

The Role of Acculturative Stress, Discrimination, Family Cohesion, and  
Social Support on Binge Eating in Latinx<sup>1</sup> Individuals

By

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<sup>1</sup> The term Latinx is used throughout the manuscript to refer to people of Latin American descent in an attempt to use gender-inclusive language. However, it should be acknowledged that individuals in this group may choose to identify using different terms, including but not limited to Hispanic, Latino, Latino/a, Latine, and Latin@. Although some prefer the term Latinx to Latinx because it makes more linguistic sense in the Spanish language, Latinx is used due to its wider use in the United States.

The thesis committee for Sarah Johnson certifies that this is the approved version of the following thesis:

The Role of Acculturative Stress, Discrimination, Family Cohesion, and Social Support on Binge Eating in Latinx Individuals

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## Abstract

Latinxs have higher rates of eating disorders characterized by binge eating compared to their non-Latinx White counterparts, yet culturally relevant factors related to binge eating in Latinxs have been largely understudied. Without understanding how social and culturally relevant factors are associated with binge eating in this population, Latinxs will continue to be underserved and receive inadequate treatment for binge eating problems. The purpose of the current study was to examine how discrimination and acculturative stress were associated with binge eating in a nationally representative sample of Latinxs. An additional aim was to test the extent to which family cohesion and social support could buffer against the effects of discrimination and acculturative stress on binge eating. Participants (56% female,  $N = 2,554$ ) were Latinxs enrolled in the National Latino and Asian American Study. Results from structural equation modeling indicated that only discrimination was significantly associated with binge eating. Neither the direct effect of acculturative stress, interaction of family cohesion and acculturative stress, interaction of social cohesion and acculturative stress, nor the interaction of social support and discrimination were significantly associated with binge eating. This study highlights the need for mental health providers to understand and assess discrimination among Latinxs presenting with concerns of binge eating.

*Keywords:* NLAAS, binge eating, discrimination, acculturative stress, Latinx

## Table of Contents

The Role of Acculturative Stress, Discrimination, Family Cohesion, and Social Support on Binge Eating in Latinx Individuals	
Acculturative Stress and Eating Pathology.....	2
Perceived Discrimination and Eating Pathology .....	3
Family Cohesion and Social Support.....	4
The Current Study.....	6
Method .....	7
Participants and Procedure.....	7
Measures .....	8
Acculturative Stress .....	8
Perceived Discrimination.....	8
Family Cohesion .....	8
Social Support.....	9
Binge eating .....	9
Statistical Analyses .....	9
Results.....	10
Measurement Model .....	11
Correlations.....	12
Structural Model .....	13
Discussion .....	14
Limitations and Future Directions .....	19
Strengths .....	21
Clinical and Theoretical Implications.....	21
Conclusion .....	22
References.....	24
Appendix A.....	46

## List of Tables and Figures

Table 1. Descriptive Statistics and Correlations.....	38
Table 2. Model Fit Statistics.....	39
Table 3. Parameters of Final Model.....	40
Figure 1. Theorized Model of Variables.....	41
Figure 2. Imputations of Acculturative Stress Variables.....	42
Figure 3. Unstandardized Path Model of Theorized Model.....	43
Figure 4. Standardized Path Model of Theorized Model.....	44

## The Role of Acculturative Stress, Perceived Discrimination, Family Cohesion, and Social Support on Binge Eating in Latinx Individuals

Eating disorders are complex mental disorders that are associated with impairment, distress, psychiatric and medical comorbidity, and premature death (Hudson et al., 2007; Rome & Ammerman, 2003; Smink et al., 2012). Eating disorders arise from, and are maintained by, a combination of biological, psychological, sociocultural, and culture-specific factors (Culbert et al., 2015; Polivy & Herman, 2002; Stice et al., 2019). Although eating disorders are multifaceted, research on culture-specific factors pertinent to ethnic and racial minoritized groups is relatively understudied compared to other domains (Soh & Walter, 2013). The dominant theoretical models of eating disorders typically center around Westernized cultural appearance ideals (e.g., Fairburn et al., 1986; Stice, 1994; Thompson et al., 2004), but do not account for other culturally relevant factors, such as discrimination and acculturation. In addition to exposure to psychosocial factors included in dominant models of eating disorders, ethnic and racial minoritized populations live in sociocultural contexts that confer increased stress and social denigration of their physical appearance due to their race or ethnicity (Kawamura, 2011). Therefore, existing models of eating disorders might not appropriately apply to ethnic and racial minoritized individuals.

The lack of cultural nuance is concerning given that research has found that eating disorders occur at equal, or even higher, rates in racial and ethnic minoritized persons in comparison to White persons (Franko et al., 2007; Shaw et al., 2004). Latinx individuals are particularly underrepresented in eating disorder research relative to the prevalence of eating disorders in the Latinx population. Evidence suggests that Latinx populations have higher rates of binge eating, as well as higher rates of bulimia nervosa and binge eating disorder (Marques et

al., 2011) compared to their non-Latinx White counterparts (Marques et al., 2011; Perez et al., 2016; Ricciardelli et al., 2007). The purpose of the current study is, therefore, to explore how culturally relevant variables, such as acculturative stress and discrimination, influence binge eating in Latinx individuals. An additional aim of the current study is to test the extent to which family cohesion and social support serve as protective factors to buffer against the influence of stress and discriminatory experiences on binge eating in a nationally representative sample of Latinx individuals.

### **Acculturative Stress and Eating Pathology**

Acculturation refers to the process of integrating into the dominant culture's beliefs, attitudes, and behaviors (Berry, 1998). Acculturation has been found to be associated with eating-disorder symptoms in Latinas (Cachelin et al., 2006; Gowen et al., 1999); however, other research has not found a significant association (Joiner & Kashubeck, 1996; Reddy & Crowther, 2007). Given the inconsistent association between acculturation and eating-disorder symptoms, researchers have theorized that the stress resulting from this process, known as *acculturative stress*, is the more salient psychosocial correlate of eating-disorder symptoms. Indeed, acculturative stress has been more consistently associated with mental health problems, including eating-disorder symptoms and general psychological distress (e.g., Kroon Van Diest et al., 2014; Kwan et al., 2018; Perez et al., 2002; Silva et al., 2017). Acculturative stress could contribute to a sense of alienation, which could result in a greater desire to integrate into the dominant culture. One way minoritized individuals might attempt to integrate into American culture is changing their physical appearance to adopt the dominant culture's appearance ideals which, in Westernized countries, is often unattainable, leading individuals to develop body dissatisfaction and engage in eating-disorder symptoms (Stice et al., 2011; Thompson & Stice, 2001).

