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Cumulative Lifetime Adversity and Depression Among a National Sample of U.S. Latinx Immigrants: Within-Group Differences in Risk and Protective Factors Using Data From the HCHS/SOL Sociocultural Ancillary Study

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Cumulative Lifetime Adversity and Depression among a National Sample of U.S. Latinx Immigrants: Within-group Differences in Risk and Protective Factors Using Data from the HCHS/SOL Sociocultural Ancillary Study

Abstract

Background: Latinx immigrants are exposed to multiple stressors before, during, and after migration. However, most past research has assumed the effects of these stressors are uniform across Latinx groups despite considerable within-group variation. The purpose of this study was to (a) assess the moderating effects of several risk and protective factors on the association between cumulative lifetime adversity and depression among U.S. Latinx immigrants and (b) examine the extent to which risk and protective processes differed between Latinx subgroups.

Method: Data came from a cross-sectional secondary dataset, called the HCHS/SOL Sociocultural Ancillary Study. The sample (N = 2893) was identified using stratified random probability sampling in four of the largest Latinx metropolitan areas: the Bronx, NY, San Diego, CA, Chicago, IL, and Miami, FL. We included four Latinx subgroups in our study: Puerto Ricans, Cubans, Mexicans, and Dominicans.

Results: Results from multi-group regression analyses suggested that social support moderated the association between cumulative lifetime adversity and depression. However, further subgroup analyses showed the moderation effect was only present for Cuban and Dominican immigrants. We also found that perceived discrimination moderated the association between lifetime adversity and depression for Cuban immigrants and ethnic identity moderated the relationship between lifetime adversity and depression for Dominican immigrants.

Conclusions: Our results provide preliminary evidence for the presence of within-group differences in responses to adverse events among Latinx immigrant groups. Results can be used to inform the development of mental health interventions tailored to the specific needs of various Latinx immigrant populations.

Key Words: Multi-group Regression Analysis, Discrimination, Acculturation Stress, Latino/a, Hispanic

Public Significance: This study suggests that the link between risk and protective factors and depression may be unique for different Latinx subgroups (e.g., Puerto Ricans, Dominicans). These within-group differences may play a role in individuals' responses to lifetime adversity. The findings can inform preventive mental health interventions tailored to the unique needs of US Latinx populations exposed to adversity.

Cumulative Lifetime Adversity and Depression among a National Sample of U.S. Latinx Immigrants: Within-group Differences in Risk and Protective Factors Using Data from the HCHS/SOL Sociocultural Ancillary Study

A wealth of literature indicates that exposure to adverse events is related to negative mental health outcomes, such as depression (Edwards, Holden, Felitti, & Anda, 2003; Ronconi, Shiner, & Watts, 2015; Ward, Shaw, Chang & El-Bassel, 2018). An adverse event is an occurrence that will likely cause some form of psychological distress. Adverse events range in severity and can include a significant life change such as divorce, serious illness or incarceration, or life-threatening experiences such as physical/sexual abuse or war. Adverse experiences have been linked with numerous health problems, such as neural impairment, chromosomal damage, anxiety, depression, or posttraumatic stress disorder (Cicchetti & Rogosh, 2012; Shalev et al., 2013). As individuals are exposed to higher amounts of adverse life events, or cumulative lifetime adversity, the likelihood of developing PTSD, depression, or other mental health disorders increases (Myers et al., 2015; Seery, Holman, & Silver, 2010; Suliman et al., 2009). Therefore, adopting a lifespan approach to studying the effects of adverse events on mental health may be beneficial, especially when working with populations known to experience high levels of adversity.

First-generation Latinx immigrants living in the United States (U.S.) often experience various types of adverse events before, during, and after migration (Li, Liddell, & Nickerson, 2016). For some immigrants, pre-migration adversity, such as war-related violence or persecution, can be the main reason families migrate. During migration, individuals often experience violence, discrimination, separation from family members, or lack of food and shelter (Bean, Derluyn, Eurelings-Bontekoe, Broekaert, & Spinhoven, 2007). Finally, there are a

number of post-migration challenges that Latinx immigrants face, such as discrimination, forced detention, unstable living arrangements, and financial struggles (e.g., Silove, Austin, & Steel, 2007). Given the frequent accumulation of numerous types of adverse events experienced by immigrants, understanding the cumulative effects of lifetime adversity is critical when working with immigrant populations.

The conservation of resources (COR) theory (Hobfoll, 1989; 2002) provides a valuable framework for understanding the effects of cumulative stress on mental health. COR theory assumes that the primary cause of stress is the loss of resources and that individuals will go to great lengths to protect and build upon their resources. Resources are defined as anything that a person values, including objects, personal characteristics, or conditions (Hobfoll, 2001). In the context of immigrant populations, resources might include interpersonal relationships, family stability, adequate income, health, and well-being. When these resources are lost or threatened, such as during migration, individuals experience stress, which may lead to mental health problems and an increased vulnerability to future stress (Hobfoll, 2002). This framework also assumes that stress responses differ based on the personal and cultural value of a particular resource.

