance has been done in the past among individuals of Mexican Heritage with good results [2], inclusion of other possible domains and pathways of religiosity were not included in our assessment. This implies that we may have overlooked other important aspects of religiosity such as specific religious

affiliation and personal convictions [65, 66], that may have individual effects on health and behavior.

Generalizability

This dissertation includes two unique populations: Chapters 2 and 3 include a large and diverse population of Hispanics/Latinos in 4 major cities [67] and Chapter 4 includes a hard to reach transnational sample of Individuals of *Tunkaseño* heritage. For chapters 2-4, unique insights into these populations are suggested. However, no comparison groups were used to compare results among other Hispanic/Latinos and thus, caution should be used when generalizing these results.

Strengths

Notwithstanding these limitations, this dissertation provides a novel examination of perceived discrimination as a stressor among two samples that are uniquely exceptional. Results in Chapters 2 and 3 provide rich data that allows results to be considered across different Hispanic/Latino heritage groups. Chapter 4 explores the association of perceived discrimination and depression among a hard-to-reach population of individuals of Mexican-indigenous heritage. To our knowledge, there is no prior scientific investigation of these constructs among this population and sets precedent for future studies. Also, results highlight the high rates of reported discrimination among Hispanics/Latinos, which can be used to heighten awareness among policy makers and the general

public. Central to the intentions of this study, results can be used to devise theoretically and culturally appropriate interventions that can help ameliorate stressors associated to perceived discrimination that can in turn be a risk factor to substance abuse and depression.

PUBLIC HEALTH IMPLICATIONS

Policy and awareness

The high prevalence of perceived discrimination reported in Chapters 2 and 3 can be considered troubling and reflects a public health issue of global importance. Thus, it is important to educate the general public as well as governmental officials in the US and abroad of the health implications and risk factors associated to perceived discrimination. A contextualization of discrimination as a health risk can also raise awareness among the Hispanic/Latino community in the US and among other minorities and immigrants in an effort to promote community empowerment. This can be achieved by including the present study and results in community empowerment initiatives [68] and community based participatory research (CBPR). These may in turn raise awareness and can also supplement assessment tools designed to detect community readiness for change levels [69] and identify proposed policies that can strongly benefit from community support. For example, current legislations aimed at combating discrimination include the End Racial Profiling Act (ERPA). The ERPA is aimed at prohibiting profiling by federal, state, local and Indian tribal law enforcement authorities on the basis of race, religion, ethnicity or national

origin. It also mandates law enforcement training on racial profiling and data collection on all law enforcement routine or investigatory activities [70].

Implications for clinical practice

As we observed in Chapters 2 and 3, prevalence of perceived discrimination across all Hispanic/Latino heritage groups averaged 50%, while those of Cuban heritage reported an average of 30%. In addition, results in Chapter 2 indicate that those of Cuban heritage who reported perceived discrimination were more likely to report current drinking than their counterparts. Consequently, interventions aimed at eliminating substance use and abuse such as alcohol and smoking among Hispanics/Latinos, should consider including discrimination as a possible stressor. Interventions should also focus on the specific cultural attributes that might be acting as protective [14], or enabling factors of maladaptive coping behaviors as applied by the Transactional Stress and Coping Theory (SCT).

Findings suggesting that individuals of Cuban heritage might be using alcohol and smoking as coping mechanisms to discrimination are based on the SCT. Following is a list of the 7 basic tenets of the SCT as well an example formulated by our findings. This information can help practitioners better understand the SCT and make a more accurate assessments of patients and develop more appropriate substance use programs: (1) The SCT was developed by Lazarus and Folkman (1984) and posits that stress is an active transaction [1] based on the perception or appraisal of stressful events. (2) A cognitive appraisal