A growing body of literature has found evidence for a significant relationship between acculturative stress and eating-disorder symptoms in racial and ethnic minoritized populations (Kroon Van Diest et al., 2014; Kwan et al., 2018; Menon & Harter, 2012; Perez et al., 2002; Reddy & Crowther, 2007). In one study, acculturative stress was associated with bulimic symptomology, including binge eating and body dissatisfaction, above-and-beyond general life stress, suggesting that acculturative stress has a unique relationship to eating-disorder symptoms in ethnic minoritized individuals (Kroon Van Diest et al., 2014). Acculturative stress has also been found to be associated with, and predictive of, body image disturbance (Menon & Harter, 2012) and eating-disorder symptoms, including eating, shape, and weight concern, drive for thinness, emotional eating and binge eating in combined ethnic minoritized samples (Akoury et al., 2019; Kroon Van Diest et al., 2014; Kwan et al., 2018; Perez et al., 2002; Reddy & Crowther, 2007). In studies of Latinx individuals, specifically, acculturative stress has been associated with body image concerns, general eating-disorder psychopathology, such as drive for thinness, and weight, shape, and eating concerns, as well as bulimic symptomology, including loss of control eating and binge eating (Claudat et al., 2016; Gordon et al., 2010; Higgins Neyland & Bardone-Cone, 2017; Kelly et al., 2018; Menon & Harter, 2012; Perez et al., 2002; Warren & Rios, 2013).

### **Perceived Discrimination and Eating Pathology**

Similar to acculturative stress, perceived discrimination has been posited to play a role in poor mental health and eating-disorder psychopathology in minoritized populations (Kwan et al., 2018; Meyer, 2003). A recent meta-analysis found a small ( $r = .14$ ) to moderate association ( $r = .39$ ) between discrimination and eating-disorder symptoms, including binge eating (Mason et al., 2020). Further, Hagiwara et al. (2020) found a positive relationship between discrimination and



eating-disorder symptoms in Latinx individuals, specifically. Discrimination, particularly discrimination due to appearance, could serve as a reminder of the ways in which a minoritized individual does not meet cultural beauty standards. This could, in turn, lead to attempts to reduce appearance differences and a greater desire to match the dominant cultural appearance ideal (Moradi, 2013; Velez et al., 2015). As a consequence of a greater desire to more closely match the dominant appearance ideal, individuals may engage in eating-disorder symptoms (Cheng, 2014). Further, Kempa & Thomas (2000) theorize that discrimination contributes to a sense of powerlessness, leading individuals to attempt to re-assert a sense of control through manipulating their eating behaviors.

Moreover, discrimination causes significant stress, and it has been theorized that one way that minoritized individuals cope with discrimination is by engaging in eating-disorder symptoms (Sutin et al., 2016). Eating-disorder symptoms may also serve as a means to distract from discriminatory experience, and the associated stress (Higgins Neyland & Bardone-Cone, 2017; Spoor et al., 2007). Binge eating, specifically, has been conceptualized as a coping mechanism to regulate intense negative emotions and stress (Kempa & Thomas, 2000; Leehr et al., 2015). Indeed, past research has supported a direct, positive relationship from perceived discrimination to binge eating in larger bodied individuals and Black, Asian American, and Latinx individuals (Durso et al., 2012; Harrington et al., 2006; Higgins Neyland & Bardone-Cone, 2017; Kelly et al., 2018).

### **Family Cohesion and Social Support**

Given the culture specific risk factors that come along with being from a marginalized group, it is prudent to examine protective factors that help minoritized populations manage the additional stress. For minoritized groups, family cohesion, defined as support, caring, belonging,

and acceptance within a family, has been associated with psychological benefits and lower perceived distress (Berry et al., 2006; Castillo et al., 2004). Families can act as a support system and create a sense of belonging when individuals face stress related to acculturation and discriminatory experiences (Bacallao & Smokowski, 2007). In other words, supportive families can protect against stressful life experiences and reduce the likelihood that negative experiences lead to significant distress.

Latinx culture, in particular, places a high value on family relationships (familismo), collectivism, and interdependence (Santiago-Rivera et al., 2012). An important component of familismo is family cohesion (Manzi et al., 2006) and, in past research on Latinx individuals, family cohesion has been used as a global indicator of family functioning (Miranda et al., 2000). Due to the high cultural value of family in Latinx populations, family cohesion and support might be even more significant in predicting psychological problems in this population. Indeed, prior research suggests that familismo weakens the effect of acculturation on eating-disorder psychopathology and body image concerns (Bettendorf & Fischer, 2009). Low family cohesion has also been associated with overeating (Cromley et al., 2010) and, in a study of adolescents, high levels of family cohesion were associated with less disordered-eating (White et al., 2014). Additionally, family functioning and family cohesion has been found to buffer against the effects of negative mood and stress on binge eating (Yu Lee et al., 2019). Taken together, previous research suggests that family cohesion has the potential to moderate the effect of stress on binge eating.

Additionally, evidence supports a reciprocal relationship between acculturative stress and family cohesion in Latinx populations (Dillon et al., 2013; Ibañez et al., 2015). On one hand, family cohesion can help individuals cope with acculturative stress; however, acculturative stress

has also been found to prospectively lead to decreased levels of family cohesion (Dillon et al., 2013; Ibañez et al., 2015). Acculturative stress can break down the bonds between family members and it's posited that as individuals acculturate to the dominant culture, traditional family values become less important (Dillon et al., 2013).

Social support and strong social networks have also been considered to be a protective factor. Low social support has been implicated as a risk factor for binge eating (Stice et al., 2002). Strong social support could protect against the effects of acculturative stress and discrimination through creating a sense of belonging. Past research has demonstrated that social support is a protective factor against acculturative stress (Crockett et al., 2007; Hovey, 2000; Poyrazli et al., 2004) and offers protection from discrimination (Lee & Ahn, 2012). In one study of Latinx individuals, social support reduced both acculturative stress and body image disturbance (Menon & Harter, 2012). Further, social support networks assist in identity development and play a role in preventing the development of eating disorders (Leonidas & dos Santos, 2014). Altogether, this suggests that social support may buffer against the effects of acculturative stress and discrimination on binge eating.

### **The Current Study**

The purpose of the present study is to examine the direct effects of acculturative stress and discrimination, and the moderating effects of family cohesion and social support, on binge eating in a Latinx sample. Consistent with previous research, I predict a positive effect of acculturative stress and discrimination on binge eating, such that increased levels of acculturative stress and discrimination will be positively associated with binge eating (see Figure 1). Additionally, I hypothesize that family cohesion and social support will be protective against (moderate) the effects of acculturative stress. Lastly, given the findings of Hagiwara et al.

(2020), which did not find that family influenced the relationship between discrimination and disordered eating, I hypothesize that only social support will protect against the effects of discrimination.

Although past studies have tested the impact of variables such as discrimination, acculturative stress, and family cohesion in Latinx populations, the current study is novel as the first known study to examine the interaction of discrimination, acculturative stress, family cohesion, and social support on binge eating, which may help develop future integrated cultural specific models of binge eating in Latinx individuals. Additionally, the current study uses data from a nationally representative dataset with participants across the adult lifespan whereas previous research in this area has mainly used samples of convenience representing a limited age range. Therefore, results from the current study will be generalizable to a larger population, namely Latinx adults in the United States, than previous studies.

