

The physiological effects of acculturative stress in Latinx adults in the U.S. and subsequent implications on mental health outcomes: A review of the literature

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Table of Contents

ACKNOWLEDGEMENTS	IV
ABSTRACT	V
INTRODUCTION	1
BACKGROUND	4
RACE AND ETHNICITY	4
DEMOGRAPHICS AND HEALTH IN THE U.S. LATINX POPULATION	5
PHYSICAL AND MENTAL HEALTH	8
INTERSECTIONALITY	9
MEYER MINORITY STRESS MODEL	11
ACCULTURATIVE STRESS	12
INSTITUTIONAL DISCRIMINATION	14
EFFECTS OF STRESS ON THE MIND AND BODY	16
METHODS	18
LITERATURE REVIEW	19
DIRECT PHYSIOLOGICAL EFFECTS OF ACCULTURATIVE STRESS	19
ACCULTURATIVE STRESS IN RELATION TO ANXIETY/DEPRESSION	21
ACCULTURATIVE STRESS IN RELATION TO PTSD AND PTSD-LIKE SYMPTOMS	23
IMPLICATIONS AND FUTURE DIRECTIONS FOR RESEARCH	25
LIMITATIONS	26
CONCLUSION	27
REFERENCES	28
APPENDIX	40
AUTHOR BIOGRAPHY	47

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Abstract

Mental health, a crucial contributor to physical health, wellbeing, and quality of life, is impacted by acculturative stress in Latinx adults living in the United States. Physiological effects of various kinds may mediate the acculturative stress and mental health outcomes measured in the U.S. Latinx population. In this project we illustrate a possible three-step line of causal associations from the social environment to subsequent bodily changes to mental health. To narrow the scope of this project, the main mental health outcomes of focus, for which associated physiological effects are discussed, were anxiety/depression and posttraumatic stress disorder (PTSD) or PTSD-like symptoms. The literature gives sufficient evidence that not only is there a wide variety of physical changes that occur due to acculturative stress and in response to perceived discrimination, but that these physical changes have been associated with consequences on mental health. This analysis also demonstrates the need for further research into the physiological effects of acculturative stress. Specifically, there is a need for more longitudinal studies in the Latinx population that accounts for other dimensions of identity such as gender identity, sexuality, skin color, etc. The research presented in this study can help healthcare professionals and the public understand how acculturative stress, as well as most forms of discrimination, can have tangible and serious consequences on the health and wellbeing of the vast Latinx population of the U.S.

Keywords: acculturation, acculturative stress, discrimination, mental health, Latinx

Introduction

Latinx adults continue to receive disparate amounts and lower quality of mental health services. Relatedly, they experience disproportionate negative mental health outcomes that worsen with time spent in the United States as compared to the rest of the population (Cabassa et al., 2006; United States, 2003). Some of these outcomes have been correlated with acculturative stress and, relatedly, ethnic discrimination, as described in the following literature review. Ethnic discrimination refers to the unequal treatment of persons based on their ethnic identity.

Acculturation refers to the phenomena in which “individuals having different cultures come into continuous first-hand contact with subsequent changes in the original culture patterns of either or both groups”; this tends to cause a greater amount of change in one group than the other.

Acculturation involved the preservation of certain aspects of one’s heritage culture in the presence of the majority culture. Thus, acculturative stress refers to the psychological stress and psychosomatic issues that result due to acculturation (Berry, 1997). John W. Berry (1970) first coined the term acculturative stress to use instead of the term “culture shock” which implied a short-term effect upon intercultural contact as opposed to including long-term effects.

This issue of acculturative stress in Latinx people in the U.S. is important because of the mental and physical implications of this multi-dimensional stress on this population, as well as their subsequent health outcomes. This issue potentially affects all of us in that the Latinx population has an enormous presence in U.S. society, contributing to over half of the country’s population growth in the last decade (Noe-Bustamante et al., 2020). The correlation between acculturative stress and negative mental health outcomes has been well established in the U.S. Latinx population, as described throughout this review. To further increase the tenability of these

associations and establish potential causality, it is important to incorporate a discussion of physiological effects. There is an inherent physiological basis to mental health conditions and stress response, as described throughout the literature review. A significant amount of this physiological basis can be explained by stress and stress theory (see section titled “Effects of stress on the mind and body”). It is also important to note that ethnic discrimination is an aspect of the acculturation experience that contributes to acculturative stress, therefore, the issues presented throughout this project consider the effects of ethnic discrimination as part of the discussion of acculturative stress.

Over the past few decades, researchers have begun to tackle the effects of acculturative stress within the Latinx population in the U.S. For example, Torres (2010) found that stressors unique to Latinx people of earlier generations, such as language competency, and living in an environment that served to devalue one’s ethnic identity, increased the likelihood of depression and other mental health problems. Zvolensky and colleagues (2021) have also explored this issue, finding that anxiety sensitivity and acculturative stress were both related to depressive symptoms, social anxiety, and other mood or anxiety disorders, highlighting the importance of both factors in mental health screening.

However, in the current literature regarding acculturative stress, there is a lack of complete understanding and direct discussion regarding the tangible reasons for the association between acculturation experiences and negative mental health outcomes. The studies available are predominantly correlational, without enough regard for physiological mediators. This gap in knowledge and discussion may dilute the use of such data for preventative and interventional programming or education. Further, it can invalidate the experiences of Latinx people and other marginalized groups who experience acculturative stress. Understanding the tangible,

physiological avenues by which discrimination affects people's health and wellbeing dismantles invalidation and denial of the enormous impact of discrimination on Latinx people. It also serves to validate their collective and individual experiences in this country, both immediately and longitudinally. The filling of this gap may explain some of the mechanisms by which the effects of discrimination manifest and illuminate further avenues for research to understand and prevent health disparities within the Latinx larger group and against other racial groups, thus contributing to health equity.

This project thus aims to describe direct physiological effects that may serve to moderate the relationship between acculturative stress and adverse mental health outcomes in the U.S. Latinx adult population. In addition, the goal is to support potential directionality in this relationship, especially as grounded in stress theory. To accomplish this aim, I first provide and explain relevant background regarding the Latinx population, terms, theory, and frameworks. I then present a narrative review on literature from common databases within the fields of psychology and sociology, as relevant to three major themes.

In the first thematic section of my literature, I discuss studies on the physiological implications of acculturative stress, explaining a variety of different direct physical changes that occur in response to discrimination and mental and physical health outcomes that interrelate with these physical changes and each other. In the second section, I discuss the association between acculturative stress and depression/anxiety, which has shown to be a major subsection of the existing literature. In the third section, I discuss the association between acculturative stress and posttraumatic stress disorder (PTSD) or PTSD-like symptoms because this is an area that I believe is an important avenue of Latinx-centered research because of PTSD's recently strengthened association with ethnic and racial discrimination, albeit in Black populations in the

U.S. Finally, after discussing the literature review results, I discuss the implications of this work for future research, our understanding of health disparities, and the U.S. Latinx community.