is the process through which an individual evaluates the demands put forward by a specific stressor [1], this cognitive appraisal may eventually mediate a response (or coping mechanism) [71]. (3) During this stage (*primary appraisal)* an individual evaluates if she is at risk and if this risk could have a possible negative impact on her well-being [72]. In other words, what are the costs of this specific exchange? Are they beneficial or detrimental? (4) A secondary appraisal (followed only if there is an actual risk perceived) is directly associated to the actual resources that the individual might possess within her reach in order for a potential threat to be diminished, or a self-evaluation of the individual's ability to handle this event [73]. (5) After the individual has appraised a stressor as either changeable or unchangeable [74], emotions and feelings are generated [73] and coping strategies result. (6) It is mostly acknowledged that there are two main types of coping resources: problem focused and emotion focused. There is a plethora of support suggesting that emotion focused coping is more likely to lead to maladaptive coping strategies such as alcohol and tobacco use [75]. In conclusion, an understanding of the components and sequential nature of the SCT, guided by heritage-group-specific frameworks may help develop and deliver more successful interventions. For example, in the case of this dissertation, using this proposed heritage group-adapted method can assist clinicians and social workers in understanding the response process that those of Cuban and Puerto Rican heritage may undergo when dealing with a stressful event, and why some may be using alcohol as a coping mechanism. Particularly, this can assist service providers in guiding their clients through the cognitive

process in order to ultimately achieve a favorable result [73]. In addition, exploring why specific individuals within groups show a greater likelihood of using maladaptive mechanism is essential in understanding why some may appraise certain discriminatory events as non-threatening more than other. These findings can ultimately provide problem solving concepts and positive coping mechanisms. Finally, there is a need to understand the mechanisms through which stress can lead not only to maladaptive coping mechanisms, but also to negative mental health outcomes such as those presented in Chapter 4.

In Chapter 4, results were based on the proposed conceptual model *Impact of Migration Experience among Indigenous Mayans*. Arguably and parallel to the above example, the transnational *Tunkaseño* community can greatly benefit from the development of evidence and heritage specific stress models. In particular, stress-models should identify the mechanisms through which negative mental health outcomes might be developed in the context of migration. Although there is a growing interest in examining the extent to which evidence-based interventions are effective among majority populations [76] very limited attention has been given to the specific needs specific indigenous Mexican populations. This widening gap in research should be addressed not only by scholars, but by the creation of a roadmap that of indigenous migrant research. Strategic priorities should be design with an ultimate goal to recognize the different indigenous migrant groups in the U.S. their health needs, and to educate federal, state, and local governments with these data.

In the *Tunkaseño* population, religiosity was found to act as a potential protective factor discrimination among some women, which in turn served as a protective factor against depression. Religiosity has been found to play a buffering role against stressors such as discrimination [2, 6, 77] and is also associated to the improvement of both mental and physical health [78]. However, research involving religiosity as beneficial towards health is relatively new and as a result, health related interventions utilizing religiosity have not been established and their use by public health professionals and practitioners not yet developed. Understandably, it is difficult to envision a theory-based intervention that encourages religious involvement or participation. According to Harold G. Koenig of the Center for Spiritual Theology and Health, "it is not ethical or desirable to change or increase religious involvement for health reasons" [46]. Yet, reports of the beneficial characteristics of religiosity can be disseminated across populations such as the *Tunkaseño* community in order for awareness to be created. This information can in turn be used individually by members of the community [46]. In addition, a clear understanding of the specific domains within religiosity that may be beneficial to the *Tunkaseño* and other minority populations can enhance existing cognitive based interventions utilizing existentialism and purpose in life theories, as these have been closely related to religiosity.

RECOMMENDATIONS FOR FUTURE RESEARCH

In Chapters 2 and 3, perceived discrimination and its association to alcohol and smoking were measured among a diverse population of Hispanics/Latinos. The following recommendations suggest future research directions based on the results of this study.

Studies focusing on perceived discrimination as a risk factor have been done across multiple populations and in different national contexts [79]. In this present work we continue and expand this course by exploring perceived discrimination across populations within larger ethnicities. Results presented in this dissertation yield important information that ultimately looks at discrimination in a more detailed context, yet questions for future researchers are raised. The evidence presented in the preceding Chapters state that different heritage background groups within the Hispanic/Latino population may have different likelihoods of reporting perceived discrimination as well as different likelihoods of the use of alcohol and smoking as possible coping mechanism. Thus, future studies should build on these results and provide a more definitive understanding of present conditions within each Hispanic/Latino heritage that may lead to the use of substance as a coping mechanism to discrimination. Although we have stated the importance of including measures of different types of discrimination in future studies, it is important to underline the need to examine discrimination and how it relates to current immigration policy, anti-immigrant sentiment and discrimination. Overall, future public health research should incorporate anti-

immigrant sentiment and discrimination as possible products of current social phenomena and events. These include high unemployment rates, economic downturns and anti-immigrant rhetoric presented by far-right parties [21].