## **Method**

### **Participants and Procedure**

Data from Latinx respondents ( $N = 2,554$ ) from the 2002-2003 National Latino and Asian American Study (NLAAS) was used. NLAAS is a nationally representative community survey of Latinx and Asian individuals over 18-years of age in the United States (see Alegria et al., 2004 & Heeringa et al., 2004 for detailed study procedures). The aims of NLAAS were to estimate both lifetime and 12-month prevalence of psychiatric disorders and mental health use in Latinxs and Asian Americans, compare lifetime, 12-month prevalence, and mental health use of Latinxs and Asian Americans to non-Latinx White and Black individuals, and to examine the relation of social position, environmental context, and psychosocial factors on the prevalence of psychiatric disorders and mental health use (Alegria, Takeuchi, et al., 2004). Participants were

recruited for inclusion in the NLAAS sample using a four-stage national area probability sample method (Heeringa et al., 2004). Materials were available in English and Spanish.

## **Measures**

### ***Acculturative Stress***

Acculturative stress was measured with nine dichotomous *yes/no* questions adapted from the Hispanic Stress Inventory (Salgado de Snyder et al., 1990) and the Mexican American Prevalence and Services Survey (Vega et al., 1998; see appendix A for full measure). Items assess stressors due to acculturation, such as difficulty interacting with others and being treated badly or unfairly by other individuals or systems. The measure was created specifically for use in Latinx immigrants (Guarnaccia et al., 2007), and in the current study demonstrated adequate reliability (ordinal alpha = .89).

### ***Discrimination***

Perceived discrimination was measured by the Everyday Discrimination Scale (EDS; Williams et al., 1997), a nine-item measure of discriminatory treatment without reference to specific demographic or personal characteristics (see appendix A for full measure). The EDS has good internal consistency, test-retest reliability, acceptable convergent and divergent validity, and is acceptable to use with Latinx populations (Krieger et al., 2005; Lewis et al., 2012). Participants rate how often they experience specific discriminatory experiences, with response options ranging from *never* to *almost every day*. In the current study, ordinal alpha was .95.

### ***Family Cohesion***

Fifteen items that gauge family closeness and connection were used as indicators for family cohesion. Two sets of items were used to measure family cohesion (see Appendix A for items). The first set of items include ten questions from Olson's (1986) Family Environment and Cohesion scales. For this set of ten items, participants rate how strongly they agree or disagree

with each item on a 1 to 4 scale, with higher scores indicating more cohesion. These items have been used in various Latinx populations and have demonstrated adequate reliability (Gil et al., 1994; Vega et al., 1993). The second set of items were rated on a 1 (*hardly ever or never*) to 3 – (*often*) scale. These items were drawn from the Hispanic Stress Inventory, which has excellent validity and reliability for use in Latinx populations (Cervantes et al., 1991). In the current study, ordinal alpha for all family cohesion items was .95.

### ***Social Support***

Twelve items that assess the quality of relationships from support sources were used as indicators for social support (see Appendix A for full measure). Higher scores on individual items indicate more social support from friends and family. These items have been previously used in Latinx populations (e.g., Mulvaney-Day et al., 2007) and were developed with cultural relevance, cultural equivalence, and generalizability in mind (Alegria, Vila, et al., 2004). In the current study, ordinal alpha was .61.

### ***Binge eating***

Participants who endorsed at least two binge episodes per week for several months or longer and endorsed a loss of control were coded as having binge episodes ( $n = 169$ , 6.6%). Participants who did not endorse one or both of these items were coded as binge episodes absent ( $n = 2,385$ , 93.4%).

### **Statistical Analyses**

Prior to analysis, four cases were removed as a result of missing all data, leaving a final sample of 2,550 participants. Missing values analysis revealed that less than 2% of individual items on discrimination, family cohesion, and social support were missing. The “Amelia” package in R was used to impute missing values for these measures using 1000 bootstrapped resamples (Honaker et al., 2011). Acculturative stress was missing approximately 37% of the

data. Values for this measure were imputed using 100 bootstrapped resamples. Visual analysis of imputed data plotted against existing data revealed that imputations adequately approximated existing data (Figure 2).

Prior to examining the hypothesized path model, the relationship of the measurement model was first examined. Factor loadings of indicator variables were inspected to determine if indicator variables adequately represent their respective latent factors. Overall model fit indices included  $\chi^2$  value, root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis Fit Index (TLI). An RMSEA value less than .06 and CFI and TLI values equal to or greater than .95 were considered a good fit (Hu & Bentler, 1999). After adequate model fit was established, testing of the structural model was performed. Due to the ordinal nature of the data and imbalanced outcome classes, diagonally weighted least squares estimator (WLSMV) was used to estimate the model. All structural equation modeling (SEM) analyzes were performed using the “Lavaan” package in R (Version 3.6.1; Rosseel, 2012).

## Results

The final sample (56% female) ranged in age from 18 to 97 ( $M = 40.6$ ,  $SD = 15.6$ ), and had a range of BMI from 16.64 to 64.91 ( $M = 27.59$ ,  $SD = 5.37$ ). Self-reported race/ethnicity was 23% Cuban ( $n = 577$ ), 19% Puerto Rican ( $n = 495$ ), 34% Mexican ( $n = 868$ ), and 24% other Hispanic ( $n = 614$ ). Less than half (43.7%) of the sample ( $n = 1,117$ ) was born in the United States, 21.2% ( $n = 542$ ) became a citizen through naturalization, 34.7% ( $n = 887$ ) was not a citizen of the United States, and 0.3% ( $n = 7$ ) declined to answer the citizenship question. Thirty-nine percent ( $n = 994$ ) of the sample had less than 11 years of education, 25% ( $n = 633$ ) had 12 years, 22% ( $n = 567$ ) had 13-15 years, and 14% ( $n = 360$ ) had 16 or more years of education.

Binge eating was present in 8% ( $n = 48$ ) of Cubans, 7% ( $n = 36$ ) of Puerto Ricans, 5% ( $n = 47$ ) of Mexicans, and 6% ( $n = 38$ ) of Other Hispanics.

### **Measurement Model**

Table 1 presents all model fit statistics. The original measurement model (Model 1) did not evidence adequate fit. Therefore, the original model was modified, and overall fit indices were re-analyzed. In Model 2, I removed non-significant indicators from the original model. Specifically, item 2 on the social support measure did not significantly load on its respective latent variable. After removing item 2 on the social support measure, Model 2 still did not yield adequate fit. Thus, in Model 3, I removed indicators with factor loadings below  $|0.3|$ . A factor loading below  $|0.3|$  indicates the item is not contributing sufficient variance in measuring the latent variable and removing items with low factor loadings reduces measurement error (Clark & Watson, 2019; Stevens, 2012). In addition to the non-significant indicator (item 2 on social support), I removed one item (item 2) from the acculturative stress measure, eight items from the social support measure (items 4, 6, 7, 8, 9, 10, 12, and 13), and two items from the family cohesion measure (items 11 and 15). Model 3 evidenced a good fit to the data.