Background

Race and ethnicity

Ethnicity has been defined in multiple different ways depending on the specific research and field. For the purpose of this thesis, ethnicity can be described as a self-identified or ascribed membership, personal identity, or group identity involving shared cultural traditions, origins, or social background (C. Ford & Harawa, 2010; Kagawa-Singer, 2001; Senior & Bhopal, 1994). These qualities are distinctive and maintained over generations and can involve a common language or religious tradition. Race, on the other hand, was once defined as personal identity and group identity involving certain biological indicators (M. E. Ford & Kelly, 2005). However, researchers have since refuted the validity of race as a biological or genetic construct, citing that genetic variation is greater within racial groups than between racial groups, and that more than 99% of our genetic codes are identical anyways. This renders the concept of “race” a scientific myth altogether (M. E. Ford & Kelly, 2005; Kagawa-Singer, 2001). Thus, race is now understood as a social construct with significant effects on one’s interpersonal relationships and social environment. Race also has political and psychological implications that play into these effects and, thus, has been a major mechanism of social stratification throughout history without any consideration for intrinsic physical variations (Smedley, 1998). In contrast to race, which involves some perceptible phenotypic indicators, ethnicity refers to cultural identification and is considered separate from race, although the two may occur together (M. E. Ford & Kelly, 2005).

Latinx is an ethnic designation, not a racial designation. Thus, Latinx people share an ethnic identity but come from a variety of racial backgrounds.

Ethnic and racial discrimination still persist in our society (Kagawa-Singer, 2001). Ethnic discrimination manifests in Latinx populations contributing to a variety of phenomena, such as minority stress, acculturative stress, and institutional discrimination, as described in the sections to follow. For example, individual biases reflect in the policies that people create and how these policies are enforced in society. However, institutional discrimination in the form of policies, institutions, social norms, and other structures also fundamentally contributes to ethnic discrimination, allowing it to occur on a population level as opposed to random individual occurrences (Pérez Huber & Solorzano, 2015). In the following literature review, acculturative stress is centered. It is further discussed how this phenomenon, involving ethnic discrimination, directly affects health and contributes to depression, anxiety, and post-traumatic stress symptoms.

Demographics and health in the U.S. Latinx population

According to the 2020 U.S. Census, the Latinx population in the U.S. was 62.1 million with major growth of 23% since the 2010 Census. In comparison, the growth of the non-Latinx population was 4.3% since the 2010 Census. More than half of total population growth in the country was due to the growth of the Latinx subset of the population. This Latinx growth includes people of all races and nationalities, and, notably, the number of Latinx people who identified as White alone decreased by over half since 2010, from 26.7 million to 12.6 million. Meanwhile, the number of Latinx people who identified as more than one race increased by 567% from 3 million to 20.3 million, reflecting the increasing racial diversity seen in the U.S. and especially in the growing Latinx population (U.S. Census Bureau, 2020).

The Latinx population is diverse not only in terms of race, but also immigrant status, language use, country of origin, gender identity, and other facets of identity. For example, those who identify as Latinx, Hispanic, or Latino collectively have more than 20 countries/territories of origin and speak more than six different languages (Aragones et al., 2014). The people in this growing group include those of various documentation statuses; notably, the percentage of immigrants in the U.S. Latinx population has declined from 40.1% in 2000 to 34.4% in 2017 and continues to decline (Flores, 2017), indicating that much of this population growth is occurring domestically. Due to the heterogeneity of the Latinx population, there are many reasons a Latinx person may experience discrimination, complicating the research on ethnic discrimination and its effects. This point is expanded upon under the section titled “Intersectionality”.

These different facets of a Latinx person’s identity have significant effects on health. For instance, Latinx immigrants who mainly speak Spanish and have been in the U.S. for a shorter period of time are less likely to have a regular source of medical care than their U.S.-born, mainly English-speaking counterparts (Aragones et al., 2014). Additionally, there is an association between disparities in cervical cancer screening and lower socioeconomic status, lower English-proficiency, and being foreign-born (Downs et al., 2008). As discussed in the section titled “Intersectionality” and the following literature review, the diversity within the Latinx population affects relative responses to discrimination and mental health outcomes. For example, undocumented immigrants face unique risks and exposure to trauma before, during, and after their immigration to the U.S. that have subsequent mental health effects such as elevated risk of depressive and anxiety disorders (Breslau et al., 2011) and worse PTSD outcomes (Chu et al., 2013). The following literature review explores its aim in the U.S. Latinx

population overall, and thus is limited by a lack of specificity to certain identities within this group which may influence its generalizability as explained in “Limitations”.

In terms of the Latinx group as a whole, the research suggests major health disparities when comparing to non-Latinx whites. For example, 21.5% of Hispanics over age 20 have diabetes, especially type-II, compared to 13% of non-Latinx whites over age 20. 20.4% of Latinx men develop liver and inflammatory bowel cancer, compared to 11.3% of non-Latinx white men. Certain cancer mortality rates are also higher in Latinx people. For instance, cervical cancer death rates per 100,000 were approximately 2.6% in Latinx women, compared to approximately 2.0% in non-Latinx white women. Stomach cancer death rates per 100,000 were 3.9% in Latinx women, compared to 1.6% in non-Latinx white women (Howlader et al., 2021). Dementia is also experienced in higher rates in Latinx people than whites, although Latinx people are less likely than whites to have a diagnosis of dementias. Latinxs are approximately 1.5 times more likely than whites to have Alzheimer’s and other dementias, but only 18% more likely to be diagnosed, indicating a disparity in prevalence and subsequent care (Alzheimer’s Association, 2022). Certain mental health disorders also have disproportionate prevalence in the Latinx population. For example, in 2016-2017, 7.9-8.6% of the Latinx population experienced major depression, while 3.9-5.3% of the non-Latinx white population experienced major depression (Rodriquez et al., 2018).

There are also disparities in utilization and quality of mental health services across the population, a fact that resulted in The President’s New Freedom Commission on Mental Health to conclude that “Latinx and other ethnic and racial minorities experience a disproportionate burden of disability associated with mental disorders” (Cabassa et al., 2006; United States, 2003). Further, rates of psychiatric disorders in Latinx adults have been found to increase with

time resided in the U.S. (Cabassa et al., 2006), indicating that, with the growing and changing Latinx presence in the U.S., it is especially important to consider the mental health needs of this particular population and its various high-risk subgroups. Assessing the mental health of Latinx people in the U.S. has also become increasingly relevant due to the sociopolitical climate of today involving changes in border control and immigration policy, which exacerbates levels of ethnic discrimination and, thus, acculturative stress. Additionally, the anti-immigrant rhetoric and related “zero-tolerance” policy of the Trump Administration has served to promote ethnic discrimination and abuse. Thus, the current climate itself has already had negative consequences on the mental health of Latinx immigrants, such as increased depressive symptoms, stress, and anxiety (Bucay-Harari et al., 2020).

