Psychological Factors And The Relation Between Neighborhood Conditions And Latino Health: A Mixed Methods Study

Patricia Rodriguez Espinosa

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Patricia Rodriguez Espinosa
Candidate
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Steven P. Verney, Ph.D., Chairperson

Kamilla Venner, Ph.D.

Gabriel R. Sanchez, Ph.D.

Felipe G. Castro, Ph.D., M.S.W.
PSYCHOLOGICAL FACTORS AND THE RELATION BETWEEN NEIGHBORHOOD CONDITIONS AND LATINO HEALTH: A MIXED METHODS STUDY

BY

PATRICIA RODRIGUEZ ESPINOSA

B.S., Psychology
M.S., Clinical Psychology
M.P.H.

DISSERTATION

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Doctor of Philosophy
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DEDICATION

In memory of my grandparents, who continue to inspire and motivate me every day. To my parents, for their extraordinary sacrifices.
PSYCHOLOGICAL FACTORS AND THE RELATION BETWEEN NEIGHBORHOOD CONDITIONS AND LATINO HEALTH: A MIXED METHODS STUDY

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Patricia Rodriguez Espinosa

B.S., Psychology, University of New Mexico, 2010
M.S., Clinical Psychology, University of New Mexico, 2013
M.P.H, College of Population Health, University of New Mexico, 2017
Ph.D., Psychology, University of New Mexico, 2018

ABSTRACT

Latinos, the largest racial/ethnic minority group in the US, face multiple health inequities including higher rates morbidity and mortality. Despite the importance of context and the wide range of stressors faced by this population, the majority of the literature on Latino and immigrant health concentrates on issues related to cultural adaptation processes. Using a social determinants of health framework, the present convergent mixed methods study investigated the relation between neighborhood conditions and Latino health with a psychological lens. A total of 361 Latino residents of Bernalillo County, the largest county in Albuquerque, New Mexico, were recruited to complete a series of questionnaires. From this sample, participants were also invited to six focus groups stratified by language and neighborhood income level. A myriad of health-related impacts associated with neighborhood conditions were supported by both methods. Several key neighborhood factors emerged as predictors of health including neighborhood walkability and social cohesion. Stark differences were observed by social class and nativity status with immigrants and low-income neighborhood residents reporting the worse outcomes. Moreover, perceived stress emerged as an instrumental mediator, even when accounting for the effect of other factors. Findings are
contextualized within the structural discrimination and social disorganization literatures.

The present study underscores the need to address fundamental causes of inequities in order to decrease or eliminate the health inequity gap for Latinos.
# INTRODUCTION

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Introduction

Background

New immigration waves and the growth of minority populations have changed the face of our nation. In 2010, Latinos accounted for over 50 million people in the US, constituting 16% of the population and the largest minority in the country (US Census Bureau, 2011). By the year 2060, they are estimated to comprise over 30% of the total population (Krogstad & Lopez, 2014). Thus, in the coming decades, understanding the context in which this population and their children live and the subsequent effect on health will become a crucial next step for health-related research, interventions, and policy making.

The Latino health profile is complex and it includes advantages and disadvantages (Escarce, Morales, & Rumbaut, 2006). Some evidence points to a protective effect of nativity, i.e., being born outside of the US, among recently arrived immigrant Latinos (hereafter referred to as immigrants), who in some instances exhibit better health-related outcomes relative to their US-born counterparts including physical and behavioral health (American Psychological Association [APA], 2012). However, despite this apparent health advantage for recent immigrants, also known as the Hispanic or Immigrant Paradox, the overall health profile for the Latino population reflects patterns of health inequities as exhibited by other ethnic/racial minorities in the US. Such health inequities include high rates of disease, disability, and premature death (US Department of Health and Human Services, 2014). Latinos face multiple health inequities, including high rates of obesity, hypertension, diabetes, higher rates of death from stroke, chronic liver disease, and AIDS as compared to non-Latino Whites (Centers for Disease Control and
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Furthermore, Latinos, including immigrants with greater years of residency in the US, exhibit an increased risk for mental health disorders such as major depression, substance use disorders, and they report high rates of comorbid psychological disorders (Institute for Hispanic Health, 2005).

**Importance of context in Latino health-related research.** As a disadvantaged population, Latinos face many social and economic barriers. High rates of socioeconomic deprivation, social isolation and neighborhood segregation, discrimination, lack of access to health insurance and presence of detrimental policies can all diminish the protective effect of nativity (Cacari-Stone, Viruell-Fuentes, & Acevedo-Garcia, 2007), and potentially contribute to the development of health inequities.

Despite the importance of context and the wide range of stressors contributing to health inequities in this population, the majority of the literature on Latino and immigrant health tends to concentrate on issues related to cultural adaptation processes (Viruell-Fuentes, 2007). Many of the proposed explanations attribute health declines across Latino generations to acculturation to the US culture (Abraído-Lanza, Armbrister, Flórez, & Aguirre, 2006; Viruell-Fuentes, Miranda, & Abdulrahim, 2012). Explanations have also centered around individual health behaviors such as changes in diet preferences over time (Ayala, Baquero, & Klinger, 2008; Benavides-Vaello, 2005). Nonetheless, while still important, cultural explanations are limited in power without incorporating larger contextual and inequality factors such as socioeconomic status (SES) and neighborhood conditions (Abraído-Lanza et al., 2006; Viruell-Fuentes, 2007; Zambrana & Carter-Pokras, 2010). Unfortunately, the context in which immigrants and later generation
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Latinos live is generally missing from explanations (Schwartz, Unger, Zamboanga, & Szapocznik, 2010) leading to interventions that often neglect broader sociopolitical and macro-level determinants of health (Horevitz & Organista, 2013).

**Theoretical Underpinnings**

The present study relied on the Social Determinants of Health framework and conceptualized neighborhood conditions and the segregation of poverty as a fundamental cause of disease (Massey & Denton, 1993; Schulz & Northridge, 2004; Williams & Collins, 2001). Scholars conceptualize racial residential segregation as a primary cause of inequities via differential access to economic and employment opportunities (Williams & Collins, 2001). This also includes differences in housing quality, medical care and social context.

Several theories have been postulated in an effort to explain the relationship between neighborhood factors and health (Gephart, 1997). Collective socialization theories argue that role models in a community help children and youth internalize social normal and acceptable behaviors. This occurs via institutions (e.g., schools, churches, police), adults in the community (e.g., presence of professionals) and via peer influences. Social comparison models, on the other hand, argue that individuals make comparisons with others around them. Unfavorable comparisons can lead to either higher efforts for social mobility or dropping out of the competition. The later outcome is particularly likely when individuals perceive barriers or lack of opportunities for social mobility. This model particularly emphasizes relative deprivation. Economist have also postulated that resources at the family and neighborhood level impact individual’s choices such as investments in accumulation of human and social capital. For example, deciding whether
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to complete schooling vs engage in illicit activity would be influenced by the local economic opportunities, the strength of the illicit economy, and other factors such as marital and welfare opportunities.

One of the most popular theories in the field is social disorganization (Gephart, 1997). In this view, several factors such as racial heterogeneity, socioeconomic deprivation, high rates of turnover or residential mobility, and population density impede systemic social organization at the community level. Social organization is thought as interdependent with positive outcomes such as community’s social networks, both formal and informal. These networks allow for social support, collective supervision, and shared values and goals. Social disorganization then overlaps with other scholars who argue that communities are central in facilitating or inhibiting social capital (Sampson, 1992). Sampson argued that community-level processes (e.g., institutional-family connectedness, social trust, extensive social networks, supervision of youth) mediate community-level structural factors previously mentioned such as population turnover, and resource deprivation.

More recent studies have also posited that a key mechanism in the development of detrimental health outcomes is the heightened exposure to stress experienced by individuals residing in low resourced neighborhoods (Aneshensel, 2009; Yen, Michael, & Perdue, 2009). Compelling evidence indicates that allostatic load levels can be 69% higher among individuals living in very-high-risk neighborhoods compared to their counterparts in low-risk communities (Theall, Drury, & Shirtcliff, 2012). This potential biological mechanism is detected as early as in adolescence after cumulative exposure to neighborhood risk factors. Social disorganization and other models previously discussed
are still thought of as producing higher levels of stress, which then translates into biological mechanisms that place individuals at higher risk of coronary disease and mortality.

Explanations have also included conceptual models around neighborhood preferences as explanations for residential segregation (Bobo & Zubrinsky, 1996; Clark, 1992). Initial proponents of this model argued that individuals have a preference for neighborhoods with high representation of their own race; or that ethno-centric preferences could explain patterns of racial residential segregation (Clark, 1992). Preferences are theoretically driven by positive attitudes about same race individuals rather than negative feelings about other racial groups. This model has been highly contested (Charles, 2003). Racial prejudice has been found to be a large contributor to preferences (Bobo et al., 1996). Additionally, attitudes of majority group members (i.e., Whites) appear to be stronger predictors of segregation and preferences against racial residential integration than attitudes held by minority group members (Bobo et al., 1996). Racial prejudice and discrimination appear to be the key drivers of neighborhood preferences and the endurance of racial residential segregation (Charles, 2003).

**Empirical Literature**

Empirical studies find that residential or neighborhood segregation can affect physical and mental health (Acevedo-Garcia, 2001; Viruell-Fuentes et al., 2012; Williams et al., 2001). Neighborhood SES has been linked to suicide, depression, anxiety, and mental health outcomes (Alegría, Pérez, & Williams, 2003). Segregated environments accumulate poverty, environmental risks, lack of resources and economic opportunities, low access to care, and often expose youth to violence and lack of role
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models (Gaskin et al., 2009; Williams & Sternthal, 2010). These communities face a disproportionate number of environmental hazards including pollutants, noise, humidity, and odors (Gee & Payne-Sturges, 2004). In addition, residents of such neighborhoods have lower access to healthy foods and more exposure to alcohol and tobacco outlets (LaVeist & Wallace, 2000; Morland, Wing, Diez Roux, & Poole, 2002); all of which contribute to ill health (White & Borrell, 2011).

Residential segregation and housing quality are not equally distributed in the general population. Racial and ethnic minorities face a higher burden of neighborhood segregation and disadvantage (Schachter, 2003; Williams et al., 2001). Data suggest that a considerable pattern of segregation exists for Latinos (Iceland & Scopilliti, 2008; Wahl, Breckenridge, & Gunkel, 2007), a pattern that has been stable over the last few decades (Iceland, Weinberg, & Hughes, 2014). In particular, many recently arrived immigrants settle in poor neighborhoods (American Psychological Association, 2012; Suárez-Orozco, Todorova, & Qin, 2006), setting the stage for their health and the health of future generations. Segregation from mainstream America affects immigrants’ chances to learn English, to access quality jobs (or any employment), and places Latino children in mostly inferior schools (Orfield & Lee, 2006). For later generation Latinos, high levels of segregation and poor housing quality have been associated with violence exposure and drug trafficking (Chaufan, Davis, & Constantino, 2011), exposure to gang-related activity (Suárez-Orozco et al., 2006), higher risk of any past-year anxiety disorder (Alegría, Molina, & Chen, 2014), and low access to health enhancing resources (Logan, 2011).

Scholars in this area have argued that residential segregation and poverty exposes Latino children to an underclass, setting the stage for potential downward social mobility
and marginalization (Portes & Rumbaut, 2001). In addition, after adjusting for context and neighborhood factors, the protective effect of nativity among Latino immigrants tends to disappear (Alegría et al., 2007) further highlighting the role of context and neighborhood disadvantage in determining Latino health.

Limitations of the Current Literature

The present study expands upon some key limitations found in the extant literature. First, according to recent reviews, the majority of the published studies on the impact of neighborhood conditions on health rely on cursory measures of neighborhood level factors, oftentimes reducible to poverty or assumption of neighborhood disorganization (Henry, Gorman-Smith, Schoeny, & Tolan, 2014). Most of these studies utilize Census level or indexes of socioeconomic conditions at the tract or zip-code level (Cummins, Curtis, Diez-Roux, & Macintyre, 2007; Diez Roux, 2001). Only recently studies have started to directly measure conditions at the neighborhood level (Diez Roux & Mair, 2010). However, these new generation studies still rely on objective neighborhood conditions (e.g., assessed via trained raters), while assessment of subjective conditions are less often addressed.

Despite this oversight, subjective perceptions of neighborhood conditions or individual-level assessment of residents’ perceptions of different neighborhood domains such as safety, availability of healthy foods, employment, and discrimination (Echeverria et al., 2004) have been shown to operate as determinants of health outcomes (Alegría et al., 2014; Ellaway, Macintyre, & Kearns, 2001; Poortinga, Dunstan, & Fone, 2007). Studies examining the overlap between subjective and objective measures of neighborhood conditions find that both (i.e., subjective and objective measures) are
related to health status (Weden, Carpiano, & Robert, 2008). Nonetheless, subjective measures have been found to be more strongly associated with health outcomes after controlling for individual level factors (Weden et al., 2008; Wen, Hawkley, & Cacioppo, 2006). Subjective measures are hypothesized to be more proximally linked to health and may affect disease occurrence via pathways such as stress and psychological well-being (Ross & Mirowsky, 2001). Failure to include subjective factors into analyses of health may lead to misinterpretations of the complete picture and may bias the estimates related to the effects of neighborhood conditions on health (Wen et al., 2006).

Second, despite the evidence pointing at neighborhood level factors as important determinants of Latino health, attention to this issue is a fairly recent area of inquiry (Acevedo-Garcia & Almeida, 2012). Most of the work on segregation has been conducted with African Americans (Fennie, Lutfi, Maddox, Lieb, & Trepka, 2015; Schulz, Williams, Israel, & Lempert, 2002; White et al., 2011). The extant literature examining the role of neighborhoods and Latino health is much smaller in comparison (Alegría et al., 2014; Corral, Landrine, & Zhao, 2014; Lee & Ferraro, 2007).

Third, to date, few papers have employed qualitative designs (Eriksson & Emmelin, 2013; Marquez et al., 2016; Plane & Klodawsky, 2013). Nonetheless, the relatively new interest in this area (Diez Roux et al., 2010), the complexity of the associations, and evidence suggesting that few studies address theoretical frameworks (Yen et al., 2009), indicate that more descriptive information might be needed. This can be particularly relevant for Latinos who are understudied in relation to contextual effects of neighborhoods. The qualitative approach of the present study will allow for a more detailed exploration of subjective perceptions of neighborhood conditions without
constraining participants’ responses, which might oversimplify neighborhoods and miss important constructs. Thus, the qualitative approach employed aims at offering a more nuanced and rich description of the lived experience of Latinos in their communities.

**Purpose of the Present Study**

The present project proposes to explore and test a psychological lens to the study of neighborhood level factors and Latino health using a convergent mixed methods design. Psychological factors play a key role in the development of negative health outcomes and risky behaviors (Maio et al., 2007; Prince et al., 2007). Despite their importance, there is a dearth of investigations that fully account for psychological constructs or that test for their mediating or moderating role on health-related outcomes. Wen and colleagues (2006) found that psychological constructs such as loneliness, stress and hostility partially accounted for the relationship between neighborhood factors and health. This underscores the potential to further examine this pathway, although more work is needed. For instance, exploring other key psychological constructs such as optimism, self-efficacy, psychological distress and internalized racism may offer a more complete picture of the process by which contextual features of neighborhoods affect Latino health. It is possible that psychological factors influence both reporting of community conditions and health (Weden et al., 2008), thus, emphasizing the need for their incorporation into this line of research.

**Self-efficacy.** Well-studied constructs such as self-efficacy, individuals' beliefs in their competence, power, and control (Bandura, 1986; Gecas & Seff, 1989), has been shown to be predictive of lower engagement in risky behaviors among Latinos (Bedoya et al., 2012; Marín, Tschann, Gómez, & Gregorich, 1998), better health among Latino
college students (Torres & Solberg, 2001), thriving among Latinas with chronic illness (Abraído-Lanza, Guier, & Colón, 1998), and the exertion of greater effort and persistence in the face of adversity (Bandura, 1999). Neighborhood unemployment level, public assistance, and overall neighborhood conditions are associated with lower general self-efficacy, after controlling for individual level factors and SES (Boardman & Robert, 2000); yet, this is an understudied construct when it comes to neighborhood and health studies (Boardman et al., 2000). The erosion over time of self-efficacy, may leave individuals exposed to detrimental effects of poverty, while at the same time they are less able to successfully perform and engage in health enhancing behaviors.

Given the proliferation of affordable unhealthy foods, the high prevalence of sedentary behaviors, and the role of neighborhoods in determining healthy food options and exercise opportunities, the present study examines self-efficacy around nutrition and exercise. Health promotion studies with diverse samples have shown that nutrition self-efficacy is an important predictor of actual food purchases (e.g., amount of fat, fiber, or produce) and consumption (Anderson, Winett, & Wojcik, 2007). Randomized self-efficacy interventions around nutrition practices have also shown to be effective in increasing fruit and vegetable consumption in participants (Luszczynska, Tryburcy, & Schwarzer, 2007).

Levels of self-efficacy around exercise have also been found to be predictive of adoption and engagement of physical activity, particularly 6-months later (King, 2001; Oman & King, 1998). Higher self-efficacy 6-months after a strength training intervention predicted exercise engagement 9 and 12-month post intervention (Neupert, Lachman, & Whitbourne, 2009). Higher exercise self-efficacy has also been found to predict high
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attendance to an exercise program and higher activity levels 8 weeks after program completion among Latinas and African American women (D’Alonzo, Stevenson, & Davis, 2004). Among a Spanish speaking low income sample, self-efficacy was a positive predictors of health behaviors such as fruit and vegetable consumption and weekly exercise (Guntzviller, King, Jensen, & Davis, 2017).

**Optimism.** Another potential pathway is the weakening of optimism typically found in recent immigrants (Kao & Tienda, 1995; Suárez-Orozco & Suárez-Orozco, 2001). Initial high levels of optimism have been posited as a potential explanation for the protective effects of nativity seen among immigrants (Suárez-Orozco et al., 2001). However, this positive outlook tends to decline with time in the US (Fuligni, 2012), potentially explaining health declines in second and later generation Latinos (Portes & MacLeod, 1996; Suárez-Orozco et al., 2008). National surveys document the decline in optimism among later generation Latinos (Escobar, 2006), while increases are seen in skepticism and disappointment with social inequality (Kellogg Foundation, 2014). While this is an understudied construct when it comes to neighborhood related research, optimism has been associated with neighborhood activism (Greenberg & Schneider, 1997), and engagement in health protective behavior such as not smoking, getting physical exams, and exercising regularly (Greenberg, 1997). In addition, optimism was found to be protective against violence exposure among inner city youth (Clark et al., 2006), highlighting its potential significance for future investigations.

**Perceived stress.** Perceived stress is another relevant psychological construct found to be associated with detrimental health outcomes in Latinos such as smoking and cardiovascular disease (Gallo et al., 2014). It is possible that neighborhood conditions
exacerbate stress levels, serving as potential pathway to ill health. Some evidence has indeed linked neighborhood disadvantage to higher levels of stress (Boardman, Finch, Ellison, Williams, & Jackson, 2001).

**Internalized racism.** Internalized racism, or the acceptance of negative messages and stereotypes, has been conceptualized as a problematic psychological response to racism and chronic negative interactions, which might act as a pathway between social determinants and detrimental health outcomes (Williams & Mohammed, 2013). Internalized racism is associated with a whole spectrum of health outcomes including lower life expectancy, cardiovascular disease, abdominal obesity, high blood pressure, and psychological distress (Williams & Mohammed, 2009). However, this concept continues to be understudied (Williams & Mohammed, 2013), and this is even more pronounced for Latino populations (Hipolito-Delgado, 2010; Velez, Moradi, & DeBlare, 2015).

**Significance of the Present Study**

The present study is significant in addressing some key limitations of the existing literature. Many published studies rely on cursory measures of neighborhood level factors, oftentimes reducible to poverty or assumption of neighborhood disorganization (Henry et al., 2014). Moreover, the majority of the published literature tends to concentrate on a single outcome variable such as self-rated health (Poortinga et al., 2007; Weden et al., 2008). While this is an important outcome, more comprehensive studies are needed that allow for comparisons of associations between neighborhood factors and different health outcomes, including mental health.
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Furthermore, as previously described, there is a need to incorporate subjective measures of neighborhood conditions along with objective measures. The majority of the literature in this area has traditionally employed objective measures alone (Cummins et al., 2007; Diez Roux, 2001). Few studies to date have included perceived measures (Poortinga et al., 2007; Weden et al., 2008; Wen et al., 2006), and many of them did not include a Latino sample (Poortinga et al., 2007; Weden et al., 2008). Failure to include subjective or perceived measures may lead to misinterpretations of the full picture and may bias the estimates related to neighborhood conditions and health (Wen et al., 2006). The present study proposes a comprehensive approach to the measurement of neighborhood level factors by incorporating both subjective and objective measures in an effort to disentangle their effects on Latino health.

Finally, pathways by which neighborhood characteristics affect Latino health remain unclear. While an increasing number of studies have attempted to propose a mechanism (Almeida, Kawachi, Molnar, & Subramanian, 2009; Vega, Ang, Rodriguez, & Finch, 2011), few of these mechanisms are empirically tested (Rios, Aiken, & Zautra, 2012; Shell, Peek, & Eschbach, 2013). Furthermore, social cohesion and social support in Latino neighborhoods have been the dominant pathways under investigation (Rios et al., 2012; Snowden, 2005). However, mixed evidence remains in this area (Viruell-Fuentes & Schulz, 2009), and unexplored alternatives can provide a fuller picture of the complex interactions between individual characteristics, cultural adaptation process, and contextual variables such as neighborhood-related factors.

**Significance of a psychological approach.** Despite evidence pointing to the relevance of these psychological constructs, they are generally understudied when it
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comes to neighborhood and health-related investigations. When they are employed, rarely are they examined as potential pathways explaining the link between neighborhood conditions and Latino health (Boardman et al., 2001; Wen et al., 2006). Furthermore, typically cited mechanisms such as social cohesion and social capita (Almeida et al., 2009) may still function by affecting these psychological factors. These variables, if shown to be important in determining health outcomes can also become targets of interventions and health promotion strategies. For instance, interventions targeting stress reduction could help ameliorate the detrimental effects of residing in high-risk communities.

**Mixed methods research contribution.** Mixed methods research involves the collection, analysis, and integration of both quantitative and qualitative data (Schifferdecker & Reed, 2009), drawing upon the strength of each approach. Mixed methods studies have increased in the literature to examine complex relationships and understand factors related to lived experience (Creswell, Klassen, Plano, & Smith, 2011). Qualitative techniques allow for better interpretation of quantitative data, as well as offering guides for future research (Creswell et al., 2011). A mixed methods project is fairly unique in this line of inquiry. To date, few papers have employed either mixed methods (Elliott, Gale, Parsons, Kuh, & HALCyon Study Team, 2014) or qualitative designs (Chrisman, Notthwehr, Yang, & Oleson, 2015; Eriksson & Emmelin, 2013; Plane & Klodawsky, 2013). Moreover, mixed methods studies of Latino health and neighborhood context are particularly scarce (Ferrer, Cruz, Burge, Bayles, & Castilla, 2014; Y. Park, Quinn, et al., 2011; Rosenblum et al., 2014).
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The qualitative approach (aim 3) of the present study first aims at exploring subjective perceptions of neighborhood conditions and their related health impacts without constraining participants’ responses (Poortinga et al., 2007; Weden et al., 2008), which may oversimplify neighborhoods and miss important constructs. Thus, the exploratory use of the qualitative portion is aimed at offering more descriptive and contextual data of the lived experience of Latinos in their neighborhoods compared to what can be obtained via quantitative approaches alone. Moreover, the qualitative portion has the goal of confirming or challenging quantitative findings, while also adding depth to the meaning of potential interpretations.

**Overall significance of the present study.** As the Latino population grows, addressing their health needs and closing the health inequality gap should be a top priority for policy makers and health related scholars. Along with population growth, we have seen an increase of Latinos settling in non-traditional or emerging destinations (Singer, 2004). These are cities such Atlanta, Washington D.C., Seattle, Salk Lake City and others that are seeing a dramatic increase in the percentages of Latinos and immigrant populations (Singer, 2004; US Census Bureau, 2017). To ensure that Latinos can strive and become healthy contributing members of society, it is important that we understand how different factors related to their neighborhoods and community conditions foster good or detrimental health outcomes. This is not only crucial for current residents but also to ensure that the next generation enjoys good health and wellbeing.

Oftentimes, research related to Latino health overemphasizes the role of cultural factors and individual-level explanations such as acculturation. Although these are important, ignoring the impact of context and conditions of deprivation at the
neighborhood or community level would inevitably lead to an incomplete picture of Latinos experiences in this country. In the absence of a new generation of research, our state of knowledge will remain mixed, misleading future research efforts, as well as yielding uninformative recommendations to policy and prevention interventions. This would not only waste lives and financial resources but will also affect the public’s perception in our ability to improve health (Link & Phelan, 1995).

This study is also significant in addressing limitations found in the literature (see previous section) while also contributing a timely and much needed new perspective to the study of neighborhood-level context and Latino health. A psychological lens to the study of neighborhoods and health related effects is a unique approach. Furthermore, the proposed mixed methods design will aid in gaining a better perspective and contribute new knowledge with regards to the lived experience of Latinos in different neighborhoods. Results will generate preliminary evidence to lay down the groundwork for an empirical model of Latino health deterioration over time, a model that better accounts for the complexity in this line of inquiry. This project can challenge multiple fields and disciplines to consider the role of these variables while pointing out potential intervening variables that can inform policy and prevention interventions to eliminate Latino health inequities.

**Research Questions & Hypotheses**

1. **Investigate how perceived and objective neighborhood conditions influence Latino physical and mental health.**

   Hypothesis: *Neighborhood disadvantage will be associated with negative health outcomes. Further, perceived neighborhood conditions will be a*
better predictor of health compared to objective measures, i.e., factor scores representing disadvantage, affluence/gentrification, and age composition.

2. Examine the mediating role of psychological factors (e.g., self-efficacy, optimism, perceived stress, and internalized racism) in the association between neighborhood factors and Latino health.

   Hypothesis: Neighborhood deprivation will detrimentally affect psychological outcomes, which will in turn negatively impact health. Partial mediation effects are expected.

3. Qualitatively examine how Latinos perceive their neighborhood conditions and subsequent health impact. Additionally, explore potential nativity or neighborhood level effect.

   Hypothesis: Immigrant Latinos will express more optimistic perceptions of their neighborhoods and the respective health impact than US-born Latinos. More favorable perceptions are expected among those living in more affluent neighborhoods. More favorable perceptions will be positively associated with health.
Methods

Conceptual Model and Overview

**Conceptual model.** The present study proposes a model that investigates the role of psychological factors in explaining the association between contextual neighborhood conditions and Latino health. Quantitative aims (1,2) test for direct and mediating effects. The qualitative aim is conceptualized as an overarching aim to investigate these associations with richer contextual data and to describe in more detail the lived experience of Latinos in different communities. See Figure 1 for a visual representation of these relationships.

![Figure 1. Overall conceptual model](image)

**Mixed Methods Design**

A convergent design was employed in the present study (Curry & Nunez-Smith, 2014; Schifferdecker et al., 2009). A mixed method design allows for the combination of multiple methods, thus overcoming the inherent limitations of each separate method (i.e., quantitative and qualitative). Moreover, this approach allows for more sensitivity to nuances in an area of inquiry via the collection of different kinds of data (Patton, 2002). This is particularly relevant in this study to add context to quantitative data, and to
explore a complex and multifaceted area of inquiry. This mixed method approach also allows for enhancement and clarification of results (complementing), which aids in the interpretation and application of research findings to future studies (Creswell & Plano, 2018), as well as in increasing the confidence in the findings. Given that quantitative and qualitative aims are carried out concurrently, a convergent design also allows for cross-checking and validation of different data (Schifferdecker et al., 2009). In this design, data are typically integrated in the final stage via merging or embedding (Creswell et al., 2011; Curry et al., 2014). See Figure 2 for a visual representation. Thus, each data (i.e., quantitative and qualitative) is analyzed first using the standards of each of the respective methodologies. Convergence of findings from the two methods is then explored. Interpretations can then go beyond each of the methods alone.
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**Figure 2. Mixed methods design overview**

**Sample, Setting, Procedures, Recruitment and Compensation**

Using mixed methods, the present study recruited 376 Latino residents of Bernalillo County, the largest county in Albuquerque, New Mexico (NM). NM is a state rich in racial/ethnic diversity, with Latinos accounting for 49% of Bernalillo County’s population (US Census Bureau, 2015). Albuquerque has a history of Spanish colonization, with well-established Hispanic settlements, as well as a more recent history of migration primarily from Mexico. In addition to the Native American culture, both Spanish and Mexican influences have permeated the city culture. The presence of older generations tracing back to the Conquista and the Mexican American War with the
changing territories, along with more current waves of immigrants, have created complex and dynamic relationships among Latinos. Moreover, the city has agrarian roots with the land grants awarded to promote initial settlements and reward Spanish patrons.¹ Along with agriculture, a complex system of water sharing, the acequias, emerged with strong Hispanic cultural values, collaborative and hierarchical undertones. The city also enjoys a history of social organization around water rights, environmental contamination and racial and gender equality. These social organization movements have been more pronounced in the more underprivileged and predominantly Latino areas in the South side of Albuquerque.