Given that the majority of problematic items in previous models were items from the social support latent variable, I ran additional exploratory models that modified the social support latent variable in an effort to correct potential sources of model misfit. Specifically, I tested for the presence of a method factor given that items included in the social support latent variable assessing family or friend support shared item stems (e.g., “How often do you talk on the phone or get together with [family or relatives who do not live with you/friends]”). A method factor may have contributed to poor model fit because sharing an item stem across questionnaire items can artificially inflate correlations among items with similar wording above-and-beyond the similarity of the constructs (Clark & Watson, 2019; Lavrakas, 2008). Thus, to explore if a



method effect as result of shared item stems for social support items increased measurement error and accounted for poor model fit, I tested four additional models using the full original set of items (i.e., these additional models did not omit non-significant or low factor loadings). Model 4: the social support latent variable was split into separate latent variables of family support (i.e., items 1, 2, 3, 4, 5, 12, and 13) and friend support (i.e., items 6, 7, 8, 9, and 10); Model 5: the error terms for social support and friend support items with the same stem were correlated (i.e., items 1 and 6, 2 and 7, 3 and 8, 4 and 9, 5 and 10, 12 and 13); Model 6: only social support items related to family support were included (i.e., items 1, 2, 3, 4, 5, 12, and 13); and Model 7: only social support items related to friend support were included (i.e., items 6, 7, 8, 9, and 10). None of the exploratory models evidenced adequate model fit.

To summarize the models tested, Model 1 allowed all items to load on latent factors, Model 2 removed non-significant factor loadings, and Model 3 removed items that had low factor loadings below |0.3|. Models 4-7 used the original full set of items, but Model 4 included both family support and friend support latent variables, Model 5 included correlated error terms for social support items with the same item stem, Model 6 only included a family support latent variable, and Model 7 only included a friend support latent variable. After examining all models, Model 3, the structural model that removed all low and non-significant factor loadings, showed the best overall model fit. Therefore, Model 3 was selected as the final model, and it was used in all subsequent analyses (see Table 2 for parameters of final model).

### **Correlations**

Table 3 presents descriptive statistics and correlations for all study variables. Binge eating was positively correlated with perceived discrimination,  $r_{pb}(2,548) = 0.23, p < .005$ . Binge eating was negatively correlated with family cohesion [ $r_{pb}(2,548) = -0.22, p < .005$ ] and social

support [ $r_{pb}(2,548) = -0.12, p < .005$ ]. Finally, binge eating was not significantly correlated with acculturative stress,  $r_{pb}(2,548) = 0.06, p = 0.111$ . In other words, greater levels of discrimination, lower levels of family cohesion, and lower levels of social support were all associated with an increased likelihood of binge eating.

Discrimination was positively correlated with acculturative stress [ $r(2,548) = 0.08, p < .005$ ], but negatively correlated with family cohesion [ $r(2,548) = -0.31, p < .005$ ] and social support [ $r(2,548) = -0.18, p < .005$ ]. That is, greater levels of discrimination were associated with more acculturative stress, but less family cohesion and social support. Acculturative stress was negatively correlated with social support [ $r(2,548) = -0.12, p < .005$ ]. However, acculturative stress was not significantly correlated with family cohesion [ $r(2,548) = -0.03, p = 0.114$ ]. Taken together this suggests that greater levels of acculturative stress were associated with less social support, but there was not a significant association between acculturative stress and family cohesion. Lastly, social support and family cohesion were positively correlated [ $r(2,548) = 0.37, p < .005$ ], indicating that greater levels of social support were associated with more family cohesion.

### **Structural Model**

Using Henseler & Chin's (2010) two-stage approach, latent construct scores were calculated and the interaction term was built using the product of the latent construct scores. The structural model included the main effects of discrimination, acculturative stress, social support, and family cohesion, as well as the interaction effects of social support on discrimination and acculturative stress and family cohesion on acculturative stress. Although not a hypothesis of the current study, the direct effects of social support and family cohesion were included in the analyses to prevent biased parameter estimates of interaction terms (Marsh et al., 2004).

See figures 3 and 4 for unstandardized and standardized path estimates, respectively. As a general guideline,  $\beta$  of 0.1 (equivalent to Cohen's  $d$  of 0.3) is considered a small effect,  $\beta$  of 0.3 (equivalent to Cohen's  $d$  of 0.7) a medium effect, and  $\beta$  of 0.5 (equivalent to Cohen's  $d$  of 1.3) a large effect (Acock, 2014). Consistent with my hypotheses, the direct path from discrimination to binge eating was significant;  $r = 0.03$ ,  $\beta = 0.10$ ,  $d = 0.29$ ,  $p < .001$ . Results indicate that if social support is constant at zero, then a standard deviation increase in discrimination would be associated with a 0.10 standard deviation increase in binge eating. A standardized  $\beta$  of 0.10, commensurate with a Cohen's  $d$  of .29, indicates that this was a small effect. However, contrary to hypotheses, acculturative stress was not significantly related to binge eating;  $r = 0.004$ ,  $\beta = 0.02$ ,  $d = 0.14$ ,  $p = .490$ .

Although social support was not directly associated with binge eating ( $r = -.003$ ,  $\beta = -0.01$ ,  $d = -0.12$ ,  $p = .686$ ), family cohesion was directly associated with binge eating ( $r = -0.02$ ,  $\beta = -0.08$ ,  $d = -0.26$ ,  $p = .028$ ). This indicates a small effect of family cohesion. Results suggest that if family cohesion decreased by one standard deviation, the likelihood of binge eating would increase by 0.08 standard deviations, assuming social support and acculturative stress were zero. Additionally, results did not support the moderating effect of social support ( $r = -0.18$ ,  $\beta = -0.04$ ,  $d = 0.18$ ,  $p = .151$ ) or family cohesion ( $r = 0.04$ ,  $\beta = 0.01$ ,  $d = 0.12$ ,  $p = .801$ ) on acculturative stress. Finally, results also did not show that social support moderated the path from discrimination to binge eating ( $r = -0.007$ ,  $\beta = -0.01$ ,  $d = -0.12$ ,  $p = .602$ ).

## Discussion

The present study assessed associations among social and culturally relevant factors including discrimination, acculturative stress, social support, and family cohesion, with binge

eating in Latinxs. My primary aim was to test the direct effect of discrimination and acculturative stress on binge eating. An additional aim of the study was to test whether family cohesion and social support protected against the effects of acculturative stress, and whether social support protected against the effects of discrimination.