Physical and mental health

Most generally, physical health is the state or wellbeing of the body, whereas mental health is the state or wellbeing of the mind. However, physical health and mental health have been increasingly shown to be interconnected. Physical and mental health may impact each other by affecting employment/income, lifestyle choices, and social relationships (Ohrnberger et al., 2017). A person who suffers from psychological symptoms that causes them sleep difficulties will have a heightened stress response and decreased regeneration after injuries and other forms of physiological damage or stress (Hasler, 2010).

Additionally, there is an inherent physiological basis to both physical and mental health conditions and stress responses. For example, mental health disorders such as depression are thought to involve loss of serotonin production, as well as other neurotransmitters and their corresponding receptors, such as norepinephrine and dopamine. Similarly, stress responses involve a release of corticotropin-releasing hormones (CRH) which, in turn, stimulate the release

of cortisol, the so-called stress hormone, and activation of the inflammatory response system mediated by pro-inflammatory cytokines (Hasler, 2010). This can increase symptoms of depression and anxiety down the line, exemplifying how psychological and physiological explanations for morbidity are exceptionally intertwined.

In this review, I focus on mental health outcomes, particularly depression/anxiety and posttraumatic stress disorder and the physiology associated both directly and indirectly with these disorders or their related symptoms. I include a section to discuss other health implications related to direct physiological changes to strengthen my argument that acculturative stress can have immediate and long-term physiological consequences that lead to morbidities.

Intersectionality

Intersectionality is a term coined in the 1980s that emphasized the importance of multi-axis thinking when approaching the topics of race, class, and gender, insurance status, and other axes of power, especially in antidiscrimination and social movement politics (Cho et al., 2013; Crenshaw, 1989). It has become a framework for recognizing the roles of the subordinate identities or dimensions of identity of an individual in their experience and treatment by society (Cole, 2008). Thus, when regarding this model and the inter-relatedness of mental and physical health, it can be understood that Latinx adults experience a variety of different stressors that may negatively affect their health in different and interacting ways.

Colorism can be defined as a type of discrimination based on skin tone that results in people with lighter complexions to be advantaged over people with darker complexions (Strmic-Pawl et al., 2021). Two people in the same ethnic or racial category may experience differential treatment because of their varying skin tones, resulting in further stratification and in-group disparities in health (Monk, 2021). As per the intersectionality framework discussed, colorism

plays a significant role in how different subgroups within the Latinx community experience discrimination and stress. For instance, Black Latinx youth were found to have significantly higher symptoms of depression than non-Black Latinx youth (Burgos & Rivera, 2009). Relevantly, the Latinx population is becoming more racially diverse (U.S. Census Bureau, 2020), and, thus, the necessity for researchers to consider racial identity in Latinx studies is becoming increasingly obvious.

In addition to the color of one's skin and other features contributing to racial categorization, there are a variety of other features and dimensions of identity that contribute to the diversity in experiences within the Latinx population. These factors, such as English proficiency, documentation status, and socioeconomic status, have also been associated with exacerbated negative health outcomes within the Latinx population as described under "Demographics and health in the U.S. Latinx population" (Aragones et al., 2014; Breslau et al., 2011; Chu et al., 2013; Downs et al., 2008). Another example is that research shows diabetes and hypertension prevalence varies depending on country of origin among U.S. Latinxs after adjusting for age, acculturation, socioeconomic status, BMI, and other relevant factors (Pabon-Nau et al., 2010). Other dimensions of identity can also affect a person's direct physiological experience, for example, the physiological response to stress is in-part gender-specific, with women exhibiting a greater stress responsiveness compared to men. This is consistent with health outcomes down-the-line such as women having a higher incidence of clinical depressive disorder (Hasler, 2010).

The diversity within the Latinx population presents complications for researchers trying to homogenize an innately heterogeneous group, especially when conducting research regarding forms of discrimination and their associated downstream effects. While the research that has

been done on the Latinx population in the U.S. is valuable and increasingly so due to their growing populations and recent sociopolitical changes that make the lives of Latinx immigrants more challenging, there needs to be more multidimensional studies that apply the intersectionality framework in their methods and design. This would allow researchers to identify factors that influence outcomes across subgroups to determine more specific vulnerabilities and protective factors within the larger group. The literature review presented explores the differences in results seen in some of these subgroups (such as a specific gender) as pertaining to the physiological effects of acculturative stress and subsequent mental health outcomes.

Meyer Minority Stress Model

The Minority Stress Model was first coined in 2003 to explain why lesbian, gay, bisexual, and transgender people are disproportionately affected by mental health issues compared to heterosexual and cis-gendered people. It was informed by other models of socially stemming stress and distress and explains a mode by which stigma can cause negative mental health outcomes and/or maladaptive responses (Meyer, 1995; Valentín-Cortés et al., 2020). This model is fundamental to the presented argument that there are physiological effects of acculturative stress and ethnic discrimination, thus leading to negative mental health outcomes.

Although, for the purposes of this thesis, acculturative stress is centered, studies on racial discrimination are conducted similarly, often using measures of perceived discrimination through surveys and related stress through measurements such as heart rate, blood pressure, and self-reported stress. It can also be difficult to separate the stress resulting from ethnic discrimination and racial discrimination, as the features and qualities that cause one to identify with or be identified as part of a particular racial or ethnic group may overlap. Thus, it is important to note

that the stress experienced in response to racial discrimination has been further studied and illustrated in the last decade. The focus of these studies has largely centered racial discrimination against Black people and shows that stress resulting from racial discrimination can have significant negative effects on mental health outcomes and increased psychological distress (Utsey et al., 2008, 2013). Similar results have been noted for acculturative stress, as explored in the literature review and background section discussing acculturative stress and its risk factors.

Acculturative stress

For this review, acculturation refers to the cultural and psychological change of Latinx people to match the dominant culture and psychology in their U.S. community (Berry, 1997). In addition to adapting to a majority culture, the experience of acculturation also involves the preservation of aspects of a heritage culture that individuals would want to preserve. In this way, the concept of acculturation separates itself from the concept of assimilation. Thus, acculturative stress refers to the difficulties, associated with stress theory, experienced because of this intercultural contact and the experiences that come with it. Acculturative stressors can include the language barriers and other pressures and/or demands to assimilate to the majority culture that overcome individual capacity and coping (Torres, 2010). Acculturative stress is not exclusively experienced by first generation immigrants; it occurs across generations.