Past studies have primarily examined risk and protective factors separately, rather than testing multiple factors in the same analytical model (e.g., Huang, Costeines, Kaufman, & Ayala, 2014). However, risk and protective factors often co-occur and have overlapping effects; therefore, including them in the same statistical model could improve the understanding of mental health processes. Even fewer studies have examined potential ethnic subgroup differences in mental health processes. Guided by the COR framework, the present study explored several risk factors (i.e., discrimination, acculturation stress) and protective factors (i.e., social support,

ethnic identity) that may contribute to how Latinx immigrants respond to adverse events. We also examined how these risk and protective factors differed across Latinx subgroups.

Mental Health and U.S. Latinx Populations

Researchers have reported conflicting findings regarding the mental health of U.S. Latinx populations. Some studies suggest first-generation Latinx immigrants are at a heightened risk for adverse mental health outcomes compared to second generation Latinxs, family members that remained in the country of origin, and non-Latinx Whites (Breslau et al., 2011; Falcón & Tucker, 2000). Other studies have reported the opposite trend, or that first-generation Latinx immigrants display better mental and physical health compared to Latinxs who have lived in the U.S. longer than a generation (Akresh & Frank, 2008; Alegría et al., 2008; Shor, Roelfs, & Vang, 2017). Alegria (2008) referred to this body of conflicting findings that suggest immigration status is both a risk and protective factor for negative health outcomes as the "immigrant paradox."

There are several possible explanations for the conflicting findings related to Latinx immigrants' mental health. First, Latinx immigrants in the U.S. are a heterogeneous group, comprised of numerous subethnic groups, each with a unique migration history and set of life experiences. For example, Mexicans immigrants, the largest U.S. Latinx group, most often migrate to find employment. Mexican immigrants, on average, migrate at a younger age and with less education than other Latinx immigrant groups (Alarcon et al., 2016). Mexican immigrants tend to experience higher levels of acculturation stress, in part due to having one of the lowest percentages of naturalized citizens, being most often targeted by immigration authorities, and being the least prepared to migrate to the U.S. as compared to other Latinx immigrant groups (Alarcon et al., 2016; Guarnaccia et al., 2007). A nationally representative survey of U.S. Latinxs concluded Mexican immigrants have lower rates of depression and other mental health issues as

compared to other subgroups (Alegría et al., 2008). This research suggests that Mexicans may be more resilient to life stressors than their Latinx subgroup counterparts.

Cubans often migrate for political reasons and bring with them considerable social capital, such as possessing greater levels of education (Guarnaccia et al., 2007). Cubans were the main beneficiaries of 1980 Refugee Act and have historically received greater support from the U.S. in seeking asylum and resettling in the U.S. (Tienda & Sanchez, 2013). Cubans are, on average, older when they migrate to the US, have higher levels of education, are more financially stable, and are most likely to be married as compared to other Latinx subgroups (Alarcon et al., 2018; Guarnaccia et al., 2007). They also tend to report having the strongest ethnic identities when compared to other subgroups (Ai et al., 2017; Guarnaccia et al., 2007). Possessing a strong ethnic identity and having greater levels of social capital could promote resilience to adversity for Cuban immigrants.

Puerto Ricans are unique from other Latinx subgroups in several ways. Puerto Ricans became U.S. citizens in 1917. As a result, they also tend to have higher English proficiency and experience less acculturation stress than other Latinx subgroups (Guarnaccia et al., 2007; Lopez & Patten, 2015). However, at the same time, they are more likely to experience economic challenges, such as unemployment (Alarcon et al., 2018; Lopez & Patton, 2015), and report greater discrimination and psychological distress compared to other subgroups (Rivera et al., 2008).

Dominicans often migrate to the U.S. for greater economic opportunities. The debt crisis of the 1980s led many Dominicans to migrate in pursuit of work (Zong & Batalova, 2018). Dominicans are more likely to be women and identify as Black (Dawson, 2009). Studies suggest that Dominicans are slower to acculturate to U.S. culture than other subgroups, preserving their

culture by visiting the Dominican Republic frequently, speaking in Spanish, and living in primarily Dominican neighborhoods in which they can engage in cultural activities (Dawson, 2009). Possessing a strong orientation towards Dominican culture may be protective against stressful events, such as discrimination. One study found that having low acculturation levels was protective against the effects of discrimination on mental health (Dawson, 2009). These types of within-group differences may influence Latinx immigrants' health trajectories and responses to lifetime adversity (Molina et al., 2013). It is paramount for researchers to consider within-group variability when engaging in mental health research with Latinx immigrants.

Social Support

Individual-level differences in risk and protective factors may also contribute to the inconsistent findings related to Latinx immigrant mental health. One important resource for immigrants is social support (Kinderman et al., 2013). Social support has been conceptualized in a variety of ways, including receiving assistance or affirmation from others and being liked by others (Gottlieb & Bergen, 2010). Research has shown that social support is one of the most significant determinants of how individuals respond to adversity (e.g., Prati & Pietrantoni, 2010). This may be particularly true for migrant populations, who have lost many of their social connections after moving to a new country and for whom social networks may enable access to resources that would otherwise be unavailable to them (Ward et al., 2018). Social networks can facilitate healthy adaptation processes for migrants, such as finding employment, housing, and access to education (Anthias & Cederberg, 2009; Barwick, 2017). Studies consistently document that low social support is associated with higher depression for Latinxs (e.g., Rivera, 2007). Social support may be particularly salient for Dominican immigrants, who often live in Dominican enclaves (Dawson, 2013).