Results in Chapter 4 revealed that women who reported any type of migration experience reported higher rates of perceived discrimination than women without any migration experience, as opposed to men. Future studies should assist in the understanding of gender mediation in this relationship between migration and risk of discrimination. In addition, religiosity among women might act as a beneficial and protective element in the *Tunkaseño* community and other minorities. Furthermore, even though religiosity may be used as a cultural resource [80] for social support and a possible buffering mechanism [81], other elements within this constellation exist. For instance, devotion and beliefs within a congregation [82], coupled with the expectation of faith-based behaviors may also have beneficial health related results. Essentially, in identifying these possible mechanisms (i.e. social, functional, spiritual), future studies and practitioners can supplement existing culturally-integrative psychotherapeutic and counseling models [83] and tailor counseling specific to minority populations from high migration sending communities such as Tunkás.

CONCLUSIONS

Research has identified perceived discrimination as a prevalent stressor among the Hispanic/Latino population. Discrimination has also been identified as

a risk factor to unhealthy behaviors such as alcohol, smoking and to negative health outcomes such as depression. This dissertation presents analyses exploring these associations among a Hispanic/Latino multi-center sample and a transnational sample of Mexican individuals of *Tunkaseño* descent. Results of this dissertation indicate that individuals who report perceived discrimination might be more likely to resort to maladaptive coping mechanisms such as alcohol and smoking, and that this association might depend on culturally specific risk and resiliency factors within Hispanic/Latino heritage groups. These findings suggest that stress-based models such as the Transactional Model of Stress and Coping must pay increased attention to these factors in order to design culturally appropriate substance use programs. This study also found that migration experience and current U.S. residence is associated with perceived discrimination, and depression, and that religiosity was found to act as a protective factor against discrimination among some women. These findings suggest that an awareness of the risk of discrimination and the protective factors of religiosity among *Tunkaseños* might be beneficial for the population. In addition, further understanding of the mechanisms by which religiosity is able to act as a buffering mechanism may assist in identifying resiliency factors that can be useful in the design of programs aimed at treating depression among indigenous individuals and the population as a whole.

References

1. Folkman S, Lazarus RS: Coping as a mediator of emotion. J Pers Soc Psychol 1988; 54:466

2. Hovey JD: Acculturative stress, depression, and suicidal ideation in Mexican immigrants. Cultur Divers Ethnic Minor Psychol 2000; 6:134-151

3. Finch BK, Vega WA: Acculturation Stress, Social Support, and Self-Rated Health Among Latinos in California. Journal of Immigrant Health 2003; 5:109-117

4. Felce D, Perry J: Quality of life: Its definition and measurement. Res Dev Disabil 1995; 16:51-74

5. Montes J: Perceived Discrimination Among Indigenous and Non-indigenous Mexican-Americans Living in the United States 2010

6. McCree DH, Wingood GM, DiClemente R, Davies S, Harrington KF: Religiosity and risky sexual behavior in African-American adolescent females. Journal of Adolescent Health 2003; 33:2-8

7. Pere D, Sribney W, Rodriguez M: Perceived Discrimination and Self-Reported Quality of Care Among Latinos in the United States. Journal of General Internal Medicine 2009:548-554

8. Araujo BY, Borrell LN: Understanding the Link Between Discrimination, Mental Health Outcomes, and Life Chances Among Latinos. Hispanic Journal of Behavioral Sciences 2006; 28:245-266

9. Lee MA, Ferraro KF: Perceived discrimination and health among Puerto Rican and Mexican Americans: Buffering effect of the Lazo matrimonial? Soc Sci Med 2009; 68:1966-1974

10. Basáñez T, Unger JB, Soto D, Crano W, Baezconde-Garbanati L: Perceived discrimination as a risk factor for depressive symptoms and substance use among Hispanic adolescents in Los Angeles. 2012

11. Williams DR, Haile R, Mohammed SA, Herman A, Sonnega J, Jackson JS, Stein DJ: Perceived discrimination and psychological well-being in the USA and South Africa. Ethn Health 2012; 17:111-133