Some risk factors associated with acculturative stress include gender (being female), marginalization, and time spent in the dominant culture, i.e., the U.S. There are also protective factors that may prevent acculturative stress to a certain extent, like societal integration as seen facilitated by diverse communities with Latinx representation and language programs (Bekteshi & Kang, 2020). For this project, ethnic discrimination is focused on as a part of marginalization as a risk factor and contributor. Relatedly, perceived discrimination, when measured using The

Perceived Racism Scale for Latinos, has been found to lead to an increase in acculturative stress which, in turn, was found to lead to increased psychological distress (Torres et al., 2012). The relationship between perceived discrimination and psychological distress may, thus, be moderated by acculturative stress, particularly in those with lower Anglo behavioral orientation, meaning those who are less perceptively assimilated into the dominant culture. Examples of Anglo behavioral orientation include a greater fluency in English and decreased presence of a non-Anglo-associated accent. High Anglo behavioral orientation was found to be protective (Torres et al., 2012), whereas Latinx behavioral orientation was not. This psychological association between discrimination and acculturative stress can be used to justify the role of acculturative stress in studies that solely address the effects of ethnic discrimination in a sample. Additionally, in line with the intersectionality framework, studies like this have shown the relevance of an array of moderating factors that influence and differentiate the individual experiences within a group as diverse as the Latinx population, such as English-speaking ability and phenotypic features.

It is important to note that acculturative stress was chosen as the focus of this study to narrow in on a particular subset of the Latinx population in the United States that experiences additional stressors associated with being unacculturated to some degree. Additionally, there seemed to be more research available at the present time centering this type of stress as opposed to more generalized stress models. This allowed for further narrowing and specificity in analysis of the sources discussed. Further, while the content of this literature review predominantly adheres to direct physiological changes and mental health outcomes, researchers have discovered many associations between acculturation-related factors and behavioral changes that result in negative health outcomes. For instance, Latina immigrant women with a lesser length of stay in

the U.S. or that are less acculturated are significantly less likely to engage in cancer screenings and self-exams and have significantly less knowledge regarding breast and cervical cancers (Lawsin et al., 2011). Although this project does not elaborate on changed health behaviors in response to acculturative stress, it is important to note that they may play a modulating factor in addition to direct physiological changes.

Institutional discrimination

In understanding ethnic discrimination and its health effects on a population such as the Latinx population of the U.S., it is important to recognize that there are differing levels of discrimination that impede on the lives of minority groups in different ways. One that is not emphasized in this study but is important to note is institutional or, synonymously, structural discrimination. Institutional discrimination can be conceptualized using the definition of institutional racism, which can be thought of as the direct and indirect or formal and informal structures that allow microaggressions and other forms of interpersonal discrimination to persist in society. This can manifest and propagate through policies, legislation, social norms, and institutions, etc. (Pérez Huber & Solorzano, 2015).

The structural systems in place as well as their resulting microaggressions and discrimination have strong associations with negative health outcomes. For example, perceived discrimination is a critical factor in increasing incidence of obesity in Latinas, in addition to low socioeconomic status (Ai & Lee, 2021). Beliefs in system fairness, which helps socioeconomically disadvantaged minority students to stay well psychologically, may increase health risk in students facing frequent discrimination in addition to financial pressure (Dover et al., 2020). Perceived language-based and ethnic discrimination both predict poorer physical health and psychological distress among Latina women (Halim et al., 2017). For this study, the

focus remained predominantly on interpersonal instances of discrimination as opposed to institutional discrimination. Although these differing levels of discrimination are highly connected, the former was more conveniently isolated in many studies and perceived and recent instances of discrimination were used in certain anecdotal studies in children and adults alike.

Despite the focus on adults for the purpose of this study, it is important to use youth studies to recognize how early in a person's lifetime this perceptible discrimination begins in the U.S. Latinx community as a result of the social institutions in which they participate. For example, in a study investigating the experiences of Latinx children in a school in Arizona, it was found that children, despite their young age, can and do recognize forms of microaggression and overt discrimination in their lives. Students are told by their peers that they will not play with them because they are of Mexican-origin, and teachers set up informal rules barring the use of Spanish in the classroom and, through words and actions, decrease or dismiss their connection to their Latinx culture (Ayón & Philbin, 2017). Thus, children are indirectly taught from a young age that not everyone is going to treat them equally and that it may be beneficial for them, at least socially, to downplay their Latinx identities. Studies like these demonstrate the existence and awareness of discrimination and microaggressions even before education and opinions on the subject is established in adolescence and adulthood. Further, the discussion of anti-immigration and anti-Latinx climates may be useful in the discussion of impacts on development and potential research on mental health implications in adulthood.

Relatedly, there have been various studies on the racialized experiences of Latinx college students in the U.S. For example, Mexican college students in Tennessee have been shown to experience regular micro-assaults, microinsults, and microinvalidations from their predominantly white peers and school officials. There is a sense of "othering", as well as stereotyping and

dismissing the accomplishments of Mexican students as part of the negative perception of Mexicans as a whole. Students subsequently become aware of their lower social status due to their Mexican identity and the way they look, emphasizing the impact of phenotypic features in Latinx ethnic discrimination and the continuation of perceptible discrimination into early adulthood (Ballinas, 2017).

Effects of stress on the mind and body

Stress refers to anything that seriously threatens homeostasis or equilibrium of bodily and psychological processes. Stress evolved as an adaptive process, but prolonged stress responses can lead to disease. Humans and other species have evolved to cope with these perceived threats physiologically and behaviorally. On a physiological level, animals, specifically mammals, tend to show positive changes in hormonal activity and autonomic activity that ready the body for the exertion necessary for “fleeing” the aversive situation. Mammals may also experience vigilance involving arousal of the sympathetic nervous system such that blood is shunted away from the periphery and movement is inhibited, especially when the former coping response is not available (Schneiderman et al., 2005).

Following an acute stressful event, stress hormones such as cortisol are produced by a cascade beginning with the sympathetic nervous system (SNS) and hypothalamic pituitary adrenocortical axis (HPAA) released to help make energy available for the “fleeing” response as mentioned above. Energy is diverted to the tissues that require it for fleeing, and bodily activities that are less critical for survival are suspended such as sex hormones and digestion. Glycogen or energy stored in tissues are turned into glucose for use, and fats are broken down into fatty acids and glycerol to be used more effectively (Schneiderman et al., 2005). Chronic SNS stimulation

can lead to elevated blood pressure, damaged arteries (Henry et al., 1975), and elevated basal stress hormone levels that suppress immunity (Kiecolt-Glaser et al., 2002).

Stress, especially intense and/or chronic stress, has an enormous range of negative psychological consequences. For example, intense and chronic stressors in children and adolescents during their formative years is associated with long-term psychological morbidities including symptoms of posttraumatic stress, increased risk of anxiety and mood disorders, decreased immune response, medical morbidity, structural changes in the central nervous system related to coping response, and even early death (Shaw, 2003). Further, stressful life events in general tend to precede depressive disorders and anxiety disorders (Schneiderman et al., 2005), and stressful events to the point of trauma can lead to psychological disorders such as Acute Stress Disorder (ASD) and posttraumatic stress disorder (PTSD) or related symptoms including intrusive thoughts, hyperarousal, insomnia, and other overlapping symptoms with depression and anxiety (Harvey & Bryant, 2002). This contributed to the inclusion of anxiety, depression, and PTSD symptoms in relation to acculturative stress in this project.