Ethnic Identity

A second resource related to immigrant mental health is possessing a strong ethnic identity, defined as "the degree to which individuals perceive themselves to be included and aligned with an ethnic group" (Smith & Silva, 2011, p. 42). Ethnic identity is assumed to be a defining characteristic for immigrants, particularly those from minority ethnic/racial groups (Phinney, 2000). A meta-analysis assessed participants from various ethnic backgrounds, including Latinx populations, and found that higher levels of ethnic identity were associated with lower levels of mental health symptoms, such as depression (Smith & Silva, 2011). However, for Latinx populations, the literature shows mixed findings regarding ethnic identity as a resilience factor. Umaña-Taylor and colleagues (2016) found that Latinx adolescents' baseline levels of ethnic identity were not associated with their future levels of self-esteem. While Brittian and colleagues (2015) identified ethnic identity as a protective factor in a context of heightened stress (e.g., when faced with discrimination), studies have found that Latinx groups tend to differ in their identification with their ethnic group. For example, Cubans reported a higher ethnic identity than other Latinx subgroups (Guarnaccia et al., 2007). These variations in ethnic identity may lead to differential associations between ethnic identity and mental health among different Latinx groups.

Acculturation Stress

There are also various factors that may threaten migrants' existing resources and lead to negative mental health outcomes. The transition into a new culture often entails various difficulties, such as socioeconomic hardships, language problems, or social isolation, all of which can threaten existing resources and prevent the acquisition of additional resources. Such difficulties can be defined as acculturation stress (Mendoza, Mordeno, Latkin, & Hall, 2017).

Acculturation stress has consistently been shown to be negatively associated with migrants' mental health, including increasing depressive symptoms (Chae, Park, & Kang, 2014; Kartal & Kiropoulos, 2016; Mendoza et al., 2017; Revollo, Qureshi, Collazos, Valero, & Casas, 2011). Researchers found that among refugee populations, post-migration factors such as acculturation stress were associated with adverse mental health outcomes above and beyond the effect of pre-migration adversity (Li, Liddell, & Nickerson, 2016). Acculturation stress may also differ between Latinx subgroups (Alegría et al., 2008). Studies suggest that Mexicans experience the highest post-migration acculturation stress as compared with other Latinx subgroups living in the U.S. (Guarnaccia et al., 2007). Puerto Ricans tend to experience lower levels of acculturation stress than other subgroups due to their U.S. citizenship.

Ethnic/Racial Discrimination

A second threat to migrants' resources is experiencing ethnic/racial discrimination. The negative effects of perceived discrimination on Latinx health have been widely documented in past literature (Lorenzo-Blanco & Cortina, 2013; Molina et al., 2013; Moradi & Risco, 2006; Umaña-Taylor et al., 2016). Experiencing greater amounts of discrimination has been linked with increases in depression symptoms and a deterioration in physical health for Latinxs (Umaña-Taylor & Updegraff, 2006; Molina et al., 2013). However, experiences of discrimination may differ depending on a variety of factors, such as skin tone, English proficiency, or socio-economic status (Molina et al., 2013; Zambrana & Dill, 2006). For example, one study found that the association between discrimination and depression was higher for Black Latinas than for other ethnic groups (Ramos, Jaccard, & Guilamo-Ramos, 2003). Other research suggests that Puerto Ricans and Mexicans experience the highest levels of discrimination as compared to other subgroups (Ai et al., 2017; Molina et al., 2013).

Understanding potential within-group differences in exposure to various risk and protective factors is critical for tailoring interventions to meet the needs of different Latinx populations.

The Present Study

The purpose of this study was to examine risk and protective processes associated with depression among Latinx subgroups living in the mainland U.S. We examined (a) the associations between several risk factors (cumulative lifetime adversity, acculturation stress, discrimination) and protective factors (social support, ethnic identity), and depression symptoms; (b) the extent to which risk and protective factors moderated the association between cumulative lifetime adversity and depression; and (c) the extent to which these risk and protective processes differed between four Latinx subgroups.

We hypothesized that, for the full sample, (a) risk factors will be positively associated with depression and protective factors will be negatively associated with depression and (b) risk factors will exacerbate the association between cumulative lifetime adversity and depression and protective factors would buffer the association between cumulative lifetime adversity and depression. Based on the extant literature, we also hypothesized that (c) discrimination will be most harmful for Puerto Ricans, Dominicans, and Mexicans as compared to Cubans, (d) acculturation stress will be most harmful to Mexicans and least harmful to Puerto Ricans, (e) ethnic identity will be most protective for Cubans and Dominicans, and (f) social support will be most protective for Dominicans. Refer to Figure 1 for a diagram of the hypothesized model.