Neighborhoods (i.e., zip codes and Census tracts) were stratified by low, medium and high-income communities to allow for exploration of different experiences based on socioeconomic standing. For this purpose, zip codes in Bernalillo County were classified as low, medium, and affluent/high income using aggregate data from the US Census and NM Department of Health indicating percent of individuals living in extreme poverty, age adjusted death rate, infant mortality, number of alcohol outlets, asthma cases, and percentage of renter occupied households. This composite index was conceptualized as a rough proxy for neighborhood SES, level of resources and general conditions. This study was approved by the University of New Mexico main campus IRB (Reference # 10715).

For the quantitative phase (aims 1 and 2), participants completed a series of questionnaires delivered either in person, over the phone or online using Opinio (1998-2014)(2016), a free secure software at UNM. Opinio offers multilingual functions, real-time data inspecting, downloading, and integration with statistical software such as SPSS

¹ http://www.albuqhistsoc.org/SecondSite/pkfiles/pk208landgrants.htm
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(IBM Corp, 2016). The in-person option included a pen-and-paper version of the survey. Assistance was offered for participants who requested it. For those with low levels of literacy and comfort with questionnaires, a research assistant aided in the completion of the full questionnaire. The full survey was available in both English and Spanish.

For the third and qualitative aim, a purposeful sample (Curry et al., 2014) was employed. In order to minimize bias, participants in the qualitative phase were drawn from the quantitative respondent pool (Creswell, Fetters, & Ivankova, 2004). Respondents who agree to be contacted for follow-up were invited to participate in a focus group discussion (aim 3) exploring perceived perceptions of neighborhood conditions, their respective health impact, and the lived experience of Latinos in their communities.

Participants were invited into groups based on language preference and their zip code classification as explained above (i.e., low, medium or high-income or resource community), regardless of their own or household income. However, household and zip code income are often times highly correlated. Nonetheless, given that the interest is at the neighborhood level, zip codes were used for homogeneity purposes within each group. Groups members might still vary in their personal or household income, among other demographic variables. Language preference and proficiency was confirmed with participants over the phone during the invitation and scheduling phase. This approach offers the possibility of having additional quantitative data on focus groups participants (e.g., demographics, mean level of optimism and objective neighborhood ratings). Thus, focus groups were stratified by neighborhood income or resource level and by language. For each low, medium and high-income category, two groups were conducted (one in
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English and one in Spanish). These data can then potentially serve to highlight differences based on ethnicity from those based on social class.

**Inclusion and exclusion criteria.** This study recruited Latinos, both male and female, over the age of 18 who reside in Bernalillo County, NM. Exclusion criteria include not identifying as Hispanic/Latino, those under 18 years of age, and not being a resident of Bernalillo County. Children under the age of 18 were excluded due to their potential lack of awareness of neighborhood conditions. Those living in Bernalillo for less than 1 year were excluded to ensure some level of stability on neighborhood residency (Sampson, Raudenbush, & Earls, 1997). In 2013 over 85% of the county residents had lived in the same household for a year or more (US Census Bureau, 2015). High proficiency in Spanish was required for the Spanish speaking focus groups.

**Recruitment.** Study flyers were posted at business, grocery stores, barbershops, churches, and clinics. Study advertisements were also posted at key locations normally visited by the Latino community throughout the city including the Hispanic Cultural Center, public libraries, and clinics serving low-income and uninsured groups such as Public Health clinics (five locations in Bernalillo county), First Choice clinics (three locations), and Centro Sávila (one location). Research assistants spent occasional time at some of these locations recruiting and delivering the paper version of the survey. This was done especially in low resourced neighborhoods with less Internet access and lower computer literacy. Second, in-person recruitment efforts occurred at a variety of events and activities throughout the city including back to school events, school fairs, free health fairs, monthly free activities at the Hispanic Cultural Center, and others. Third, a radio advertisement aired with study advertisement in both English and Spanish on a local
radio station during their public service announcement windows. Potential participants were directed to the study Facebook page for additional information and the link to the online survey or they could contact team members via phone for more information or to participate. Finally, data on Hispanics was obtained from Catalist, a national company offering survey researchers potential participants’ personal information using voter registration information. Data were obtained from this company for individuals with Hispanic surnames residing in Bernalillo County. This included names, addresses, and phone numbers. Emails were available for only a subset of individuals. Research assistants contacted individuals via email and phone to offer an invitation for the study.

**Screening.** For the online survey (aims 1 and 2) screening was conducted before participation in the survey. Screening questions consisted of inclusion and exclusion criteria. Individuals not meeting the criteria were thanked for their time and redirected to a home page. For the paper or phone version, screening was conducted by the researcher. Focus group screening occurred over the phone and in person at recruitment locations. Information was also requested regarding best contact information for reminders, preference for English or Spanish speaking focus groups, preference for hours and location, and the need for childcare or other accommodations.

**Informed consent.** Informed consent was completed prior to the completion of the survey. For those completing the paper version, informed consent occurred in person with the researcher. Online consent was obtained prior to participants being able to complete the survey. Information was provided on risk, benefits, time of completion, confidentiality, and compensation. In addition, individuals were given contact information for their records, including the PI, and UNM Institutional Review Board. For
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focus group participants, informed consent occurred in person using a paper form.

Additional details were provided regarding confidentiality in a group format, audio recording, and use of the qualitative data. Both consent forms included information on local referrals in the event of emotional distress.

Compensation. Survey participants were entered into a gift card raffle. One $30 gift card was raffled per every 10 participants and another $50 gift card was raffled per 50 participants. Hence, participants had two opportunities to earn gift cards with 1 in 10, and 1 in 50 chances. Winners were notified via their preferred method, phone or e-mail.

All focus group participants were compensated with a $30 department store gift card.

Table 1

Survey Measures Employed

<table>
<thead>
<tr>
<th>Purpose (time to complete)</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics (5-7 min)</td>
<td>Age, gender, race, nativity (time in US for foreign born), preferred language, personal and household income, number of individuals in the household, marital status, employment status, educational attainment, time of residency in their current neighborhood, Body Mass Index, and smoking status.</td>
</tr>
<tr>
<td>Objective Neighborhood Factors (1 min)</td>
<td>Home address providing access to Census tract information (see Appendix 1 for a list of variables)</td>
</tr>
<tr>
<td>Perceived Neighborhood Factors (12 min)</td>
<td>Aesthetic environment, walking/exercise environment, safety from crime, access to healthy foods, social cohesion (Sampson scale), and neighborhood problems index.</td>
</tr>
<tr>
<td>Psychological Mediators/Explanatory Factors (20 min)</td>
<td>Nutrition and Exercise Self-Efficacy Scale Optimism via Life Orientation Test- Revised (LOT-R) Perceived Stress Scale (PSS) Internalized racism via Collective Self-Esteem Scale</td>
</tr>
<tr>
<td>Outcomes (10 min)</td>
<td>SF-12 (includes self-rated health) Patient Health Questionnaire-9 (PHQ-9) Generalized Anxiety Disorder-7 (GAD-7) Alcohol Use Disorders Identification Test (AUDIT)</td>
</tr>
</tbody>
</table>
Procedure. Survey participants completed a series of questionnaires (aims 1 and 2), including demographic questions and home address for geocoding. Using this information, individuals’ self-reported data were linked to Census tract data in order to add objective measures of neighborhood factors while reducing participant burden. Table 1 summarizes all measures employed. Measures have known psychometric properties (described in the following section) and have been used in studies with Latino and minority populations. Completion time was estimated to be around 25 to 40 minutes. After completion, participants were asked if they could be contacted for follow up (i.e., focus group). As previously mentioned, the survey was available in pen-and-paper format, over the phone, or online. All materials were available in both English and Spanish.

For focus groups, approximately between eight and twelve participants were initially invited to each of the six groups. Given the heterogeneity of the Latino population and an interest in comparing immigrant and US-born Latino experiences, three focus groups were conducted in Spanish and three in English. Focus groups were held at Community Centers located in different quadrants of the City. Community Centers were conveniently located, offering evening hours and conference and meeting rooms accommodations. Completion time for each group was approximately 1.5 hours. As previously stated, focus group participants comprised a subset of the quantitative sample.

Measures

Participants answered a series of demographics questions including age, gender, educational level, racial identification, nativity and generational status, household and
personal income, household size, and others. Next, participants completed a series of scales measuring each construct of interest. Psychometric properties and other details of the scales are provided below.

*Subjective perceptions of neighborhood conditions.* Subjective measures of neighborhood conditions were obtained using a self-reported measure developed by Echeverria, Diez-Roux and Link (2004). This measure includes subscales assessing neighborhood domains such as aesthetic quality, walking/exercise environment, safety, access to healthy foods, and social cohesion. In line with the present study, their sample was composed primarily of Latinos and African Americans. Reported Cronbach’s α’s ranged from .77 to .94, with test–retest reliability ranging from 0.73 to 0.91.

*Psychological measures.* Self-efficacy was measured using the Nutrition Self-Efficacy and the Physical Exercise Self-Efficacy scales (Schwarzer & Renner, 2009). These are measures of individuals’ health-specific self-efficacy with factor analysis showing that each scale measures a unique dimension. Cronbach’s α was 0.87 for the nutrition scale and to 0.88 for the exercise scale. Test re-test reliability at six-month was 0.59 for the nutrition subscale (Schwarzer et al., 2009). These scales have been shown to correlate with nutrition and exercise behavior (.34 and .39 respectively) at six-month follow (Schwarzer et al., 2009).

Optimism was assessed via the Life Orientation Test-Revised measure (Scheier, Carver, & Bridges, 1994). This short scale measures an individual’s expectancies for positive and negative outcomes. Cronbach’s alpha was reported as .82 (Scheier et al., 1994). This scale was found to be positively correlated with measures of adaptive coping such as use of humor, turning to religion, active coping, seeking instrumental and
emotional support, and negatively correlated with depression, number of symptoms, and with alcohol use. Other empirical studies have concluded that this is an appropriate measure with Latin American samples (Zenger et al., 2013).

In addition, questions regarding belief in the American dream were included to tap into beliefs that hard work is sufficient to succeed in America, as well as optimistic ideas that the next generation would be better off than the current one. These additional questions were obtained from the Latino National Survey (“Latinos can get ahead in the United States if they work hard”) and the Pew Hispanic Research Center (e.g., “how confident are you that Latino children growing up in the US will have better jobs and make more money than you”).

In the case of perceived stress, the present study employed the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983). This widely used scale, designed for community samples, measures the extent to which individuals appraise their current life situation as stressful. High scores are predictive of failure to quit smoking, susceptibility to colds, vulnerability to depression elicited by stress, and mismanagement of diabetes (Cohen & Williamson, 1988). This scale has been used with Latino samples, with a reported Cronbach’s alpha of 0.77 (Flores et al., 2008; S. M. Perez, Gavin, & Diaz, 2015).

Internalized racism was measured using the Private subscale of the Collective Self-Esteem Scale (CSES; Luhtanen & Crocker, 1992). This short measure includes four-items assessing one’s judgments regarding our racial/ethnic group. Item selection was based on factor analysis. Test-retest reliability for this subscale was 0.62 after a 6-week period with a Cronbach’s alpha of 0.90. This subscale has been used in studies with
Latino samples as a measure of internalized racism with a Cronbach’s alpha of 0.81 (Velez et al., 2015). In another Latino study, this subscale was found to be associated with self-esteem and group attachment (Spencer-Rodgers & Collins, 2006).

**Health-related outcomes.** Outcome questionnaires include the Medical Outcomes Study Short-Form Health Study (SF-12, Ware, Kosinski, & Keller, 1996). This shorter version was found to be highly predictive of the longer version, the SF-36, with $R^2$ of 0.911 and 0.918 for physical and mental health components of the scale. The scale offers a total score for each of these components, the Physical Component Summary (PCS) and the Mental Health Component Summary (MSC). Validation tests over 14 studies revealed a median Cronbach’s alpha of 0.67 for physical health items and 0.97 for mental health items. Test-retest correlations were 0.89 and 0.76 respectively for physical and mental health components (Ware et al., 1996). This measure has been validated with both English and Spanish-speaking populations (Gandek et al., 1998). The SF-12 also includes an item regarding self-rated health (SRH) with options ranging from “5=excellent” to “1=poor.”. This simple item has been shown to be a valid and reliable measure of global health (Bombak, 2013). This item has been associated with physician’s assessments and mortality risk (Idler & Benyamini, 1997). Of note, for the Spanish translation of this item, “mas o menos” was employed as the translation of “fair” rather than “regular.” Research evidence suggests this translation helps reduce bias and suppressions of Latino SRH ratings (Sanchez & Vargas, 2016).

Depression symptoms were examined using the Patient Health Questionnaire-9 (PHQ-9, Spitzer, Kroenke, & Williams, 1999), a self-reported measure of depressive symptomatology. This measure can be used as a diagnostic screener and severity
measure. Cronbach’s alpha was 0.89 and authors reported excellent reliability. Other studies find similar validity and reliability properties with outpatient samples, α=0.85 and test-retest reliability of 0.89 (Bian, Li, Duan, & Wu, 2011), as well as with the general population (Martin, Rief, Klaiber, & Braehler, 2006). Evidence suggests that this is an appropriate measure for racial/ethnic minority groups including Latinos (Huang, Chung, Kroenke, Delucchi, & Spitzer, 2006).

Anxiety was measured via the Generalized Anxiety Disorder-7 (GAD-7, Spitzer, Kroenke, Williams, & Löwe, 2006). This scale has been found to have excellent validity, Cronbach’s α = .92, and an intraclass correlation of 0.83. Scores on the GAD-7 were predictive of mental health, pain, general perceptions of health, and physical functioning (Spitzer et al., 2006). This scale, along with its Spanish version, has been found appropriate for use among Latinos in the US (Mills et al., 2014).

Alcohol use was assessed with the Alcohol Use Disorders Identification Test (AUDIT, Babor, Higgins-Biddle, Saunders, Monteiro, & Dependence, 2001). This short measure developed by the World Health Organization as a screen for hazardous alcohol use, alcohol dependence and harmful alcohol use. A recent review of the literature indicated that the AUDIT has psychometric properties comparable or superior to other self-report screening measures (Reinert & Allen, 2002) with validity and reliability scores generally in the 0.80s (Allen, Litten, Fertig, & Babor, 1997). This is an appropriate measure for use across gender and cultures (Allen et al., 1997; Saunders, Aasland, Amundsen, & Grant, 1993).

*Focus groups.* A focus group guide was developed asking participants to reflect on 1) their neighborhood conditions in an attempt to further explore perceived
neighborhood factors, 2) the connection between neighborhood conditions and health in general as related to aim 1, 3) how their neighborhood affects their psychological functioning (e.g., stress, optimism), and 4) in turn how this affects their health. These last two questions are designed to explore aim 2. Finally, participants were asked what should be done (“if you had one minute with the governor, what would you say”) in order to inform policy and other potential interventions. As the moderator of all groups, I provided summaries of the discussion throughout the group and a final summary at the end. Time was allowed during and at the end of each group for participants to respond and give feedback regarding summaries of key points provided.

**Analytic Strategy**

**Quantitative models exploring neighborhoods and health (aim 1).** Preliminary analyses were conducted to check variables for non-normality, the presence of multicollinearity, and scale reliability indicators. Second, means and standard deviations for sociodemographic variables, perceived neighborhood conditions, and outcome measures were examined. Statistical differences in these variables according to nativity and neighborhood income level were assessed via independent sample t-tests and chi-squared tests. SPSS 24 (2016), STATA 14 (StataCorp LLC, 2017), and Atlas.ti version 8.1 for Mac (Scientific Software Development GmbH, 2018) was employed for all analyses.

Census data at the tract level was obtained using the American Community Survey (US Census Bureau, 2014). Data were downloaded in excel format. A total of 20 relevant variables were organized into a master version per Census tract. Variable selection followed previous published work with Latinos (Morenoff et al., 2007).
Examples of variables of interest include percent unemployed, % female-headed household, % foreign-born, % Hispanic, % with less than 12 years of education, % owner occupied homes, % professional/managerial occupation, and % families in poverty. Due to issues of normality with percentage data, a logit or logistic transformation\(^2\) was employed with all census tract data. Logit p cannot be determined for values of 0 and 1. Thus, 0.1 was added to all variables before conducting the log transformation. Given the large number of variables, exploratory and confirmatory factor analyses were conducted following Morendoff and colleagues’ work (2007). Factor scores are standardized with a mean of zero and a standard deviation of one. Several studies have used this methodology successfully with Latino samples (Viruell-Fuentes, Morenoff, Williams, & House, 2013; Viruell-Fuentes, Ponce, & Alegría, 2012). Factors found with this method tend to represent socioeconomic disadvantage, affluence/gentrification, and age composition (Viruell-Fuentes et al., 2012). Factor scores were saved and merged with each individual’s self-reported data.

Subjective neighborhood condition variables were centered within the cluster following recommendations by Enders and Tofighi (2007) for multilevel model centering in cross-sectional studies. Furthermore, intraclass correlation coefficients (ICC) were utilized to determine the need for multilevel vs linear regression models for each of the dependent variables. ICC values were calculated for both null and full models. For models with ICC close to zero, a linear model was employed. This low cut-off for the ICC was employed due to studies showing that ICCs for neighborhoods are typically around 10% or less (Diez Roux, 2007). For dependent variables with at least 1% of the

\(^2\) OR logit \( p = \log \left[ \frac{p}{(100 - p)} \right] \) where \( p \) = percentage
variance at the neighborhood level multilevel models were employed (Snijders & Bosker, 2012). A random intercept model was employed for multilevel models. These models allow for intercepts to vary by groups, thus properly accounting for the nestedness of the data. Each group then can be thought of as having its own regression line, which is parallel to the overall or average regression line. Variance parameters are obtained for each level of the data, i.e., individuals and neighborhoods. Sample size limitations prohibited the use of random slope models, in which both slopes and intercepts are allowed to vary by group.

**Model building approach.** A bottom up variable selection approach was utilized in which models were tested for each outcome variable independently. Model 1 included demographic control variables such as gender, age, education, language preference, employment, marital status, personal and household income. Models 2 and 3 introduced subjective neighborhood conditions (e.g., aesthetics, walkability, access to health foods, and neighborhood problem index) and factor scores from Census tract data, respectively. For each model, a backward selection approach with a “relaxed” cut-off of $p \leq .20$ for variables’ retention was used. This choice of cut-off value was slightly more generous than the simulation-based recommendation of Sauerbrei (1999) to use a value of $\alpha = .157$. This step-wise approach to model building was employed to arrive at a parsimonious model for each outcome of interest. While regression modeling is a complex topic (Harrell, 2015), this approach with a bounded number of planned, possible backward elimination steps on a small number of variables was also designed to help limit the model instability that can be associated with more general stepwise subset selection methods (Morozova, Levina, Heimer, & Uuskuela, 2015). In addition to using $p$
≤ .20 as cut-off, other model fit indices were also considered, such as RMSEA, chi-square significance, and log-likelihood. Thus, it is possible that a variable does not meet the cut-off, however, if other model fit parameters indicate that the variable accounts for a significant amount of variance and/or contributes to better model fit, this variable would be kept in subsequent models.

Given the co-occurrence of depression and anxiety in the general population, and literature suggesting that both variables assess psychological distress (Hirschfeld, 2001; Kaufman & Charney, 2000), a seemingly unrelated regression model (Zellner, 1962) was employed. This approach allows for correlated error terms between both regression models. Seemingly unrelated regression models provide a generalization of more traditional MANCOVA models and allow for more efficient estimation in cases in which outcomes are correlated. In this regard, anxiety and depression can each have their unique predictors, while error terms are allowed to correlate. R-squared statistics, representing proportion of explained variance, were calculated. As previously discussed, $p \leq .20$ was used as the threshold for variable selection, while $p \leq .05$ was employed for statistical significance.

**Quantitative mediation models (aim 2).** Mediation analyses were performed using the Monte Carlo Method for Assessing Mediation (MCMAM) as described by Selig and Preacher (2008) and employed with multilevel regression models (Bauer, Preacher, & Gil, 2006). In this procedure, parameter estimates from linear and multilevel models ($a =$ association between neighborhood variables and psychological factors; $b =$ association between psychological factors and outcome variable) and their asymptotic variances and covariance are entered into a macro software provided by Preacher.
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(quantpsy.org), which runs the Monte Carlo simulation using R software. This procedure expands on the traditional Sobel test for mediation by directly testing for the significance of the indirect effect using a bootstrapping approach (Preacher & Hayes, 2004). Moreover, this strategy does not assume normality for the $a^*b$ sampling distribution and has been shown to perform better than the Sobel test (MacKinnon, Lockwood, & Williams, 2004).

Mediation models were conducted for each outcome and mediation variable of interest. This aim builds upon findings from aim 1. Key control demographic variables from final aim 1 models were retained during these analyzes in order to obtained more accurate estimates. Additionally, similar approaches were used to obtain estimates for $a$ and $b$ as were employed during the first aim. For example, similar approaches were employed with regards to linear vs multilevel models, and traditional regression vs seemingly unrelated regressions used for anxiety and depression. Of note, for aim 1 models in which intraclass correlation coefficients indicated no significant clustering issues, linear mediation models were conducted. Due to the complexity of the baseline models, mediators were tested one at a time rather than in a multi-mediator strategy.

For models showing significant clustering, multilevel mediation models were employed. Neighborhood variables (both subjective and objective) were conceptualized as the key independent variables. However, depending on their level of measurement, different strategies were used. Objective and subjective perceptions of neighborhood conditions are measured at different levels (objective at level 2 or neighborhood level, and subjective at level 1 or individual level). In the literature, these are different kinds of mediation models (Bauer et al., 2006). Lower level mediation of upper level effect
(2→1→1) refers to an independent variable of interest measured at the level 2, with a mediator and outcome variable measured at the level 1. For the present study, this occurs when examining models with key Census level variables as the predictors. Mediators (psychological constructs) and health outcomes are measured at level 1, or individual level. For perceived or subjective measures (level 1) of neighborhood conditions, a lower level mediation of lower level effect (1→1→1) was employed. This is a unique mediation model in that the $a$, $b$, and $c^3$ effects can be random, thus necessitating additional considerations. In this case, a modified version of the previously discussed Monte Carlo online macro was used (Bauer et al., 2006). This procedure has been adapted for estimating indirect effects in multilevel models with random effects.

**Qualitative overarching aim 3.** This study follows published guidelines to conduct and analyze data from focus groups (Krueger & Casey, 2008). A focus group guide was developed and finalized before conducting the groups. A draft of the questions can be found on Appendix 2. Questions were designed to parallel the information being obtained using quantitative methods (aims 1 and 2). Thus, quantitative and qualitative methods explore the same conceptual model (see Figure 1). This would also allow for better integration and triangulation of the data.

Focus groups were audiotaped, in addition to extensive notes taken during the discussion with the help of bilingual undergraduate research assistants. Audiotapes were transcribed verbatim. An inductive or bottom up coding approach was used to generate an initial set of codes, which was later revised and condensed based on the literature. For instance, in the case of the first question regarding neighborhood conditions, it was

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3 $c =$ total effect of $X$ on $Y$
expected that answers would cover relevant domains such as crime, exercise opportunities, aesthetics, presence of recreational facilities, environmental contamination, access to healthy foods, and so on. Thus, this coding strategy encompasses both a top down and a bottom up approach.

All transcripts were coded independently by three coders (two graduate students including the author of this paper, and one post-baccalaureate research assistant) in order to increase reliability. After coding each focus groups transcript, I reviewed the three versions and highlighted any discrepancies. In weekly meetings, we discussed discrepancies and achieved consensus. These meetings also served to discuss coding strategies, emerging codes, and for training.

A thematic analysis was conducted at two levels, within each group and across groups, to identify common themes (Creswell, 2003). Atlas.ti, a specialized qualitative software, was employed for storage, coding, and theme development. Triangulation of different data sources and inter-coder agreement were employed as strategies for verification and ensuring rigor. Verification also occurred by allowing focus group members to respond to summaries of the key points discussed at the end of each group. Moreover, to ensure a systematic analysis I employed notes from the debriefing between the myself and the assistant moderator immediately after each group. Memos were also kept and updated during each coding meeting. These memos were employed to track processes during the coding (e.g., coder's reactions to pieces, summaries of the data, thoughts on larger picture constructs, connection between constructs). Scale coding was employed to give frequency of responses, also referred to as frequency scale coding.
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(Castro, Kellison, Boyd, & Kopak, 2010). This was employed to assess potential gradients and better explore groups differences.

Finally, given the heterogeneity of the Latino population and the relevance of potential differences among immigrant and US-born population, themes were compared and contrasted between Spanish and English-speaking focus groups. One hypothesis is that Spanish-speaking groups would have more positive perceptions of their neighborhood conditions and hence lower perceived negative impact on their health. This hypothesis stems in part from potential comparisons immigrants might be making using their home country as a baseline. Additionally, it is possible that optimism and beliefs in the American dream might lead to more positive appraisals of community conditions and resources.

Integration of quantitative and qualitative data. Integration refers to the process of mixing qualitative and quantitative methods (Creswell et al., 2003; Curry et al., 2014). Integration occurred in the interpretation stage of this mixed methods design via merging (Curry et al., 2014), which is typical of convergent designs (Onwuegbuzie & Teddlie, 2003; Schifferdecker et al., 2009). Using this approach, findings from both quantitative and qualitative portions of the study are compared and examined for convergence or divergence. Findings from both methods are combined to generate conclusions that go above and beyond what each method could achieve on its own. This has been referred to as “deep structure” conclusions (Castro et al., 2010). Divergent findings among the two phases (quantitative and qualitative) were resolved by investigating similar patterns in the published literature, by further analyzing data to follow up on specific hypothesis if possible, and by conceptualizing future hypothesis
that could help explain the differences. Results from both phases are presented simultaneously for corroboration, enhancement, and clarification.

**Power Analysis.** Using the PinT software (*Power in Two-Level Designs*) and estimates provided by previous research (Viruell-Fuentes et al., 2013; Weden et al., 2008; Wen et al., 2006) a sample of size of 341 participants was estimated to obtain a power level of 0.80 to detect main effects in the full aim 1 model, plus the addition of psychological variables. Anticipated effect sizes are in the small to medium range. In addition, this power calculation allowed for a 0.20 error rate and an intraclass correlation of 0.16, as found by Viruell-Fuentes and colleagues (2013). Parameter estimates from this model are used for aim 2, hence the same sample size will suffice for both aims. While there might not be enough power to explore differences based on gender, nativity, or interaction effects, results can serve as preliminary evidence and initial parameter estimates for larger studies.
Results

A total of 361 participants were recruited and included in the present study. The sample includes data on 109 different Census tracts and 18 different zip codes across the city metro area. Of these tracts, 51.7% were classified as low-income, 29% of medium or moderate income, and 19.3% as high-income tracts. This distribution reflects the overrepresentation of Latinos in more underserved areas of the city. The majority of the sample participated in person (78%), with fewer percentages completing materials online (14%) or over the phone (8%).

Quantitative Results (Aim 1)

Checks were conducted for normality, multicollinearity and other data abnormalities. Outliers were also checked to correct any scoring and/or data entry errors. Potential normality issues were found for the Collective Self-Esteem scale and for the AUDIT. Both of these scales exhibited a right or positively skewed distribution with the majority of the cases reporting high levels of collective self-esteem (scored with lower values) and not reporting any problematic drinking, thus scores accumulating on the left side of the distribution. Follow up included the Shapiro-Wilk parametric test, which tests the null hypothesis that data was drawn from a normal distribution. Results for the Collective Self-Esteem and the AUDIT revealed a significant test (.76 and .59, both with \( p < .001 \)) indicating that the data are not normally distributed. As a result, both variables were transformed using a natural log transformation. These transformed variables were used in subsequent analysis. Improvements were seen in skewness, kurtosis, and QQ plots following the transformation. Values on the Shapiro-Wilk test improved; however, they continued to be significant.
Descriptive statistics. Table 2 shows sample characteristics and comparisons among immigrant \((n=139)\) and US-born Latinos \((n=222)\). Overall, similarities in background and demographic characteristics were observed for both groups. Similar age distributions and gender representation were observed. Additionally, immigrant and US-born Latinos reported similar rates of employment, marital status, and preference for bilingualism and English language use. Comparable rates were also found for percentages in each group with incomes categorized as 300% below the poverty line.