Stress is also associated with health behaviors that predispose people to negative health outcomes. For example, there is evidence that stress related to life events and other chronically stressful conditions is associated with higher alcohol consumption (Linsky et al., 1985), the onset of bulimia nervosa or disordered eating (Welch et al., 1997), and decreased natural killer cell cytotoxicity and, thus, decreased efficacy of the immune system (Ironson et al., 1997). There is also evidence that stress directly leads to more sleep issues and disturbances (Harvey et al., 2003), hence the inclusion of acculturative stress' negative effects on sleep in the section of this project exploring direct physiological effects. The following literature review discusses the physiological effects and subsequent mental health effects of acculturative stress, which

according to the provided definition and information presented in the literature review, can be considered stressful. As per the discussion above, the negative effects of stress on the mind and body may thus be a potential mediator in many of the health effects discussed.

Methods

The following literature review is a narrative literature review, as opposed to a systematic literature review, and thus focuses on three themes: direct physiological effects of acculturative stress, acculturative stress in relation to anxiety and depression, and acculturative stress in relation to PTSD and PTSD-like symptoms. Research articles relevant to these themes (see “Appendix”) were chosen to pursue the desired aim of demonstrating physiological effects as a potential mediator between acculturative stress and negative mental health outcomes. To collect the appropriate data, I accessed the following EBSCO databases through the University of Texas at Austin library website: APA PsycInfo, SocINDEX, and CINHAHL Plus with Full Text. I used the following search terms in all three of these databases at once via EBSCO: (discrimination or acculturative stress or xenophobia or prejudice or racism) AND (Latin* or Hispanic) AND (physiological effects or physical effects or physical health or health outcomes or physical outcomes or stress or stress response) AND adult. I then sorted through the first ten pages of results in order of relevance to obtain sources for the three sections of the literature review as pertaining to generalized physiological changes, anxiety/depression, and PTSD or PTSD-like symptoms. There were some sources that were extracted outside of these parameters to provide further context regarding a specific morbidity or health factor, such as the downstream effects of sleep disruption. This allowed for a broader understanding of the studies included in the literature review and their potential implications on health and wellbeing.

Literature Review

Direct physiological effects of acculturative stress

Acculturative stress and ethnic discrimination have been associated with tangible effects on various physiological processes. For example, greater physiological reactivity and, particularly, greater total cortisol output has been observed in Latinx participants exposed to indirect ethnic discrimination while accomplishing cognitively stressful tasks (Huynh et al., 2017). Increases in discrimination-related stress has been found to predict higher systolic blood pressure in male Latino participants (McClure HH et al., 2010). Acculturative stress negatively affects certain neurocognitive functions, specifically “psychomotor speed, verbal learning, and word fluency”. However, the association with verbal memory was no longer significant after accounting for mental and physical health (Muñoz et al., 2021). This reinforces the idea that mental and physical health can serve as mediators for further issues down the line due to acculturative stress. Finally, a higher count of everyday discrimination was associated with increased inflammation, particularly in a sample of Latina women (Caceres et al., 2021).

Everyday instances of discrimination and its effects have also been explored in samples of diabetics specifically, as an important factor connected to diabetes-specific outcomes is diabetes-related distress (DRD). In Latinx people specifically, discrimination was found to be associated with higher levels of DRD and depressive symptoms (LeBrón et al., 2019). A major subset of everyday instances of discrimination are microaggressions, which have been linked to subsequent changes in weekly diurnal cortisol patterns in both Latinx and African American young adults, cortisol being the touted hormone responsible for stress (Zeiders et al., 2018). This finding demonstrates the direct effects of even subtle forms of discrimination on bodily functions and responses that may mediate health outcomes down the line.

Relatedly, cortisol patterns and, more specifically, cortisol awakening response (CAR), describing the increase in cortisol levels under acute stress as described in the section titled “Effects of stress on the mind and body”, has been found to be a mediator for the relationship between acculturative stress and self-reported health outcomes in Mexican Americans, further strengthening this potential biological pathway towards psychological symptoms in the Latinx population of the U.S. (Garcia et al., 2017). For instance, there is direct evidence that stress and chronic stress predicts depression and worsened general health even beyond the effects of perceived discrimination in adults of Mexican origin (Flores E et al., 2008). The relationship between acculturative stress or ethnic discrimination and depression/anxiety symptoms is explored further in the subsequent section, but this study demonstrates that stress may be a significant mediator.

Sleep is another important health measure that has been shown to be impacted by forms of discrimination, especially when it leads to acculturative stress. For example, Majeno et al. (2018) found a significant negative correlation between ethnic discrimination and sleep duration and quality, as well as between non-ethnic discrimination and sleep quality. The association with ethnic discrimination was mediated by loneliness, and the association with non-ethnic discrimination was mediated by both loneliness and perceived stress. The study thus highlighted a potential avenue by which these associations exist, as discrimination is associated with hyper-vigilance and stress, which is, in turn, associated with poorer sleep outcomes (Majeno et al., 2018). These results relate directly with discussions of stress response and psychological distress, as explored in Torres et al. (2012) and Lilly et al. (2018), as issues with sleep may affect these experiences in undesirable ways or vice versa. Consistent sleep disruption and decreased quality of sleep may also theoretically result in lower quality of life, cognitive ability, and performance.

It may further result in certain negative health outcomes such as weight-related issues, hypertension, and cardiovascular disease (Medic et al., 2017).

Acculturative stress in relation to anxiety/depression

Anxiety and depression are different but broad conditions that have some overlapping symptoms and a prevalence of comorbidity. Some overlapping symptoms, for example, include fatigue, difficulty concentrating, and difficulty sleeping. Some estimates of comorbidity predict that 60% of those with anxiety will also experience additional and/or overlapping depressive symptoms (*The Comorbidity of Anxiety and Depression / NAMI: National Alliance on Mental Illness*, 2018). For this reason, most of the research in this field group them together in measurement, and, thus, I chose to group them together in my analysis.

Latinx adults in the U.S. experience anxiety and depression at differing rates than other groups, and there are differences between Latinx subgroups. For instance, among Latina mothers in emerging immigrant communities, the presence of cultural stressors, such as acculturative family-based conflict and other sources of acculturative stress, have been found to significantly predict depressive symptoms in ways that surpassed the effects of universal stressors such as economic hardship and parent-child conflict (Hill et al., 2019). Another example of subgroup differences in these outcomes was demonstrated in a study by Barragán and colleagues (2020) in which the relationship between comorbid mental health disorders and psychological distress was found to be different between Puerto Ricans and other Latinx subgroups. In another study, when controlling for gender, age, and time in the U.S., Mexican-origin people were found to experience higher levels of stress than Cuban and Dominican immigrants, cultural resilience being a protective factor against related, subsequent depressive symptoms (Cervantes et al., 2019). However, perceived discrimination was found to be associated with increased depressive

symptoms among Latinx individuals regardless of race (Nalven et al., 2021), demonstrating one generality in discrimination effects based on ethnicity.