Method

Sample

Data from this study came from the baseline assessment of an epidemiological survey of Latinx health, called the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociocultural Ancillary Study, conducted in 2009-2011. The HCHS/SOL study used a household

probability sampling procedure to identify potential participants in four of the largest Latinx metropolitan areas including the Bronx, Chicago, Miami, and San Diego. Based on the objectives of the original study, researchers oversampled (a) households in areas with high concentrations of Latinxs and (b) households with higher probabilities of having adults over the age of 45 (LaVange et al., 2010). The original study included 4,393 Latinxs; however, for the purposes of this study, we only included participants born outside the mainland U.S. For analysis purposes, we only included Latinxs from locations with at least 100 participants, including Mexico (N = 1353), Cuba (N = 689), Puerto Rico (N = 402), and the Dominican Republic (N = 449). Respondents were adults aged 18-74. Most participants were above the age of 45, had at least a high school degree, and had a yearly household income of less than $30,000. Participants, on average, arrived in the mainland U.S. at 28.71 years of age and had lived in the U.S. for over 22 years prior to completing the baseline survey. See Table 1 for differences in demographics across the four Latinx subgroups. Refer to Gallo and colleagues (2014) for further information regarding the study design and procedure.

Measures

Cumulative Lifetime Adversity. We assessed cumulative lifetime adversity using 20-items from two different measures of adversity: (a) the Adverse Childhood Experiences (ACE) scale (Felitti et al., 1998) and (b) the Traumatic Stress Schedule (TSS; Norris, 1990). The ACE scale is composed of 10 items that assess the number of adverse and traumatic events people experienced during childhood, including emotional abuse, sexual abuse, physical abuse, emotional or physical neglect, witnessing female parent being abused, parental separation or divorce, living with someone abusing substances or who has a mental illness, and imprisonment of a household member. The TSS is a brief 10-item assessment of lifetime trauma that includes

events commonly experienced by the general public, such as experiencing a mugging, physical attack, unwanted sexual activity, unexpected death of a friend or loved one, house fire, natural disaster, forced evacuation of home, exposure to war/combat, motor vehicle accident, or other terrifying experience. Participants indicated the number of events they had experienced on a dichotomous scale (0 = "no," 1 = "yes"). Scores ranged from 0 to 20, with higher scores representing a higher frequency of exposure to adverse events.

Acculturation Stress. We assessed acculturation stress using an abbreviated 17-item version of the Hispanic Stress Inventory (HSI; Cavazos et al., 2006). Likert-type items in this scale focused on various stressful experiences associated with transitioning into living in a new culture, such as occupational/economic stress, immigration stress, parental stress, and familial stress. Participants first indicated if they experienced a particular type of acculturation stress (0 = "no," 1 = "yes"), then rated the level of stress that item caused (1 = "not at all worried/tense," 5 = "extremely worried/tense"). The total score was based on a sum of the 17 items and ranged from 0 to 85, with higher scores representing higher levels of acculturation stress. The internal consistency of the scale was $\alpha = .83$ for this sample.

Perceived Ethnic Discrimination. We assessed perceived discrimination using a 17-item Brief Perceived Ethnic Discrimination Questionnaire-Community Version (PEDQ). Items assess lifetime experiences of discrimination based on race and ethnicity in various areas of life, including the workplace and other social contexts. The PEDQ examines four dimensions of perceived ethnic discrimination: exclusion/rejection, stigmatization/evaluation, work/school discrimination, and threat/aggression (Gallo et al. 2014). Participants were asked to respond to how often they had been discriminated against because of their race or ethnicity from 1 = "never" to 5 = "very often." Total scores ranged from 17 to 85, with higher scores indicating

higher levels of perceived discrimination. This scale has been widely used Latinx populations (Molina et al., 2013). The internal consistency in the current sample was $\alpha = .87$.

Social Support. We measured social support using a brief 12-item version of the Interpersonal Support Evaluation List (ISEL; Gallo et al., 2007) which evaluates the perceived availability of potential sources of social support. Items are scored on a four-point Likert-type scale (from 0 = "definitely false" to 3 = "definitely true"). The ISEL includes positive and negative statements assessing three types of social support: appraisal (advice or guidance), tangible (help or assistance), and sense of belonging (empathy or acceptance). Example items include: *if I were sick, I could easily find someone to help me with my daily chores* (tangible) and *when I need suggestions on how to deal with a personal problem, I know someone I can turn to* (appraisal). After reverse scoring the negatively worded items, the 12 items were summed to create a composite scale ranging from 0 to 36. Higher scores represented higher perceived social interpersonal support. This scale has been validated with Latinx populations (Merz et al., 2014) and the internal consistency was $\alpha = .82$ for our sample.

Ethnic identity. We assessed ethnic identity using a 12-item subscale from the Scale of Ethnic Experiences (SEE; Malcarne et al., 2006). Items are scored on a five-point Likert-type scale asking about thoughts and feelings surrounding ethnic group membership. Example items include: *I believe it is important to take part in holidays that celebrate my ethnic group*, *I have a strong sense of myself as a member of my ethnic group*, and *I do not feel it is necessary to learn about the history of my ethnic group*. Six items were reverse scored. The following item was removed due to poor internal consistency: *My ethnic background plays a very small role in how I live my life*. The scale was created by calculating the mean of the remaining 11 items, with

higher scores reflecting higher ethnic identity. The internal consistency was α = .70 for our sample.