Significant differences were observed in education, with immigrant Latinos being less likely to have completed high school \((26.6\% \text{ vs } 3.2\% \text{ for less than high school education})\) or college \((71\% \text{ vs } 56\% \text{ for less than college education})\). Immigrant Latinos were also less likely to racially identify themselves as White \((59\% \text{ vs } 69\%)\). As expected, another key difference was found on language proficiency. Immigrant Latinos were more likely to report monolingual Spanish preference \((54.7\%)\), while US-born Latinos tended to report monolingual English language preferences \((61.3\%)\). Also, as expected, significant differences were observed among the two groups in generational status with US-born Latinos accounting for all reports of second to fifth generation status. Finally, a key demographic difference emerged in personal income and income-to-needs ratio with immigrant Latinos overrepresented in the below poverty income categories and reporting less income after controlling for family size \(i.e., \text{income-to-needs ratio})\).
### Table 2
**Descriptive Statistics for Immigrant and US-Born Latino Samples**

<table>
<thead>
<tr>
<th></th>
<th>Immigrant Latinos (n=139)</th>
<th>US-born Latinos (n=222)</th>
<th>Test Statistic (df)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (% female)</td>
<td>71.9%</td>
<td>68.9%</td>
<td>$\chi^2 (1)=0.45$</td>
</tr>
<tr>
<td>Age (SD)</td>
<td>42.32 (13.25)</td>
<td>43.20 (16.82)</td>
<td>$t (351)=0.52$</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than High School</td>
<td>26.6%</td>
<td>3.2%</td>
<td>$\chi^2 (1)=44.40^{**}$</td>
</tr>
<tr>
<td>Less than College Degree</td>
<td>71.2%</td>
<td>55.9%</td>
<td>$\chi^2 (1)=9.11^{**}$</td>
</tr>
<tr>
<td>Currently employed</td>
<td>59.7%</td>
<td>58.6%</td>
<td>$\chi^2 (1)=.09$</td>
</tr>
<tr>
<td>Currently married</td>
<td>47.5%</td>
<td>37.8%</td>
<td>$\chi^2 (1)=3.46^{†}$</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>59.0%</td>
<td>69.4%</td>
<td>$\chi^2 (1)=4.30^{*}$</td>
</tr>
<tr>
<td>Black</td>
<td>0.7%</td>
<td>0.5%</td>
<td>$\chi^2 (1)=0.11$</td>
</tr>
<tr>
<td>AI/AN</td>
<td>0.7%</td>
<td>1.8%</td>
<td>$\chi^2 (1)=0.74$</td>
</tr>
<tr>
<td>Asian</td>
<td>0%</td>
<td>0.5%</td>
<td>$\chi^2 (1)=0.63$</td>
</tr>
<tr>
<td>Pacific Islander/Hawaiian</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>25.0%</td>
<td>16.6%</td>
<td>$\chi^2 (1)=3.72^{†}$</td>
</tr>
<tr>
<td>Mixed</td>
<td>9.6%</td>
<td>11.2%</td>
<td>$\chi^2 (1)=0.22$</td>
</tr>
<tr>
<td>Spanish proficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monolingual Spanish</td>
<td>54.7%</td>
<td>.5%</td>
<td>$\chi^2 (1)=148.07^{**}$</td>
</tr>
<tr>
<td>Bilingual</td>
<td>39.6%</td>
<td>36.9%</td>
<td>$\chi^2 (1)=.163$</td>
</tr>
<tr>
<td>Monolingual English</td>
<td>5.8%</td>
<td>61.3%</td>
<td>$\chi^2 (1)=112.27^{**}$</td>
</tr>
<tr>
<td>Generational status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First generation</td>
<td>100%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Second generation</td>
<td>0%</td>
<td>38.9%</td>
<td>$\chi^2 (1)=66.22^{**}$</td>
</tr>
<tr>
<td>Third generation</td>
<td>0%</td>
<td>24.2%</td>
<td>$\chi^2 (1)=107.39^{**}$</td>
</tr>
<tr>
<td>Fourth generation or more</td>
<td>0%</td>
<td>36.9%</td>
<td>$\chi^2 (1)=64.67^{**}$</td>
</tr>
<tr>
<td>Personal Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300% below poverty</td>
<td>16.5%</td>
<td>11.7%</td>
<td>$\chi^2 (1)=1.82$</td>
</tr>
<tr>
<td>Below poverty</td>
<td>36%</td>
<td>25.2%</td>
<td>$\chi^2 (1)=5.14^{*}$</td>
</tr>
<tr>
<td>300% above poverty</td>
<td>13.7%</td>
<td>28.8%</td>
<td>$\chi^2 (1)=10.93^{**}$</td>
</tr>
<tr>
<td>Income-to-needs ratio a</td>
<td>1.54 (1.21)</td>
<td>2.27 (1.57)</td>
<td>$t (343)=3.35^{**}$</td>
</tr>
</tbody>
</table>

*Note. N= 361 ** p<0.01, * p<0.05. a Income-to-needs ratio represents the ratio of family income and relative to the poverty line adjusted for family size. For example, 2 indicates that the family income is two times the poverty line or 200% above poverty. † Marginally significant ($p < .10$).*
Table 3 includes information on descriptive statistics, scales reliability and further comparisons among immigrant and US-born Latinos for each. Both groups were comparable for the majority of the neighborhood conditions measured including safety from crime, access to healthy foods, social cohesion and neighborhood problems. Similarities were also observed for mean scores in psychological variables including nutrition and exercise self-efficacy, optimism and internalized racism. Moreover, immigrant and US-born Latinos also reported comparable levels of anxiety, depression, and overall mental health as measured by the MCS.

Significant differences among perceived neighborhood variables were found for aesthetic environment with immigrant Latinos reporting lower levels of beauty and aesthetically pleasing communities compared to their US-born counterparts. Similarly, immigrant Latinos reported lower levels of walkability and exercise opportunities in their neighborhoods compared to US-born Latinos. Regarding psychological constructs of interest, significant differences were found for belief in the American dream and perceived stress. Immigrant Latinos endorsed higher levels of belief in the American dream and opportunities via hard work regardless of racial/ethnic or socioeconomic background, and lower levels of perceived stress compared to US-born Latinos. Finally, in terms of outcomes, immigrants reported higher levels of physical health on the PCS of the SF-12 (e.g., lower levels of disability, pain, interference with activities of daily living) and lower levels of hazardous drinking compared to their US-born counterparts. Interestingly, immigrants also reported lower levels of self-rated health compared to native born Latinos. However, the difference is unlikely to be clinically significant (3.07 vs 3.36 on a 1-5 scale).
Table 3.  
*Means, Standard Deviations, and Scale Reliability for Immigrant and US-born Latino*

<table>
<thead>
<tr>
<th></th>
<th>Cronbach alpha</th>
<th>Immigrant Latinos (n=139)</th>
<th>US-born Latinos (n=222)</th>
<th>Test Statistic (df)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neighborhood Related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aesthetic environment</td>
<td>α=.91</td>
<td>3.22 (1.17)</td>
<td>3.50 (0.98)</td>
<td>t (359)=2.44*</td>
</tr>
<tr>
<td>Walking/exercise environment</td>
<td>α=.80</td>
<td>3.24 (0.81)</td>
<td>3.41 (0.71)</td>
<td>t (359)=2.16*</td>
</tr>
<tr>
<td>Safety from crime b</td>
<td>α=.71</td>
<td>3.04 (0.98)</td>
<td>3.21 (0.93)</td>
<td>t (358)=1.66†</td>
</tr>
<tr>
<td>Access to healthy foods</td>
<td>α=.97</td>
<td>3.26 (1.24)</td>
<td>3.22 (1.10)</td>
<td>t (358)=.28</td>
</tr>
<tr>
<td>Social cohesion (Sampson scale)</td>
<td>α=.62</td>
<td>3.14 (0.65)</td>
<td>3.21 (0.67)</td>
<td>t (358)=.86</td>
</tr>
<tr>
<td>Neighborhood problems index</td>
<td>α = .93</td>
<td>1.62 (0.51)</td>
<td>1.62 (0.52)</td>
<td>t (359)=.06</td>
</tr>
<tr>
<td><strong>Psychologically Related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition Self-Efficacy</td>
<td>α=.94</td>
<td>2.95 (0.83)</td>
<td>3.03 (0.76)</td>
<td>t (359)=0.89</td>
</tr>
<tr>
<td>Physical Exercise Self-Efficacy</td>
<td>α=.94</td>
<td>2.65 (0.93)</td>
<td>2.74 (0.93)</td>
<td>t (359)=0.88</td>
</tr>
<tr>
<td>Optimism (LOT-R)</td>
<td>α=.65</td>
<td>16.13 (3.97)</td>
<td>15.42 (4.35)</td>
<td>t (359)=-1.55</td>
</tr>
<tr>
<td>Belief in the American Dream</td>
<td>α=.87</td>
<td>2.95 (1.15)</td>
<td>2.68 (1.08)</td>
<td>t (359)=2.19*</td>
</tr>
<tr>
<td>Perceived Stress Scale</td>
<td>α=.85</td>
<td>15.47 (6.33)</td>
<td>17.08 (7.11)</td>
<td>t (359)=2.17*</td>
</tr>
<tr>
<td>Internalized Racism (Collective Self-Esteem Scale – Private subscale)</td>
<td>α=.68</td>
<td>1.81 (1.09)</td>
<td>1.84 (1.13)</td>
<td>t (357)=.29</td>
</tr>
<tr>
<td><strong>Health Related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Component Summary d</td>
<td>α=.78</td>
<td>42.72 (5.75)</td>
<td>41.06 (5.84)</td>
<td>t (359)=-2.64**</td>
</tr>
<tr>
<td>Mental Health Component Summary d</td>
<td>α=.84</td>
<td>45.04 (7.24)</td>
<td>45.50 (8.22)</td>
<td>t (359)= .55</td>
</tr>
<tr>
<td>Self-Rated Health d</td>
<td></td>
<td>3.07 (1.03)</td>
<td>3.36 (1.06)</td>
<td>t (354)= 2.56*</td>
</tr>
<tr>
<td>Depression (PHQ-9)</td>
<td>α=.90</td>
<td>5.13 (4.96)</td>
<td>5.65 (6.22)</td>
<td>t (349)=.82</td>
</tr>
<tr>
<td>Anxiety (GAD-7)</td>
<td>α=.93</td>
<td>4.43 (5.00)</td>
<td>5.02 (5.98)</td>
<td>t (346)=.94</td>
</tr>
<tr>
<td>Alcohol Use (AUDIT)</td>
<td>α=.85</td>
<td>1.94 (3.62)</td>
<td>3.11 (5.12)</td>
<td>t (350)=2.32*</td>
</tr>
</tbody>
</table>

*Note.** p<0.01, * p<0.05. Cronbach alpha reliability scores are reported for the full sample. No alpha score is reported for self-rated health as it is composed of a single item. a Higher scores correspond to less neighborhood disadvantage. b Scale composed of only three items. c Scale composed of only four items. d Subscales of the SF-12; higher scores correspond to better health. † Marginally significant (p < .10).
## Table 4

**Descriptive Statistics by Neighborhood-Income Level for Key Demographic, Neighborhood, Psychological and Health Outcome Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Low-income neighborhoods ( (n=181) )</th>
<th>Medium-income neighborhoods ( (n=101) )</th>
<th>High-income neighborhood ( (n=68) )</th>
<th>Significance Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Immigrant (n, %)</td>
<td>85 (47) (^{a,b})</td>
<td>31 (31)</td>
<td>19 (28)</td>
<td>( \chi^2(2)=11.27^{**} )</td>
</tr>
<tr>
<td>Less than High School</td>
<td>20.3% (^{a,b})</td>
<td>2.9%</td>
<td>2.9%</td>
<td>( \chi^2(2)=24.95^{**} )</td>
</tr>
<tr>
<td>Less than College Degree</td>
<td>74.7% (^{a,b})</td>
<td>50.5%</td>
<td>44.1%</td>
<td>( \chi^2(2)=25.23^{**} )</td>
</tr>
<tr>
<td>Currently employed</td>
<td>59%</td>
<td>65.3%</td>
<td>52.9%</td>
<td>( \chi^2(2)=2.69 )</td>
</tr>
<tr>
<td>Income-to-needs ratio</td>
<td>1.52 (1.16) (^{a,b})</td>
<td>2.47 (1.60)</td>
<td>2.56 (1.64)</td>
<td>( F(2)= 21.11^{**} )</td>
</tr>
<tr>
<td><strong>Neighborhood Related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aesthetic environment</td>
<td>3.04 (1.09) (^{a,b})</td>
<td>3.64 (0.97)</td>
<td>3.91 (.78)</td>
<td>( F(2)= 23.05^{**} )</td>
</tr>
<tr>
<td>Walking/exercise environment</td>
<td>3.14 (.78) (^{a,b})</td>
<td>3.53 (0.69)</td>
<td>3.67 (.55)</td>
<td>( F(2)= 18.47^{**} )</td>
</tr>
<tr>
<td>Safety from crime</td>
<td>2.85 (.98) (^{a,b})</td>
<td>3.33 (0.88) (^{c})</td>
<td>3.66 (.71)</td>
<td>( F(2)= 23.06^{**} )</td>
</tr>
<tr>
<td>Access to healthy foods</td>
<td>2.98 (1.15) (^{a,b})</td>
<td>3.48 (1.15)</td>
<td>3.62 (0.99)</td>
<td>( F(2)= 10.98^{**} )</td>
</tr>
<tr>
<td>Social cohesion (Sampson scale)</td>
<td>3.09 (.67) (^{a,b})</td>
<td>3.27 (.63)</td>
<td>3.35 (.67)</td>
<td>( F(2)= 4.79^{*} )</td>
</tr>
<tr>
<td>NPI (^{d})</td>
<td>1.80 (.55) (^{a,b})</td>
<td>1.44 (.40)</td>
<td>1.40 (.36)</td>
<td>( F(2)= 28.35^{**} )</td>
</tr>
<tr>
<td><strong>Psychologically Related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition Self-Efficacy</td>
<td>2.94 (.80) (^{b})</td>
<td>3.04 (.75)</td>
<td>3.16 (.75)</td>
<td>( F(2)= 2.08 )</td>
</tr>
<tr>
<td>Physical Exercise Self-Efficacy</td>
<td>2.62 (.95) (^{b})</td>
<td>2.74 (.95)</td>
<td>2.90 (.88)</td>
<td>( F(2)= 2.33^{†} )</td>
</tr>
<tr>
<td>Optimism (LOT-R)</td>
<td>15.74 (4.11)</td>
<td>15.88 (4.37)</td>
<td>15.56 (4.35)</td>
<td>( F(2)= .12 )</td>
</tr>
<tr>
<td>Belief in the American Dream</td>
<td>2.76 (1.14)</td>
<td>2.76 (1.15)</td>
<td>2.93 (.95)</td>
<td>( F(2)= .64 )</td>
</tr>
<tr>
<td>Perceived Stress Scale</td>
<td>16.61 (6.78)</td>
<td>16.22 (6.39)</td>
<td>16.50 (7.52)</td>
<td>( F(2)= .11 )</td>
</tr>
<tr>
<td>Internalized Racism (^{e})</td>
<td>1.75 (1.12)</td>
<td>1.88 (1.16)</td>
<td>1.92 (1.01)</td>
<td>( F(2)= .71 )</td>
</tr>
<tr>
<td><strong>Health Related</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Rated Health</td>
<td>3.20 (1.08)</td>
<td>3.22 (.99)</td>
<td>3.46 (1.07)</td>
<td>( F(2)= 1.52 )</td>
</tr>
<tr>
<td>Physical Component Summary</td>
<td>41.83 (5.70)</td>
<td>41.79 (5.84)</td>
<td>41.31 (6.55)</td>
<td>( F(2)= .20 )</td>
</tr>
<tr>
<td>Mental Health Component Summary</td>
<td>45.85 (7.53)</td>
<td>45.34 (8.40)</td>
<td>44.50 (7.67)</td>
<td>( F(2)= .75 )</td>
</tr>
<tr>
<td>Depression (PHQ-9)</td>
<td>5.58 (5.98)</td>
<td>5.25 (5.38)</td>
<td>5.37 (6.01)</td>
<td>( F(2)= .11 )</td>
</tr>
<tr>
<td>Anxiety (GAD-7)</td>
<td>4.85 (5.71)</td>
<td>4.78 (5.65)</td>
<td>4.74 (5.55)</td>
<td>( F(2)= .01 )</td>
</tr>
<tr>
<td>Alcohol Use (AUDIT)</td>
<td>3.08 (5.49)</td>
<td>2.14 (3.74)</td>
<td>2.37 (3.43)</td>
<td>( F(2)= 1.45 )</td>
</tr>
</tbody>
</table>

**Note.** *\( p<0.05, \) **\( p<0.01. \) Unless otherwise indicated, table showing means and standard deviation, M (SD). NPI= Neighborhood Problem Index. \(^{a}\) Significant difference between low income and medium-income neighborhoods. \(^{b}\) Significant difference between low-income and high-income neighborhoods. \(^{c}\) Significant difference between medium income and high-income neighborhoods. \(^{d}\) Higher values constitute more problematic issues in the neighborhood. \(^{e}\) Measured by the Collective Self-Esteem Scale – Private subscale. \(^{†}\) Marginally significant (\( p < .10). \) Missing data due to 11 participants not reporting their home address and/or zip code.
Table 4 presents statistics for demographics and scales by neighborhood SES. Based upon results of the omnibus tests, post-hoc pairwise T-test comparisons were conducted to investigate specific group differences. Significant differences were found on key demographic variables including % immigrant, education and income-to-needs ratio. Low-income tracts have significantly higher proportion of immigrants compared to medium-income tracts, $\chi^2(1) = 8.42, p < .01$, and to high-income tracts, $\chi^2(1) = 6.75, p < .01$. Medium and high-income neighborhoods did not differ with regards to % immigrants, $\chi^2(1) = .01, p = .92$. Similarly, low-income tracts were more likely to have a higher proportion of individuals with less than high school education and with less than a college education compared to both medium ($t[281] = -4.12, p < .001$ and $t[281] = -4.24, p < .001$ respectively) and high-income tracts ($t[248] = -3.44, p < .001$ and $t[248] = -4.74, p < .001$ respectively). No differences were found among medium and high-income tracts in terms of educational attainment. Significant differences were also found for income with low-income tracts exhibiting a lower income-to-needs ratio compared to medium, $t(258) = -4.72, p < .001$, and high-income tracts, $t(224) = -4.19, p < .001$. No differences were found among medium and high-income tracts.

Table 4 also shows differences in neighborhood related variables by tract income level. Significant differences were observed for all six subjective or self-reported neighborhood scales. A consistent gradient was observed in which participants in lower income tracts reported the worse levels in all variables, followed by medium-income tracts, while high-income ones reported the highest and better levels in all variables. Low-income tracts scored significantly lower than medium, $t(282) = -4.56 (p < .001)$, and high-income tracts $t(248) = -6.01 (p < .001)$ in aesthetics. They also scored significantly
lower in perceptions of walkability and exercise opportunities than medium and high-income tracts, $t(282) = -4.29$ ($p < .001$) and $t(248) = -5.21$ ($p < .001$) respectively. Regarding safety, those in low-income neighborhoods reported significantly lower levels of safety from crime compared to their Latino counterparts in medium and high-income tracts, $t(281) = -4.13$ ($p < .001$) and $t(248) = -6.25$ ($p < .001$) respectively. Medium and high-income tracts also differed significantly in this regard in the expected direction, $t(167) = -2.58$ ($p < .05$).

Similar patterns were found in healthy food availability with lower income tract residents reporting significantly lower levels compared to medium and high-income tract residents, $t(281) = -3.48$ ($p < .01$) and $t(248) = -4.03$ ($p < .001$) respectively. Also, in terms of social cohesion, low-income tract participants reported the lowest levels compared to medium and high-income tracts, $t(281) = -2.19$ ($p < .05$) and $t(248) = -2.72$ ($p < .01$) respectively. Finally, lower income neighborhood participants reported significantly higher levels of problems in their communities (e.g., trash, selling of illegal drugs, fighting, lack of public services) compared to medium and high-income tract participants, $t(282) = 5.93$ ($p < .001$) and $t(248) = 5.64$ ($p < .001$) respectively.

In terms of psychological variables of interest, significant differences were only observed for nutrition and exercise self-efficacy. Low-income tract residents reported significantly lower levels of nutrition self-efficacy compared to high-income tract residents, $t(248) = -1.98$ ($p < .05$). Similarly, low-income neighborhood participants scored significantly lower than those in high-income neighborhoods in terms of exercise self-efficacy, $t(248) = -2.13$, $p < .05$. No significant differences in mean scores were observed for outcome variables by tract income level.
Model Building. ICCs were estimated for the null models (i.e., dependent variable only) in order to identify which models had potential variability at the neighborhood level and hence required a multilevel model for analysis. ICCs for both anxiety and depression were zero. For both variables, the variance at the Census tract level was zero, while variance at the individual level was estimated at 31.77 and 33.59 respectively ($p < .001$ for both). SRH had an ICC of .056 indicating that over 5% of the variance is found at the neighborhood level. However, despite a positive ICC, the variance at the tract level was .06 and non-significant ($p = .21$). ICC for the PCS null model was .0355, meaning that approximately 3.6% of the total variance in PCS is found at the neighborhood level. Of note, the intercept variance was 1.23 and non-significant ($p = .26$), meaning that variability at the neighborhood level is non-significant. For the MCS, the ICC was zero. Variance at the tract level was also zero (i.e., intercept variance), while variance at the level 1 was 60.9 ($p < .001$). ICC for the AUDIT null model was zero, with a level two variance of zero. The level one variance was 1.55 ($p < .001$) indicating that AUDIT scores vary significantly from person to person.

Given these null model ICC results, linear models were subsequently estimated for variables with zero variance at the second or neighborhood level which included anxiety, depression, the MCS, and the AUDIT. Hierarchical linear models (HLM) were estimated for variables with positive ICCs such as the PCS, and the SRH. As previously discussed in the methods, for HLM models, continuous variables were centered within the cluster following recommendations by Enders and Tofighi (2007). Variables for linear models were grand mean centered.
Census data merging. Exploratory factor analysis (EFA) were first conducted with 20 Census data variables (Morenoff et al., 2007). Four factors emerged as the optimal solution, accounting for 71.63% of the variance. Factor one was conceptualized as neighborhood disadvantage and was composed of variables such as % of families below the poverty line, % of families with government cash assistant and SNAP, and % of adults unemployed. Variables such as % of families with incomes over $50,000 and % of owner occupied homes negatively loaded onto this factor. Factor two was conceptualized as neighborhood affluence, and it was composed of variables such as % of professionals or individuals with managerial occupations, and % of individuals with college education or more. Additionally, % of individuals with less than a high school education and % female-headed households negatively loaded onto this factor. The third factor can be classified as racial/ethnic/nativity composition, composed of % Hispanics in the tract, % foreign born individuals, and % Blacks in the tract. The fourth factor was composed of variables that loaded more strongly on other factors. While it’s eigenvalue was 1.31, this factor does not appear to be conceptually different than others and hence not clearly interpretable.

Based on these results, a confirmatory factor analysis (CFA) was conducted to confirm results. Based on model fit parameters (e.g., RMSEA, AIC, BIC, likelihood ratio test, and chi-square), % Black was dropped from factor three. This is consistent with this variable having the highest uniqueness score on the EFA, .77, indicating that this variable is not well explained by the factor. Potentially the low percentage of Blacks in the city might account for this result. Additionally, % female-headed households was found to contribute to poor model fit and was dropped from factor two. Factor three was not
replicable using a CFA due to convergence issues. After increasing the number of iterations allowed, convergence was achieved. However, model fit parameters indicated a poor fit with an RMSEA of .45, much higher than the indicated .10 or below. Thus, factor score estimates were saved and merged for each individual participant for factors one and two, neighborhood disadvantage and affluence respectively. While factor three was found to have poor model fit, variables originally in that factor such as % Hispanic and % foreign born were still retained as part of the variables composing objective neighborhood conditions due to their theoretical relevance. These later variables were added to models independently.

Results by health outcomes. A summary of variables retained in the final models and the direction of the effect is shown on Table 5. For anxiety and depression, a seemingly unrelated regression model (Zellner, 1962) was employed in order to appropriately account for the high level of comorbidity found among these constructs. This approach allows for correlated error terms between both regression models, with each dependent variable having its own set of predictors. The sample correlation between both variables was .806 (p < .001), which further reinforced the decision to run a linear model that addresses the high level of co-occurrence of symptoms in the data. As discussed on methods, p ≤ .20 was used as the threshold for variable selection, while p ≤ .05 was employed for statistical significance. Key demographic predictors for both variables included language, smoker status, and income-to-needs ratio. For both anxiety and depression, higher English proficiency was associated with higher levels of symptomatology, .77 (p < .01) and .68 (p < .05) respectively. Smokers (current and ex-smokers) also reported higher levels of both anxiety and depression, 1.39 (p < .05) and
1.55 ($p < .05$) respectively. Low income-to-needs ratios were also significantly associated with higher anxiety, -.68 ($p < .01$) and depression levels, -.86 ($p < .001$). For anxiety, being unemployed was marginally associated with increases in reported symptomatology, .77 ($p = .052$). For depression, being unmarried, single or widower was marginally predictive of higher symptoms, .73 ($p = .07$). Gender was also retained in the depression model due to its significance value being under the pre-set cutoff, -.68 of $p = .12$. In this case, females appear to generally report lower depression compared to males.
Table 5

Overview of Final Quantitative Models Exploring Neighborhood Conditions and Health

<table>
<thead>
<tr>
<th>Demographics Variables</th>
<th>Anxiety (A) &amp; Depression (D)</th>
<th>Alcohol Use</th>
<th>Physical Component Summary</th>
<th>Mental Health Component Summary</th>
<th>Self-Rated Health</th>
</tr>
</thead>
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<tr>
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<td>NR</td>
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<td>–</td>
<td>NR</td>
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<tr>
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<td>–</td>
<td>R (-)</td>
<td>† (+)</td>
<td>† (-)</td>
</tr>
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<td>NR</td>
<td>NR</td>
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<tr>
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<td>NR</td>
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<td></td>
</tr>
<tr>
<td>Smoking status</td>
<td>+</td>
<td>+</td>
<td>NR</td>
<td>NR</td>
<td></td>
</tr>
</tbody>
</table>

Perceived Neighborhood Factors

| Aesthetic environment          | NR                            | NR          | NR                         | NR                             | NR                |
| Walking/exercise environment   | – for D                       | NR          | † (-)                     | † (+)                          | NR                |
| Safety from crime              | NR                            | † (-)       | NR                         | NR                             | NR                |
| Access to healthy foods        | NR                            | NR          | † (+)                     | NR                             | NR                |
| Social cohesion                | –                             | NR          | R (-)                     | NR                             | +                 |
| Neighborhood problems index    | NR                            | NR          | † (-)                     | NR                             | –                 |

Census Neighborhood Factors

| Neighborhood disadvantage † for D (+), R for A (+) | NR | NR | NR | NR | NR |
| Neighborhood affluence           | NR | NR | NR | NR | +  |
| % foreign born                   | NR | NR | +  | +  | † (-) |
| % Hispanic                       | NR | –  | +  | NR | NR |

Note. NR = not retained in final model due to p > .20. R = retained, p between .10 and .20. Direction of the effects between independent and dependent variables are indicated with + and – signs. Mental health and physical component summaries, and self-rated health, were obtained from the SF-12 measure. Anxiety and depression are shown together given the use of seemingly unrelated regression modeling approach.
Regarding perceived neighborhood conditions, neighborhood social cohesion was the single most consistent predictor of both anxiety and depression, \(-1.7 (p < .001)\) and \(-1.37 (p < .001)\), indicating that higher perceptions of social cohesion at the community level is associated with better outcomes in terms of the two variables. Better perceptions of neighborhood walkability and exercise opportunities were also significantly associated with lower depression symptoms \(-.81 (p < .01)\). No other perceived neighborhood variable was retained in the final model for either outcome variable. Among objective or Census derived variables, neighborhood level disadvantage was a consistent predictor of anxiety \((.47, p = .13)\) and depression \((.64, p = .055)\). While it did not achieve significance for either variable, it was maintained in the model due to pre-established thresholds for variable retention. Descriptively, neighborhood level disadvantage appears to be particularly important for depression. The model accounted for 13% of the variance in anxiety scores and 15% of the variance in depression scores.

**Mental health component summary.** For the MCS of the SF-12, the full sample model revealed a marginal effect for gender, with females reporting better MCS scores compared to their male counterparts, \(1.62 (p = .08)\). As in prior models, income-to-needs ratio was an important demographic predictor with higher ratios predicting a more salubrious MCS profile, \(.66 (p < .05)\). Neighborhood walkability was retained in the final model \((.91, p = .13)\), although it was not a significant predictor of MCS values. No other subjective neighborhood variable was retained in the final model. Percentage of foreign born individuals present at the tract level was a significant predictor of MCS scores, \(1.74 (p < .01)\). Evaluating standardized coefficients revealed that % foreign born was the strongest predictor, followed by income-to-needs ratio. Nonetheless, the overall model
accounts for less than 5% of the total variance in MCS scores for the full sample. A summary of variables retained in the final model and the direction of the effect is shown on Table 5.