Additionally, research has shown that the relationship between ethnicity and depression is strengthened by daily discrimination events and stressors (Burgos & Rivera, 2009) and that elevated acculturative stress across multiple domains of a person's life are associated with increased depression compared to those with elevated acculturative stress predominantly in one domain of a person's life (Driscoll & Torres, 2021). Notably, research has shown that microaggressions are not only extremely common but increase levels of psychological distress and likelihood of depression, independent of subjective social status and demographic characteristics. The impact and frequency of microaggressions implies that this form of ethnic discrimination may have even greater emotional and physiological impact than that of less subtle forms of racism (Ballinas, 2017; Lilly et al., 2018).

Depressive symptoms associated with acculturative stress in Latinx young adults has also been suggested to interplay with decreased relationship commitment, a factor that has also been associated with acculturative stress (Maiya et al., 2021). These negative effects on social relationships and relationship-building may also, by association, have exacerbating effects on existing depressive symptoms and lifestyle. The association between acculturative stress and psychological distress has been found to be moderated by increased social constraints or perceived social constraints (Celia Ching Yee Wong et al., 2017). Relatedly, greater ethnic discrimination towards Latinx individuals has been associated with greater social anxiety and associated alcohol-related issues (Buckner et al., 2022). This type of anxiety is suggested to be a potential mediator between ethnic discrimination and alcohol-related issues, possibly due to

individuals abusing or misusing alcohol for its anxiety-relieving effects, alone and especially in social situations.

Acculturative stress in relation to PTSD and PTSD-like symptoms

Posttraumatic stress disorder (PTSD) is a chronic mental illness with impact on quality of life, suicidality, anxiety-like symptoms, etc. (Sibrava et al., 2019). Although there is a lack of sufficient research to conclude that acculturative stress can directly lead to the development of PTSD, there is evidence of racial and ethnic discrimination increasing Latinx risk of developing PTSD and/or PTSD-like symptoms. For example, Sibrava and colleagues (2019) notes that previous research has suggested that Latinx and African American adults experience higher rates or incidence of PTSD than their white counterparts. When conducting a longitudinal study with a five-year follow-up, they found that greater frequencies of discrimination in these minority groups predicted the development of PTSD. The negative mental health outcomes associated with higher levels of acculturative stress frequently parallel the outcomes associated with trauma. Note that some of the studies that point to this conclusion describe acculturative stress as a potential moderator between research specific to ethnic and racial discrimination, meaning individuals with higher levels of total acculturative stress experience worse outcomes in response to interpersonal discrimination (Ballinas, 2017; Brabeck et al., 2022; Torres et al., 2012).

Anticipatory stress response and other physiological changes may play a role (Utsey et al., 2013). Anticipatory stress response has been identified in individuals who have been subject to racial discrimination, but this research has so far seemed to center Black people in the U.S. and has yet to be expanded and solidified in the Latinx community, illustrating an area for further longitudinal research. There has, however, been some research on anticipated prejudice and its resultant psychological and physiological stress response. One 2012 study, for example,

placed Latin American female college students in either a “prejudice” test group or “non-prejudice” test group. Those in the “prejudice” test group were asked to prepare a presentation for a white female that they had not yet spoken to, but they were provided a questionnaire filled out by the white female (a self-identified confederate, unknowing of the study conditions) that indicated racially/ethnically biased attitudes. Those in the “non-prejudice” test group were asked to prepare a presentation to a non-prejudiced white female; they were given alleged questionnaire responses that indicated the White female had egalitarian attitudes. The Latina participants were asked to report their cognitive and emotional states, and cardiac and hemodynamic data was collected throughout.

The results showed that Latinas in the “prejudice” group reported more threat emotions and greater concern prior to the interaction, as well as more stress after the interaction. Additionally, the cardiovascular response was greater and blood pressure increased compared to those in the “non-prejudice” group. These associations were significant even when controlling for depression, optimism, and other personality factors/traits that might differentiate the extent of perceived threat. The study showed that merely anticipating discrimination leads to significant psychological and physiological stress responses (Sawyer et al., 2012). These results are in-line with the exploration of anticipatory stress in Black populations in the U.S., such as that of Utsey and colleagues (2013). This phenomenon may overlap or closely relate to findings of increased PTSD-like symptoms in Latinx populations due to ethnic discrimination.

PTSD-like symptoms may also be related to other mental health outcomes associated with acculturative stress and discrimination. For example, traumatic stress has been shown to, at least in-part, account for the depressive symptoms associated with ethnic discrimination, particularly in U.S.-born Latinx individuals (Torres & Vallejo, 2015). This provides support for

the consideration of incidences of ethnic discrimination as traumatic events with corresponding consequences on health and wellbeing.

Implications and Future Directions for Research

This review serves to consolidate the evidence that illustrates potential avenues of causality that would be worth researching further, especially in the form of longitudinal studies in the Latinx population. These studies may incorporate the intersectionality framework in their methodology, further exploring differences between groups with different races, genders, sexualities, and other marginalized identities within the Latinx group. This review illustrates the value of studies that incorporate dimensions of identity that differentiate subgroups within the Latinx population of the U.S. and cause them to be subject to differing societal experiences and, thus, different health outcomes.

The literature review presented also demonstrates a need for more studies across-the-board on the physiological effects of acculturative stress in the Latinx population of the U.S. and other marginalized groups. The link between these effects and PTSD or PTSD-like symptoms is a major area of research with significant gaps; future studies will be necessary to establish causality and strengthen the characterization of acculturative stress and discrimination as traumatic events. This recognition in the Latinx experience has the potential to reinforce the severity of acculturative stress and discrimination, even in the form of microaggressions, and broaden existing education and programming in coping with PTSD or PTSD-like symptoms and healing from trauma.

Further, this study demonstrates the variety of ways that acculturative stress may result in physiological changes that lead to negative mental health outcomes in the U.S. Latinx

population. Understanding and further researching the mechanisms by which everyday instances of discrimination and intercultural contact affects health is important because it validates the difficult experiences and everyday reality of minority groups in the U.S. Increasing societal understanding and validating these individuals may contribute to harm reduction, as invalidating traumatic experiences can worsen psychological symptoms (Hong et al., 2011; Westphal et al., 2016). Also, this understanding has the potential to stimulate advocacy against ethnic discrimination on an everyday to structural level and promote the creation of programs and communities that help support Latinx families and high-risk groups, as well as provide the resources they need to buffer the negative effects of acculturative stress, promoting greater health equity in the U.S.