The hypothesized direct effect of discrimination on binge eating was supported, indicating that increased levels of discrimination were associated with a greater likelihood of engaging in binge eating. Although results indicated a small effect (i.e., Cohen's  $d$  of .29) of discrimination on binge eating (Keith, 2014), the association between discrimination and binge eating is important for several reasons. First, this finding is consistent with a growing body of literature, which has found that discrimination is important in Latinx individuals when understanding risk and maintenance factors contributing to eating disorder symptoms and associated features (e.g., Higgins Neyland & Bardone-Cone, 2017; Kwan et al., 2018; Mason et al., 2020). More specifically, previous research with Latinx populations has linked discrimination to binge eating, loss of control eating, restraint, eating concern, shape concern, weight concern, and drive for muscularity (Hagiwara et al., 2020; Higgins Neyland & Bardone-Cone, 2017; Kelly et al., 2018). Further, the effect size found in the current study is consistent with the effect sizes in Mason et al.'s (2020) meta-analysis of discrimination and eating disorder symptoms. Specifically, effect sizes for binge eating in the meta-analysis ranged from Cohen's  $d$  of .16 (for LGBT discrimination) to .70 (for gender discrimination/sexual harassment), depending on the type of discrimination that was experienced (Mason et al., 2020). The current study did not examine the specific types of discrimination experienced by participants, but the results of Mason et al., (2020) indicate that different types of discrimination are associated more strongly with binge eating. It will be important for future research to examine the extent to which different types of

discrimination are associated with binge eating in Latinx populations while also applying an intersectional lens considering that members within this population may experience unique types of discrimination based on the intersection of their identities (e.g., female Latinx). Additionally, the results of the current study are important given that research has found that nearly 40% of Latinx individuals reported experiencing at least one discriminatory experience within the last year alone (Pew Research Center, 2020), and another study found that 80% of Latinx individuals reported experiencing discrimination at some point in their life (Arellano-Morales et al., 2015). Despite the small effect size identified in the current study, given how common experiencing discrimination is in the Latinx population, the effect of discrimination potentially has large public health implications for understanding binge eating in this population. In sum, the direct pathway between discrimination and binge eating warrants further attention in this population.

Contrary to hypotheses, there was not a direct effect of acculturative stress on binge eating. Although some previous studies have supported a relationship between acculturative stress and eating disorder symptoms in Latinx individuals (Gordon et al., 2010; Kroon Van Diest et al., 2014; Menon & Harter, 2012; Perez et al., 2002), other studies have also failed to find a direct effect of acculturative stress on binge eating (Borghese, 2021; Higgins Neyland & Bardone-Cone, 2017). One potential explanation for null findings in the current study was that participants endorsed minimal acculturative stress and there was low variability, as evidenced by the relatively low mean and standard deviation of acculturative stress. This may have been an artifact of the acculturative stress measure used in the current study which assessed limited instances of acculturative stress compared to more robust measures of acculturative stress such as the Multidimensional Acculturative Stress Inventory (Rodriguez et al., 2002) or the Societal, Attitudinal, Familial, and Environmental Acculturative Stress Scale (Padilla et al., 1985), which

have been used in previous studies (e.g., Akoury et al., 2019; Claudat et al., 2016; Gordon et al., 2010; Kroon Van Diest et al., 2014; Kwan et al., 2018; Perez et al., 2002). In other words, the low variability in acculturative stress combined with low endorsement of binge eating may have contributed to not finding a significant effect of acculturative stress on binge eating, and perhaps samples with more variability in acculturative stress and binge eating would show an association. Differences in participant demographics between the current study and previous research may also provide an explanation for discrepant findings. Studies that have found a significant association between acculturative stress and binge eating have mainly used samples of female college students (Akoury et al., 2019; Claudat et al., 2016; Gordon et al., 2010; Kroon Van Diest et al., 2014; Perez et al., 2002). Even studies that included males, samples were still limited to college students (Kwan et al., 2018; Menon & Harter, 2012; Warren & Rios, 2013), or to adults below 25 years of age (Neyland & Bardone-Cone, 2019) or 30-years (Reddy & Crowther, 2007). Importantly, binge eating occurs across the lifespan, and this is the only study to explore this relationship in Latinxs using a nationally representative sample that includes individuals across a range of ages. Given the inconsistent findings between the current study and previous research, future research should examine the extent to which demographic characteristics, such as age or gender, influence the association between acculturative stress and binge eating in this population. For example, Kwan et al. (2018) found that acculturative stress was associated with drive for muscularity among women but not men, suggesting that the relationship between acculturative stress and eating disorder symptoms could differ between genders. Altogether, given the mixed findings regarding the association between acculturative stress and binge eating, more research into potential moderators is warranted.

There was not a significant interaction between social support and acculturative stress nor family cohesion and acculturative stress on binge eating. Results also showed that there was not an interaction between social support and discrimination on binge eating. In other words, social support and family cohesion did not influence the relationship between acculturative stress and binge eating, and social support did not protect against the effects of discrimination on binge eating. These results are surprising when considering previous research has found that familismo can protect against the effect of acculturation on general eating-disorder psychopathology (Bettendorf & Fischer, 2009), and that family cohesion can be protective against binge eating more specifically (Yu Lee et al., 2019). Moreover, greater social support has been found to be a robust predictor of better mental health outcomes across a range of mental disorders (Wang et al., 2018), and models of minority mental health often highlight social support as an important protective factor between discrimination and poor mental health (Meyer, 2003; Pascoe & Richman, 2009). Nonetheless, one plausible explanation for the lack of moderation by family related variables in the current study is that family members may also experience similar levels of acculturative stress and discrimination and there are limited resources within the family unit to buffer the impact of negative experiences. For example, a family unit may be supportive, yet have limited psychological resources to cope with the effects of acculturative stress on all family members. In fact, some research has found that for Latinx individuals friend support plays a greater role in psychological well-being than family support (Rodriguez et al., 2003), suggesting that social support from non-family members who are not subject to similar contexts may be a better buffer than close family members. Overall, these results indicate that the protective effects of culturally relevant factors, particularly family cohesion and support, on discrimination and acculturative stress and binge eating in Latinx populations needs to be further explored. Future

research should also explore additional interpersonal and intrapersonal factors, such as individual differences in personality traits, coping strategies, and the larger social environment, that might buffer against the effect of discrimination on binge eating.