Given that the MCS model was linear and less complex in comparison to HLM models or seemingly unrelated regressions, follow up analyses were conducted in order to explore potential differences among immigrant vs US-born Latinos. Models were explored independently for each sample, following the same model building and variable retention approaches. For immigrant Latinos, longer time in US was a significant predictor of higher MCS scores, .14 (p < .05). Higher personal income, however, was predictive of lower scores on the MCS, -33 (p < .05). No other demographic factors were retained in the final model. Among perceived neighborhood conditions, lower neighborhood problem index scores were marginally predictive of better MCS profiles, -2.33 (p = .08). Higher percentage of foreign born individuals at the tract level was marginally predictive of higher MCS scores, 1.77 (p = .09). Based on standardized results, time in the US, personal income, and % foreign born are the most important predictors of MCS profiles for immigrant Latinos.

For US-born Latinos, gender and language use appear to be potentially important demographic factors. Females tended to report better mental health compared to males, although this was not significant (2.00, p = .10). Those who reported higher use of Spanish also tended to report better levels of MCS scores, -.90 (p = .24). Higher personal income was significantly predictive of higher and thus more salubrious MCS profiles, .41 (p < .01). None of the perceived neighborhood subscales were significant predictors. However, three of them were retained in the final model: aesthetics (-1.16, p = .17),
walkability or exercise conditions ($1.15, p = .27$), and neighborhood social cohesion ($1.12, p = .26$). Finally, similar to results for immigrants, percentage of foreign born individuals at the tract level also seems to be an important protective factor in US-born Latinos’ mental health profile ($1.23, p = .19$). After evaluating standardized scores, personal income, aesthetics, gender and % foreign born are the top predictors, in order, of MCS scores for this Latino group. While language use and two perceived neighborhood variables did not meet the threshold for variable retention, other model fit indicators (e.g., RMSE, chi-square, and R squared) indicated that they improved model fit and were hence retained in the final model.

**Alcohol use.** For the AUDIT, a hierarchical linear regression model was employed. Age, gender, marital status, smoking, and personal income were significant demographic predictors. As participants aged, their reported problematic alcohol use decreased, -.02 ($p < .001$). For gender, females reported lower alcohol use compared to their male counterparts, -.38 ($p < .01$). Married participants reported lower levels of alcohol problems compared to their single, widower or divorced counterparts (-.30, $p < .05$) while smokers reported higher levels of problematic alcohol use compared to non-smokers, .34 ($p < .05$). Higher personal income was also associated with higher levels of alcohol use, .06 ($p < .001$). Employment, although not marginally significant, exhibited a significance value below the cut-off score for variable selection and was therefore retained in the final model, .19 ($p = .196$).

Regarding perceived neighborhood variables, positive perceptions of neighborhood safety was marginally predictive of lower levels of alcohol use, -.09 ($p = .09$). No other perceived neighborhood variables were retained in the final model. For
Census level predictors, higher percentages of Hispanic individuals at the tract level was predictive of lower problematic alcohol use, \(-.13 (p < .05)\). This model accounted for 16% of the variance in AUDIT scores. A summary of variables retained in the final model and the direction of the effect is shown on Table 5.

Given that the AUDIT model was linear, differences between immigrant and US-born Latinos were explored. For immigrant Latinos, being currently employed (.46, \(p < .05\)), being a smoker (.79, \(p < .01\)), and higher personal income (.07, \(p < .01\)) were predictive of more problematic drinking. Married participants reported lower hazardous drinking, \(-.41 (p < .05)\), while older participants reported marginally lower levels, \(-.01 (p = .09)\). Only neighborhood safety and % Hispanics at the tract level were retained in the final model from all neighborhood related variables. Both were marginally predictive of lower drinking for immigrant Latinos, \(-.20 (p = .052)\) and \(-.19 (p = .055)\) respectively. This model accounts for 25% of the variance in AUDIT scores for immigrant Latinos.

For US-born Latinos, older age and being female were predictive of less problematic drinking, \(-.02 (p < .001)\) and \(-.67 (p < .001)\) respectively. Similar to the immigrant model, higher personal income was predictive of more drinking, \(.04 (p < .5)\). A higher number of Hispanics at the tract level was marginally associated with lower problematic drinking, \(-.17 (p = .09)\). Language preference and % foreign born were retained in the final model given model fit indications that it improved model performance. However, neither variable was significantly or marginally significantly associated with AUDIT scores. This model accounts for 14% of the variance in AUDIT scores for US-born Latinos.
**Self-rated health.** For this outcome, a random intercept (fixed slope) model was employed. A summary of variables retained in the final model and the direction of the effect is shown on Table 5. The average level of SRH was 2.96 for men and when all other variables are controlled for. A score of three on this item is indicative of “good” health. It appears than women tended to report marginally lower SRH compared to men in their tracts, \(-.19 (p = .10)\). Similarly, married participants tended to report marginally higher levels of SRH compared to unmarried participants in their same tract, \(.21 (p = .06)\). However, results for gender and marital status should only be interpreted as a potential trend. Higher levels of both personal and income-to-needs ratio were predictive of higher or more salubrious levels of SRH when compared to other individuals in the same tract, \(.01 (p < .05)\) and \(.11 (p < .05)\) respectively. Language preference, although not a significant predictor, was retained in the model as its significance was lower than the a-priory cutoff for variable retention, \(.07 (p = .19)\).

Regarding perceptions of neighborhood conditions, participants who reported more positive views regarding neighborhood social cohesion also reported better levels of SHR after accounting for tract level variability and all demographic predictors, \(.32 (p < .01)\). Participants who endorsed a higher number of problematic issues in their community (e.g., trash, illegal drugs, empty lots, lack of green spaces) reported lower levels of SRH after controlling for all other factors, \(-.34 (p < .05)\). Neighborhood level affluence emerged as a tract level predictor of SRH, with more affluent tracts being predictive of more salubrious levels of SRH, \(.21 (p < .05)\). A higher number of foreign born individuals at the tract level was marginally predictive of lower levels of SRH and
thus a potential risk factor, \(-.16 (p = .09)\). Nonetheless, results for foreign born should only be interpreted as a potential trend and should be explored in future studies.

Finally, an ICC score was computed for the final model in order to assess changes in variance at the neighborhood level after more fully accounting for variance at the individual and tract levels via multiple predictors. After accounting for all demographics and perceived neighborhood conditions, the ICC increased from 5.6% (null model) to 7.66%. However, in the final model that accounts for level two predictors, the ICC decreased to .81% indicating that the model properly accounts for all level two variability or clustering effects. For the final model, the intercept or level two variance was .007 (\(p = .87\)).

**Physical health component summary.** A random intercept (fixed slope) model was also employed to analyze this outcome variable. The average level of PCS was 44.50 for men and when all other variables are controlled for. Older participants reported lower and thus poorer levels of PCS, \(-.04 (p < .05)\). Immigrant participants reported higher, and thus more salubrious, levels of PCS compared to their US-born counterparts in the same tract, 1.49 (\(p < .05\)). Gender, although not significant, was retained in the final model, \(-1.04 (p = .13)\), with women potentially reported reduced levels of PCS compared to men on the same tracts. No other demographic factors were retained in the final model. A summary of all variables in the final model and the direction of the effect is shown on Table 5.

Regarding perceived levels of neighborhood conditions, positive perceptions of health food availability was marginally protective as it predicted higher levels of PCS, \(.71 (p = .09)\). Poor perceptions of problems in the neighborhood (e.g., trash, fights, lack
of public services) were marginally predictive of lower PCS scores, -1.82 ($p = .09$). Neighborhood walkability (-1.23, $p = .09$) and social cohesion (-.90, $p = .17$) were retained in the final model although they did not reach significance. Level two or tract level predictors in the final model include % Hispanics and % foreign born. Higher number of Hispanics and foreign-born individuals in the tract were predictive of higher levels of PCS scores, 1.13 ($p < .01$) and 1.48 ($p < .05$) respectively.

After accounting for demographics and perceived neighborhood conditions, the ICC remained relatively stable at .036 from an ICC of .0355 for the null model. In the final model that accounts for level two predictors, the ICC decreased to .99 indicating that less than 1% of the variance resides at the tract level. Thus, the model appears to properly account for all level two variability or clustering effects. In this final model, the intercept or level two variance was .32 ($p = .75$).

**Quantitative Results (Aim 2)**

The following section reports on mediation analyses conducted using the Monte Carlo mediation method for linear and multilevel models. Significant $a$ and $b$ paths are reported for further contextualization of results. A bootstrapping approach of 10,000 draws was employed for directly testing the indirect effect. Using this method, a 95% CI of the sampling distribution of $c - c'$ (i.e., total – direct effect) was obtained. CIs not containing zero are indicative of a significant indirect effect (i.e., indirect effect is significantly different from zero). The following models accounted for relevant covariates determined in the respective final models of aim 1. For brevity purposes, statements related to controlling for covariates on the estimation of $a$ and $b$ paths will be
omitted. Similarly, given standard protocol, mentions of controlling for the independent variable when estimated the b path will be omitted.

**Audit.** No significant mediation results were found for either of the two neighborhood variables from the initial models (i.e., NS and % Hispanic). None of the mediators tested were found to mediate the effects of these variables on problematic or hazardous drinking. It appears that b paths were particularly non-significant overall and perhaps account for the lack of significant indirect effects. Thus, there seems to be a weak relation, in this sample, among psychological constructs under examination and AUDIT scores. Psychological constructs were, however, at times significantly predicted by neighborhood safety. Regression models estimating the a path were often predictive of the mediator. Higher scores on neighborhood safety significantly predicted higher levels of exercise self-efficacy (.16, p < .01) and higher ratings regarding a belief in the American dream (.25, p < .001). Similarly, higher neighborhood safety perceptions were marginally predictive of higher levels of optimism (.44, p = .07) and lower stress levels (-.71, p = .07). Regarding the presence of co-ethnics, higher percentages of Hispanics in participants’ communities was associated with significantly lower levels of nutrition self-efficacy (-.10, p < .05).

**Anxiety.** Neighborhood variables explored included neighborhood social cohesion and neighborhood disadvantage. Several mediators were found for the relation between neighborhood social cohesion and anxiety including nutrition self-efficacy, optimism, belief in the American dream, and perceived stress. Thus, each model is indicative of partial mediation. An overview of mediation results for anxiety can be seen on Figure 3. For nutrition self-efficacy, results indicate that higher neighborhood social
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cohesion is a significant positive predictor of nutrition self-efficacy ($a = .20, p < .01$) while nutrition self-efficacy was a significant protective factor for anxiety ($b = -1.29, p < .01$). The indirect effect was significant, $-.31, SE = .15, 95\%$ bootstrapped CI [-.51, -.07]. Nonetheless, after accounting for the mediator, the direct effect of neighborhood social cohesion on anxiety remained significant, $-1.3693, SE = .4503, p < .01$.

Figure 3. Summary of mediation results for anxiety and depression.

Notes. Figure shows overall relations. Only one $a$ path is shown when the same variables had multiple relations. Neighborhood social cohesion had two $a$ paths the following mediators: nutrition self-efficacy, optimism, belief in the American dream, and perceived stress. Each corresponds to anxiety and depression models respectively.

In the case of optimism, higher values of neighborhood social cohesion were predictive of higher optimism levels ($a = 1.79, p < .001$), which in turn predicted lower anxiety levels ($b = -.33, p < .001$). The indirect effect was significant, $-.57, SE = .19, 95\%$ bootstrapped CI [-.96, -.29]. The direct effect was also significant, $-1.11, SE = .45, p <
.05. Similarly, stronger endorsement of beliefs in the American dream was also found to be a mediator of the relation between neighborhood social cohesion and anxiety. Higher social cohesion ratings were predictive of increased endorsement of the American dream \((a = .33, p < .01)\). These beliefs were associated with lower ratings of anxiety symptomatology \((b = -.73, p < .01)\). The indirect effect was significant, \(-.25, SE = .13, 95\% \text{ bootstrapped CI} [-.49, -.05]\). The direct effect remained significant, \(-1.4334, SE = .45 (p < .01)\).

Finally, higher levels of neighborhood social cohesion were protective against perceived stress \((a = -1.82, p < .001)\), which was in turn predictive of lower anxiety symptoms \(b = .43 (p < .001)\). The indirect effect for this model was also significant, \(-.76, SE = .28, 95\% \text{ bootstrapped CI} [-1.29, -.30]\). The direct effect remained significant but showed the largest decrease compared to other mediators, \(-.93, SE = .38 (p < .05)\). It is also worth noting that this model accounted for 39\% of the variance in anxiety.

A post-hoc exploratory mediation model investigated the combined impact of all mediators previously described. The indirect effects and 95\% bootstrapped CI were as follows: nutrition self-efficacy at \(-.14 [-.38, .06]\), optimism at \(.04 [-.22, .31]\), belief in the American dream at \(.01 [-.18, .16]\), and perceived stress at \(-.74 [-1.50, -.20]\). As shown here, only perceived stress remained a significant mediator when other mediators were accounted for. Moreover, the direct effect remained significant, \(-.85, SE = .40, (p < .05)\). Results are indicative of partial mediation.

None of the mediators significantly accounted for the relationship between neighborhood disadvantage and anxiety. It is possible that this relationship is mediated by non-psychological constructs or by psychological constructs not measured in the present
study. In general, neighborhood disadvantage was not significantly predictive of the mediators (i.e., non-significant $a$ estimate). Nonetheless, after accounting for control variables and neighborhood disadvantage, mediators were significant predictors of anxiety. Higher levels of nutrition and exercise self-efficacy were significantly predictive of lower anxiety levels, -1.57 ($p < .001$) and -1.66 ($p < .001$) respectively. Higher levels of optimism and beliefs in the American dream were also significantly predictive of lower anxiety levels, -0.39 ($p < .001$) and -0.93 ($p < .001$) respectively. Finally, higher levels of perceived stress were predictive of higher anxiety levels, .45 ($p < .001$).

**Depression.** Neighborhood variables explored included neighborhood walkability and/or exercise opportunities, neighborhood social cohesion, and neighborhood disadvantage. An overview of mediation results for depression can be seen on Figure 3. Exercise self-efficacy was found to partially mediate the relationship between neighborhood exercise or walkability conditions and depression scores. Higher perceived levels of neighborhood exercise opportunities was a significant positive predictor of exercise self-efficacy ($a = .27, p < .001$). In turn, exercise self-efficacy was a strong protective factor against depression symptomatology ($b = -1.97, p < .001$). The indirect effect was significant, -0.52, SE = .18, 95% bootstrapped CI [-.87, -.23]. The direct effect remained significant, -1.05, SE = .42 ($p < .05$). Optimism and beliefs in the American dream were also moderators of this relation. Higher neighborhood walkability/exercise opportunities positively predicted optimism ($a = 1.05, p < .01$) and endorsement of beliefs in the American dream ($a = .44, p < .001$). Next, optimism and beliefs in the American dream were found to predict lower depression scores, $b = -.43 (p < .001)$ and $b = -1.02 (p < .001)$ respectively. The indirect effects for optimism was -.45, SE = .18, 95%
bootstrapped CI [-.79, -.17], while that of belief in the American dream was -.44, SE = .15, 95% bootstrapped CI [-.77, -.18]. The direct effect remained significant after including both mediators, -1.12 (p < .01) and -1.13 (p < .05) respectively.

Perceived stress was also a mediator of this relation. Higher perceptions of neighborhood walkability predicted lower stress levels (a = -2.14, p < .001), while high stress levels were associated with endorsement of depression symptoms (b = .51, p < .001). The indirect effect was significant, -1.09, SE = .26, 95% bootstrapped CI [-1.63, -.58]. Unlike previous models, after accounting for the mediating effect of stress, the direct effect was no longer significant, -.48 (p = .18). Additionally, this model accounts for 44% of the variance in depression (R² = .444). Thus, stress appears to be the strongest mediator of the relation between neighborhood walkability and depression scores.

An exploratory post-hoc analysis was conducted to explore the combined effect of all four mediators on this relation. These results should be interpreted with caution due to sample size, although they provide some information for future studies and interpretation. Indirect effects and 95% bootstrapped CI for the full model were as followed: exercise self-efficacy at -.23 [-.46, -.06], optimism at -.06 [-.23, .08], belief in the American dream at -.07 [-.31, .15], and perceived stress at -.96 [-1.45, -.53]. Results confirm previous finding of stress being the strongest mediator followed by exercise self-efficacy. After accounting for these two mediators, optimism and beliefs in the American dream are no longer significant mediators. This model accounts for 46% of the variance in depression scores. Additionally, the direct effect is now non-significant, -.25 (p = .49). Thus, this model can be said to fully mediate the relationship.
Neighborhood social cohesion. Another key relation explored is that of neighborhood social cohesion and depression. Multiple mediators were found to be significant including nutrition self-efficacy, optimism, belief in the American dream and perceived stress. For nutrition self-efficacy, higher neighborhood social cohesion scores were predictive of higher values of the mediator ($a = .19$, $p < .01$). This in turn predicted lower depression scores ($b = -1.34$, $p < .001$). The indirect effect was found to be significant, -.26, SE = .14, 95% bootstrapped CI [-.52, -.06]. The direct effect remained significant in this case, -1.35 ($p < .01$). Next, optimism and beliefs in the American dream were explored. Higher neighborhood social cohesion was also positively predictive of optimism ($a = 1.78$, $p < .001$) and beliefs in the American dream ($a = .30$, $p < .01$). These in turn predicted lower depressive symptom endorsement, $b = -.44$ ($p < .001$) and $b = -1.13$ ($p < .001$) respectively. A significant indirect effect was also found for both variables, -.76 for optimism with a 95% bootstrapped CI [-1.20, -.43] and -.32 for beliefs in the American dream with a 95% bootstrapped CI [-.64, -.11]. The direct effect of neighborhood social cohesion on depression was no longer significant after accounting for the mediating effects of optimism, -.86 ($p = .07$). Nonetheless, the direct effect remained significant after accounting for beliefs in the American dream as a mediator, -1.29 ($p < .01$).

Perceived stress was also found to mediate this relation. Higher levels of neighborhood social cohesion predicted lower stress levels, $a = -1.71$ ($p < .01$). Moreover, higher stress levels were predictive of higher depression scores, $b = .51$ ($p < .001$). The indirect effect was significant, -86, SE = .33, 95% bootstrapped CI [-1.44, -.31]. The direct effect was still significant, but the significance value was greatly reduced
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(-.76, p = .049). This model accounts for 45% of the variance in depression scores. Thus, perceived stress appears to be a strong mediator in this relation.

A post-hoc exploratory mediation analysis was conducted that included all four mediators previously found to be significant. Indirect effects and 95% bootstrapped CI for the full model were as followed: nutrition self-efficacy at -.08 [-.29, .07], optimism at -.06 [-.34, .19], belief in the American dream at -.06 [-.24, .08], and perceived stress at -.81 [-1.47, -.22]. Only perceived stress remained a significant mediator once all other mediators were accounted for. The direct effect of neighborhood social cohesion on depression was no longer significant (-.61, SE = .40, p = .13), suggesting full mediation. Moreover, this model accounts for 45% of the variance in depression scores.

*Neighborhood disadvantage.* Similar to findings for anxiety, none of the psychological factors explored significantly mediated the relation between neighborhood disadvantage (i.e., Census factor score representative of this construct) and depression. Once again, neighborhood disadvantage appears to be a poor predictor of mediators. However, after accounting for control variables and neighborhood disadvantage, mediators were often significant predictors of depression symptomatology. Higher values of nutrition and exercise self-efficacy were significant predictors of lower depression scores, -1.65 (p < .001) and -2.21 (p < .001) respectively. Higher optimism and beliefs in the American dream were also predictive of lower depression scores, -.48 (p < .001) and -1.20 (p < .001) respectively. Perhaps unsurprisingly, higher levels of stress were a positive and significant predictor of depressive symptomatology, .52 (p < .001).

*Mental health component summary.* Neighborhood variables explored included neighborhood walkability and/or access to exercise opportunities and % of foreign born
individuals in the neighborhood. An overview of mediation results for the MSC can be seen on Figure 4. For neighborhood walkability, three mediators were found to be significant, exercise self-efficacy, optimism and perceived stress. Higher neighborhood walkability scores were predictive of increased exercise self-efficacy ($a = .26, p < .001$) and increased optimism ($a = .91, p < .01$). These mediators were then predictive of more salubrious MCS scores, $b = 1.81 (p < .001)$ and $b = .40 (p < .001)$ respectively. The indirect effect for exercise self-efficacy was significant, .48 with a 95% bootstrapped CI [.19, .86], with a non-significant direct effect (.20, $p = .74$). The indirect effect for optimism was also significant, .37 with a 95% bootstrapped CI [.10, .71], with a non-significant direct effect (.31, $p = .59$).

**Figure 4.** Summary of mediation results for the mental and physical health component summaries of the SF-12 outcome measure.

*Note.* Figure shows overall relations. Only one $a$ path is shown when the same variables had multiple relations. Neighborhood walkability has two $a$ paths to the following mediators: exercise self-efficacy, optimism and perceived stress. Each corresponds to the MCS and PCS models respectively.
Higher neighborhood walkability scores were also predictive of lower perceived stress, $a = -1.93$, $p < .001$. Perceived stress was then predictive of lower MCS scores which are indicative of poorer mental health profiles, $b = -.39$, $p < .001$. The indirect effect was significant, .78, SE = .22, 95% bootstrapped CI [.34, 1.25]. Additionally, the direct effect was no longer significant after accounting for perceived stress as a mediator, -.09 ($p = .87$).

A post hoc exploratory combined mediation model was tested in order to investigate the combined effect of all three significant mediators on the relation between neighborhood walkability and MSC scores. The indirect effects were as follows: .27 with a 95% bootstrapped CI [.02, .60] for exercise self-efficacy, .10 [-.08, .37] for optimism, and .61 [.25, 1.03] for perceived stress. These results indicate that both exercise self-efficacy and perceived stress are potentially important mediators in this relation. The direct effect was no longer significant after accounting for mediation effects, -.31, SE = .56, $p = .58$. This model accounted for 14% of the variance in MCS scores.

Percent foreign born. No significant mediators were found for the relation between % foreign born and the MCS of the SF-12. This is probably the result of lack of significant $a$ estimates, indicating that % foreign born is not a good predictor of the mediators in this study. However, after accounting for control variables and % foreign born, mediators were significant predictors of MCS scores ($b$ estimates). In this case, higher nutrition and exercise self-efficacy were predictive of more salubrious MCS profiles, 1.23 ($p < .05$) and 1.95 ($p < .001$) respectively. Similarly, higher optimism scores predictive better MCS scores, .38 ($p < .001$). Perceived stress, on the other hand, was predictive of more negative or concerning MCS scores -.38 ($p < .001$).
**Physical health component summary.** Initial models examining the relation between neighborhood conditions and the PCS of the SF-12 showed that significant neighborhood variables were % Hispanics and % foreign born in the participants’ Census tract. However, subjective variables of neighborhood conditions such as neighborhood walkability, access to healthy food options, and problematic features (e.g., trash, abandoned lots or homes, selling of illegal drugs) measured by the neighborhood problem index (NPI), were marginally significant predictors of outcomes and were thus retained in the aim 1 final model. In this mediation analysis, all of these five variables were explored. As explained by MacKinnon and colleagues (2000), it is possible that mediation occurs even though the relationship between the independent and the dependent variable is non-significant. This can be particularly the case when the direct and indirect effects are opposite in sign. Of note, neighborhood social cohesion was also retained in the final aim 1 model ($p = .17$) but was not explored here as it did not meet the threshold for marginally significance. An overview of mediation results for the PCS can be seen on Figure 4.

**Neighborhood walkability.** Three mediators were found to be significant in explaining the relation between neighborhood walkability or exercise opportunities and PCS scores: exercise self-efficacy, optimism, and perceived stress. Higher ratings of neighborhood walkability were positively predictive of exercise self-efficacy scores, $a = .27$, ($p < .01$). In turn, higher exercise self-efficacy was predictive of more salubrious (i.e., higher) PCS scores, $b = .90$, ($p < .01$). The indirect effect was significant, .29, SE = .13, 95% bootstrapped CI [.04, .52]. The direct effect was no longer significant after accounting for exercise self-efficacy as a mediator, .09 ($p = .83$). Similar results were
obtained for optimism. Higher levels of neighborhood walkability were predictive of optimism ($a = .91, p < .05$), which in turn was associated with higher PCS scores ($b = .25, p < .01$). The indirect effect was significant, $b = .27, SE = .12$, with a 95% bootstrapped CI [0.03, 0.50] that does not include zero. The direct effect was no longer significant after accounting for this mediation effect, $b = .11 (p = .81)$. Perceived stress was also found to mediate this relation. Neighborhood walkability scores negatively predicted perceived stress scores, $a = -2.53, (p < .001)$. Perceived stress was predictive of lower PCS scores, $b = -.14, (p < .01)$. The indirect effect was $.34, SE = .12$, with a significant 95% bootstrapped CI [.12, .61]. The direct effect was not significant, $.04 (p = .93)$.

A post hoc exploratory mediation model was also conducted in order to investigate the combined effect of all three significant mediators on the relation between neighborhood walkability and PCS scores. The indirect effects were as follows: $b = .22$ with a 95% bootstrapped CI [-.02, .50] for exercise self-efficacy, $b = .19 [-.01, .44]$ for optimism, and $b = .16 [-.07, .41]$ for perceived stress. These results indicate that while analyzed independently, these mediators are significant. However, when combined, their effect losses statistical significance. It is possible that reduced statistical power when combining all mediators, lead to loss of significant effects. Accounting for them reduces the direct effect, which is now non-significant, $b = .18, SE = .44, p = .68$. This model accounted for 8% of the variance in PCS scores.

*Neighborhood healthy food options*. Better self-reported scores of neighborhood healthy food options significantly predicted higher exercise self-efficacy scores, $a = .15 (p < .01)$. These scores were predictive of higher or more salubrious PCS scores, $b = .98 (p < .01)$. The indirect effect was found to be significant, $b = .19, SE = .08$, 95% bootstrapped
CI [.02, .32]. The direct effect was no longer significant, .45 (p = .11). Stress was also found to be a significant mediator in this relation. Higher ratings of neighborhood health food options were predictive of lower perceived stress scores, $a = -1.39$ ($p < .01$). Perceived stress, on the other hand, predicted lower PCS scores, $b = -.16$ ($p < .01$). The indirect effect was found to be significant, .20, SE = .07, 95% bootstrapped CI [.06, .42]. The direct effect was no longer significant after accounting for the mediating effects of stress, .46 ($p = .10$).

A combined post hoc exploratory mediation model was also conducted in order to investigate the effect of both mediators on the relation between neighborhood healthy food options and PSC scores. Both indirect effects remained significant: .14 with a 95% bootstrapped CI [.01, .30] for exercise self-efficacy, and .15, 95% bootstrapped CI [.04, .30] for perceived stress. The direct effect, however, remained significant, .56 ($p < .05$).

**Neighborhood problem index.** Two mediators, optimism and perceived stress, were found for the relation between neighborhood problems and PCS scores. Higher ratings of neighborhood problems predicted lower levels of optimism ($a = -2.01$, $p < .01$), which in turn predicted higher PCS scores ($b = .27$, $p < .01$). The indirect effect was found to be significant ($-.49$, SE = .19, 95% bootstrapped CI [-1.05, -1.16]), while the direct effect was no longer significant ($-.22$, $p = .73$). Similarly, higher neighborhood problem index scores predicted higher perceived stress levels, $a = 3.98$ ($p < .001$). Perceived stress scores were negatively predictive of PCS scores, $b = -.16$ ($p < .01$). The indirect was significant ($-.48$, SE = .17, 95% bootstrapped CI [-1.16, -1.21]), while the direct effect was no longer significant ($-.21$, $p = .74$). A post hoc combined mediation model revealed that both variables remained significant when each of their effects were accounted for, -.34 [-}
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.75, -.0001] and -.32 [-.68, -.01] respectively. The direct effect was no longer significant, -.39, p = .54.

**Percent Hispanic.** No significant mediators emerged that explain the relation between % Hispanics and PCS profiles in the present sample of Latinos. In this case, both a and b estimates were significant or marginally significant. Nonetheless, indirect effects were found to not achieve significance. After accounting for key control variables, % Hispanics in the Census tract was predictive of lower nutrition self-efficacy (-.12, p < 0.01) and marginally predictive of lower optimism (-.36, p = .08). After controlling for demographics and % Hispanics in the tract, several mediators were also significant predictors of PCS profiles. Higher levels of exercise self-efficacy and optimism were predictive of more salubrious PCS scores, .93 (p < .01) and .26 (p < .001) respectively. On the other hand, higher perceived stress levels were associated with negative outcomes as measured by the PCS, -.15 (p < .01).