Limitations

The research consolidated has a variety of limitations within each individual study that would be transferable to this literature review. For example, many studies had a higher female proportion of participants than male participants and/or obtained participants from a particular region of the United States, and thus may not be generalizable to males and other genders and Latinx communities in other regions of the U.S. Additionally, any given study cited could not account for or explore all the dimensions of identity and subgroup characteristics that may play a role in the associations observed, such as specific country of origin, phenotypic features, or resident/citizenship status. Also, this literature review is not all-inclusive in available literature, as there were limits on time, and it excluded journal articles or sources for which the University of Texas did not provide Full Text, or the Full Text was not available for free to the public.

Conclusion

This study explored acculturative stress and ethnic discrimination, their associations with adverse mental health outcomes in U.S. Latinx adults, and the role of direct physiological effects in mediating these associations. The study thus grounds the association between the unique difficulties faced by Latinx adults and psychological morbidities in tangible, physical changes in the body. In collecting research, I also realized it is pertinent to discuss how these physical changes result in poor health behaviors that may also contribute to subsequent mental health issues, such as worsened sleep quality and duration. This allowed for a more complete picture of the potential mechanisms by which ethnic discrimination and acculturative stress affect mental health in the U.S. Latinx population.

Knowing that there are significant negative health consequences of acculturative stress grounded in physiology may serve to validate the experiences of Latinx people and any other ethnic or racial group that face unique challenges and marginalization. Further, it may provide necessary context for the health disparities we see in the U.S. Latinx population. The question remains: in what ways can we utilize this information to further health equity? Increasing awareness and validating these experiences is itself beneficial to health after major stress or trauma (Hong et al., 2011; Westphal et al., 2016). However, future researchers should determine the optimal way to use these kinds of connections to educate health professionals and the public such that it would contribute to greater health equity and empowerment of Latinx people and other marginalized groups in society.

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Appendix

Table 1: Literature Review Results

Direct Physiological Effects			
Author	Date	Sample	Description
Caceres et al.	2021	40 Latinas: 85% born in the Dominican Republic, 95% post-menopausal, more than 65% with household incomes less than \$15,000	Inflammation ratios were calculated via data in blood samples and examined in relation to everyday discrimination. A higher count of everyday discrimination was associated with a higher inflammation ratio.
Flores E. et al.	2008	215 Mexican-origin adults; 96 fathers and 119 mothers, 91 couples were married to each other	Scaled responses from 1-hour telephone interviews of each participant measured perceived discrimination, perceived stress, acculturation, and other health symptoms. Perceived discrimination predicted depression and poorer general health, controlling for the effects of perceived stress.
Garcia et al.	2017	105 participants of Mexican descent aged 18-38 recruited in San Antonio, Texas. Excluded those with factors that potentially affect the HPA axis.	Based on surveys and measurement of cortisol awakening response (CAR) and hormonal assays via salivary collection, poorer self-reported health was found to be associated with reduced CAR profiles by moderate-high levels of acculturative stress.
Huynh et al.	2017	36 Latinx emerging adults recruited from West Coast public university: 66% female, 82% second generation, 6.1% third generation.	Cortisol assays were performed on saliva samples, blood pressure and heart rate were measured, and participants were made to perform tasks under ethnic discrimination and control conditions. Ethnic discrimination resulted in higher cortisol output and affected cortisol recovery responses.
LeBrón et al.	2019	157 African Americans and Latinx adults with type 2 diabetes with health insurance in Eastside or	Scaled survey data showed that discrimination was associated with higher diabetes-related distress in

		Southeast Detroit at enrollment into a diabetes management intervention.	Latinx adults and higher depressive symptoms in Latinx adults.
Majeno et al.	2018	319 adolescents: 42% Latinx, 57% female	Self-reported discrimination, loneliness, and perceived stress were collected and analyzed. Sleep duration and variability were assessed via actigraphy and sleep quality via self-reports. Ethnic discrimination was associated with shorter sleep duration. All discrimination was associated with decreased sleep quality; loneliness and perceived stress was a partial mediator in this relationship.
McClure HH et al.	2010	79 adult immigrant Latinx farm workers in Willamette Valley, Oregon: 51 female and 28 male, 18-69 years of age.	Data was obtained from assessments of blood pressure, height/weight, total cholesterol, and fasting glucose, a 20-minute interview, and analyses of Epstein-Barr Virus antibodies and C-reactive protein as a marker of infection via blood spot samples. Increases in discrimination-related stress predicted elevated systolic blood pressure and Epstein-Barr Virus antibodies in males. In females, more years in the U.S. was associated with higher diastolic blood pressure.
Muñoz et al.	2021	3,265 Latinx adults, aged 18-74 years: 56.6% women and 43.4% men.	Via scaled responses and neurocognitive measures administered by trained interviewers, it was found that each standard deviation increase in acculturative stress was significantly associated with poorer performance in psychomotor speed, word fluency, and verbal learning, even after adjusting for mental/physical health symptoms.
Torres et al.	2012	Community sample of 669 Latinx adults from a moderately sized, Midwestern city: 63.6% female, aged 18-80.	Via data from scaled questionnaires, it was found that the acculturative stress could mediate the relationship between perceived discrimination and psychological distress. It was found that Anglo behavioral orientation and

			not Latinx behavioral orientation moderated the link between perceived discrimination and acculturative stress.
Zeiders et al.	2018	145 African American and Latinx young adults (average age of 20 years) attending a Midwestern University: 72% female.	Microaggressions were measured via a scaled questionnaire, cortisol patterns were measured via salivary samples, and other demographic and health factors were reported by participants. Increases in microaggressions predicted a greater overall cortisol output the following week. Microaggressions centering criminality and second-class citizenship were associated with greater cortisol awakening responses the following week.
Anxiety/Depression			
Author	Date	Sample	Description
Barragán et al.	2020	28,630 overall study sample, with 4,921 Latinx adults available for inclusion in analysis: 48.4% male.	Data regarding psychological distress, demographics, and mental health disorders was collected via interviews and scaled questionnaires then analyzed. The presence of multiple mental health disorders and comorbid mental health disorders were associated with higher rates of psychological distress; this varied across subgroups.
Buckner et al.	2022	373 Latinx undergraduate adults who currently drink alcohol and are below age 30. 82.1% born in the U.S.	Cross-sectional data from various scaled questionnaires were analyzed. Ethnic discrimination was positively correlated with alcohol-related problems, social anxiety, and drinking for coping. Discrimination was related to social anxiety and coping motives, thus indirectly related to alcohol problems.
Burgos & Rivera	2009	845 Latinx people from an original data set of majority female participants.	Cross-sectional data from a three-wave longitudinal study was used to determine that Black Latinx youth have significantly higher depression symptoms than nonblack Latinxs. The relationship between race and