12. Grant BF, Stinson FS, Hasin DS, Dawson DA, Chou SP, Anderson K: Immigration and lifetime prevalence of DSM-IV psychiatric disorders among

Mexican Americans and non-Hispanic whites in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Arch Gen Psychiatry 2004; 61:1226

13. Alva SA: Psychological distress and alcohol use in Hispanic adolescents. Journal of youth and adolescence 1995; 24:481-497

14. Pérez DJ, Fortuna L, Alegria M: Prevalence and correlates of everyday discrimination among US Latinos. J Community Psychol 2008; 36:421-433

15. Hate and Extremism. http://www.splcenter.org/what-we-do/hate-and-extremism: 2013

16. Pulido L: A day without immigrants: The racial and class politics of immigrant exclusion. Antipode 2007; 39:1-7

17. Cano G: Political Mobilization of Mexican Immigrants in American Cities and the US Immigration Debate. Mexico-North Research Network, Washington, DC, and the University of Nebraska Omaha.At www.mexnor.org 2006

18. Archibold CR: Arizoan Encats Stringent Law on Immigration. New York Times 2010

19. Massey DS: Racial formation in theory and practice: The case of Mexicans in the United States. Race and Social Problems 2009; 1:12-26

20. Citrin J, Green DP, Muste C, Wong C: Public opinion toward immigration reform: The role of economic motivations. Journal of Politics 1997; 59:858-881

21. Cochrane C, Nevitte N: Scapegoating: Unemployment, far-right parties and anti-immigrant sentiment. Comparative European Politics 2012

22. Ayón C, Marsiglia FF, Bermudez Parsai M: Latino family mental health: Exploring the role of discrimination and familismo. J Community Psychol 2010; 38:742-756

23. Hovey JD, Magaña C: Acculturative stress, anxiety, and depression among Mexican immigrant farmworkers in the Midwest United States. Journal of Immigrant Health 2000; 2:119-131

24. Lee DL, Ahn S: Discrimination Against Latina/os A Meta-Analysis of Individual-Level Resources and Outcomes. The Counseling Psychologist 2012; 40:28-65

25. Cobb S: Presidential Address-1976. Social support as a moderator of life stress. Psychosom Med 1976; 38:300-314

26. Lakey B, Cohen S: Social support theory and measurement. Social support measurement and intervention: A guide for health and social scientists 2000:29-52

27. County Health Rankings and Roadmaps: http://www.countyhealthrankings.org/roadmaps; 2013

28. Cheung YW: Approaches to ethnicity: Clearing roadblocks in the study of ethnicity and substance use. Subst Use Misuse 1993; 28:1209-1226

29. Brook JS, Whiteman M, Balka EB, Win PT, Gursen MD: Drug use among Puerto Ricans: Ethnic identity as a protective factor. Hispanic Journal of Behavioral Sciences 1998; 20:241-254

30. Umaña-Taylor AJ: Ethnic identity and self-esteem: Examining the role of social context. J Adolesc 2004; 27:139-146

31. Marsiglia FF, Kulis S, Hecht ML: Ethnic labels and ethnic identity as predictors of drug use among middle school students in the Southwest. J Res Adolesc 2003; 11:21-48

32. Schuster MA, Collins R, Cunningham WE, Morton SC, Zierler S, Wong M, Tu W, Kanouse DE: Perceived Discrimination in Clinical Care in a Nationally Representative Sample of HIV Infected Adults Receiving Health Care. Journal of general internal medicine 2005; 20:807-813

33. Dixon J, Durrheim K, Tredoux C, Tropp L, Clack B, Eaton L: A paradox of integration? Interracial contact, prejudice reduction, and perceptions of racial discrimination. J Soc Iss 2010; 66:401-416

34. Wright SC: Dimensions of perceived discrimination: The personal/group discrimination discrepancy. 1993; 7:233

35. Li X, Stanton B, Fang X, Lin D: Social stigma and mental health among rural-to-urban migrants in China: A conceptual framework and future research needs. World Health Popul 2006; 8:14-31

36. Diaz RM, Ayala G, Bein E, Henne J, Marin BV: The impact of homophobia, poverty, and racism on the mental health of gay and bisexual Latino men: Findings from 3 US cities. Am J Public Health 2001; 91:927