**Percent foreign born.** Similar to findings for % Hispanics, no significant mediators were found for the association between % foreign born at the tract level and PCS scores. In terms of a estimates, % foreign born was only a significant predictor of nutrition self-efficacy, -.17 (p < .01). After accounting for demographics and % foreign born, several mediators significantly predicted PCS scores (b estimates). Similar to results for % Hispanics, higher levels of exercise self-efficacy and optimism were predictive of more salubrious PCS scores, .90 (p < .01) and .25 (p < .01) respectively, while higher stress levels were associated with negative outcomes as measured by the PCS, -.14 (p < .01).
**Self-rated health.** Potential mediators of self-rated health were also explored. Key neighborhood variables found from aim 1 and explored in these analyses included neighborhood social cohesion, the neighborhood problem index, % foreign born, and affluence at the tract level. As previously discussed, affluence was obtained via factor scores (see previous aim 1 results for further details) from Census level data. Of note, SRH was obtained from the first item of the SF-12, scored as typically used in the literature with increasing values indicating better health. An overview of mediation results for SRH can be seen on Figure 5.

**Figure 5.** Summary of mediation results for self-rated health.

*Notes.* Figure shows overall relations. Only one b estimate is shown when the same variables had multiple relations. Nutrition self-efficacy has two b paths, each corresponding to effects from % foreign born and neighborhood affluence respectively.

**Neighborhood social cohesion (NSC).** Higher NSC values were positively predictive of optimism scores, $a = 1.91$ ($p < .001$). Optimism values were predictive, in
turn, of higher SRH, \( b = .05 \) (\( p < .001 \)). The indirect effect for optimism was significant (.10, \( SE = .03 \), 95% bootstrapped CI [.04, .18]); however, the direct effect remained significant, \( .29 (p < .01) \). Beliefs in the American dream were also found to mediate this relation. Higher NSC scores predicted higher endorsement of belief in the American dream, \( a = .32 (p < .01) \). Moreover, beliefs in the American dream were predictive of higher SRH endorsement, \( b = .11 (p < .05) \). The indirect effect was significant, although small (.04, \( SE = .02 \), 95% bootstrapped CI [.002, .08]), with an also significant direct effect (.35, \( p < .001 \)). Thus, while optimism and beliefs in the American dream appear to be important mediators, they do not account for the full mediating effect on their own.

Perceived stress was also found to significantly mediate this relation. Higher NSC were predictive of lower perceived stress scores, \( a = -1.84 (p < .01) \). In turn, higher perceived stress was predictive of lower ratings for SRH, \( b = -0.04 (p < .001) \). The indirect effect was found to be significant, \( 0.07, SE = .03 \), 95% bootstrapped CI [.02, .13]. However, the direct effect continued to be significant after accounting for the mediating effect of stress, .31 (\( p < .01 \)). A post hoc combined mediation model that simultaneously included all three significant mediators revealed that only perceived stress remained significant when each of their effects are accounted for, .05, \( SE = .03 \), [.008, .11]. Confidence intervals for optimism and belief in the American dream contained zero in this model. The direct effect remained significant,.27 (\( p < .01 \)).

*Neighborhood problem index.* Similar to results for NSC and SRH, for NPI, the same mediators were found to be significant: optimism, belief in the American dream and perceived stress. NPI scores predicted lower levels of optimism, \( a = -1.93 (p < .01) \). On the other hand, optimism predicted more salubrious SRH scores, \( b = .06 (p < .001) \). The
Indirect effect was significant, $-.11, \text{SE} = .04$, 95% bootstrapped CI $[-.20, -.03]$. The direct effect continues to be significant, $-.45$ ($p < .001$). Similar to these results, NPI scores negatively predict endorsement of beliefs in the American dream, $a = -.77$ ($p < .001$). Beliefs in the American dream predicted higher SRH scores, $b = .10$ ($p < .05$). Both the indirect and direct effect were found to be significant, $-.05, \text{SE} = .03$, 95% bootstrapped CI $[-.17, -.003]$ and $-.50$ ($p < .001$) respectively.

NPI scores predicted higher stress levels ($a = 3.46, p < .01$), which were predictive of lower SRH scores ($b = -.04, p < .001$). The indirect effect was significant, $-.12, \text{SE} = .04$, 95% bootstrapped CI $[-.23, -.04]$. However, the direct effect also remained significant, $-.44$ ($p < .001$). A post hoc mediation model that simultaneously included all three significant mediators showed that optimism and perceived stress remained significant mediators. The indirect effects with 95% bootstrapped CI were as followed: optimism at $-.07, \text{SE} = .04 [-.16, -.0004]$, beliefs in the American dream at $-.02, \text{SE} = .03 [-.08, .04]$, and $-.09, \text{SE} = .05 [-.28, -.07]$ for perceived stress. The direct effect remained significant, $-.39$ ($p < .001$). This model accounted for 23% of the variance in SRH scores.

**Percent foreign born.** Nutrition self-efficacy was the only significant mediator in the relation between % foreign born and SRH. Higher % foreign born predicted lower nutrition-self-efficacy scores, $a = -.17$ ($p < .05$). On the contrary, higher nutrition self-efficacy predicted higher SRH scores, $b = .23$ ($p < .01$). The indirect effect was significant, $-.04, \text{SE} = .02$, 95% bootstrapped CI $[-.08, -.007]$. Nonetheless, the direct effect remained significant, $-.24$ ($p < .01$).

While this was the only significant mediator, it is worth noting that four other $b$ paths were also significant. Thus, after accounting for relevant control variables and %
foreign born at the tract level, several other psychological constructs appear to be important predictors of SRH. In this case, protective relations were found among exercise self-efficacy (.22, \( p < .001 \)), optimism (.26, \( p < .001 \)), belief in the American dream (.14, \( p < .01 \)) and SRH scores. Additionally, higher levels of stress were found predictive of lower levels of SRH, -.04 (\( p < .001 \)).

*Neighborhood affluence factor score.* Nutrition self-efficacy was also a significant mediator in the relation between neighborhood affluence and SRH. Higher affluence levels were predictive of increased nutrition self-efficacy, \( a = .17 \) (\( p < .01 \)). Nutrition self-efficacy was predictive of higher SRH ratings, \( b = .22 \) (\( p < .01 \)). The indirect effect was significant, .04, SE = .02, 95% bootstrapped CI [.008, .78]. However, the direct effect remained significant, .25 (\( p < .001 \)).

Similar to results for % foreign born, four other \( b \) paths were also significant. After accounting for relevant control variables and affluence at the tract level, several other psychological constructs appear to be important predictors of SRH. Protective relations were found among exercise self-efficacy (.32, \( p < .001 \)), optimism (.06, \( p < .001 \)), belief in the American dream (.14, \( p < .01 \)) and SRH scores. Moreover, higher levels of perceived stress were found predictive of lower levels of SRH, -.04 (\( p < .01 \)).

**Qualitative Results (Aim 3)**

The neighborhoods that lay the context for the present study’s qualitative portion represent a wide array of communities within the city. Tables 6 and 7 offer a demographic description of participants’ neighborhoods. Zip codes represented in each focus group confirm the desired recruitment plan of obtaining views from participants residing in neighborhoods with different levels of income or resources. Low-income
groups were composed of individuals from zip codes such as 87105 and 87121 located in the South Valley and West Mesa areas, along with 87108 or the International Districts. These are areas particularly known for their poverty and their high percentage of immigrants and racial/ethnic minorities such as Latinos. On the other end of the spectrum, high-income groups were composed of participants living in more affluent areas of the West side such as Paradise Hills in 87114, to those in the North East heights or 87111. These later areas are well known for the readily access to resources, their affluence and their racial composition of majority White Americans.

Moreover, Tables 6 and 7 display the expected gradient of socioeconomic indicators. Higher-income groups have the lowest rates, in participants’ respective neighborhoods, of households living below the poverty line, of unemployment rates and the lowest percentages of individuals with less than a high school diploma. Moreover, neighborhoods represented range in racial/ethnic and immigrant composition with low-income groups having the highest percentages of Hispanic/Latino and immigrant residents, compared to both medium and high-income groups. Finally, small neighborhood demographic differences were observed among Spanish and English-speaking groups within each SES category.

**Participant characteristics.** Basic focus group participant demographics are shown in Table 7. All groups were similar in age. Socioeconomic indicators (e.g., education, personal income, income-to-needs ratio and employment) confirm the expected gradient where low-income groups scored the lowest compared to both medium and high-income groups. Spanish speaking participants were more like to be immigrants compared to English speaking participants, with the highest percentage (90%) of
immigrants found in the low-income Spanish group. Low income Spanish-speaking Latinos were also the most recent immigrants with an average length of stay of 14 years, followed by high-income Spanish speakers with an average length of stay in the US of 17 years. Spanish speaking participants, across SES, were also more likely to be married compared to English speaking participants.

Table 6

*Demographic Profile of Focus Group Participants’ Neighborhoods*

<table>
<thead>
<tr>
<th></th>
<th>Low Income Groups</th>
<th></th>
<th>Medium Income Groups</th>
<th></th>
<th>High Income Groups</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spanish speaking</td>
<td>Spanish speaking</td>
<td>Spanish speaking</td>
<td>Spanish speaking</td>
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<td></td>
<td>group</td>
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<td>group</td>
<td>group</td>
<td>group</td>
<td>group</td>
</tr>
<tr>
<td>% Below poverty</td>
<td>25.4%</td>
<td>25.97%</td>
<td>15.74%</td>
<td>14.36%</td>
<td>11.35%</td>
<td>8.27%</td>
</tr>
<tr>
<td>% Unemployment</td>
<td>10.93%</td>
<td>11.95%</td>
<td>9.92%</td>
<td>8.54%</td>
<td>5.6%</td>
<td>6.92%</td>
</tr>
<tr>
<td>% With less than</td>
<td>27.11%</td>
<td>32.07%</td>
<td>16.98%</td>
<td>18.01%</td>
<td>10.63%</td>
<td>9.80%</td>
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<tr>
<td>high-school diploma</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>% Foreign born</td>
<td>18.92%</td>
<td>22.4%</td>
<td>9.39%</td>
<td>7.21%</td>
<td>6.968%</td>
<td>7.78%</td>
</tr>
<tr>
<td>% Hispanic/Latino</td>
<td>76.45%</td>
<td>82.9%</td>
<td>37.78%</td>
<td>40.01%</td>
<td>54.65%</td>
<td>44.68%</td>
</tr>
<tr>
<td>Zip codes represented</td>
<td>87105, 87105,</td>
<td>87107, 87107,</td>
<td>87114, 87114,</td>
<td>87120, 87120,</td>
<td>87120, 87120,</td>
<td></td>
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<tr>
<td></td>
<td>87108, 87121</td>
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<td>87110, 87109,</td>
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<tr>
<td></td>
<td>87121</td>
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<td>87123, 87112,</td>
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</table>

*Note.* Estimates were obtained from the US Census American Community Survey 5-year estimates, 2010-2014, at the Census tract level for each participant and averaged for each group.
# NEIGHBORHOOD CONDITIONS AND LATINO HEALTH

## Table 7

**Focus Groups Demographics by Neighborhood Income Level**

<table>
<thead>
<tr>
<th>Group Characteristic</th>
<th>Low Income Groups</th>
<th>Medium Income Groups</th>
<th>High Income Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>44.82</td>
<td>45.12</td>
<td>45.29</td>
</tr>
<tr>
<td>Gender (% female)</td>
<td>82%</td>
<td>89%</td>
<td>67%</td>
</tr>
<tr>
<td>Nativity (% foreign born)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Spanish speaking groups</td>
<td>90%</td>
<td>83%</td>
<td>75%</td>
</tr>
<tr>
<td>• English speaking groups</td>
<td>0%</td>
<td>25%</td>
<td>17%</td>
</tr>
<tr>
<td>• Average length in US (yrs)</td>
<td>14</td>
<td>24</td>
<td>17</td>
</tr>
<tr>
<td>Language use (^a)</td>
<td>2.83</td>
<td>3.17</td>
<td>2.96</td>
</tr>
<tr>
<td>Marital status (% married)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Spanish speaking groups</td>
<td>70%</td>
<td>54%</td>
<td>100%</td>
</tr>
<tr>
<td>• English speaking groups</td>
<td>20%</td>
<td>38%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Socioeconomic Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• At least high school (%)</td>
<td>69%</td>
<td>94%</td>
<td>88%</td>
</tr>
<tr>
<td>• College or more (%)</td>
<td>36%</td>
<td>26%</td>
<td>79%</td>
</tr>
<tr>
<td>Personal income</td>
<td>5.61</td>
<td>8.63</td>
<td>11.56</td>
</tr>
<tr>
<td>Income-to-needs ratio (^b)</td>
<td>0.94</td>
<td>1.74</td>
<td>3.17</td>
</tr>
<tr>
<td>Employment status (%) employed</td>
<td>19%</td>
<td>52%</td>
<td>71%</td>
</tr>
<tr>
<td>Group size range</td>
<td>6-10</td>
<td>7-9</td>
<td>4-6</td>
</tr>
</tbody>
</table>

*Note.* Table shows averages for the two focus groups (i.e. English and Spanish speaking groups) composing each category of low, medium and high-income groups. \(^a\) Language use was measured with an item ranging from 1 (*Spanish only*) to 5 (*English only*), with 3 indicating bilingualism. \(^b\) Personal income was measured with an item ranging from 1 (under $4,000) to 15 ($75,000 or more), with 5 indicating $10,000 - $11,999, 8 indicating $20,000 - $24,999 and 11 indicating $35,000 - $39,999 yearly. \(^c\) Income-to-needs ratio represents the ratio of family income and relative to the poverty line adjusted for family size. For instance, a 2 indicates that the household income is two times the poverty line for their family size or 200% above poverty.
Neighborhood conditions. Across focus group, participants offered a comprehensive and rich description of their neighborhood conditions and resources. In line with previous theoretical and empirical findings, two overarching themes or family of codes emerged, one related to the built and/or physical environment and one related to the social environment of neighborhoods (Diez Roux et al., 2010). Within each of these two related themes, participants spoke about positive and negative characteristics of their communities. Table 8 offers a typology of all themes, their subcategories and sample quotes. Table 9 offers exemplary quotes for themes and subthemes. Moreover, a pattern emerged in which low-income groups, followed by medium and then high-income groups, expressed the majority of the negative complaints. Thus, a gradient was seen in which social class appears to augment or buffer the effects of neighborhood conditions.

Built/physical environment. When describing their neighborhoods, the largest theme emerged around descriptions of the physical or built environment. This theme includes descriptions of areas such as basic infrastructure (e.g., sidewalks, street lighting, trash pick-up and other basic services), aesthetics, the presence of parks, exercise or recreational spaces, and access and quality of other resources such as schools, food options, and health care services.

Negative related comments. Overwhelmingly, participants, especially those in the low-income groups, spoke about a myriad of challenges and staggering need in their communities. Subcategories within the negative built environment theme include: (1) lack of access to resources, (2) lack of basic infrastructure, (3) noise and traffic, (4) environmental contamination, and (5) other general complaints.
### Table 8

**Integration of Quantitative and Qualitative Findings per Key Question of Interest**

<table>
<thead>
<tr>
<th>Key Questions</th>
<th>Quantitative Results</th>
<th>Qualitative Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Important Demographic Factors</strong></td>
<td>• Gender, income-to-needs ratio and marital status emerged as consistent predictors of health outcomes. Overall, women and married participants reported better health. Higher income-to-needs ratio was predictive of better outcomes (e.g., lower depression and anxiety, better mental health, and higher self-rated health). • Personal income was often not retained in models, while income-to-needs ratio was a consistent predictor. Thus, accounting for family size seems important.</td>
<td>• Participants spoke about the importance of demographic factors in influencing outcomes. Access to personal resources in terms of disposable income was especially important in buffering the detrimental impacts from residing in lower income neighborhoods. Personal resources also included flexible job schedules, and ability to drive or commute outside the neighborhood for needed resources. “My car also got broken in and they swiped everything out. They took everything out! […] But I have renters insurance, I can afford that. Somebody else like that doesn’t have that you know? So, it’s like even though shit happens in your neighborhood at least you have like a little bit more than somebody else that loses everything.” • Family relations are key for Latinos. Participants often spoke about other members of the family and in particular about their children with 71 mentions of youth or children.</td>
</tr>
<tr>
<td><strong>Key Neighborhood Conditions</strong></td>
<td>• Neighborhood social cohesion was a consistent predictor for multiple outcomes including anxiety and depression, and self-rated health. Social cohesion appears to be a protective factor as higher scores predicted more salubrious health outcomes. • Walkability or exercise opportunities were also a consistent predictor of health outcomes. It was significantly associated with lower depression scores and was retained in MCS and PCS models. • NPI was also an important risk factor for self-rated health and marginally predictive of worse PCS scores. • Census level variables such as % foreign born and % Hispanics were</td>
<td>• Qualitative data also supported the importance of the built (e.g., access to exercise opportunities such as parks, access to healthy food options, quality schools) and the social environment (e.g., social cohesion and safety from crime). The following quote highlights social cohesion conversations: “The neighbors all tend to know each other. So, it’s a good feeling. I think it creates this sense somewhat sense of security in peace.” Low income groups spoke in detail about conditions similar to those captured by the NPI: “This is an area that has been contaminated for years. […] There is the train tracks, there we are surrounded by junk yards, the lead from the car painting, the oils, the water sewer factory. We are surrounded by pure junks and the exhaust...the smells. Even the skunks smell better than the South […] Terrible.”</td>
</tr>
</tbody>
</table>
protective for multiple variables including MCS, PCS, and alcohol use.

- Both advantage and disadvantage matter. Neighborhood level disadvantage was predictive of higher depression scores while neighborhood level affluence was predictive of more salubrious self-rated health endorsement.

- Participants also spoke about both physical and mental health impacts as the result of the conditions of their communities:
  
  “I think to that point yes, that is tiredness. Physical fatigue because in fact our body is always on… as on the defensive, no? It has no moment of tranquility and that also causes physical wear in people (voices from other group members in agreement). And maybe we don’t realize it, but it is affecting a lot.”

- Data also supported the idea that both advantage and disadvantage matter. Positive and negative comments about neighborhood conditions and related health impacts were mentioned. For instance, medium and high-income focus group members spoke about the importance of accessing organic produce, of being able to relax, to enjoy the outdoors, or to have good aesthetics, as key in their ability to buffer the effects of stress and in facilitating healthy behavioral choices.

- Negative emotions and stress were discussed as having the largest role in mediating the impact of neighborhood conditions on health outcomes:

  “It makes one feel bad about why we cannot provide more. How does one feel in society in general and where is one on that scale? [Group agreement on the background]. And it is especially the people who come from another country and want to get ahead and when you start to see that you are not, this happens over the years. You start thinking ‘Wow. Who knows, I'm not fine, maybe I'm not doing things the way I should.’”

- Participants also spoke about impacts on health behavior choices as a potential mechanism. For example, participants spoke about a depletion of their cognitive resources and energy to engage in healthy behaviors such as healthy nutrition, exercising, and to resist coping with more deleterious alternatives such as drinking, smoking or reaching for comfort food.

  “Also, when these situations happen, we get stressed and one has the bad health. […] For example, if you are stressed and then come home from work tired, the first thing you want to do is to feed the family. What is easy? It's easier to get...
scores). It also remained significant in explaining the effects of neighborhood healthy food availability and PCS scores. to McDonald's, Burger King, Little Caesar .... or whatever it is and it's more economical to feed your family that food than to get to a store and make a meal.”

Are there differences between immigrants and US-born Latinos?

- Immigrants Latinos were less likely to have completed high school (3%) compared to US-born Latinos (27%).
- Immigrant Latinos were overrepresented in the below poverty income categories (36%) compared to US-born Latinos (25%). After controlling for family size, the same pattern was observed.
- Immigrants Latinos reported lower levels of pleasing aesthetics and exercise opportunities in their communities when compared to their native counterparts. a
- In terms of general mental health (i.e., MCS scores), for immigrants, longer time in the US, >% foreign born at the tract level, and lower NPI scores were protective factors. For US-born Latinos, being female, higher personal income, and % foreign born were key factors.
- Higher perceptions of neighborhood safety appear to be potentially protective against problematic alcohol use for immigrant Latinos (both marginally significant). For US-born Latinos, only % Hispanics was marginally associated with alcohol use (protective in this case).
- Differences were observed in focus group discussions based on language of the group. Spanish speakers were much more likely to report more adversity in terms of negative conditions in their communities (e.g., more environmental contamination, lack of infrastructure, serious crimes) and lack of access to positive things in their communities (e.g., healthy food options or exercise opportunities) compared to English-speaking groups.
- Spanish speaking groups were more likely to report experiencing detrimental mediating factor such as stress (77% of the quotes in this category) and negative emotions (86% of the quotes) compared to English-speaking groups. Additionally, Spanish-speaking groups reported less protective factors such as experiencing positive affect in their communities (14% of the quotes in this category).
- See Figures 6 and 8 for more details.

Neighborhood or Tract Income Gradient

- Significant differences were observed in mean levels for all six perceived neighborhood variables explored (e.g., aesthetics, walkability, safety from crime, healthy food availability, social cohesion). Participants in lower income tracts reported worse levels in all variables, followed by
- A gradient was observed in which lower income focus groups were more likely to report detrimental conditions, lack of access to resources, and more negative health impacts compared to medium or higher-income groups. For example, low income groups accounted for 76% mentions of structural issues and discrimination, 47% of negative health impacts,
medium-income tract residents. Those in high-income tracts reported the highest and more desirable levels in all variables. See Table 4 for more details.

• Similar differences were observed in psychological constructs. For example, low-income tract residents reported the lowest levels of exercise and nutrition self-efficacy. While not statistically significant, similar trends can also be observed on other psychological constructs.

• Lower income groups were also less likely to report positive factors, such as positive aspects of their communities or in terms of health and psychological well-being. For instance, low-income focus groups accounted for 20% of all positive comments regarding neighborhood conditions, 6% of comments related to feeling safe, and 14% of mentioned of experiencing positive affect or emotions.

• See Figures 6 and 7 for more details.

Notes. a See Table 3 for more details on the comparisons. MCS= Mental health Component Summary. PCS= Physical Component Summary. NPI= Neighborhood Problem Index.

Lack of access to resources was among the most typical complaints. This included lack of quality schools or exercise opportunities, lack of access to healthy food options, and lack of health care services including behavioral health. When speaking about access to schools, one participant in the low-income Spanish group explained:

“We take our children to another place for school... because the schools nearby have a very bad rating... and then they limit the resources, everything is very limited, even the teachers are limited in everything. Then we decided to take them further but that they have the same resources than any other normal student.”

This quote also highlights other overarching patterns seen across groups including the deep concern and worry that parents often expressed regarding children and youth and their opportunities and well-being. Additionally, this quote highlights the additional burden placed on individuals and families of having to go outside their neighborhoods and oftentimes drive long distance in order to access resources and basic necessities.

4 Quote was translated from Spanish to English for reporting purposes.
Lack of basic infrastructure was also among the most typical complaints related to the built or physical environment. This included, among other things, lack of street lighting, lack of sidewalks or sidewalks in need of repairs, and lack of basic public services such as trash pickup and cleaning. A participant from the Spanish low-income group shared:

“What I have seen is that that whole area is very dark at night, and also that there is… there is trash, for example, in the trash lots outside the houses there is trash. And they let the grass grow and sometimes you cannot see. There is no maintenance.”

Due to the lack of basic services and infrastructure, oftentimes participants spoke about needing to provide such services themselves. For example, one man in a low-income group reported having placed lighting on a street pole to decrease the darkness in the street at night. Another woman in a medium-income group reported that oftentimes individuals in her community run light from their own homes and electric bills to the street in order to illuminate the neighborhood at night.

Next, focus group members often reported issues with noise and traffic around their neighborhoods. Noise complaints were oftentimes related to traffic nearby participants’ residences and car racing during the nights. However, other noise complaints were unrelated to traffic. For instance, a male participant in the low-income English group shared:

“If you live closer to the Rio where there is also the train, when it does that big drop, (a female participant: Oh, yeah!) it is almost like an earthquake shaking.”

Traffic appeared to be an added stressor for many participants across groups. Heavy traffic surrounding communities often deterred participants from accessing resources in those areas, such as grocery stores, exercise and leisure opportunities. Moreover, as previously mentioned, many participants drive far for resources, which coupled with heavy traffic adds

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5 Quote was translated from Spanish to English for reporting purposes.
another layer of stress and exhaustion. A woman in the medium-income English speaking group explained:

"Mine is busy, and it wasn’t busy growing up... it’s around fourth and Montaño, and traffic got really super busy once obviously the bridge was built. And now it’s super busy and we used to play outside, we used to go, not all business were there so I mean there is pros and cons but it’s super busy."

Another concerning subcategory, overwhelmingly discussed by low-income groups, was environmental contamination. As will be further discussed in later sections, participants often made a clear connection between environmental contamination and health. Participants also often connected this issue with lack of investment in the community by the relevant authorities. A man in the Spanish-speaking low-income group stated:

"This is an area that has been contaminated for years. […] There are the train tracks, there we are surrounded by junk yards, the lead from the car painting, the oils, the water sewer factory. We are surrounded by pure junks and the exhaust... the smells. Even the skunks smell better than the South Valley. Terrible... it’s terrible and then we have the smells from the septic company there; they are also on second street. So, we are surrounded by pure things."

Finally, participants also discussed other general complaints of their neighborhoods’ built environment including issues with poor aesthetics, stray dogs roaming the streets and interfering with walking, and lack of green spaces. A woman in the Spanish medium-income group commented:

"I feel very good where I live but also sometimes, how can I say this, like the street sometimes are very ugly. Well, where we live it is a bit ugly but for the reach of our income I guess is fine."

To summarize, groups expressed a wide range of complaints regarding the built or physical environment around their neighborhoods. These concerns ranged from potentially less worrisome issues such as lack of aesthetics to serious issues such as environmental contamination.

6 Quote was translated from Spanish to English for reporting purposes.
7 Quote was translated from Spanish to English for reporting purposes.
contamination. Moreover, a gradient was seen in which low-income groups expressed more challenges than medium and high-income groups respectively. This SES gradient was especially noticeable for more serious issues such as environmental contamination, lack of basic infrastructure and lack of access to resources.

*Positive related comments.* Although a smaller category in comparison, participants also expressed some positive views of the built environment in their communities. Subcategories within the positive built environment theme include: (1) access to health enhancing resources, (2) positive aesthetics, (3) proximity to valued locations and (4) general positive comments.

The largest subcategory related to access to health enhancing resources. This included access to grocery stores and healthy food choices including organic food, access to health care, to convenient shopping, and access to gyms, parks and other exercise opportunities. As summarized by a male participant in the English medium-income group:

“My neighborhood, I’m by Lomas between Juan Tabo and Eubank and (sigh)… it’s very accessible to different things like there is a grocery store near the house, there is a Target, there is fast food everywhere… there is a club of pool, an indoor pool, there is a botanic gardens by there, there is a baseball park, a dog park which I really like…”

Similarly, a woman in the high-income English group expressed:

“Parks, a few steps and I am in a doggy park. Really pretty, small, really nice. Another reason I bought the house was because I had a poodle back then she’s passed, but I kind of dream about you know walking her there and she really liked the doggy park. And when my nieces and nephews visit from Texas there’s a park that is walking distance also and it’s great cause it’s got, you know, its brand new and it’s got beautiful trees for picnicking."

Some participants also elaborated on the positive aesthetics of their communities. An SES gradient was also observed in this area with low-income participants making no references to positive aesthetics in their neighborhoods. Comments related to this subcategory often related to the presence of green spaces such as proximity to the golf course, the Rio Grande, and the
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mountains. Living in places with views of the city, and where buildings and streets were 
attractive, well maintained and clean.

Another subcategory related to being in close proximity to valued locations such as 
schools, stores, coffee shops and leisure destinations, and other valued places such as the post 
office and other services. As discussed in the previous section, participants often found driving 
and traffic stressful. Thus, many of them valued living closer to locations needed for daily life. A 
woman in the medium-income English group stated:

“Yeah, like I said, in my neighborhood I’ve got an elementary, a middle, and a high 
school. That was my big seller, you know, like my daughter and I don’t care for my house, the 
way its set up. But I love the fact that her school is right there, she doesn’t have to change. You 
know what I mean? [...] My daughter would like to move, but I tell her, ‘I ain’t moving’ until 
she’s out of high school. Cause it’s like it’s just too convenient, you know, like the school district 
and everything, that’s what sold me when I first moved into that neighborhood.”

Finally, group members also expressed general positive comments related to the built 
environment of their neighborhoods, including enjoying the calm and quietness of their 
communities, seeing people and children play outside, and also conveyed an emotional 
connection to their communities. For example, a woman in the high-income English group 
shared:

“Our neighborhood, it is definitely home. [...] I am by the river so it’s scenic, it’s very 
pretty out there, it’s quiet but if I need anything it’s just over the river one way or the other. I 
don’t think I would ever leave, I told you I left and I came back. I missed it so bad I came back. 
And its historical and it has a long family history as well so yeah. Very connected to my 
neighborhood.”