			depression depended on daily experiences of discrimination, even when accounting for many measures of stress.
Celia Ching Yee Wong et al.	2017	306 college students at the University of Houston and the University of Texas at Brownsville, of which 169 were Latinx. 83.3% of the total sample were women.	Via analyses of scaled questionnaires, it was found that acculturative stress and social constraints were significantly associated with greater psychological distress in Latinx students.
Cervantes et al.	2019	575 US-born Latinx adults and 941 immigrant Latinx adults for a total of 1,516 Latinx adult participants, 57% of which were female and represented individuals from at least 10 Latin American national origins.	Via analyses of scaled questionnaires, it was found that Mexicans had a higher stress level compared to Cuban or Dominican immigrants. Cultural resilience to was shown to serve a potential protective role to prevent the onset of depression.
Driscoll & Torres	2021	230 Mexican-descent adults, aged 18-76, in a moderately sized city in the Midwestern United States; 73% were women.	Via secondary data analyses of previously published data on the sample involving scaled questionnaires, it was found that the group with elevated acculturative stress across multiple domains reported significantly greater depression than the group with elevated acculturative stress in a single domain.
Flores E. et al.	2008	215 Mexican-origin adults; 96 fathers and 119 mothers, 91 couples were married to each other	Scaled responses from 1-hour telephone interviews of each participant measured perceived discrimination, perceived stress, acculturation, and other health symptoms. Perceived discrimination predicted depression and poorer general health, controlling for the effects of perceived stress.
Hill et al.	2019	169 Latinx adolescents and their mothers from two different middle schools in semirural North Carolina (NC). The mothers' average age was 41 with a standard deviation of 5.79. 88.6% of the sample was born in	Via data from various scaled questionnaires, it was found that universal stressors significantly predict depressive symptoms, and acculturative-based family conflict predicts depressive symptoms more than universal stressors.

		Mexico and had lived an average of 15 years (SD = 4.56) in the U.S.	
Lilly et al.	2018	325 minority, adult graduate-level students at major state public university.	Observational cross-sectional study was conducted with scaled questionnaires. 98.8% of the sample recently experienced microaggressions, frequency of microaggression exposure was associated with 2.46 greater odds of depression, and distress evoked by microaggressions was associated with 2.14 greater odds of depression.
Maiya et al.	2021	475 Latinx young adults with a mean age of 24.8 (SD of 3.2), of which 61% are women, 66.1% had Mexican Heritage, and 89.9% were U.S.-born.	Data was collected via a Qualtrics panel study or online surveys. It was found that Latinx young adults that experience acculturative stress display greater depressive symptoms and, subsequently, lower relationship commitment. Ethnic identity was found to buffer the negative effects of acculturative stress on relationship commitment.
Nalven et al.	2021	296 Latinx adult participants (63% male) who met criteria for hazardous drinking and were non-treatment-seeking were separated into two categories: White (63 adults) or a minoritized race (233 adults).	Via analyses of various scaled questionnaire responses, it was found that Latinx individuals with a minoritized race reported higher levels of depressive symptoms than Latinx individuals who were categorized as White. It was also found that those who greater inside-neighborhood discrimination also reported greater hazardous drinking, alcohol-related consequences, and depressive symptoms. Racially minoritized Latinxs perceived more of this type of discrimination than their White counterparts and it was related to more anxiety symptoms in this group only.
PTSD or PTSD-like symptoms			
Author	Date	Sample	Description

Brabeck et al.	2022	306 Latinx youth, of which 58% were female and 53% were born outside of the U.S. The sample was evenly originated from Harris County, TX, and Rhode Island. Approximately 80% of youth had origins from Mexico, Guatemala, Honduras, or El Salvador.	Scaled questionnaire responses were analyzed. Those who perceived more discrimination were more likely to report PTSD symptoms, with females reporting higher PTSD symptoms than their male counterparts, e.g., avoidance and reexperiencing symptoms. Perceived discrimination was associated with greater PTSD symptoms, e.g., hypervigilance and avoidance, in females.
Sawyer et al.	2012	54 Latina college students, aged 18-28, of which 85% were born in the U.S.	An online scaled questionnaire was filled out by participants prior to testing. The test consisted of an encounter/discussion regarding diversity items with a White female (a confederate blind to condition), which was the prejudiced condition compared to a nonprejudiced condition. Post interaction cognition and emotions, as well as cardiac and hemodynamic data, were collected, assessed, and analyzed. It was found that merely anticipating prejudice led to stress responses, both psychological and cardiovascular.
Sibrava et al.	2019	166 African Americans and 134 Latinx adults, aged 18 or older, diagnosed with one or more of the following anxiety disorders: generalized anxiety disorder, social anxiety disorder, panic disorder, and panic disorder with agoraphobia.	A series of scaled questionnaire responses were analyzed longitudinally. Reported frequency of discrimination experiences significantly predicted PTSD diagnosis in this sample, demonstrating the chronic course of discrimination on PTSD development in these populations.
Torres et al.	2012	Community sample of 669 Latinx adults from a moderately sized, Midwestern city: 63.6% female, aged 18-80.	Via data from scaled questionnaires, it was found that the acculturative stress could mediate the relationship between perceived discrimination and psychological distress. It was found that Anglo behavioral orientation and not Latinx behavioral orientation moderated the link between perceived discrimination and acculturative stress.

Torres & Vallejo	2015	244 Latinx adults from a moderately sized Midwest city of which 66% were women and 57% were born in the U.S. 89% were of Mexican descent.	Via data from scaled questionnaires, it was found that among U.S.-born but not foreign-born Latinxs, source of discrimination and reaction to discrimination were associated with increase traumatic stress symptoms. Increased traumatic stress symptoms were associated with depressive symptomology.
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Author Biography

Sofia was born in Caracas, Venezuela and spent the first few years of her life between the cities of Caracas and Puerto La Cruz. She and her family relocated frequently throughout her childhood, from Venezuela to Houston, TX, Corpus Christi, TX, Tulsa, OK, Singapore, and The Woodlands, TX, where she attended The Woodlands High School. In 2018 she started college of the University of Texas at Austin, pursuing a Neuroscience BSA Honors with a Business of Healthcare Certificate. Sofia was active in her UT and honors community throughout college; her proudest achievement was creating *Wellness 101: The Honors Student Edition*, an honors seminar courses that teaches strategies for cultivating wellness in college and onwards and explores mental health's intersections with different facets of identity. This course will continue after she graduates for a minimum of two years. Sofia also served as Social Chair and President of UT Alpha Phi Sigma, a pre-health honors organization that provides pre-health resources, mentorship, and community to its members. In her free time, she has enjoyed practicing yoga, exploring coffee shops and outdoor activities throughout Austin, and fostering shelter dogs. Sofia will graduate in May 2022, after which she plans to attend Baylor College of Medicine, back in Houston, TX. There and onwards, she hopes to contribute to health equity in her medical practice and community health endeavors.

Sofia's upbringing and immigrant parents, a Colombian dad and Chinese mom, lead to her interest in ethnic/racial discrimination and immigration's effects on health, hence the topic of this project. The time she spent in The Woodlands, TX, a majority-white suburban city, made her realize the importance of explaining discrimination to people who do not understand it in a way that is very tangible, and evidence-based. In writing this thesis, she feels that she is more

equipped to help validate the adverse experiences of people of color and continue working towards health equity throughout her career.