### **Limitations and Future Directions**

It is important to interpret results within the context of the limitations of the current study. First, given the cross-sectional nature of the data, causality cannot be determined. Although it theoretically makes sense that discrimination leads to binge eating, it is possible that binge eating may lead to increased discrimination. For example, binge eating could lead to weight gain, which could in turn increase discrimination. Future research should use longitudinal data or ecological momentary assessment to determine the causal direction of discrimination and binge eating to determine if discrimination is indeed a culture-specific risk and/or maintenance factor for binge eating. Another potential limitation of this study was that all data were self-report; thus, responses may have been influenced by social desirability and self-awareness. Although most measures were previously validated, some measures, including acculturative stress and social support, were not. Due to low loadings and poor model fit, the social support items assessing friend support were removed from the model. Thus, the retained social support variables only assessed support from family members. Although family support had a stronger correlation with binge eating ( $r_{pb} = -.179$ ) and discrimination ( $r = -.204$ ) than friend support ( $r_{pbBingeEating} = -.115$ ,  $r_{Discrimination} = -.074$ ), the inclusion of only family support items could have potentially influenced the results. Therefore, future research should continue to explore the relationship of social support and binge eating using well-validated measures that robustly assess social support across multiple domains.



Additionally, the binary coding of binge eating as present or absent is a limitation of the current study. The binary coding precludes further analyses into the nature of the relationship between study variables and binge eating. For example, it is unclear if discrimination has a linear relationship with binge eating or if there is a ceiling effect wherein more discrimination does not lead to more frequent episodes of binge eating. Moreover, the binary coding of binge eating may have also presented a methodological reason for discrepant findings with previous research. That is, due to the binary coding of binge eating, there was low variance in binge eating compared to previous studies. Furthermore, binge eating was coded as present if participants had at least two binge episodes per week for several months or longer and a loss of control. Therefore, participants with less frequent binge eating or binge eating for shorter periods of time were not included in the binge eating group in the current sample. At the time of data collection, the DSM-IV frequency criteria for bulimia nervosa was two binge episodes per week, but DSM-5 reduced the frequency criteria to one episode for week. Therefore, the frequency of binge eating in the current study is conservative compared to the current DSM-5 and ICD-10 criteria for binge eating frequency for bulimia nervosa and binge eating disorder.

Lastly, Latinxs comprise a heterogeneous group with different cultural backgrounds, countries of origin, migration patterns, and experiences in the United States. Given small subgroups sizes, there was insufficient power to examine whether results differed across racial groups. Future research with larger sample sizes should seek to understand the extent to which different ethnic groups of Latinxs are impacted by culturally relevant factors. Moreover, future research should examine the extent to which discrimination is related to associated features of binge eating. For example, some researchers have posited that negative interpersonal situations, such as discriminatory experiences, may increase socially avoidant behaviors, such as eating

alone (Richman & Leary, 2009). Thus, in addition to binge eating, discrimination may also play a role in associated features of binge eating.

### **Strengths**

Despite noted limitations, the current study has several strengths. A major strength of the current study was that it used a nationally representative sample. Thus, results are more generalizable than previous studies, which mainly included college students. Another strength of the study was the use of clinical interviews to assess binge eating. Fairburn & Beglin (1994) have posited that binge eating is more accurately assessed through clinical interviews, rather than questionnaires, due to difficulties with defining “loss of control” and “large” amount of food. Therefore, the clinical interviews employed in the current study may have more validly assessed binge eating than studies that have used questionnaire measures. Further, the way in which loss of control eating was assessed also represents a strength of the study. It has been posited that some Latino males do not endorse binge eating when asked strictly about “out of control” eating because the phrase is associated with aggressive behavior (Reyes-Rodriguez, 2021). In addition to assessing loss of control by asking participants if they felt “out of control,” loss of control was also assessed with supplementary items (e.g., continuing to eat despite lack of hunger). Therefore, it is likely that the current study’s use of multiple items to assess loss of control more accurately captures binge eating in this population compared to single item assessments of loss of control.

### **Clinical and Theoretical Implications**

Importantly, the current study identified a significant association between discrimination and binge eating, suggesting that existing models of eating disorders may be better tailored to Latinx populations by including discrimination. The relationship between discrimination and binge eating is likely complex, but understanding the mechanisms through which discrimination

may lead to binge eating will be important to develop more culturally sensitive theoretical models of binge eating in Latinx populations. Various theoretical models have conceptualized discrimination as a stressor that leads individuals to engage in binge eating as a coping mechanism (Kempa & Thomas, 2000; Meyer, 2003; Sikorski et al., 2015). Indeed, past research has highlighted the role of binge eating in both distracting from discriminatory experiences and regulating negative emotions (Higgins Neyland & Bardone-Cone, 2017; Leehr et al., 2015; Spoor et al., 2007). A more complete understanding of the association between discrimination and binge eating can help refine theoretic models of eating disorders for Latinx populations.

In terms of clinical implications, the results of the current study suggest that mental health providers and researchers need to better understand the ways in which discrimination can contribute to binge eating in Latinx individuals. Existing empirically supported treatments for eating disorders do not explicitly discuss discrimination (Pennesi & Wade, 2016). Although researchers have begun to modify cognitive behavioral therapy (CBT) to address culture specific factors for Latinx individuals (e.g., Reyes-Rodríguez et al., 2013, 2019; Shea et al., 2012), no treatment has been modified to address discrimination specifically. Treatments that effectively provide coping strategies to manage discriminatory experiences and reduce binge eating could improve both effectiveness of treatment and retention rates by more adequately addressing the unique experiences and realities of being Latinx.

## **Conclusion**

Latinxs are the largest and fastest growing minoritized group in the United States (U.S. Census Bureau, 2019), and despite higher rates of eating disorders characterized by binge eating (Marques et al., 2011), culturally relevant factors related to binge eating in Latinxs have been largely overlooked. The current study adds to the body of knowledge that seeks to understand better ways to serve the Latinx community and highlights the need for future studies to address

the unique factors contributing to eating disorder pathology in racial and ethnic minoritized groups. Given that discrimination was the only factor significantly associated with binge eating in a nationally representative sample of Latinxs, this study underscores the need for mental health providers to understand and assess discrimination among Latinxs. In conclusion, treatment that focuses on adaptive ways to handle discriminatory experiences and public health interventions to reduce discrimination is warranted.

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**Table 1***Descriptive statistics and correlations among study variables*

Variable	M (SD)	Frequency	Correlations			
			1	2	3	4
1. Acculturative Stress	1.19 (0.21)		-			
2. Perceived Discrimination	15.60 (7.30)		0.08***	-		
3. Family Cohesion	3.42 (0.47)		-0.03	-0.31***	-	
4. Social Support	3.25 (0.70)		-0.12***	-0.18***	0.37***	-
5. Binge Eating		.07 (169)	0.06	0.23***	-0.22***	-0.12***

\*\*\* $p < .005$

**Table 2***Model fit statistics*

Model	$\chi^2$ (df)	RMSEA	CFI	TLI
Model 1	10,379.46 (939)***	0.06	0.82	0.81
Model 2	8,813.15 (896)***	0.06	0.85	0.84
Model 3	2,419.48 (521)***	0.04	0.95	0.95
Model 4	25,523.82 (990)***	0.05	0.87	0.86
Model 5	5,022.87 (933)***	0.06	0.83	0.82
Model 6	2,555.90 (734)***	0.04	0.91	0.90
Model 7	2,326.36 (659)***	0.04	0.92	0.91