37. Parker G, Brotchie H: Gender differences in depression. International Review of Psychiatry 2010; 22:429-436

38. Araujo Dawson B, Panchanadeswaran S: Discrimination and Acculturative Stress Among First-Generation Dominicans. Hispanic Journal of Behavioral Sciences 2010; 32:216-231

39. Jasinskaja-Lahti I, Liebkind K, Jaakkola M, Reuter A: Perceived Discrimination, Social Support Networks, and Psychological Well-being Among Three Immigrant Groups. Journal of Cross-Cultural Psychology 2006; 37:293-311

40. Hartshorn KJS, Whitbeck LB, Hoyt DR: Exploring the Relationships of Perceived Discrimination, Anger, and Aggression among North American Indigenous Adolescents. Society and Mental Health 2012; 2:53-67

41. Ahmed SR, Kia-Keating M, Tsai KH: A structural model of racial discrimination, acculturative stress, and cultural resources among Arab American adolescents. Am J Community Psychol 2011; 48:181-192

42. Lin D, Li X, Wang B, Hong Y, Fang X, Qin X, Stanton B: Discrimination, Perceived Social Inequity, and Mental Health Among Rural-to-Urban Migrants in China. Community Ment Health J 2011; 47:171-180

43. Pascoe EA, Smart Richman L: Perceived discrimination and health: A meta-analytic review. Psychological Bulletin 2009; 135:531-554.

44. Bhui K, Stansfeld S, McKenzie K, Karlsen S, Nazroo J, Weich S: Racial/ethnic discrimination and common mental disorders among workers: findings from the EMPIRIC Study of Ethnic Minority Groups in the United Kingdom. Journal Information 2005; 95

45. Kessler RC, Mickelson KD, Williams DR: The prevalence, distribution, and mental health correlates of perceived discrimination in the United States. J Health Soc Behav 1999; 40:208-230

46. Religion, Spirituality and Public Health: Research, Applications, and Recommendations.

47. Hovey JD: Acculturative stress, depression, and suicidal ideation in Mexican immigrants. Cultural Diversity and Ethnic Minority Psychology 2000; 6:134

48. Pineda F: Racist Discourse in Mexico. Racism and discourse in Latin America 2009:217

49. Alegria M, Canino G, Shrout PE, Woo M, Duan N, Vila D, Torres M, Chen C, Meng X: Prevalence of Mental Illness in Immigrant and Non-Immigrant U.S. Latino Groups. Am J Psychiatry 2008; 165:359-369

50. Noh S, Morton Beiser, Kaspar V, Hou F, Rummens J: Perceived Racial Discrimination, Depression, and Coping: A Study of Southeast Asian Refugees in Canada. J Health Soc Behav 1999; 40:pp. 193-207

51. Mossakowski KN: Coping with perceived discrimination: does ethnic identity protect mental health? J Health Soc Behav 2003:318-331

52. Rothman KJ, Greenland S, Lash TL: Modern epidemiology. : Lippincott Williams & Wilkins; 2008

53. Ornelas IJ, Perreira KM: The role of migration in the development of depressive symptoms among Latino immigrant parents in the USA. Soc Sci Med 2011

54. Radloff LS: the Ces-D scale. Applied psychological measurement 1977; 1:385-401

55. Bojorquez Chapela I, Salgado de Snyder N: Características psicométricas de la Escala Center for Epidemiological Studies-depression (CES-D), versiones de 20 y 10 reactivos, en mujeres de una zona rural mexicana. Salud mental 2009; 32:299-307

56. Salgado-de Snyder VN, Maldonado M: The psychometric characteristics of the Depression Scale of the Centro de Estudios Epidemiologicos in adult Mexican women from rural areas. Salud Publica Mex 1994; 36:200-209

57. Donlan W, Lee J: Screening for depression among indigenous Mexican migrant farmworkers using the patient health questionnaire-9 1. Psychol Rep 2010; 106:419-432

58. Baer RD, Weller SC, de Alba Garcia, Javier Garcia, Glazer M, Trotter R, Pachter L, Klein RE: A cross-cultural approach to the study of the folk illness nervios. Cult Med Psychiatry 2003; 27:315-337