Thus, participants expressed complex views of their neighborhoods and its conditions, 
which included not only negative complaints but also positive comments and sometimes pride 
and joy in the community. However, the SES gradient is evident in the fact that the majority of 
the negative comments originated in low-income groups while positive comments emanated for 
the most part in the higher income groups.
Social environment. Another major category emerged around the social environment of participants’ neighborhoods. This category is closely related to the quality of the social interactions and social norms in communities. In the literature, the areas of safety and social cohesion in particular have received the most attention (Alcántara, Molina, & Ichiro Kawachi, 2015; Cornwell & Cagney, 2014; Kim, 2010). The following section will offer further details on both negative and positive views related the social environment of participants’ neighborhoods.

Negative related comments. In the present study, the following subcategories emerged: (1) crime, (2) drugs, and (3) homelessness as a problem. Crime was the largest category and a consistent theme across groups. Many participants reported lack of safety in their communities and concerns not only for themselves but also for their children and families. Complaints ranged in severity from petty crime such as some graffiti, to moderate and serious crimes such as burglaries and shootings. It is worth noting that low-income groups were much more likely to report more serious crime incidents and concerns than medium and high-income groups. Additionally, participants often expressed worries related to their lack of personal means (e.g., ability to pay for insurance) to deal or recover from crimes such as burglaries. A woman in the Spanish low-income group reported the following incident, which was second by at least three other group members who had had similar experiences:

“It also happened once in a New Year when a ton of bullets started, very hard and a lot of bullets, and you could hear it a lot and one of the bullets came in. But in those times, we all leave, all of us including the children we all sleep in just one of the bedrooms in like a corner. So, we slept there and the next day we got up and we saw that one of the bullets came through the window. So, we always do that.”

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8 Quote was translated from Spanish to English for reporting purposes.
In addition, oftentimes, mentions of crime by medium or high-income groups were contextualized by participants as rare incidents or opportunity crime that did not influence their sense of safety. A woman in the English medium-income group stated:

"We, uh, I had my car egged one time. But I mean, my daughter’s a teenager and so I think it was a little teenage rivalry kind of thing going on. But beside that, I’ve never had my house broken into or felt unsafe. You know what I mean?"

Participants also expressed worries related to drug use and dealings around their communities. This was often a concern with regards to youth and their potential involvement with drugs. An SES gradient was also observed in this subcategory with more concerns reported by the low-income groups (58%), followed by medium-income (33%) and high-income groups. A woman in the medium-income English group recounts:

“I’ve found paraphernalia, like spoons and needles, like walking down Montgomery. Or you know, sometimes you even see them, um, a lot after the day I see a lot of, liquor, empty liquor bottles too. I think because there is a Seven-Eleven right there. So, you know I do see sometimes. Some, little bit of liquor trash, like single shots.”

A final subcategory emerged related to homelessness as a problem. Participants reported various concerns including safety, homeless camps in parks and other locations that cause avoidance of such areas and feeling uncomfortable with the striking inequality and the personal struggle of homeless individuals nearby their homes. A man in the medium-income English group shared:

"We are surrounded by fence and barbed wire because our cars have gotten broken into. Just people in that area, a lot of homeless, we live right by a homeless shelter."

In summary, participants expressed concerns related to their social environment. While presented in three separate subcategories (i.e., crime, drugs, and homeless as a problem), conceptually they are related to each other and reinforce each other. These concerns potentially also reflect deeper struggles such as chronic poverty, lack of opportunities and rehabilitation services.
**Positive related comments.** The following subcategories were found related to positive comments surrounding the social environment: (1) feeling safe, and (2) social cohesion. In contrast to the prior section and despite mentions of crime by all groups, several participants also expressed feeling safe in their communities. Consistent with prior findings, a reverse gradient was seen with very few mentions by low-income participants and more mentions by medium and high-income. Personal resources such as the ability to have a fence or to live in a gated community were often mentioned in conjunction with feeling safe. Moreover, participants living in more affluent communities often saw crime as a rare and more opportunistic incident and continued to feel safe. For instance, a man in the medium-income English group reported:

“That incident in my garage I think it might have been just a casual event. It wasn’t anything purposely targeted or anything you know? An opportunity kind of thing. But even with that, I feel safe. My daughter rides her bike around the block by herself or with the neighbor girl. Um, there’s this little kid where I’m like, ‘Why are you out by yourself?’ And he is a police officer’s son; he is like four. And he is riding a bicycle up and down the street by himself and that makes me feel safe that people are trusting in the neighborhood that the police officer lets his son do that.”

Some participants also reported a sense of social cohesion with neighbors and a shared sense of community. A reverse gradient was also observed in this subcategory with fewer mentions by low-income groups and none by Spanish speaking low-income participants. Residential stability and remaining in a community for generations appears to aid in the sense of feeling connected with neighbors. Furthermore, connections and trust in neighbors was oftentimes related to feeling safe. A woman in the high-income English group expressed:

“Our neighborhood is old. Alameda is actually one of the first villages in the city of Albuquerque, so it’s old, so there’s a deep history there. So, everybody knows each other there, though we live in this big city of Albuquerque. The neighbors all tend to know each other. So, it’s a good feeling. I think it creates this sense somewhat sense of security in peace. [...] My dad knows pretty much everybody in the neighborhood, so it creates a sense of security to be there.”

In summary, participants expressed both negative and positive experiences related to their neighborhoods’ social environment. Similar to results surrounding the built or physical
environment, an SES gradient was observed with low-income groups being more likely to report negative impacts such serious crime compared to higher income groups which were more likely to report positive impacts such as feeling safe or social cohesion.

**Health impacts related to neighborhood conditions.** Participants also connected their neighborhood conditions to health outcomes for themselves and their family members. Similar to the above section, health impacts can be conceptualized as negative or positive, with subcategories within each of these major themes. This section will describe these larger themes and their subcategories. Table 8 also offers a typology of themes, subcategories and sample quotes. Table 9 offers exemplary quotes for each theme and subcategory.

**Negative health impacts.** Participants, especially those in low and medium-income groups, often related environmental insults such as contamination, lack of access to resources, and other neighborhood complaints to deleterious health outcomes. Both built/physical characteristics and the social environment were associated with negative health impacts. The following subcategories arose: (1) sleep problems, (2) health concerns due to environmental contamination, (3) respiratory problems, (4) stress related problems, and (5) miscellaneous health problems.

The most typically discussed health concern was sleep problems or difficulties. Participants related several neighborhood features to sleep problems including noise from cars racing in the night, dogs barking, and very often worries related to crime in the vicinity. Participants reported waking up with small noises due to concerns regarding their safety and/or a potential break in. For example, a woman in the Spanish low-income group reported:

“Look, is that with any little noise one gets scared and gets up and start looking out the window and so... where I live for example there is no lights in that street... it is very dark,
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everything is very dark, and... yes, sometimes I’m scared because you hear a lot of noise and everything.”9

Thus, sleep difficulties are often tied to both features of the built environment such as noise, and also to the social environment in the case of crime and safety concerns. An SES gradient was observed with lower income groups reporting more difficulties (59% of comments in this category) than higher income groups (7%).

Another major issue raised by focus group members, especially by low-income groups, related to health concerns due to environmental contamination. As previously seen in the section describing environmental concerns in general, participants often described being in closed proximity to a wide variety of insults including brick, cement and paper plants, car junks, metal recycling locations and others. Additionally, pests were oftentimes mentioned as a concern. These pests were attracted by the aforementioned locations, as well as by agricultural centers. These environmental insults were associated with a range of health problems. A male participant in the Spanish low-income group recounted:

“We are surrounded... they are opening more places of junk cars and metal recycling, paper... everything is full. Imagine the whole plague of rats and everything that begins to gather. We have the brick manufacturing Kinney Brick right there in front. So, we are going to start with breathing problems... allergies, the eyes, the skin, all that dust is in the environment. Then if in 2020 begins to be more cancer then we know why, because the government has not done anything.”10

Respiratory problems were also reported. Once again, low-income groups were more likely to report difficulties (66% of quotes) than medium or high-income groups (17% respectively). These were sometimes related to environmental contamination such as poor air quality. However, it was also related to substandard housing conditions and locations in which

9 Quote was translated from Spanish to English for reporting purposes.
10 Quote was translated from Spanish to English for reporting purposes.
policies allowed for smoking and other contaminants without control. A woman in the medium-income Spanish group detailed:

“When I used to leave in the apartments here around Montgomery, it was awful. My daughter, the younger one, started with asthma because the neighbors smoked a lot. And even if we told them, they would not listen, and then at night it was like the smoke accumulated in the apartment, especially around the hallway, the bathroom and the bedrooms. And my daughter started suffering from asthma attacks, very ugly. She used to have very ugly attacks.”\(^{11}\)

Although a smaller category, stress related problems also emerged as a health issue. Stress, even not a health outcome in and of itself, appears to be a key pathway connecting neighborhood conditions to the development of negative health conditions. Participants reported stress related to features of both the built and the social environment. With regards to the physical characteristics, stress was associated with noise, traffic, having to drive or commute far to obtain basic resources, environmental contamination, and others. In terms of the social environment, stress was particularly associated with crime and perceived lack of safety.

Furthermore, experiencing the effects of poverty and inequality, coupled with an inability to surmount such obstacles, was recounted as a form of added stress. Some participants where kindly aware of the connection between the unequal environment, stress and health. A woman in the low-income Spanish group expressed:

“We live with fears, stressed out…. I think that stress creates physical and emotional illness; it is a social disease. It has been clinically proven that stress is a disease that exists and ... and heart attacks, blood pressure problems, depression, all that ... depression, suicides, so I think it is something that is impacting us much more than cancer itself, the stress. I think it’s a disease that… that will not be removed until the social piece changes. So, we have a lot of work to do.”\(^{12}\)

Finally, miscellaneous health problems were associated with a wide range of neighborhood conditions. These included allergies, concerns regarding obesity due to the abundance of fast food restaurants, and other general health problems. An SES gradient was also

\(^{11}\) Quote was translated from Spanish to English for reporting purposes.

\(^{12}\) Quote was translated from Spanish to English for reporting purposes.
observed with more mentions by low (60% of mentions) and medium-income groups and none by the high-income groups.

In summary, results show evidence of an intrinsic connection between neighborhood conditions and health related outcomes among Latinos. Findings highlight the complexity of the relationship between a wide range of neighborhood factors (e.g., resource availability, crime and safety, opportunities for exercise and healthy food habits, to environmental contamination and social cohesion) and a myriad of health outcomes from sleep problems, allergies, respiratory problems such as asthma, among others. The physical and emotional weathering experienced by individuals, especially those living in less resourced or affluent neighborhoods, can be seen on the following quote by a participant in the low-income Spanish group:

“I think to that point yes, that is tiredness. Physical fatigue because in fact our body is always on… as on the defensive, no? It has no moment of tranquility and that also causes physical wear in people (voices from other group members in agreement). And maybe we don’t realize it, but it is affecting a lot.”\(^{13}\)

**Positive health impacts.** Although less often, participants also mentioned positive physical and emotional impacts related to their neighborhoods. It is worth mentioning the absence of mentions of positive health impacts by the low-income focus groups and by any of the Spanish-speaking groups. These comments emanated solely from the medium and high-income English-speaking groups. Given the smaller numbers of mentions, a single theme emerged around general beneficial impacts. Living in a calm and peaceful community, with opportunities for outdoor activities and leisure, as well as health enhancing resources such as healthy food options and health care, appear to have beneficial impacts. Moreover, participants spoke about their communities facilitating their ability to relax or unwind in order to cope with daily stressors. A female participant in the medium-income English group stated:

\(^{13}\) Quote was translated from Spanish to English for reporting purposes.
“I think that has a lot of influence. Like being a college student and everything that you go through, a lot of stress and everything, but my neighborhood is like super calm, and so like I don’t have to worry about getting robbed. Or like anything like that. It’s filled with a low of older people too, so that it kind of mellows me out more. So, I’m not like all crazy. And, yeah I think that it influences me in a positive way.”

Pathways or mediators between neighborhoods and health. Participants were asked their input on potential factors they have experienced or witnessed that could help explain the relationship between neighborhood conditions and health. Group discussions included both negative and positive factors that can be conceptualized as potential pathways or mediators. Negative pathways included (1) negative emotions, (2) stress, (3) general factors, and (4) direct exposure to environmental insults. Positive pathways included (1) access to health enhancing resources and (2) positive affect. Further descriptions are provided below.

Negative effects. Participants discussed factors that can be conceptualized as potential explanations of the link between neighborhood conditions and disease. Negative emotions were the largest subcategory reported by participants, and in particular by low-income and Spanish-speaking groups who accounted for 74% and 86% of the quotes respectively. Group members reported a variety of emotions secondary to their neighborhood conditions including fears related to crime and safety; sadness, hopelessness and frustration related to perceptions of poverty and lack of opportunities for health and social mobility; and general worries about neighborhood conditions and their impact on children and adolescents and their well-being. Spanish-speaking participants also spoke about fears around deportation, police and structural discrimination. They reflected on how negative emotions shared in the family affected children and their ability to performed well in school. In general, participants also mentioned the impact of stress on their ability to regulate emotions at home, leading to anger and irritability around the family. A pattern also appeared in which a large proportion of the quotes were intrinsically connected to structural issues and upstream determinants of health such as structural discrimination, chronic lack of
investment in low-income communities, and lack of opportunities for economic mobility. This is particularly the case for the low-income and Spanish-speaking participants. A woman in the low-income Spanish-speaking group elaborated related to fears of crime:

“But it is not the material but the fear... [Man in the group: yes ... it breaks your privacy]. No, as if they break something inside you. You say, ‘I'm vulnerable.’ You lose the confidence to leave.” Moreover, a woman in the medium-income Spanish-speaking group stated regarding frustration and hopelessness: “You mentioned [referring to another woman in the group] that having difficulties in the house or conditions that are not ideal make you feel bad. It makes one feel bad about why we cannot provide more. How does one feel in society in general and where is one on that scale? [Group agreement on the background]. And it is especially the people who come from another country and want to get ahead and when you start to see that you are not, this happens over the years. You start thinking ‘Wow. Who knows, I'm not fine, maybe I'm not doing things the way I should.’ That kind of thing.”

Stress as a pathway was the second largest subcategory discussed by participants. A gradient was also observed in which quotes originated primarily from low and medium-income groups (43% and 40% respectively) compared to high-income groups. Notably, Spanish speakers accounted for most of the quotes at 77% compared to English speaking participants. Participants discussed a variety of stress-related impacts on health including negative impacts on emotion regulation, as explained above, and general impacts on disease and mortality including cardiovascular disease implications. Participants also spoke about stress-related impacts on their ability to make healthy choices. For instance, stress was seen as depleting energy and resources, thus making it more difficult not to overeat, reach for comfort foods, or feel motivated to exercise. Participants gave examples of being too tired after the day due to chronic stress to cook and reaching for convenient foods around their communities, which often only included fast food options. Others spoke about the connection between stress, chronic poverty and deprivation in many low-income and immigrant communities. A woman in the low-income Spanish-speaking group described the following relating stress, access, and healthy choices:

14 Quote was translated from Spanish to English for reporting purposes.
“Also when these situations happen, we get stressed and one has the bad health. But there is also no access to healthy food in the community. For example, if you are stressed and then come home from work tired, the first thing you want to do is to feed the family. What is easy? It's easier to get to McDonald's, Burger King, Little Caesar .... [Man in the group says: ‘pizza’] or whatever it is and it's more economical to feed your family that food than to get to a store and make a meal. So what kind of access is there for the community to eat healthier, to be able to offer to the family in situations when one is perhaps stressed?”

The third largest subcategory was general factors connecting neighborhoods and health. Within this, social isolation or lack of connection emerged as a potentially important factor. This particularly includes isolation and lack of social connection with neighbors and others in the community. Moreover, participants spoke about negative conditions in their communities leading to a dislike and apathy for their communities, which they saw as affecting their general well-being and ability to enjoy and relax in their homes and daily environment.

Direct exposure to environmental insults was the fourth largest subcategory of potential explanations for the development of negative health outcomes. Participants described a variety of factors including direct exposure to environmental contamination and concerns regarding the development of cancer, skin and respiratory conditions, and others. This was often due to the overrepresentation of polluting companies (e.g., cement plants, car junk yards, water processing plants, landfills) in the low-income communities. Noise exposure, which can also be conceptualized as an environmental insult, was mentioned as a key factor leading to chronic poor sleep and related impairments in functioning. Noise was attributed to business, car racing at night, and dogs and cats. A sharp gradient was observed with 65% of the quotes in this category of environmental exposures originating in the low-income groups compared to less than 1% from the high-income groups.

**Positive effects.** Focus group members also spoke about protective factors they saw as leading to positive health impacts. The largest subcategory related to having access to health enhancing resources in their local neighborhood. These included having access to groceries
stores and affordable fresh produce options, retail stores, places for entertainment, parks and
green spaces, community centers, and local health care access. Moreover, having convenient
access to transportation or freeway access was mentioned as a desirable aspect of neighborhoods
that facilitated mobility and accessibility. Notably, English speakers were twice more likely to
speak about personally having some of these features in their communities than their Spanish-
speaking counterparts (26 quotes vs 13 quotes). A gradient was not observed when comparing
low, medium or high-income neighborhood focus groups. A woman in the high-income English-
speaking group stated regarding her neighborhood:

“The access to a Walmart Super Center, Smith, Albertson’s, the Organic stores is within
minutes, less than ten. The mall is three minutes away and Costco is two minutes away. Mmmh,
parks also, a few steps and I am in a doggy park.”

The second largest category mentioned related to neighborhood conditions having the
potential to create positive affect on its residents, which could then translate to beneficial health
impacts. For example, some participants spoke about feeling optimistic about opportunities given
positive changes they have witness in their own communities. Others spoke about how having
access to quality schools locally created a sense of relief and destress among parents. Several
participants used positive emotion laden language to describe their communities and their
feelings in them such as “love,” “piece,” “calm,” and “serenity.” Notably, only 14% of quotes in
this subcategory emerged from low-income groups. A woman in the high-income English group
shared:

“I have a wonderful view of the mountains, and the Bosque and the entire city. At night it
is breath taking from the back view of my master bedroom. [...] I feel blessed. I feel I go to my
balcony every night and go ‘Wow! I can’t believe I am here!’ Looking at you know, the sky full
of stars, and the city lights and I see the sunrise in the mornings in the Sandias [local mountains].
When they turn the colors, you know, that to me is whoa. To me that’s the most wonderful
feeling.”
Potential moderating factors. A theme emerged related to factors that can be conceptualized as potential moderating variables in the relation between neighborhood conditions and health. These included (1) barriers to accessing existing neighborhood resources, (2) presence of personal resources to deal with stress and make healthy choices, (3) ability to drive far for resources, and (4) collective action and/or efficacy. This theme emerged in the context of participants speaking about general neighborhood conditions and health-related impacts.

Barriers to accessing existing neighborhood resources was the largest subcategory discussed by participants. A gradient was observed in which the largest number of comments (58%) were made by low-income focus group participants, followed by medium-income participants (34%). Only one comment in this subcategory was made by a high-income focus group participant. Barriers included lack of safety for walking and physical activity, crime and homeless as concerns preventing parents from allowing children to use parks or play outside, and economic barriers preventing families from purchasing fresh produce or healthier meals. Stray dogs were also mentioned as a barrier to physical activity around some communities. Participants also spoke about the high cost of local gym memberships, long waitlists on the few available behavioral health clinics, or some health care facilities requiring health insurance cards. Moreover, several participants spoke about lack of awareness of existing programs and resources such as food assistance programs, healthy cooking classes and Spanish-speaking services offered by local organizations.

Presence of personal resources to deal with stress and make healthy choices was also brought up as a potentially important area to consider. Participants discussed both lack and access to personal resources such as additional disposable income as a buffer that can help with
managing unforeseen stressors and aid in making healthier choices. Low-income participants often spoke about lack of additional personal or family resources as a constant stress. For instance, inability to purchase good insurance was related to increased fears of crime or auto theft; lack of additional income for home repairs, for adding fences or security systems, were also related to fears of crime; and financial constraints were mentioned in relation to inability to purchase healthier foods or gym membership regardless of the local availability of those options. In contrast, higher income participants often spoke of having typical stressors but being better able to cope with them by relying on extra capital and resources on those times. The following quote by a low-income English-speaking participant showcases how in the face of similar neighborhood crime conditions, personal resources have allowed her to cope and have a positive perception of her community:

“I was raised in the North Valley, and that’s why I like the South Valley because it reminds me of the North Valley (laughs). I like rural environment, but yet you have everything there, and we have our own little slice. I call it our little slice of paradise. We are fenced in because we had some burglaries and that type of thing, so I have a six-foot fence. I feel very secure at my home. But, also, I have a gate that locks, and a six-foot fence and we protect our property. So, I feel real optimistic.”

Similar to personal resources, the next largest subcategory related to ability to drive far for resources. Participants discussed driving for multiple resources including taking their children to schools outside their neighborhood, driving several miles to purchase food and to exercise, and for medical care. Notably, low-income focus groups mentioned driving for needed or basic resources such as any food, access to basic health care, or taking their children to different schools due to the poor quality of the local schools. Medium and high-income group members spoke more closely about driving for additional resources such as their favorite organic food store, driving for a hike in the mountains, or their preferred doctor or clinic.

The final and smallest subcategory within this theme of moderating factors is
collective action and/or efficacy. Different types of neighborhood level organization systems were mentioned as a way to combat detrimental conditions such as lack of access to food or crime. Participants elaborated on their reliance and participation on local community non-profit organizations that have programming around food justice. Some of these programs involve farming and donations of food bags to needy families. Others spoke about participation in informal and formal neighborhood watch programs to combat crime and create community safety norms. Low-income groups also spoke about individually setting up street lights to improve safety in their blocks and decrease crime concerns for their local community.

**Structural discrimination as underlying context.** Many of the negative complaints related to neighborhood conditions can be traced to underlying inequities in resource sharing and distribution, as well as in the implicit value placed on different communities. Participants explicitly or implicitly traced back negative conditions and their related health impacts to structural issues. Among the most salient issues raised were a (1) general lack of investment in low-income and predominantly Latino and immigrant communities, (2) overall structural discrimination, and (3) issues with authorities including the police. Overwhelmingly, comments in this theme were generated primarily by low-income groups and Spanish-speaking participants. See Figure 6 for a visual representation. Moreover, see Table 9 for exemplary quotes.
Figure 6. Structural discrimination sub-themes by focus groups neighborhood income and language.

Note. Figure shows overall gradients for neighborhood income level and language of the groups.

The general lack of investment in low-income and predominantly Latino and immigrant communities was discussed as structural discrimination leading, in part, to previously discussed lack of basic infrastructure and differential access to health enhancing resources (e.g., exercise, food, quality schools, health and behavioral health care). This chronic disinvestment in low-income communities was perceived by participants as emanating from differential regard by city authorities and government structures. In particular, participants discussed a lack of investment in multiple important areas including basic infrastructure and services such as sidewalks, cleanliness, and trash pickup. They also spoke about lack of general investment in the neighborhood such as parks, green spaces, aesthetics, programs to ameliorate poverty and drug
problems, and lack of investment in education and the local school system. A woman in the low-income Spanish group explained:

“There is no sidewalks around the school where I work. To ask for the basics like lights or signs, or to get cars to reduce the speed, we had to ask for federal money and some money from the county. But it takes a long time. The school has been there for 15 years and nothing has happened yet.”

Overall structural discrimination was the second largest subcategory discussed within this overall theme. Multiple areas were mentioned including structural discrimination in housing, anti-immigrant sentiment, and zoning and city incorporation. Lack of incorporation into the city for some low-income neighborhoods, despite central location within the city geographic limits, was seen as justification for lower number services and potentially concerning for voting rights. Moreover, participants reported noticing vast social inequalities in resource distribution among neighborhoods. Participants in the low-income groups recounted about the abundance of services and opportunities in other areas such as the North East, while those in the high or medium-income groups often spoke about the lack of resources on the South Valley and other lower income neighborhoods. These included noting differences in basic infrastructure, poverty rates, responsiveness by city officials when problems arise, and police presence and timeliness when called. For instance, a woman in the high-income English group elaborated:

“Not my neighborhood because like I said I’m happy where I am at, but it does bug me that like, I don’t know the North Valley area, but in the South Valley where I go to meet with my family, they don’t have sidewalks, like there’s hardly any parks out there. You know, they just don’t, you go over there and then you go to the North-East heights, huge! It’s like two different worlds. Why, why is it that there is this big disparity?”

Finally, participants spoke about differential reporting by the media with regards to crime and other neighborhood problems. This was reported by focus group members as creating a

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Quote was translated from Spanish to English for reporting purposes.
negative perception of certain communities by the overall city and also by the local community members.

Referring to housing discrimination, a man in the low-income Spanish-speaking group stated: “When I was in the market looking for my house, I was looking all over Albuquerque, and the realtors would always send me to the South Valley. To all the immigrants or Hispanics, they send us there. I asked to see other houses but they [referring to the realtors] would say ‘no, no, no, they are too expensive, you do not qualify’ or ‘there are none available.’ Then it is true that the politics of some companies push us to create communities of all Hispanics, all poor people, all African-American people in one place, and whites in another place.”¹⁶

The third subcategory related to issues with authorities including the police. Participants reported general differential treatment and lack of responsiveness by city authorities and elected officials when it comes to low income and primarily immigrant communities. This was seen as translating into lower resource allocation and a general lack of appreciation for these communities, regardless of their tax payments and overall contribution to the city economy and live. Discrimination by the police based on ethnicity and language was also discussed as a major issue leading to increased fears and stress by community members and their families. Spanish-speaking immigrants described several incidents of unfair treatment and bias. For instance, a participant described a traffic accident with an intoxicated driver in which the blame was placed on her due to her lack of English fluency. Interestingly, participants in virtually all communities reported wanting police presence and responsiveness as a way to ameliorate fears of crime. Thus, police presence was seen as desirable, as long as they are not a discriminatory or immigration enforcing authority. A woman in the Spanish-speaking low-income group elaborated:

“And then you also feel like you always have to be on high attention when you go outside, as if ... you are stopped by the officers, be it a sheriff or local police... how do you behave? One has to take certain steps to ensure that they do not ... perhaps put themselves [speaking in third person] in the situation where they may run into a dangerous situation with an officer. And then that's where ... one instead of feeling protected maybe feels the other way around, at a disadvantage ... without being able to trust in the public servants. As the gentleman informs [referring to a man in the group] it is a social problem. And if we make those social

¹⁶ Quote was translated from Spanish to English for reporting purposes.
changes, then that impacts the stress when one leaves the house... how one behaves in public ...the stress of having to ensure that children behave well so as not to attract attention in those situations.”

**Solutions.** Focus group participants had an opportunity to discuss potential solutions that could address or improve their previously mentioned concerns. Multiple solution categories emerged including, in order of popularity, (1) investments in the community, (2) miscellaneous solutions, (3) collective action/efficacy, (4) improved relationships with authorities, (5) and non-neighborhood specific solutions. Table 9 offers exemplary quotes for themes and subthemes.

Investment in the community emerged as the largest solution category. Participants’ comments related to the need for investments in a variety of areas such as infrastructure and maintenance, the local business economy, and investments in education and youth programing. Examples included improvements in sidewalks, addition of street lighting, aesthetic improvements in the community, assistance to local business owners, and efforts to reduce homelessness. Notably, comments related to improvements in education or youth programming was the largest subcategory within this theme, accounting for nearly 60% of the quotes within the theme. A woman in the medium-income Spanish-speaking group elaborated the following with regards to education and youth investments:

> “Another thing is that parents do not have time to take the kids to certain events due to their work schedule. And the sports at school are beneficial to the kids because they are already there. And as parents we know they are at school and safe. Many times, both parents work, and as we were saying before, trying to improve their situation and maybe don’t earn much and live in a bad place.”

17 This quote particularly highlights the added burden placed on parents, and low-income families in particular, when schools lack built-in programing for children and/or adolescents. The second largest subcategory included miscellaneous solutions. Participants spoke about the need

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17 Quote was translated from Spanish to English for reporting purposes.
for translation services for monolingual Spanish-speaking community members. Lack of culturally appropriate language services was seen as a barrier for health care access and for communication with important individuals such as policy officers and school teachers or staff. Moreover, returns to cultural revitalization and pride, and added behavioral health services were mentioned as important solutions. Pride and awareness of Hispanic cultural heritage, as well as incorporation in school curriculums, were discussed as a way to increase well-being and a sense of positivity and resilience for community members. Focus group participants also spoke about lack of mental health services in low-income areas of the city and long waitlists for the few available programs.