\*\*\*  $p < .005$

**Table 3***Parameters of final model*

Item	Factor loading (SE)
Acculturative stress	
AS1	0.104 (0.006)
AS3	0.445 (0.010)
AS4	0.361 (0.010)
AS5	0.135 (0.007)
AS7	0.178 (0.008)
AS8	0.158 (0.007)
AS9	0.063 (0.005)
AS10	0.039 (0.004)
Discrimination	
DS1	2.130 (0.026)
DS2	1.952 (0.024)
DS3	1.801 (0.021)
DS4	1.912 (0.024)
DS5	1.615 (0.021)
DS6	1.550 (0.019)
DS7	1.797 (0.023)
DS8	1.503 (0.019)
DS9	1.329 (0.013)
Family Cohesion	
F1	3.623 (0.013)
F2	3.577 (0.014)
F3	3.571 (0.013)
F4	3.569 (0.014)
F5	3.640 (0.013)
F6	3.767 (0.011)
F7	3.578 (0.014)
F8	3.514 (0.014)
F9	3.617 (0.013)
F10	3.784 (0.011)
F12	2.671 (0.011)
F13	2.780 (0.010)
F14	2.734 (0.011)
Social Support	
S1	3.449 (0.025)
S2	3.233 (0.021)
S3	3.124 (0.021)
S5	3.199 (0.018)

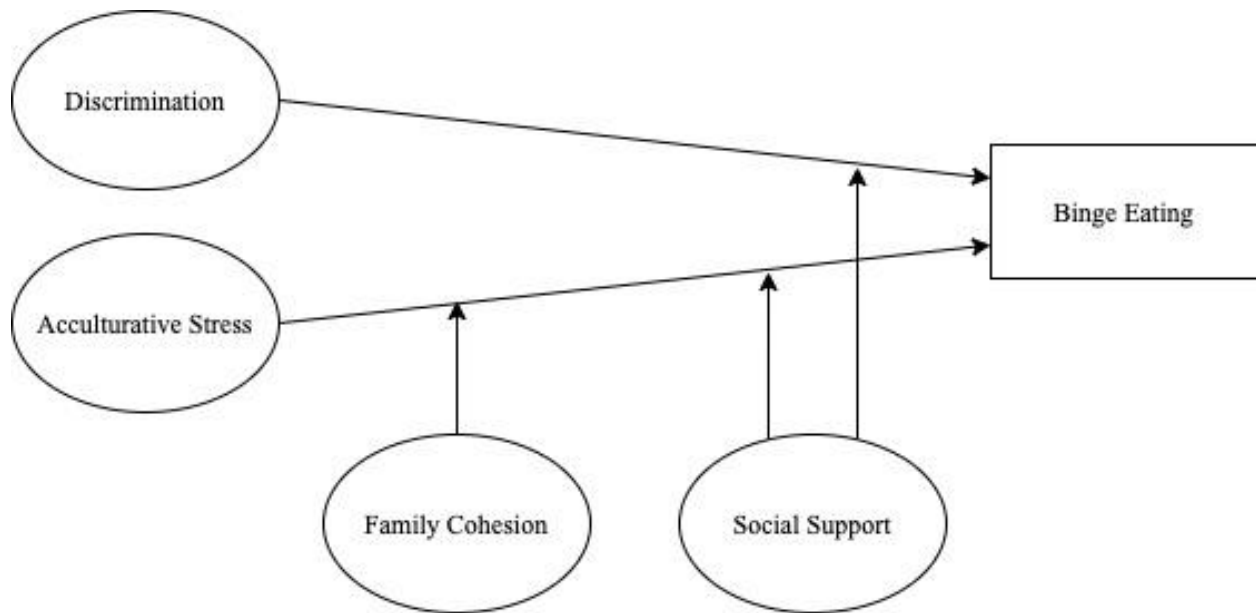


Figure 1. Theoretical model of relationship between acculturative stress, discrimination, family cohesion, social support, and binge eating. Constructs represented by circles are represented in the model as latent variables; those represented by squares are measured variables.

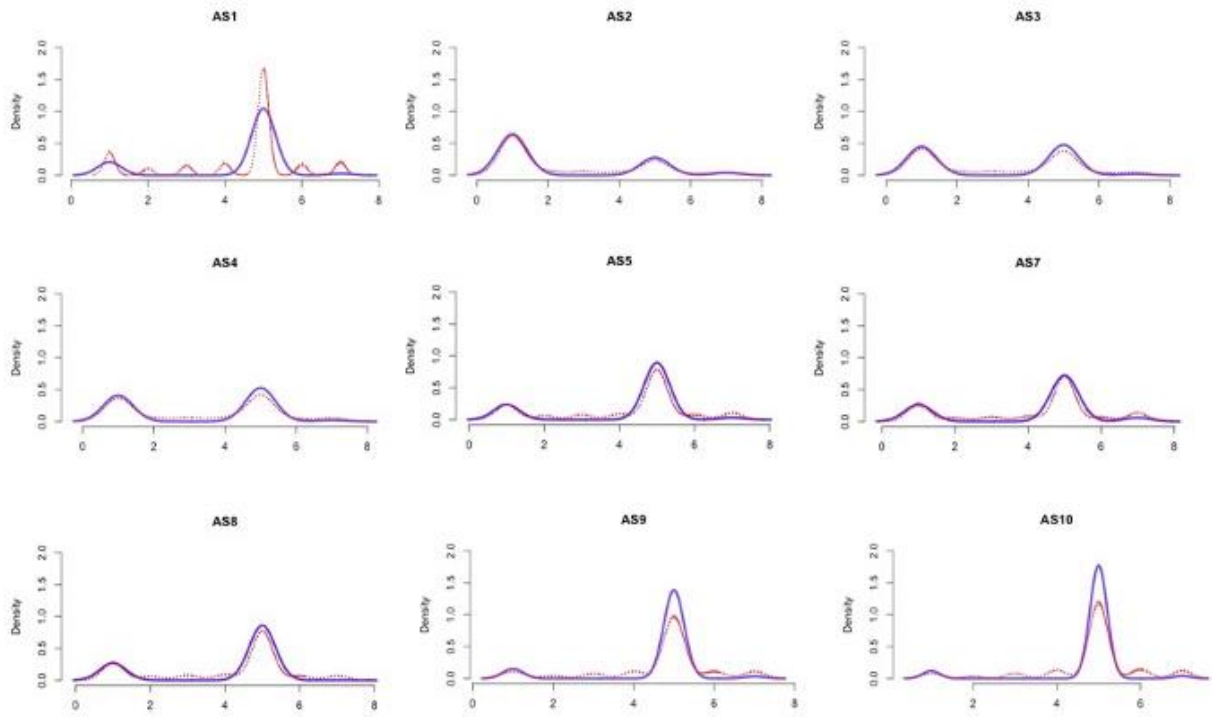


Figure 2. Imputations of acculturative stress variables. Solid purple lines represent empirical data and red dotted lines represent imputed data.