Depression. To assess depression, we used a 10-item scale from the Center of Epidemiologic Studies Scale (CES-D; Björgvinsson et al., 2013). The CES-D is a brief, widely used measure that identifies the level of depression symptoms experienced over the past week. It includes positive and negative items scored on a four-point Likert-type scale from 0 = "less than one day" to 3 = "5-7 days". Example positive items include: *I felt hopeful about the future* and *I was happy*. Example negative items include: *I was bothered by things that don't usually bother me* and *I felt depressed*. After reverse scoring the two positively worded items, we calculated the sum score for the 10 items (ranged from 0 to 30), with higher scores indicating greater levels of depression. The criteria for clinical depression is met when individuals score above 10 on the CES-D scale. The CES-D has been validated with Latinx populations (Gonzalez et al., 2017). The internal consistency was α = .84 for this sample.

Data Analysis

We used Mplus 8 (Muthén & Muthén, 2017) to test all aims of this study. We conducted preliminary analyses to examine item and variable distribution, internal consistency, bivariate correlations, and verified that our data met the assumptions required for conducting multi-group regression analyses. To test the associations between cumulative lifetime adversity, risk factors, protective factors, and depression, we used multivariate regression. We used robust maximum likelihood (MLR) estimation, which is better at handling non-normal distributions (Maydeu-Olivares, 2017).

To test the moderation effects of cultural risk and protective factors on the relationship between cumulative lifetime adversity and depression, we conducted a moderation regression

analysis. Moderators change the relationships that two variables have with one another. Researchers often use moderation analyses to determine for whom or under which conditions an association between two variables exists. We calculated interaction terms by (a) standardizing the independent and moderating variables and (b) calculating the product of these two variables (Little, 2017). We then added these interaction terms to the main effects model and conducted a R^2 change test to determine the extent to which the moderators improved the model. To determine whether moderation effects were significant, we examined unstandardized and standardized regression coefficients ($p < .05$).

To test the subgroup differences in risk and protective processes, we used multi-group regression analyses. Multi-group analysis determines whether the constructs in the model are associated with one another in the same way in each group. Multi-group analysis involves comparing a model in which all the parameters are freely estimated to a model in which all the parameters are constrained to equal across groups. Equality constraints do not allow estimates to vary across groups, consistent with the null hypothesis that no group differences exist (Kline, 2016). If model fit significantly worsens after setting equality constraints, this would indicate that the model's fit to the data depends on ethnic group membership.

We compared two nested models: (a) a baseline model with all parameters freely estimated, and (b) a model with all parameters constrained to be equal across groups. The two models were compared using a Satorra-Bentley χ^2 difference test, where a significant χ^2 value indicated a significantly worse fit for the constrained model. We also tested alternative models using the same variables to avoid confirmation bias (assuming the hypothesized model is the best fit to the data). The proportion of missing data in our study ranged from between 0-1% of the cases. Based on missing data analysis, we assumed that our missing data were missing at random

(MAR) and handled missing data using listwise deletion. Power analyses demonstrated that we had adequate statistical power to detect small to moderate effect sizes.

Results

Preliminary Analysis

We calculated descriptive statistics to assess item means, standard deviations and test the assumptions required for conducting multivariate regression analysis. We assessed demographic differences between Latinx subgroups by conducting Analyses of Variance (ANOVAs). We found that there were significant group differences in gender, age, years lived in the U.S., race, language preference, income level, and marital status ($p < .05$). Therefore, we controlled for these variables in subsequent analyses.

The mean cumulative lifetime adversity for the full sample was 4.25 ($SD = 3.30$) and the mean depression score was 7.73 ($SD = 6.14$). The most common types of lifetime adversities were: unexpected death of a friend or loved one, parents separated or divorced, mugging, and physical assault. About 31% of the sample met criteria for depression. See Table 1 for descriptive statistics for each Latinx subgroup. We also calculated bivariate correlations between focal constructs. Cumulative lifetime adversity was significantly associated with depression ($r = .27$, $p < .05$). The associations between the four moderating variables (discrimination, acculturation, social support, ethnic identity) depression, and our control variables were small to moderate and all were statistically significant. See Table 2 for all bivariate correlations for the full sample.

Main Effects for Total Sample

We tested the main effects of cumulative lifetime adversity, social support, ethnic identity, discrimination, and acculturation stress on depression for the full sample using a

multivariate regression. We controlled for the effects of age at the time of the survey, years lived in the U.S., gender, language preference, marital status, and income level. We selected these control variables because they have been shown to contribute to mental health problems for Latinxs (e.g., Alegria & Woo, 2009; Smith & Silva, 2012). However, three control variables (i.e., marital status, years lived in the U.S., and income level) were removed from the main effects model (and all subsequent models) because they were not associated with depression and did not improve model fit.

We found that cumulative lifetime adversity was significantly associated with depression scores (b = .15, p < .001). Two of the four moderator variables were also significantly associated with depression scores, including social support (b = -.29, p < .001) and acculturation stress (b = .26, p < .001). Discrimination (b = .02, p > .05) and ethnic identity (b = .00, p > .05) were not associated with depression. In addition, we found that our three control variables were significantly associated with depression: age (b = .06, p < .001), language preference (b = .07, p < .001), and gender (b = -.08, p < .001). The main effects model accounted for 27% of the variance in depression scores for the full sample.