59. Nations MK, Camino LA, Walker FB: 'Nerves': Folk idiom for anxiety and depression? Soc Sci Med 1988; 26:1245-1259

60. Rubel AJ: The epidemiology of a folk illness: Susto in Hispanic America. Ethnology 1964; 3:268-283

61. Guarnaccia PJ: Ataques de nervios in Puerto Rico: Culture- bound syndrome or popular illness? Med Anthropol 1993; 15:157-170

62. Cochran SV, Rabinowitz FE: Gender-sensitive recommendations for assessment and treatment of depression in men. Professional Psychology: Research and Practice 2003; 34:132

63. Mexico Demographics Profile http://www.indexmundi.com/mexico/demographics_profile.html: 2013.

64. Tuttle J: Observing the Effects of Race, Gender, and Socioeconomic Status on Roman Catholic Religiosity 2011

65. Curlin FA, Lawrence RE, Chin MH, Lantos JD: Religion, conscience, and controversial clinical practices. N Engl J Med 2007; 356:593-600

66. Fiala WE, Bjorck JP, Gorsuch R: The religious support scale: Construction, validation, and cross-validation. Am J Community Psychol 2002; 30:761-786

67. HCHS/SOL: About the study. http://www.cscc.unc.edu/hchs/ ; 2013

68. Eisen A: Survey of neighborhood-based, comprehensive community empowerment initiatives. Health Education & Behavior 1994; 21:235-252

69. Castañeda SF, Holscher J, Mumman MK, Salgado H, Keir KB, Foster-Fishman PG, Talavera GA: Dimensions of Community and Organizational Readiness for Change. Progress in community health partnerships: research, education, and action 2012; 6:219-226

70. End Racial Profiling Act. http://www.aclu.org/blog/tag/end-racial-profiling-act: 2013

71. Folkman S, Lazarus RS, Dunkel-Schetter C, DeLongis A, Gruen RJ: Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. Journal of Personality and Social Psychology; Journal of Personality and Social Psychology 1986; 50:992

72. Chang EC: Dispositional optimism and primary and secondary appraisal of a stressor: Controlling for confounding influences and relations to coping and psychological and physical adjustment. J Pers Soc Psychol 1998; 74:1109

73. Matthieu MM, Ivanoff A: Using stress, appraisal, and coping theories in clinical practice: assessments of coping strategies after disasters. Brief Treatment and Crisis Intervention 2006; 6:337

74. Puffer ES, Kochman A, Hansen NB, Sikkema KJ: An evidence-based group coping intervention for women living with HIV and history of childhood sexual abuse. Int J Group Psychother 2011; 61:98

75. Stanton AL, Kirk SB, Cameron CL, Danoff-Burg S: Coping through emotional approach: scale construction and validation. J Pers Soc Psychol 2000; 78:1150

76. Le H, Zmuda J, Perry DF, Muñoz RF: Transforming an Evidence- Based Intervention to Prevent Perinatal Depression for Low Income Latina Immigrants. Am J Orthopsychiatry 2010; 80:34-45

77. Maltby J, Day L: Religious orientation, religious coping and appraisals of stress: Assessing primary appraisal factors in the relationship between religiosity and psychological well-being. Personality and Individual Differences 2003; 34:1209-1224

78. Aukst-Margetić B, Margetić B: Religiosity and health outcomes: review of literature. Coll Antropol 2005; 29:365-371

79. Williams D, Mohammed S: Discrimination and racial disparities in health: evidence and needed research. J Behav Med 2009; 32:20-47; 47

80. Ellison CG, Finch BK, Ryan DN, Salinas JJ: Religious involvement and depressive symptoms among Mexican- origin adults in California. J Community Psychol 2009; 37:171-193

81. Salgado H, Castaneda SF, Talavera GA, Lindsay SP: The Role of Social Support and Acculturative Stress in Health-Related Quality of Life Among Day Laborers in Northern San Diego. Journal of Immigrant and Minority Health 2012:1-7

82. Ryan RM, Rigby S, King K: Two types of religious internalization and their relations to religious orientations and mental health. J Pers Soc Psychol 1993; 65:586-586

83. Ibrahim FA: Cross-cultural counseling and psychotherapy: An existential-psychological approach. International Journal for the Advancement of Counselling 1984; 7:159-169