Another subcategory related to collective action/efficacy. This was overwhelmingly discussed by low-income focus groups, which account for over 90% of the comments in this area. Participants stated the importance of leaders, whether formal or informal leaders, in unifying the community and addressing structural discrimination. Some focus group members further elaborated on divisions among communities based on class, country of origin, race or other factors. These divisions were seen as being instigated and exploited by politicians in order to maintain the status quo and prevent meaningful community organizing. Others spoke about barriers to community organizing and participation such as inability to attend community meetings due to conflicting work schedules. Participants reported that low-income individuals are more likely to work jobs that do not allow for flexible schedules or are unable to afford time off to attend meetings. A male in the Spanish-speaking low-income group reported:

“They should put money in finding good leaders, because there are bad things, but if we have good leaders they change and work better. You can have a little bit of money, but you accomplish much if you work all together… in seeing one raze, one community. Yes? Because a family does not make much money; however, they are united and sustaining themselves. So, if a good leader could do that, even with little money, everyone working together putting their grain of sand, this would change. [...] Then, the leaders are the ones creating divisions. Carlo Magno
used to say: ‘divide and you would conquer.’ And that is what the politicians want, to divide us. They say to the Asians: ‘look at the Hispanics, they are robbing you.’ Or ‘look at the African Americans, they are robbing you.’ And they divide us and make us weak. That is what a bad leader does. They divide us to control us. But with good leaders that unite us, this would be another life. We would support each other.” 18

Participants also spoke about improved relationships with authorities as a needed solution. This refers to relations with both city officials and general authorities, and with the police. A sharp gradient was observed in this subcategory, with most of the comments originating from the low-income groups (73%). Participants discussed the need for increased trust with authorities, increased knowledge by authorities of community needs, recognition of tax payments and hence of contribution to the city by lower income communities, and programs designed to increase relationships and mentoring between the policy and youth.

Finally, a pattern emerged of high-income groups speaking about potential interventions or actions related to overarching city problems. This was classified as non-neighborhood specific solutions. For instance, participants spoke about concerns for the homeless problem in the city and potential efforts to address it. Some spoke about regulating alcohol sales to decrease DUI rates, long waitlists and lack of resources at the University of New Mexico Hospital to address the overall social need in the city, and a demand for more resources to address early childhood education and overall high rates of poverty in the county. It is possible that the lack of immediate disadvantage or concerns in their own communities created a space for higher neighborhood income participants to think and be concerned about broader issues.

18 Quote was translated from Spanish to English for reporting purposes.
Table 9.

*Focus Group Themes and Exemplary Quotes.*

<table>
<thead>
<tr>
<th>Higher-Order Theme</th>
<th>Sub-family Environment – Negative Related Comments</th>
<th>Subcategory Themes</th>
<th>Exemplary Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighborhood Conditions</td>
<td>Built/Physical Environment</td>
<td>• Lack of Access to Resources</td>
<td>“What I have seen is that that whole area is very dark at night, and also that there is… there is trash, for example, in the trash lots outside the houses there is trash. And they let the grass grow and sometimes you cannot see. There is no maintenance.” <em>Lack of basic infrastructure</em></td>
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<td></td>
<td></td>
<td>• Lack of Basic Infrastructure</td>
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<td></td>
<td></td>
<td>• Noise and Traffic</td>
<td>“If you live closer to the Rio where there is also the train, when it does that big drop, (a female participant: Oh, yeah!) it is almost like an earthquake shaking.” <em>Noise and traffic</em></td>
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<tr>
<td></td>
<td></td>
<td>• Environmental Contamination</td>
<td>“This is an area that has been contaminated for years. […] There is the train tracks, there are surrounded by junk yards, the lead from the car painting, the oils, the water sewer factory. We are surrounded by pure junks and the exhaust... the smells. Even the skunks smell better than the South […]]. Terrible... it's terrible and then we have the smells from the septic company there; they are also on second street. So we are surrounded by pure things” <em>Environmental contamination</em></td>
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<tr>
<td></td>
<td></td>
<td>• Other General Complaints</td>
<td></td>
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<tr>
<td>Built/Physical Environment – Positive Related Comments</td>
<td>“My neighborhood, I’m by Lomas between Juan Tabo and Eubank and (sigh)... it’s very accessible to different things like there is a grocery store near the house, there is a Target, there is fast food everywhere... there is a club of pool, an indoor pool, there is a botanic gardens by there, there is a baseball park, a dog park which I really like...” Access to health enhancing resources</td>
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<tr>
<td>• Access to Health Enhancing Resources</td>
<td>“I have a wonderful view of the mountains, and the Bosque and the entire city. At night it is breath taking from the back view of my master bedroom. [...] I feel blessed. I feel I go to my balcony every night and go “Wow! I can’t believe I am here!” Looking at you know, the sky full of stars, and the city lights and I see the sunrise in the mornings in the Sandias. When they turn the colors, you know, that to me is whoa you know. To me that’s the most wonderful feeling.” Positive aesthetics</td>
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<tr>
<td>• Positive aesthetics</td>
<td>“Our neighborhood, it is definitely home. [...] I am by the river so it’s scenic, it’s very pretty out there, it’s quiet but if I need anything it’s just over the river one way or the other. I don’t think I would ever leave, I told you I left and I came back. I missed it so bad I came back. And its historical and it has a long family history as well so yeah. Very connected to my neighborhood.” Positive related comments</td>
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<tr>
<td>• Proximity to Valued Locations</td>
<td>“It also happened once in a New Year when a ton of bullets started, very hard and a lot of bullets, and you could hear it a lot and one of the bullets came in. But in those</td>
<td></td>
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<tr>
<td>• General Positive Comments</td>
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times we all leave, all of us including the children we all sleep in just one of the bedrooms in like a corner. So we slept there and the next day we got up and we saw that one of the bullets came through the window. So we always do that.”

**Crime**

“I’ve found paraphernalia, like spoons and needles, like walking down Montgomery. Or you know, sometime you even see them, um, a lot after the day I see a-loot of, liquor, empty liquor bottles too. I think because there is a Seven-Eleven right there. So, you know I do see sometimes. Some, little bit of liquor trash, like single shots.”

**Drugs**

<table>
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<tr>
<th>Social Environment – Positive Related Comments</th>
<th>Feeling Safe</th>
<th>Social Cohesion</th>
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</thead>
</table>

“That incident in my garage I think it might have been just uhh… a casual event. It wasn’t anything purposely targeted or anything you know? An opportunity kind of thing. But even with that, I feel safe. My daughter rides her bike around the block by herself or with the neighbor girl. Um, there’s this little kid where I’m like, “Why are you out by yourself?” And he is a police officer’s son; he is like four. And he is riding a bicycle up and down the street by himself and that makes me feel safe that people are trusting in the neighborhood that the police officer lets his son do that.”

**Feeling safe**

“Our neighborhood is old. Alameda is actually one of the first villages in the city of Albuquerque, so it’s old, so there’s a deep history there. So, everybody knows each other there, though we live in this big city of Albuquerque. Um, the neighbors all tend to know each other. So, it’s a
I think it creates this sense somewhat sense of security in peace. [...] Um, my dad knows pretty much everybody in the neighborhood, so it creates a sense of security to be there.” *Social cohesion*

| Health Impacts | Negative Health Impacts | “Look, is that with any little noise one gets scared and gets up and start looking out the window and so... where I live for example there is no lights in that street... it is very dark, everything is very dark, and... yes, sometimes I’m scared because you hear a lot of noise and everything.” *Sleep problems*

“Health concerns due to environmental contamination

“We live with fears, stressed out…. I think that stress creates physical and emotional illness; it is a social disease. It has been clinically proven that stress is a disease that exists and ... and heart attacks, blood pressure problems, depression, all that ... depression, suicides, so I think it is something that is impacting us much more than cancer itself, the stress. I think it’s a disease that... that will not be
NEIGHBORHOOD CONDITIONS AND LATINO HEALTH

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**Positive Health Impacts**

- General Beneficial Impacts

  “I think that has a lot of influence. Like being a college student and everything that you go through, a lot of stress and everything, but yeah my neighborhood is like super calm, and so like I don’t have to worry about getting robbed. Or like anything like that. It’s filled with a low of older people too, so that it kind of mellows me out more. So I’m not like all crazy. And uh, yeah I think that it influences, my in a positive way.” *General beneficial impacts*

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**Pathways Related**

**Negative Pathway**

- Stress
- Negative Emotions
- Environmental Contamination
- Social Isolation
- Other (e.g., diet, noise)

  “We live with fears, stressed out…. I think that stress creates physical and emotional illness; it is a social disease. It has been clinically proven that stress is a disease that exists and … and heart attacks, blood pressure problems, depression, all that … depression, suicides, so I think it is something that is impacting us much more than cancer itself, the stress.” *Stress*

  “And to see poverty in a country that is so powerful, that invests millions to protect itself from its neighbor and denigrate them. Do you remember the Brazeros groups and how they threw us disinfectant when our parents and grandparents came to work? And things are the same now, a little different, the prisons full of our countrymen… it's very hard. Our children are afraid of being deported, of being caught by the migra. I lived a case with my son and I still do not recover. Believe me, whenever I talk about this, it affects me. Luckily it was removed until the social piece changes. So we have a lot of work to do.” *Stress related problems*
one and they did not take my other daughter. She would go to school with the fear of leaving... ‘will papa come back?, would he return from work?’” Negative emotions

“This is an area that has been contaminated for years. […] There are the train tracks, there we are surrounded by junk yards, the lead from the car painting, the oils, the water sewer factory. We are surrounded by pure junks and the exhaust... the smells. Even the skunks smell better than the South Valley. Terrible... it's terrible and then we have the smells from the septic company there; they are also on second street. So, we are surrounded by pure things” Environmental contamination

“I think the isolation. Like she was saying the neighbors don’t talk to you. You don’t know anybody in the community. It is very difficult. For me it doesn’t matter, but I can see people get isolated especially the elderly. If you don’t have community activities and things that include everybody, and I know we have our West Side Community Center and those types of things, but I don’t see some real resources that help.” Social isolation

“I think the noise affects my health. I can’t sleep! You know there’s noise, dogs barking all night and cars going by.” Other

<table>
<thead>
<tr>
<th>Positive Pathway</th>
<th>Access to Health-Enhancing Resources</th>
<th>Positive Feeling or Emotion</th>
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<tbody>
<tr>
<td></td>
<td>“The access to a Walmart Super Center, Smith, Albertson’s, Organic stores is within minutes, less than ten. The mall is three minutes away, Costco is two minutes away. Parks, a few steps and I am in a doggy house”</td>
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**Access to health-enhancing resources**

“I have a wonderful view of the mountains, and the Bosque and the entire city. At night it is breath-taking from the back view of my master bedroom. I feel blessed. I feel I go to my balcony every night and go, ‘Wow! I can’t believe I am here!’, looking at the sky full of stars, and the city lights and I see the sunrise in the mornings, in the Sandias. When they turn the colors, you know, that to me is ‘whoa’ you know. To me that’s the most wonderful feeling.”

**Positive feeling or emotion**

<table>
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<tr>
<th>Structural Issues</th>
<th>Issues with authorities, including the police</th>
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<tr>
<td></td>
<td>Lack of infrastructure and investment in communities</td>
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<td></td>
<td>Other Structural Discrimination</td>
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“And then you also feel like you always have to be on high attention when you go outside, as if ... you are stopped by the officers, be it a sheriff or local police... how do you behave? One has to take certain steps to ensure that they do not ... perhaps put themselves [speaking in third person] in the situation where they may run into a dangerous situation with an officer. And then that's where ... one instead of feeling protected maybe feels the other way around, at a disadvantage ... without being able to trust in the public servants. As the gentleman informs [referring to a man in the group] it is a social problem. And if we make those social changes, then that impacts the stress when one leaves the house... how one behaves in public ...the stress of having to ensure that children behave well so as not to attract attention in those situations.”

**Issues with authorities - police**

“There is no sidewalks around the school where I work. To ask for the
basics like lights or signs, or to get cars to reduce the speed, we had to ask for federal money and some money from the county. But it takes a long time. The school has been there for 15 years and nothing has happened yet” *Lack of infrastructure and investment*

“When I was in the market looking for my house, I was looking all over Albuquerque, and the realtors would always send me to the South Valley. To all the immigrants or Hispanics, they send us there. I asked to see other houses but they [referring to the realtors] would say ‘no, no, no, they are too expensive, you do not qualify’ or ‘there are none available.’ Then it is true that the politics of some companies push us to create communities of all Hispanics, all poor people, all African-American people in one place, and whites in another place.” *Other structural discrimination - housing*

<table>
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<tr>
<th>Solutions</th>
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<tbody>
<tr>
<td>• Increased Behavioral Health Services</td>
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<td>• Collective Action/Efficacy</td>
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<td>• Improved Relations with Authorities</td>
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<tr>
<td>• Investment in Youth and Education</td>
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<tr>
<td>• Investment in the Community</td>
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<tr>
<td>• Other (e.g., language interpretation services)</td>
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“I say clinical mental health and drug addiction. Our kids are suffering in this city, we can’t turn our eye away from it. Actually I’m in the graduate program now for mental health counseling, but I mean if you don’t address the drug addiction in this community then I don’t know what the fix is. Mental health yes absolutely.” *Increased behavioral health services*

“I want to make a comment because we had mentioned who is going to get close to the capital, who goes to that meeting, to the meetings, and it is very difficult. For example, there are many who work here I imagine, and have to ask for a day off. It is a day of salary and what happens with
that salary, which is where it is best to go? So, when it is easier for other people who might have a better job. I have the opportunity to have those days of rest and continue with my salary but I work with many families immigrants and when they do not have those same opportunities. Then who can represent families?” *Collective action/efficacy*

“I would tell the governor or the mayor that a better interaction between the police and the youth. In other words, you can create a good communication office or whatever it's called, a kind of... well, in Puerto Rico there are leagues of police. It's kind of a social organization organized by the police, they call boys and they march and all that. They entertain them in quotation marks but they teach them a kind of discipline and that makes the community involved with the police. Something, a social contact office with the police. Yes, of noticing that the police care about the young and a kind of coaching” *Improved relationship with authorities*

“Now another thing, many times the parents work and their work does not give them time sometimes to take children to these events because sometimes they take several hours. And at school, when they already have sports at school, that is more beneficial for the children because they are already there. One knows that they are there at school, and many times the two parents work and as they were saying a while ago, to make a little better life they live in a little better
place than they cannot afford.”

**Investment in youth and education**

“I would tell them to, we need an attractive community. We have the ugliest community I have ever seen. It’s disgusting, I mean we need to make our environment attractive, so these kids that are going to school feel like they’re in poverty. They walk down their streets and it’s a beautiful street, and the roads are paved and they’re safe. Why can’t we do that? There’s no reason”

**Investment in the community**

“And one of the official languages of the state is Spanish. So, in the legislature they are supposed to have to always have an interpreter who speaks Spanish to be able to represent ... to be able to translate in need.”

**Other – language interpretation**

**Notes.** Table shows exemplary quotes for some subcategory themes. Quotes for each subcategory theme are provided within the text.

**Summary.** Qualitative results highlight the lived experience of Latinos across different communities. Stark differences were observed by social class, with residents of low-income neighborhoods reporting worse general conditions, less access to health enhancing opportunities, and negative health-related impacts compared to their counterparts living in medium or high-resourced neighborhoods. This can be appreciated by different gradients shown on Figures 6, 7 and 8. Participants were also able to discuss different pathways or potential mediators of the relation between neighborhood conditions and health, including stress, exposure to environmental contaminants, negative emotions, social isolation, and others. Moreover, immigrants Latinos reported a much higher number of hardships, of detrimental health impacts, and of structural discrimination compared to their US-born counterparts, even when compared to
US-born Latinos living in the same zip codes. Thus, results showcase the complex and multifaceted ways in which neighborhoods impact health. It appears that both social class and nativity play crucial roles in this area of inquiry.

Figure 7. Qualitative themes by low, medium and high-income focus groups. 
Note. Each income category is composed of two focus groups for a total of six groups. Examples of pathways related include comments relating specific issues to health, such as noise, environmental contamination, social isolation, and stress.
Integration of results. Results were integrated using a merging approach. Table 8 presents a joint display of findings for each question of interest. As can be seen in this table, findings largely converged and supported similar conclusions. Focus group members often spoke about similar neighborhood conditions and their relevance as was measured by the quantitative portion of the study. Social class, often discussed in terms of personal or family income, was found as a key demographic factor with both methodologies. Focus groups members, despite not being asked about personal income or resources, often mentioned it as a factor that could buffer...
the negative effects of lack of access to resources or other deleterious neighborhood features. In turn, as can be seen on quantitative models, income-to-needs ratio was often a significant predictor of outcomes. In terms of neighborhood conditions, both methodologies also converged in that the built and the social features of communities were key when considering health-related impacts.

Perceived stress emerged as an instrumental mediator in the relation between neighborhood conditions and health. Quantitative findings highlighted the consistency of this variable as a key mediator, even when controlling for other significant mediators. This was further validated by qualitative data showing not only the presence of stress and its perceived health connection, but also detailing potential ways in which stress impacts health. For instance, participants spoke about the impact of stress on their ability to engage in healthy behaviors such as shopping for fresh food, cooking at home, and exercising. Additionally, stress seems to play a role in participants’ engagement in unhealthy behaviors including smoking, drinking, anger displays and others. Both qualitative and quantitative findings also highlighted the importance of psychological constructs in explaining these complex relations. For instance, qualitative findings point to the relevance of negative emotions as well as positive affect in mediating some of the effects. This is further validated by quantitative models showing that optimism, self-efficacy, and beliefs in the American dream are important factors.

A myriad of health-related impacts associated with neighborhood conditions was also supported by both methods. Results cover a broad range of impacts including both physical and mental health. Additionally, findings converged on showcasing a neighborhood-SES gradient when it comes to conditions and health-related impacts. Quantitative findings showed mean differences in the expected direction in neighborhood conditions and psychological constructs,
while qualitative findings contributed examples and lived experience context to these same findings highlighting stark differences among low neighborhood income residents and Spanish-speaking Latinos compared to their English-speaking counterparts residing in more resourced or affluent communities.

One divergent finding emerged regarding the effects of personal income. On quantitative models in which differences were explored between immigrants and US-born Latinos were explored, personal income and being employed was predictive of higher problematic alcohol use for both groups. This is consistent with the pattern observed in the model for the overall sample. Additionally, for immigrants, higher personal income was predictive of lower and hence less salubrious MCS scores. For US-born Latinos, higher personal income was positively predictive of MCS scores. Of note, personal income was not retained in the final MCS model for the overall sample. In this overall model, higher income-to-needs ratios were protective for the MCS. In general, these findings are at odds with qualitative findings showcasing the beneficial impacts of personal resources to deal with stress and buffer the negative health effects of poor communities.

Moreover, qualitative findings served to enhance and contextualize quantitative findings. The impacts of structural discrimination were particularly discussed by low-income and Spanish-speaking Latinos. Participants spoke about different ways in which structural level issues trickle down to affect their communities and their own lives. Qualitative results discussed in prior sections detail impacts of housing discrimination, racial profiling and lack of response by police and other authorities, and differential investment by the city in low-income neighborhoods of color. These findings add underlying context and understanding for overall quantitative and qualitative results and shed light on a potential mechanism for the creation of differential community conditions.
Finally, Figure 9 shows an overall conceptual model depicting key relationships among variables based on learnings from both methodologies. The figure highlights expected relationships among neighborhood conditions, psychological constructs and health. The mixed methods in the present study allowed for findings related to structural discrimination in the creation of these differential community conditions, shed light on the impact on healthy behaviors (i.e., engagement healthy behavioral choices as its influenced by stress and the depletion of resources), and added potentially moderating factors such as access to personal resources to buffer detrimental effects of neighborhood conditions and stress, ability to drive far for resources or proximity to other communities where one can access health-enhancing resources.
Figure 9. Overall conceptual model.

Note. Figure showcases overall findings that incorporate quantitative and qualitative results. Personal SES refers to personal resources to deal with stress and make healthy choices.
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Discussion

The present study investigated the relationship between neighborhood conditions and Latino health using a mixed method approach. Findings revealed a multifaceted connection between neighborhood characteristics and various health-related outcomes. After accounting for individual level factors, both perceived and objective neighborhood conditions matter for health; however, the specific relations vary by outcome of interest. Several mediators were found to partially explain the relation between neighborhood conditions and various health outcomes, with perceived stress emerging as a consistent mediator even after accounting for the effects of other factors. Results also highlighted vast inequalities among communities based on neighborhood-level SES. A gradient was consistently observed in which Latinos living in low-income communities were more likely to report worst conditions, less access to resources and more negative health impacts compared to participants living in medium or high-income neighborhoods. In line with this gradient, those living in higher income communities were more likely to report positive conditions and a plethora of resources along with beneficial impacts.

**Demographic variables matter.** Consistent significant gender differences were found for multiple outcomes with women reporting less depression symptoms, less problematic drinking, and better general mental health profiles. Thus, results indicate a mental health advantage for Latinas. This is somewhat inconsistent with evidence indicating that while women have lower mortality rates, they are more likely to report higher levels of psychological distress including depression and other psychiatric illnesses compared to men (Denton, Prus, & Walters, 2004). Nonetheless, the literature is mixed and outcome dependent with evidence also indicating a health gap for morbidity and mortality, with men having more difficulties throughout life (Harvard Health Publishing, 2010). Studies also showcase the higher likelihood of men to
engage in detrimental behaviors such as drinking, smoking and unhealthy diets (Denton et al., 2004). Studies with Latinos indicate that social marginalization was associated with depression for Latinos but not for Latinas (Hiott, Grzywacz, Arcury, & Quandt, 2006). It is possible that men’s higher employment rate exposes them to additional opportunities for discrimination and marginalization. Consistent with this hypothesis, some evidence suggests that for Latino men, financial and employment-related stress are a predictor of depression (Aranda, Castaneda, Lee, & Sobel, 2001). Additionally, in the present sample, post-hoc descriptive statistics indicate that men report higher levels of perceived stress compared to women.

Marital status was found to be a protective factor for problematic alcohol use. This is consistent with longitudinal literature indicating that married individuals report less heavy drinking compared to their never married or divorced counterparts (Power, Rodgers, & Hope, 1999; Prescott & Kendler, 2001). Evidence for Latinos appears to be consistent with findings of a protective effect for marriage and alcohol use (Alvarez et al., 2007).

Moreover, income-to-needs ratio was found to be a consistent predictor of poor health outcomes in the present study. It is worth noting that this measure of SES was found to be more consistent and perhaps a better predictor than SES measured at the individual level. Income-to-needs ratio better captures family size and accounts for family needs such as the number of adults in the home bringing an income vs children or non-working adults. This variable is oftentimes conceptualized as a measure of unmet needs (Kreuter, McQueen, Boyum, & Fu, 2016). Low income-to-needs ratio have been associated with worse childhood outcomes in terms of school readiness, language, and behavioral problems (Dearing, McCartney, & Taylor, 2001), higher depressive symptomatology in community-dwelling adults (Blazer, Sachs-Ericsson, & Hybels, 2007), and predicted higher mortality during a ten year follow up period (Blazer, Sachs-
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Ericsson, & Hybels, 2005). Moreover, lower ratios, and thus more unmet needs, have been shown to contribute to lower effectiveness of prevention strategies such as health communication and following up with health care referrals (Kreuter et al., 2016).

Qualitative findings supported and expanded the relevance of individual-level factors. The effects of poverty and lack of personal resources (e.g., disposable income, ability to drive for resources, and time) to deal with stressors and day-to-day challenges was discussed by many participants. Personal and other resources have been cited in the literature as key factors in the relation between demands and health problems (Garrosa, Moreno-Jiménez, Rodríguez-Muñoz, & Rodríguez-Carvajal, 2011; Mayerl, Stolz, Waxenegger, Rásky, & Freidl, 2016). Personal resources appear to help buffer the negative impacts of stress and lack of community resources, as well as facilitate the benefit of resources when available. For instance, Carlson and colleagues (2014) found that high-income individuals benefit more from neighborhood safety in terms of physical activity. Thus, personal resources appear to be key moderators in the relation between neighborhoods and health.

**Key neighborhood factors.** Both quantitative and qualitative results supported consistent evidence linking the built and social environment with health (Diez Roux et al., 2010). Neighborhood walkability and general exercise opportunities emerged as a consistent predictor of health outcomes, being retained in both mental and physical health quantitative models. This is consistent with the extant literature showcasing the benefits of neighborhood walkability and health for obesity outcomes (Van Cauwenberg, Van Holle, De Bourdeaudhuij, Van Dyck, & Deforche, 2016) and increased physical activity (Sallis et al., 2009). Prior studies have overwhelmingly concentrated on sedentary behaviors and have not consistently explored mental health or other psychological outcomes. Hernandez and colleagues (2015) found that
neighborhood walkability was not associated with lower depression among older Latinos. However, results might be limited to the sample being 60 years of age or older, potentially limiting data variability. In a non-Latino sample, neighborhood walkability was protective for depression symptoms even after adjusting for physical activity (Berke, Gottlieb, Moudon, & Larson, 2007). Thus, the present study highlights the importance of walkability opportunities for outcomes beyond physical health for Latinos.

Neighborhood social cohesion was also found to be a consistent predictor of physical and mental health outcomes in the present study. This is consistent with evidence pointing to the protective effects of neighborhood-level social cohesion for depression, mental health, and higher ratings of self-rated health among Latinos (Alegria, Sribney, & Mulvaney-Day, 2007; Echeverria et al., 2008; Perez et al., 2015). Neighborhood social connection has also been associated with increased quality of life among older adults (Friedman, Parikh, Giunta, Fahs, & Gallo, 2012) and higher levels of physical activity (Fuzhong & Fisher, 2004). This is in line with social capital theory and support for the positive effects of strong social networks (Sampson, 2003). An increased sense of trust and social networks is proposed to contribute to coordination and the achievement of common goals. Social ties are also intrinsic in exchanges of information and access to resources such as employment (Sampson, 2003). This is particularly important for low-income communities that might be isolated from norms and information shared in the larger society.

Qualitative findings expand on the concept of social cohesion by allowing further descriptions based on neighborhood SES and nativity. Focus group data suggested some barriers for low-income participants in being able to organize and engage in collective efforts. This included competing time demands in inflexible jobs, language barriers, childcare, and structural
constraints such as politics of neighborhoods’ associations. Higher-income focus group members were more likely to speak about social cohesion and positive interactions with neighbors in their communities. This is perhaps consistent with studies showing that protective effects of social cohesion and ethnic enclaves on health are stronger for US-born Latinos than for immigrants (Viruell-Fuentes et al., 2013). In the present study, nativity was often distributed based on neighborhood income level.

Neighborhood problems, as measured by the NPI, was another consistent predictor of physical health for Latinos in the present sample. Similar features of communities (e.g., trash, illicit drugs, lack of infrastructure) have been associated, among Latinos, with poor diabetes management, poor indicators of physical health (Elliot, Quinless, & Parietti, 2000; Moreno et al., 2014), and with behavioral problems in children (McLeod & Nonnemaker, 2000). Moreover, lower neighborhood problems were associated with lower depression symptomatology, and lower prevalence of smoking or drinking behaviors (Echeverria et al., 2008). Qualitative results showed the serious impacts of environmental contamination and their higher prevalence in predominantly low income and communities of color. Thus, findings from both methodologies align with the extant literature in this area (Carter-Pokras, Zambrana, Poppell, Logie, & Guerrero-Preston, 2007; Katz, 2012).

In terms of Census level variables, both % foreign-born and % Hispanics emerged as the most consistent predictors among neighborhood-level variables. Percent foreign-born was protective for both physical and mental health outcomes while percent Hispanics at the tract level was protective for both physical health and problematic alcohol use. Consistent evidence suggests a protective effect of Hispanic composition or ethnic enclaves (Alvarez & Levy, 2012; Nobles et al., 2017). Systematic reviews have found a buffering effect of ethnic enclaves for
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Latinos in morbidity, self-rated health and depression (Yen et al., 2009). For Latinos, ethnic enclaves emerge out of a complex interplay of discriminatory policies coupled with migration processes (Shell et al., 2013). Scholars have posited that high percentages of co-ethnics is associated with shared norms, values, language, and social support, which facilitate social organization and buffer the deleterious effects of poor neighborhood conditions (Shell et al., 2013). Additionally, high presence of co-ethnics might, via lower exposure to majority groups, protect against discrimination and other stressors (Diwan, 2008).

Nonetheless, the evidence around ethnic enclaves and health is also mixed. Studies have also associated higher concentrations of Latinos with negative health outcomes such as high blood pressure and high cholesterol (Li, Wen, & Henry, 2017), and diabetes risk (Salinas et al., 2012). It is worth noting that while results on the present study were mostly consistent with a protective effect of co-ethnic concentration, % foreign born was marginally negatively associated with lower SRH. In this model, higher neighborhood-level affluence was predictive of higher ratings of SRH. Additionally, % foreign-born was negatively correlated with affluence. This is consistent with evidence suggesting that oftentimes concentration of co-ethnics is also associated with concentration of risk factors including poverty and other neighborhood-level risk factors as it is typically the case with racial residential segregation (Kawachi & Berkman, 2003).

Mediating Factors of Neighborhood Conditions and Health

The second aim of the present study investigated potential mechanisms that could explain the link between neighborhood conditions and health outcomes, concentrating on psychological constructs as potential pathways. Multiple constructs (e.g., nutrition and exercise self-efficacy, optimism, belief in the American dream and perceived stress) were found to be significant mediators for several of the models tested. Results are consistent with some evidence suggesting
that these variables matter in explaining the role of neighborhood context and minority health. For example, studies have found that self-efficacy is a mediator of neighborhood violence and internalized behaviors (i.e., anxiety and depression) among adolescents (Dupéré, Leventhal, & Vitaro, 2012). Self-efficacy has also been found to mediate the relation between neighborhood characteristics and healthy eating in low-income communities (Gase, Glenn, & Kuo, 2016). In the case of exercise self-efficacy, physical activity has been shown to be a mediator of neighborhood walkability and health outcomes including BMI and waist circumference (Van Cauwenberg et al., 2016).