Moderation Model for Total Sample

We tested the extent to which discrimination, acculturation stress, ethnic identity and social support moderated the association between cumulative lifetime adversity and depression, controlling for gender, age at time of survey, and language preference. Specifically, we examined whether ethnic identity and social support weakened the association between cumulative lifetime adversity and depression and whether discrimination and acculturation stress strengthened the association between cumulative lifetime adversity and depression. Our results suggested that the moderation effects model was superior to the main effects model (F = 2.63, p

< .05). We found that only social support significantly moderated the relationship between cumulative lifetime adversity and depression, β = -.30, p < .01. This means that the strength of the association between cumulative lifetime adversity and depression depended on individuals' levels of social support (see Figure 2 for a graph of the interaction). None of the other moderators were significant. The moderation model accounted for 28% of the variance in depression scores for the full sample.

Multi-Group Analysis: Comparing Latinx Subgroups

We conducted multigroup analyses to determine the extent to which our hypothesized main effects and moderation models differed between four Latinx subgroups. For the freely estimated models, we selected one parameter that was relatively equivalent across groups to constrain to equal (for model identification purposes). We conducted ANOVAs to make sure these constraints did not affect model fit.

The main effects model with all the parameters constrained to equal fit the data significantly worse than the freely estimated model (robust $\Delta\chi^2$ = 101.54, p < .001), rejecting the hypothesis that all parameters were the same across the four Latinx subgroups. Results of the multi-group main effects model showed that the association between discrimination and depression was only significant for Mexican immigrants (b = .07, p < .01). The moderation model with all parameters constrained fit the data significantly worse than the freely estimated model (robust $\Delta\chi^2$ = 125.11, p < .001), meaning the moderating effects were not consistent across the four subgroups. First, we found that social support only moderated the association between cumulative lifetime adversity and depression for Cuban (β = -.79, p < .01) and Dominican (β = -.78, p < .01) immigrants. Second, we found that discrimination significantly moderated the association between cumulative lifetime adversity and depression for Cuban

immigrants (β = -.68, p < .05). However, this association was in the opposite direction than expected. Third, we found that ethnic identity moderated the association between cumulative lifetime adversity and depression for Dominican immigrants (β = .66, p < .05). This association was also in the opposite direction than we predicted. See Table 3 for the main and interaction effects for each of the four Latinx subgroups. Refer to Table 3 and Table 4 for results of the multigroup analyses

Discussion

This study investigated the association between cumulative lifetime adversity and depression in a diverse sample of Latinx immigrants living in the U.S. Based on the Conservation of Resources (COR) theory (Hobfoll, 1989), which suggests that cultural resources are critical in determining responses to stress, we examined the extent to which several risk and protective factors moderated the relationship between cumulative lifetime adversity and depression controlling for several demographic characteristics. We also examined the extent to which these risk and protective processes differed across four Latinx subgroups. Our findings provide important direction for future intervention work with Latinx immigrants living in the US.

Associations between Risk and Protective Factors and Depression

Prior to testing moderation effects, we tested a main effects model that examined the associations between cumulative lifetime adversity, our four moderating variables (i.e., social support, ethnic identity, acculturation stress, discrimination), control variables, and depression. Consistent with our hypotheses, we found that higher levels of cumulative lifetime adversity and acculturation stress were linked with higher levels of depression and that higher levels of social support were linked with lower depression symptoms for the full sample. These findings are consistent with past research linking these constructs with depression (Hammen, 2005;

Kinderman et al., 2013; Muscatell et al., 2009; Paykel, 2003; Revollo et al., 2011).

Contrary to expectations, discrimination was not associated with depression for the full sample of Latinx immigrants. This finding is inconsistent with past research documenting the negative association between discrimination and the well-being of minority populations (Ellis, MacDonald, Lincoln, & Cabral, 2008; Lorenzo-Blanco et al., 2015; Torres & Ong, 2010). Although discrimination was not significantly associated with depression for the full sample, our multi-group analysis (explained below) provide some support for our hypothesis that discrimination is a risk factor for developing depression.

Contrary to our hypothesis, we did not find an association between ethnic identity and depression. This is surprising as meta-analytic findings suggest a negative association between ethnic identity and depression among ethnic minority individuals (e.g., Smith & Silva, 2011). However, not all studies have shown ethnic identity to be linked with positive mental health outcomes (Kiang, Gonzales-Backen, Yip, Witkow, & Fulingi, 2006; Umana-Taylor et al., 2009). In recent years, scholars have come to recognize that migrant's ethnic identity is a dynamic, multi-dimensional concept; it likely changes as immigrants acculturate to their host societies (e.g., Schwartz, Montgomery, & Briones, 2006). Individuals in the current study may have been in different stages of the acculturation process and, consequently, their ethnic identity may not have been associated with depression in a unified manner. It is also possible that different dimensions of ethnic identity (i.e., exploration, resolution, affirmation) may be associated with different mental health outcomes (Umaña-Taylor et al., 2016). Future studies could benefit from assessing the associations between each component of ethnic identity and mental health.

Moderating Effects of Social Support for the Full Sample

Social support was the only significant moderator of the relationship between cumulative lifetime adversity and depression for the full sample. This suggests that social support is protective for Latinx immigrants exposed to adverse events. This finding corresponds with past research and theory suggesting that social support buffers the effects of lifetime adversity on depression (Amberg, Hultman, Michael, & Lundin, 2012; Cohen & Wills, 1985, Ward et al., 2018). According to the COR theory, social support is a major resource for individuals exposed to adverse events and can facilitate the preservation of other resources, such as having a sense of well-being or a strong ethnic identity (Hobfoll, 1989). This finding provides important information about the potential buffering effect social support can have for those who have experienced high levels of lifetime adversity.

Contrary to our hypotheses and COR theory, ethnic identity, discrimination, and acculturation stress did not moderate the relationship between cumulative lifetime adversity and depression in the full sample. According to COR theory, experiencing multiple threats to existing resources (e.g., acculturation stress and discrimination) will have a cumulative effect, exacerbating the effects of adversity on mental health. Past research suggests that these types of stressors can have overlapping effects and negatively influence Latinx mental health (Torres et al., 2012). COR theory also assumes that increasing resources, such as by improving one's ethnic identity, will improve mental health and protect against future losses of resources. Similarly, past literature indicates that components of ethnic identity can be protective against developing mental health disorders (Smith & Silva, 2011). Our unexpected findings may be a result of the large amount of within-group variation in our sample. As suggested by our subgroup analyses (explained below), the moderating effects may not be consistent across all groups of Latinx immigrants.

Differences in Risk and Protective Processes Across Latinx Subgroups

Past research suggests that associations between life stressors and psychological health can vary between Latinx subgroups (Ai et al. 2017; Molina et al., 2013; Rivera et al., 2008). We found several differences in risk and protective processes across Latinx subgroups in our sample. First, from our main effects multi-group analysis, we found discrimination was significantly linked with depression only for Mexican immigrants. This finding supported our hypothesis that the association between discrimination and depression would be particularly high for Mexican immigrants. Ai and colleagues (2017) found that Mexican reported higher levels of discrimination compared to their Cuban counterparts. Additionally, prior studies have shown that Mexicans often have less social capital (e.g., education) at the time of arrival in the U.S. and have experienced higher levels of deprivation and inequality in their home country compared to other Latinx subgroups (Alegria et al., 2008; Guarnaccia et al., 2007; Torres; 2004). These factors may make Mexican immigrants particularly vulnerable to discrimination. However, we also hypothesized that discrimination would be associated with depression for other subgroups, considering past research documenting the negative effects of discrimination across Latinx populations (Ai et al., 2017; Molina et al., 2013). Without other covariates in the model, discrimination was associated with depression for all subgroups. This suggests that while discrimination may be significantly related to depression when assessed alone, discrimination may not be associated with depression above and beyond the effects of cumulative lifetime adversity, acculturation stress, social support, ethnic identity, age, gender, and language preference.

Second, we found that social support only moderated the association between cumulative lifetime adversity and depression for Cuban and Dominican immigrants. This finding supported

our hypothesis that social support would be most protective for Dominican immigrants. Dominican immigrants tend to have lower education, household income, and are the least likely Latinx subgroup to be married (Alarcon et al., 2018; Zong & Batlova, 2018). Hence, social support may be more protective for Dominicans than other Latinx subgroups. In addition, many Dominicans live in ethnically homogenous neighborhoods in which they have the opportunity to engage in Dominican cultural activities and social gatherings to build their sense of community (Dawson, 2009). Cubans' social ties are more likely to be with other Spanish speakers based on their lower levels of English proficiency compared to other subgroups (Guarnaccia et al., 2007). This may explain the particular importance of social support in protecting against depression for Cuban immigrants. Further research is needed with these groups before these explanations can be generalized across all Cuban and Dominican immigrant populations.

Third, we found discrimination moderated the association between cumulative lifetime adversity and depression for Cubans. However, the moderation was not in the direction that we expected. Cumulative lifetime adversity seemed to be more strongly associated with depression for those who had experienced low levels of discrimination compared to those who had experienced high levels of discrimination. This goes against past literature and theory documenting the cumulative effects of stress, or that experiencing multiple stressors at the same time is especially harmful to mental health (e.g., Seery et al., 2010).

Finally, we found that ethnic identity moderated the association between cumulative lifetime adversity and depression for Dominican immigrants. However, the moderation effect was in the opposite direction than we predicted. Based on the literature, we predicted that ethnic identity would be protective for all subgroups with particular importance for Cuban immigrants. Conversely, we found that having high levels of ethnic identity had an exacerbating effect on the

association between lifetime adversity and depression. Although this result in part supports our hypothesis that there would be subgroup differences in the role of ethnic identity in protecting against depression, this finding contradicts ample past literature suggesting a significant positive link between ethnic identity and well-being (Iturbide, Marcela, & Gustavo, 2009). However, some studies suggest that having a strong ethnic identity is not always beneficial to psychological health (Umaña-Taylor et al., 2016). Smith & Silva (2012) stated that individuals living in ethnic enclaves, such as many Dominican immigrants, "may not initially activate ethnic identity as a coping strategy" (p. 21). Additional research is needed to explore the role of ethnic identity in mental health outcomes for Dominican immigrants.