The literature on optimism or beliefs in the American dream as mediators of neighborhood effects is scant. However, some evidence indicates that they might confer a protective effect in the face of neighborhood disadvantage (Clark et al., 2006), as well as relate to both positive perceptions of neighborhoods and mental health outcomes (Coulombe et al., 2017; Gallagher & Lopez, 2009). Thus, the present study results expand the prior literature by showing evidence of mediation effects rather than simple associations or correlations with different variables.

Qualitative data also converged to support and further validate the role of psychological constructs in mediating neighborhood effects on health. Negative emotions (e.g., frustration, anger, hopelessness, fear) and positive affect emerged as important mediators. Negative emotions were described by participants as being influenced by several neighborhood features including crime, persistent poverty, lack of opportunities for social mobility, and lack of quality schools and resources for children and youth and others. Moreover, positive affect was often associated with features of the environment such as beauty and aesthetics, and with optimism due to positive changes in the community. While emotions can be conceptualized as
psychological distress, conceptualizations of them in terms of mediators or outcomes can vary depending on the research question. In the present study, focus group members often spoke about negative emotions as mediators in effects related to other outcomes including physical health and sleep. The extant literature supports a relation between poor community conditions and Latino psychological distress (Lim, Meausone, Norman, Quinlan, & Driver, 2017). Additionally, feelings of powerlessness have been shown to mediate the relation between neighborhood conditions and psychological distress (Booth, Ayers, & Marsiglia, 2012). Consistent with the present results, fear of crime has also been posited as influencing behaviors and mental health outcomes such as anxiety and depression (Wandersman & Nation, 1998), well-being, teenage pregnancies and graduation rates (Harding, 2009; US Department of Housing and Urban Development, 2016). Also consistent with findings related to serious vs. petty/opportunity crime, which did not impact residents perceptions of safety, a multi-city study revealed that serious or violent crime is a stronger predictor of perceptions of safety compared to other kinds of crime (Hipp, 2013). Other emotions such as hopelessness has also been found to be associated with neighborhood disorganization (Mair, Kaplan, & Everson-Rose, 2012). Thus, findings highlight the complex impacts of neighborhoods on health and the importance of psychological constructs as intervening or mediating variables and as outcomes.

Internalized racism did not significantly mediate any of the relations explored. Multiple factors might have played a role in the lack of findings for this variable. First, as described in the results, this variable showed a significant amount of skewness and low variability. Participants in the present sample reported low levels of internalized racism or were perhaps not willing to endorse items with high negative face validity (e.g., “I often regret that I belong to my racial/ethnic group”). Second, internalized racism if thought to be detrimental to health via lower
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self-esteem and feeling worthless or powerless (Jones, 2001; Smedley, 2012). It is possible the lack of results is due to failing to directly measure those constructs.

**Perceived stress as a key mediator.** Perceived stress emerged as the most consistent mediator across quantitative models, even when accounting for the effect of other mediators. Discourse in the focus groups also supported this finding and prior research indicating that stress might constitute a key mechanism linking environmental conditions to health inequities (Theall et al., 2012). Consistent evidence exists that residents of low-income communities are exposed to a higher degree of stressful events compared to residents of more resourced areas (Boardman, 2004; King & Ogle, 2014). Studies also support the mediating role of stress in the relation between neighborhood conditions and outcomes including mental well-being and self-rated health (King et al., 2014). Qualitative data in the present study also showed a neighborhood-SES gradient in these relations where low-income participants were more likely to report negative neighborhood conditions, additional stress impacts, and more deleterious health outcomes. This is consistent with prior research suggesting that stress is a stronger predictor of negative outcomes in low-income communities, potentially due to the lack of additional resources in those communities (e.g., social capital) to cope with stress (Boardman, 2004; Latkin & Curry, 2003). Hence, the presence of added stress, coupled with lack of resources, places many low-income community residents at a higher risk of negative health outcomes.

The present study advances the current literature by offering mixed method data showcasing the role of perceived stress in mediating neighborhood effects in a non-biological conceptual framework. While the literature on the importance of stress exposure in health equity has increased over the past decades, many of the current studies conceptualize stress effects as a biological response and explain findings by dysregulation in mechanisms such as the
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hypothalamic-pituitary-adrenal (HPA) axis (Burdette & Hill, 2008; Glass, Rasmussen, & Schwartz, 2006; Powell-Wiley et al., 2013; Sullivan et al., 2016). These studies, while valuable, often miss an opportunity to also explore the psychological and behavioral implications of stress.

Qualitative results showcased repercussions of stress for psychological functioning and engagement in healthy behaviors. Participants elaborated and gave examples of the depletion of their cognitive resources as a result of chronic stress exposure. This oftentimes was associated with less ability to engage in health-enhancing behaviors such as healthy cooking, exercise, or quality time with family or loved ones. In addition to depleted cognitive resources, other barriers such as financial limitations and lack access in the local community to healthy food choices also appear to contribute to engagement in less healthy behaviors (e.g., eating fast food). This is consistent with literature supporting the role of stress in influencing health behaviors (Park & Iacocca, 2014). Stress can act as barrier to engagement in healthy behaviors and also as a facilitator of engagement in negative behaviors in order to cope with stress including physical inactivity, smoking, and alcohol use (Krueger & Chang, 2008; Park et al., 2014).

Census level variables. Several Census tract-level variables (e.g., % foreign born, % Hispanics, neighborhood-level affluence) were found to be significant predictors of outcomes. Nonetheless, when exploring mediation effects, only nutrition self-efficacy was found as a significant mediator for relations with self-rated health. It appears that psychological constructs explored were better mediators for self-reported or perceived neighborhood variables than for Census-level data. The measurement level might partly explain these results. For perceived neighborhood models, all variables (i.e., independent, dependent and mediators) were measured at the individual level compared to objective or Census models in which the IV is measured at the neighborhood level. It is possible that psychological mediators explored are more proximally
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linked to subjective perceptions of community conditions and health ratings, leading to significant mediation effects. It is also possible that Census level variables influence health by pathways not measured by the present study (e.g., via behaviors such as frequency of socialization with neighbors, or number of visits to local parks) or are functioning as proxies for unexamined constructs.

Acculturation and Nativity Effects

Quantitative findings highlighted the protective role of low acculturation levels for Latino health. Acculturation, as measured by language preference, appears to play a key role in mental health outcomes, even after controlling for neighborhood effects. Lower acculturation levels were protective for anxiety and depression for the full sample, and also protective for general mental health for US-born Latinos. As reviewed in the introduction, the literature on acculturation and neighborhood context is limited. Most studies in this area rely on ethnic composition as a proxy of acculturation and tend to concentrate on issues of social cohesion or support (Almeida et al., 2009). Consistent with the present study, research using language proficiency in the household as a measure of acculturation found protective effects of acculturation for healthy dietary practices in Latino neighborhoods in New York (Park, Neckerman, et al., 2011). This same study also found detrimental effects of neighborhood level poverty for diet.

Qualitative findings highlighted stark differences in the lived experience of immigrant and US-born Latinos. Immigrants reported higher exposure to neighborhood problems, and in particular to more serious issues such as environmental contamination or violent crime compared to their English-speaking US-born counterparts. Immigrants also reported higher rates of psychological distress and deleterious health impacts. At the same time, they also reported less
resources to cope with disadvantage such as personal income or experiencing positive affect. These findings are contrary to the study hypothesis that immigrants, due to their higher optimism levels and less familiarity with structural determinants of health, would be less likely to report negative conditions or be aware of structural inequality. This initial hypothesis was based on data suggesting that foreign born Latinos may use their country of origin as a comparison standard, and hence might be less likely to perceive deprivation (Abraído-Lanza, Echeverría, & Flórez, 2016). Others have also found that US-born individuals experience frustration and prejudice due to blocked opportunities for social mobility (Schwartz et al., 2010).

Findings indicate that discrimination, and not acculturation might account for health declines among Latinos (Abraído-Lanza et al., 2016; Gee, Ryan, Laflamme, & Holt, 2006; Molina & Simon, 2014). A meta-analysis suggests this may be particularly the case for anxiety and depression (Lee & Ahn, 2012). Research also shows that immigrants in the US experience an “otherness” effect that is reinforced by policies and interactions with authorities including the police, as mentioned by focus group members, which enhances their self-perception as a minority (Viruell-Fuentes, 2007). Scholars conceptualized this “otherness” as potentially leading to questioning beliefs in the American dream and other potentially protective beliefs (Abraído-Lanza et al., 2016).

In summary, results from both methodologies highlighted the complexity of acculturation influences on health. While quantitative findings align with the literature showing positive impacts of low acculturation and retention of Spanish language skills, qualitative findings showcase the need to measure context. Spanish speaking focus group members described a vastly different lived experience in their communities and in society at large compared to their English-speaking counterparts. Given their reports of more psychological distress and negative
outcomes, it is possible to infer that the impacts of deleterious neighborhood conditions and discriminatory structural policies are too large in magnitude to be completely buffered by acculturation or cultural protective factors. Measuring acculturation without context can then lead to erroneous conclusions related to a health advantage for Latino immigrants and concentration of interventions at the individual level.

**Structural Discrimination as Fundamental Cause of Inequality**

Results were consistent with structural discrimination as a fundamental cause of health inequities and the higher burden of diseases experienced by minority groups in the US (Gee & Ford, 2011). Structural conditions at the neighborhood level shape and constrict the health and opportunities of individuals. A large body of literature now documents the detrimental effects of discrimination on health (Williams & Mohammed, 2009). Neighborhood conditions were described by participants and reported in the literature as resulting from systemic racism present in policies, housing segregation, and differential investment in communities based on racial and income distribution. Immigrant Latinos appear to be particularly affected by structural discrimination and reported a much higher number of both systemic and individual level discrimination. Findings indicate that interventions aimed at individual-level variables, or even those aimed at improving particular features of neighborhoods (e.g., improving parks, sidewalks, or lighting) are not addressing the fundamental cause of the inequality. As a fundamental cause, effects on health will be manifested via other pathways or will reproduce themselves in other ways (Link & Phelan, 1995).

**Significance of Mixed Methods**

Mixed methods used in the present study provided substantive significance and rich contextual meaning to the associations under investigation. Results from both methodologies
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were first analyzed with the standards and rigor required by each method and later merged to explore convergence or divergence of findings and additional context and meaning in the data. Results overwhelmingly converged and highlighted the negative impacts of poor neighborhood conditions and lack of access to resources in predicting various Latino health outcomes. They also converged in identifying perceived stress as a crucial mediator in these associations. Quantitative methods allowed for significance hypothesis testing, comparisons among groups, examination of a variety of demographics factors, and for examining magnitude of effects. These results can also serve as preliminary estimates for future modeling and power analysis (e.g., expected ICCs and standard errors). Qualitative data, on the other hand, allowed for rich contextualization of findings and for exploration of the lived experience of immigrant and US-born Latinos throughout the metro area. Results from this methodology also allowed for the exploration of variables and factors not included in questionnaire materials but brought up by participants as important factors (e.g., worries or effects on children/youth, barriers to accessing existing resources, and moderating factors).

Theory Implications

Findings supported several theories related to neighborhood effects on health. First, results were consistent with social disorganization as a key driver of outcomes. Social disorganization at the neighborhood level has been conceptualized as a powerful stressor implicated in negative health outcomes (Latkin & Curry, 2003; Ross, 2000). In this case, not only neighborhoods produce stressors that are perceived as uncontrollable, but individuals also lack the personal resources to cope appropriately. Results from quantitative models and focus groups showcasing the negative impacts of problems such as crime and lack of basic infrastructure (e.g., street light, trash pickup, lack of sidewalks) are consistent with social
disorganization conceptualizations of neighborhood issues. High levels of disorganization have been posited as impeding organization at the community level and the development of social capital (Sampson, 1992). This is consistent with reports by lower income and primarily Spanish-speaking participants regarding lack of social cohesion in their communities and the multiple barriers they face for collective action.

Second, focus group findings also lend support to social comparison theories. Participants often spoke about awareness of social inequalities and made specific comparisons of resources and differential opportunities across communities in the city. Per social comparison theory, individuals who perceived blocked opportunities might be more likely to drop out of the race. This is particularly applicable for youth who might drop out of school or join the illicit economy as an alternative strategy.

Third, findings were consistent with the growing body of literature and theories highlighting stress exposure as a key driver of health inequities among racial/ethnic and other minority populations (Aneshensel, 2009; Yen et al., 2009). Low-income and primarily Spanish-speaking Latinos reported a higher burden of stress and exposure to problematic features of their neighborhoods compared to higher income or English-speaking Latinos. The former groups also reported a higher prevalence of adversity and lower access to coping tools in order to deal with stress. This is consistent with literature reporting higher levels of allostatic load among residents of very-high-risk neighborhoods (Theall et al., 2012). In the present study, stressful experiences also emanated from exposure to structural discrimination in policies (e.g., housing discrimination) and in interactions with authorities such as the police.

Findings support multiple theoretical conceptualizations. Theories in this area of inquiry are often complementary rather than exclusive. For example, social disorganization can be
conceptualized as subsuming stress-exposure explanations as disorganization exposes neighborhood residents to stressful events such as crime. Additionally, residents of disorganized neighborhoods often lack social capital, are aware of social inequalities and make social comparisons accordingly.

**Results Summary**

Findings support initial hypotheses regarding poor neighborhood conditions as detrimental factors to Latino health. Several features of communities emerged as key predictors of various health outcomes, including neighborhood social cohesion, exercise opportunities, and problematic features of the environment. These effects remained significant even after accounting for multiple demographic variables, showcasing a neighborhood effect above and beyond individual-level factors. Findings also supported the hypothesis regarding the importance of psychological constructs as mediators of these relations. In this case, perceived stress emerged as a strong and consistent mediator, even after controlling for other indirect effects. Moreover, several of the direct effects remained significant even after controlling for potential mediators. This was the case for some of the quantitative models for anxiety, self-rated health, and the PCS. Focus group data also supports the findings that even after accounting for mediation effects, concentrated poverty and neighborhood problems remain as significant direct predictors of multiple outcomes (Sampson, 2003).

Qualitative results highlighted the impact of stress on health and potential mechanisms of this effect, including via negative impacts on behaviors such as healthy nutrition, physical activity and positive coping strategies. Results showed that, despite expectations of protective effects for immigrants, primarily Spanish-speaking and immigrant Latinos are keenly aware of structural discrimination issues and potentially more affected by them. Immigrant Latinos
reported a stark picture of disadvantage and lack of resources and opportunities for health enhancement or maintenance. They also reported concerns for youth and children, indicating potentially deepening inequities for future generations.

Overall, Latinos in the present study faced health challenges emanating from personal variables (e.g., acculturation, personal income, and other demographics), from the context of their neighborhood, and from stress related experiences emanating from the social environment such as discriminatory interactions with institutions such as schools, police, and health care settings (Perreira, Chapman, & Stein, 2006). Thus, health impacts are multifaceted and likely require multi-level interventions.

**Study Implications**

**Public health and policy implications.** The present study offers several key implications for public health practice and efforts to address social determinants of health in order to improve Latino health and ameliorate inequities. The following should be considered in developing public health interventions and policies. First, neighborhoods are fundamentally linked to health via multiple mechanisms (e.g., food and exercise opportunities, safety, schools and employment access). These multi-dimensional pathways, while offering multiple opportunities for interventions, also offer challenges. Single target interventions are likely to fail to address health inequities as the effects would likely reproduce via other unaddressed pathways. Addressing fundamental causes of disease such as racism and poverty is of key importance for successful interventions and prevention efforts (Bailey et al., 2017). Some initiatives exist that can serve as models for the development of such efforts. Place Matters, for example, is a community-based, national effort to identify and address root causes of inequity (Turner et al., 2013) with a chapter concentrating on environmental contamination in Bernalillo County (Joint Center for Political
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and Economic Studies, 2012). Support for improving broad neighborhood conditions comes from studies such as Moving into Opportunity, an experimental design testing the effects of moving poor families into better environments (Orr et al., 2003). Preliminary evidence suggests that as families saw improvements in the quality of their neighborhoods, adults reported improvements in mental health and reduced obesity rates, and children showed fewer behavioral problems compared to the control group (Orr et al., 2003). In the future, improving whole communities, rather than moving families out of their social network, is likely to show even greater positive outcomes.

Broader social and economic policies aimed at improving or ameliorating the impact of social class on individuals and families have also been recommended as health policies (Schoeni, House, Kaplan, & Pollack, 2008). Public policies, including Section 8 vouchers and Earned Income Tax Credit, have been found to improve mental health outcomes for Latinos (Alegría et al., 2003). Other examples include Supplemental Security Income (SSI), Temporary Assistance for Needy Families (TANF), and the Supplemental Nutrition Assistance Program (Bleich, Jarlenski, Bell, & LaVeist, 2012). This framework is often referred to as the Health in all Policies approach (HiAP, Collins & Koplan, 2009). Given its complex and interdisciplinary nature, HiAP offer an opportunity for collaboration and integration of knowledge in an attempt to improve population health. Addressing the “wicked” health problems faced by US communities of color demands addressing root causes of disease. Scholars argue that HiAP may be one of the solutions by incorporating and demanding equity, sustainability, collaboration, and larger procedural changes (Rudolph, Caplan, Ben-Moshe, & Dillon, 2013).

Second, many participants, regardless of their personal income, spoke about desires to lead healthy lives in terms of nutrition, physical activity and emotional well-being. However,
only those with higher incomes where able to devote resources towards this goal. Hence, creating structural opportunities that enhance health and lessen the impact of personal income and family resources on health will be crucial. For instance, creating safe spaces for recreation and leisure, or readily available food markets can facilitate their use by individuals who might not have the means or time to travel away from their community for these resources. High quality schools, regardless of the neighborhood overall SES, can also offer resources to families and lessen worries regarding children and youth. Additionally, schools can reduce the added burden placed on families when having to find educational opportunities outside of their community.

Thus, quality infrastructure and access to resources in less affluent communities can be conceptualized as a strategy for decreasing the impact of personal or household income on health and well-being. Investments in local infrastructure by local government and the private sector (e.g., foundations such as Kellogg, the California Endowment, or Robert Wood Johnson) have a key role in allowing segregated communities of color to enjoy a modern system of infrastructure. Moreover, this developments and investments are key in ensuring that poor and isolated communities can engage in economic and employment opportunities that are key for social mobility and health (Cárdenas & Treuhaft, 2013). These strategies have been referred to as “mitigating initiatives” as they aim to address inequities and resource distribution within typically low-income and segregated communities (Hopkins & Ferris, 2015). However, new state of the art initiatives tend to accompany these efforts by strategies that address larger and more upstream power inequalities (Hopkins & Ferris, 2015).

A third key implication of the current study is a reminder of the critical role of supporting low-income Latino families via wrap-around services. Latino parents consistently spoke about worries related to their children and adolescents. Lack of resources and opportunities, and in
particular crime-related concerns add an extra stress burden for Latino parents who not only worry about themselves but also about their children and their future. This is consistent with evidence suggesting that Latino parents, especially those in low-income neighborhoods, often express concerns regarding their children’s safety and other issues such as lack of enrichment activities (Ceballo, Kennedy, Bregman, & Epstein-Ngo, 2012; Cruz-Santiago & Ramírez García, 2011). Thus, interventions for Latinos must take into account families and children in order to increase uptake and sustainability. Evidence-based efforts related to early childhood education and services are likely to be positively received by Latino communities and can aid with quality education in particular, a key determinant of future social class and adult health (Karoly, Kilburn, & Cannon, 2005).

Fourth, results indicated the importance of social cohesion and collective efficacy and action as both protective factors and as potential solutions. Efforts aimed at increasing civic engagement and participation are potential intervention strategies in this area. Scholars have called for the creation of venues for democratic participation that better represent the growing diversity of the US (Cárdenas & Treuhaft, 2013). Moreover, reducing barriers to engagement such as lack of leadership opportunities in low-income neighborhoods, language, and time barriers typically found in immigrant communities is also needed. Recent efforts in community organizing have also addressed the role of data in advocacy and policy making and planning. For instance, tools such as health impact assessments can be used to highlight the potential impact of a new policy or program and the distribution of its effects among different groups and geographic areas (Collins & Koplan, 2009). Other tools such as the Urban Institute’s “Map your
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Metro”19 allow communities to explore longitudinal data on where poor individuals live and other data aimed at setting policy agendas and debates.

In summary, recommendations from the present paper are in line with the current literature and with evidence-based and empirically tested interventions. A recent report commissioned by the Robert Wood Johnson Foundation similarly concluded on the need for multidisciplinary and multi-sector collaborations that leverage resources to promote and achieve health equity at the community or neighborhood level (National Academies of Sciences, Engineering, and Medicine, 2017). They discussed the need for funding, planning and government oversight of areas discussed in the present study such as housing, land use, transportation, environmental contamination, quality education, and support for community organizing. In general, prioritizing equity in social determinants of health with investment in low-income and communities of color appears to be of uttermost importance.

Clinical implications. Convergence of findings around the importance of perceived stress points to the potential for stress-related interventions. Current evidence-based clinical interventions exist, both in individual and group format, for stress management and reduction including mindfulness-based stress reduction (MBSR) and physical activity. Empirical evidence supports the positive benefits of MBSR with medium effect sizes (Grossman, Niemann, Schmidt, & Walach, 2004). Applications with Latinos suggest that these interventions are effective for reducing depression and stress in this population (Edwards, Adams, Waldo, Hadfield, & Biegel, 2014). Studies collaborating with Latino community members have also shown beneficial effects of physical activity interventions for stress management (Jacquez, Vaughn, & Suarez-Cano, 2018). Other stress reduction interventions, such as relaxation audios and training in progressive

19 http://www.urban.org/urban-wire/poverty-race-and-place-map-your-metro
muscle relaxation, are also effective in addressing stress, anxiety and depression for Latino populations (Wagner et al., 2016).

Similarly, interventions and support for parents seems warranted as findings suggested high levels of parental distress surrounding children and youth. Intervening at the school level and providing resources and support could help ameliorate the stress and negative emotions reported in the present study. Indeed, neighborhood disadvantage such as poverty and crime appear to change parenting practices for Latinos (Ceballo et al., 2012; Cruz-Santiago & Ramírez García, 2011). Furthermore, evidence suggests that parental psychological resources in part mediate the relation between neighborhood poverty and children’s outcomes (McLeod & Nonnemaker, 2000). In this regard, school-based programs have shown promise in engaging Latino families in prevention programs, with high engagement of Spanish speaking parents in particular (Dillman Carpentier et al., 2007). Positive youth outcomes of parental interventions (Martinez & Eddy, 2005) are also promising in preventing negative outcomes for the next generation of Latinos such as behavioral problems or school dropout.

Limitations and Strengths

This study has some limitations including the geographic restriction of participants. It is possible that the information obtained, although very valuable for prevention and intervention efforts locally, might not generalize to cities with different demographics or spatial arrangements, such as those with more integrated neighborhoods or with higher population density. Another limitation includes the cross-sectional nature of the data, limiting causality inferences. Furthermore, given limited time and resources, this study might be underpowered to make comparisons among different populations (e.g., across gender, or generational status). Sample size also limited the ability to explore differences in effects across neighborhoods via
random slope models. Multilevel models in this study were only able to explore random intercepts and properly account for the nestedness in the data. In terms of qualitative limitations, only one group was conducted per each category (e.g., one low-income Spanish speaking group). This might increase the chance that the information was obtained by chance given the participants in that group. However, the results indicate a stable and expected pattern of results.

Despite these limitations, the present study has several strengths including offering a broad and comprehensive look at the myriad of relationships between neighborhood conditions and multiple health outcomes. The literature oftentimes concentrates on a single neighborhood condition and its impact on a single outcome, for example neighborhood walkability and depression (Berke et al., 2007). Moreover, results offer a glimpse into the lived experience of Latinos and the countless challenges faced by these families. In particular, low-income and predominantly Spanish-speaking immigrant Latinos’ experiences were distinguished from the remarkably different realities of their counterparts residing in more affluent communities. This moves prior research further and highlights the importance of examining social class and the layers of complexities that emerged when study designs do not simply control for it.

Additionally, this study showcases Latinos’ understanding of the impact of social conditions in their environment and their remarkable ability to even articulate potential pathways explaining complex relationships. Thus, subjective or perceived conditions were found to be good indicators of the realities experienced by individuals on a daily basis and offered rich contextual descriptions from which to conceptualize and design future studies.

The present study also builds upon the prior qualitative literature on Latino health and neighborhood conditions. In particular, many prior investigations in this area are limited by a small sample size (Carr, Napolitano, & Keating, 2007; Marquez et al., 2016), or tend to exclude
Spanish-speaking Latinos (Chaufan, Constantino, & Davis, 2012). Moreover, many qualitative studies with Latinos have concentrated on youth (Dill & Ozer, 2016) or parenting issues (Ceballo et al., 2012). By using mixed methods this study enhances our understanding of the relationship between objective and subjective neighborhood factors, psychological constructs and Latino health. Comparisons between Spanish and English-speaking focus groups added to our understanding of potential differences among Latinos in their neighborhood perceptions and the respective health impact. Overall, results yielded valuable insights for the development of targeted interventions and policies designed to improve Latino health.

**Future Directions**

Based on study results and limitations, several future directions are recommended. First, exploring differences in effects across neighborhoods, both in terms of significance and magnitude, is a crucial next step. Larger sample sizes could offer the opportunity to test random slope models that can disentangle particularly nuances effects. For example, neighborhood walkability has been found to be a stronger predictor of lower BMI among higher-income individuals and for more advantaged neighborhoods (Lovasi, Neckerman, Quinn, Weiss, & Rundle, 2009). It is possible that some of the effects seen in the present study are stronger for some communities than others and should be further explored. Second, additional exploration of gender differences seems warranted. The present study indicated some differential health outcomes for women and men. Future studies can be designed to test how neighborhood conditions might differentially influence health behaviors and psychological outcomes or how deprivation or other environmental features might differentially impact men and women. For example, fears of crime have been shown to differ by gender with potential repercussions for mental health (Snedker, 2015).
Third, in order to examine causality, longitudinal designs are needed. Future studies should consider following up participants and conducting focus groups at different lengths of neighborhood residency. Unfortunately, the large majority of the literature in this area of inquiry is cross-sectional or with short time periods of follow up, with few longitudinal designs (Butte et al., 2014; Lee & Liechty, 2015). Finally, findings from the present study suggest a complex interplay between acculturation and potentially protective cultural factors (e.g., nativity, language preference, ethnic enclaves) and the detrimental impacts of neighborhood level disorganization and health. Future studies should attempt to disentangle the contributions and the net effect from each of these contributing factors.

Conclusions

Latino health and the reduction or elimination of health inequities are paramount public health goals. Findings from the present study showcase the importance of upstream determinants of health and the influence of structural racism in creating different opportunities for low-income and communities of color. Immigrant Latinos in particular, seem to encounter additional barriers to health enhancement and maintenance compared to their US-born counterparts living in the same communities. While solutions oftentimes emphasize individual level choices and behaviors, without addressing the structural fundamental causes of inequities, health intervention and prevention approaches will remain limited.
### Appendices

#### Appendix 1. Objective Measures of Neighborhood Conditions.

**Variables**

- % Families with Income Less Than $10k
- % Families with Income $50k or Higher
- % Families in Poverty
- % Families on Public Assistance
- % Unemployed in Civilian Labor Force
- % Families Female Headed
- % Never Married
- % Less than 12 years of education
- % 16 or more years of education
- % Professional/Managerial Occupation
- % Non-Hispanic Black
- % Hispanic
- % Foreign Born
- % Homes Owner Occupied
- % In Same Residence in 1995
- % 0-17 Years Old
- % 18-29 Years Old
- % 30-39 Years Old
- % 50-69 Years Old
- % 70+ Years Old
Appendix 2. Focus Group Guide

1. How would you describe your current neighborhood? Think about the community around a 20-block radius from your home. (Follow-up question to get more elaboration if needed – you can think about different domains such as aesthetics, safety, opportunities for physical activity and nutrition, employment, institutions, and so on)

2. Do you think there is a connection between where you live (i.e., your neighborhood) and your health? If so, can you think of an example, perhaps something from your own life? (Follow-up question if needed – how does your neighborhood impacts your family and your own health? This can be in a good or in a bad way?)

3. How does your neighborhood or community impact your mental health in terms of for example stress, how you feel about yourself or your opportunities, or how you think about life in general?

4. After offer a quick summary regarding the discussion for question 3 …… So now, do you think this impact on your mental health or psychological functioning if you will, translates into other effects on your health in general or that of your family? Please elaborate.

5. If you had 1 minute with the governor or another policy maker, what would you say about what is needed in your neighborhood? What should be done and why?
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