Overall, these findings provide evidence for the large within-group diversity that exists among U.S. Latinx immigrant populations. Past theory and research highlight the importance of culture and life experiences in shaping risk and resilience processes (Miranda, Estrada, Firpo-Jimenez, 2000). Our results also provide a potential explanation for the conflicting findings related to Latinx immigrant mental health (e.g., the immigrant paradox). We found that for the full sample, social support was the only moderator of the association between cumulative lifetime adversity and depression. However, the results were very different when examining each subgroup separately. Without doing subgroup analyses, these complexities are lost, and the conclusion validity is compromised. The inconsistent findings in the literature related to Latinx immigrant mental health could be due to the large within-group variability among the Latinx populations assessed (e.g., Leong et al., 2013). Most past research has focused on Mexican samples and has not tested subgroup differences in responses to adverse events. Additional research is needed to further explore subgroup differences in mental health processes.

Limitations

There are several limitations worth noting in this study. First, our data came from a cross-sectional study. This means that the relationships between variables in the study are associations, and we cannot infer causation or the direction of these associations. Future researchers will need to replicate the results with longitudinal data. Second, our assessment of cumulative lifetime adversity did not account for the duration of the adverse events. This is an important element to consider because research has shown that exposure to long periods of adversity can be particularly detrimental (Suliman et al., 2009). Third, our assessment of cumulative lifetime adversity was not exhaustive. Although we included many of the most commonly experienced adverse events, we did not include all possible forms of lifetime adversity. Fourth, there may have been some level of overlap in the constructs in our model, such as cumulative lifetime adversity, discrimination, and acculturation stress. For example, past theory and research suggest that discrimination and acculturation stress may be closely related (Lorenzo-Blanco et al., 2016) and certain types of discrimination can classify as traumatic events (Ellis et al., 2008). Therefore, some of the variance in discrimination may have been accounted for by other constructs in our model. We chose to conceptualize cultural stressors (discrimination and acculturation stress) as distinct from general lifetime adversities (perceived stress, chronic stress, ACEs) in order to test the exacerbating effects of experiencing cultural and general stressors. Fourth, although random sampling procedures were used to identify participants, they were not representative of all age groups or geographic areas of the U.S. Finally, although we found differences in mental health processes between Latinx subgroups, we do not know why these differences exist. Future studies could examine what life events, beliefs, or values are driving these subgroup differences.

Conclusion

Despite these limitations, this study represented the first effort to examine culture-specific risk and resilience processes across multiple Latinx subgroups in a national epidemiological sample of U.S. Latinx immigrants. Few studies have used multi-group analyses to examine the mental health trajectories of populations with high levels of within-group diversity. The present study serves as an example of the rich information that can be obtained by using subgroup analyses. Our findings have implications for tailoring mental health interventions for specific Latinx immigrant groups, as different Latinx immigrant groups may need different interventions. Factors that may be protective for some Latinx groups might not be protective for others. For example, our results indicate that Cuban and Dominican immigrants exposed to lifetime adversity could benefit from interventions focused on building social support. Moreover, discrimination seems to be a significant issue for Mexican and South American immigrants and may be a worthwhile target for mental health interventions with these populations. Health professionals face the risk of making inaccurate assessments about Latinx immigrants' mental health if they assume all Latinx immigrants are similar to one another. Future studies examining risk and protective factors related to mental health could be strengthened by further assessing within-group differences and could increase our understanding of Latinx mental health.

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Abstracto

Contexto: Los inmigrantes Latinx están expuestos a varios factores que les causan estrés antes, durante, y después de migrar. Sin embargo, casi todas las investigaciones previas han asumido que los efectos de estos factores que causan estrés son uniformes entre todos los grupos inmigrantes Latinx, a pesar de variación considerable dentro del grupo. El propósito de esta investigación fue (a) evaluar los efectos moderativos de los varios factores riesgosos y protectores en la relación entre la adversidad acumulativa de la vida y la depresión entre los inmigrantes Latinx en los estados unidos y (b) examinar hasta qué punto los procesos riesgosos y protectores se distinguían entre los subgrupos Latinx.

Método: Los datos vinieron de un conjunto de datos secundarios transversales llamados el HCHS/SOL Estudio Sociocultural Ancilar. La muestra de personas (N = 2893) fue identificada usando un muestreo aleatorio proporcionalmente estratificado en cuatro de las áreas metropolitanas más grandes de gente Latinx: El Bronx en New York, San Diego, California, Chicago, Illinois, y Miami, Florida. Hemos incluyendo cuatro subgrupos Latinx en nuestra investigación: puertorriqueños, cubanos, mexicanos, y dominicanos.

Resultados: Resultados del análisis de regresión multi-grupo sugirieron que el apoyo social moderó la relación entre la adversidad acumulativa de la vida y la depresión. Sin embargo, análisis más a fondo de subgrupos demostraron que el efecto de moderación solo estaba presente para los inmigrantes cubanos y dominicanos. También descubrimos que la discriminación moderó la relación entre la adversidad acumulativa de la vida y la depresión para los inmigrantes cubanos y que la identidad étnica moderó la relación entre la adversidad acumulativa de la vida y la depresión para los inmigrantes dominicanos.

Conclusiones: Nuestros resultados proveen evidencia preliminar de la presencia de diferencias dentro del grupo en las repuestas a los eventos adversos entre los subgrupos de inmigrantes Latinx. Los resultados pueden informar el desarrollo de intervenciones de salud mental personalizadas para las necesidades específicas de varias poblaciones de inmigrantes Latinx.