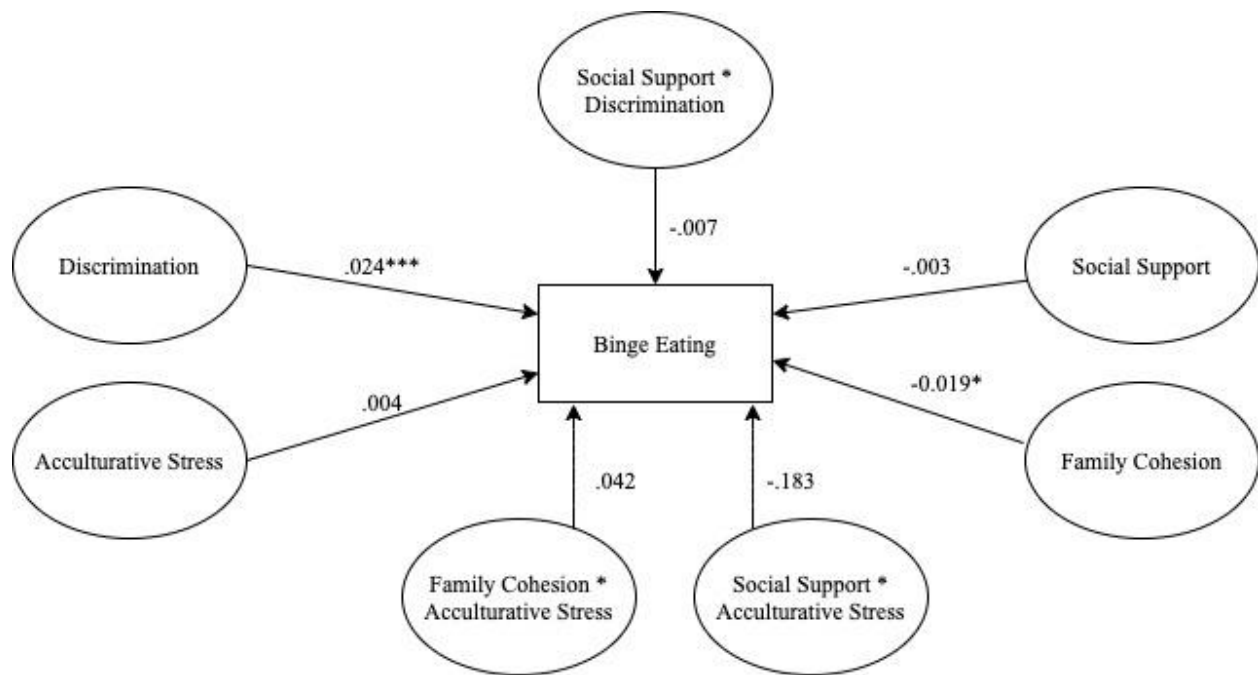


Figure 3. Unstandardized path model of the theorized model.

\*\*\* $p < .001$ ; \*  $p < .05$

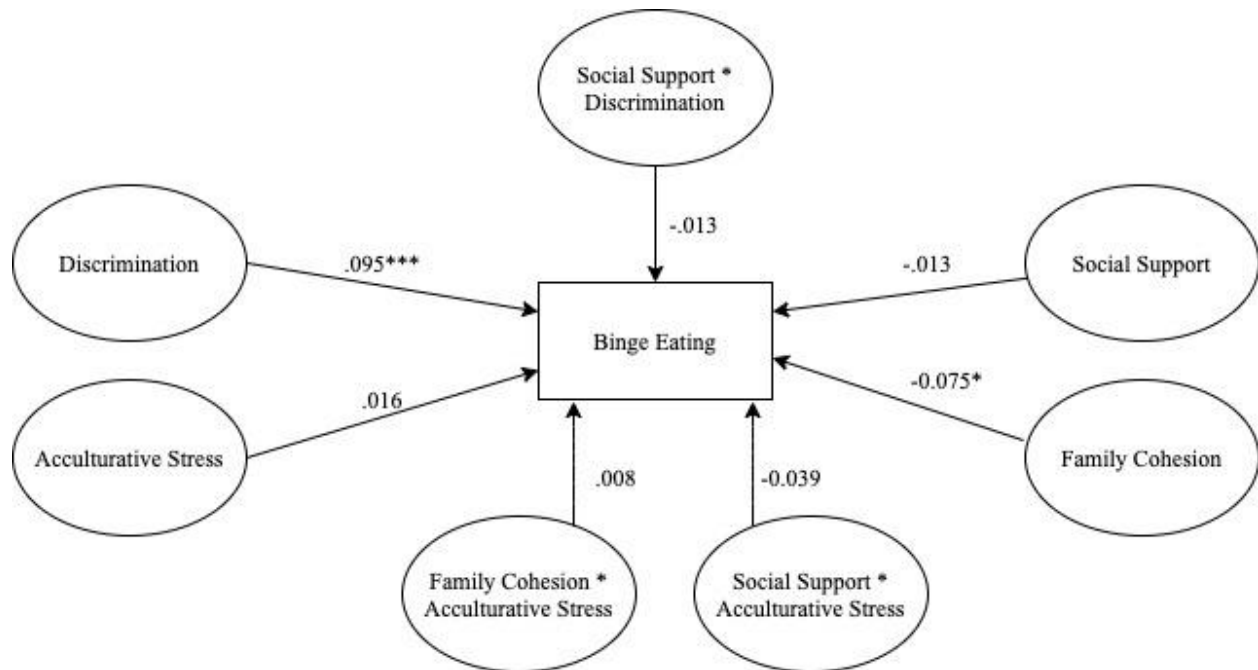


Figure 4. Standardized path model of the theorized model.

\*\*\* $p < .001$ ; \*  $p < .05$

## Appendix A

### Acculturative Stress

Please tell me if you have felt this way, in the following situations:

- |  |     |    |    |
|--|-----|----|----|
| 1. Do you feel guilty for leaving family or friends in your country of origin?                             | Yes | No | NA |
| 2. Do you feel that in the United States you have the respect you had in your country of origin?           | Yes | No | NA |
| 3. Do you feel that living out of your country of origin has limited your contact with family or friends?  | Yes | No | NA |
| 4. Do you find it hard interacting with others because of difficulties you have with the English language? | Yes | No | NA |
| 5. Do people treat you badly because they think you do not speak English well or speak with an accent?     | Yes | No | NA |
| 6. Do you find it difficult to find the work you want because you are of Latino/Asian descent?             | Yes | No | NA |
| 7. Have you been questioned about your legal status?   | Yes | No | NA |
| 8. Do you think you will be deported if you go to a social or government agency?                           | Yes | No | NA |
| 9. Do you avoid seeking health services due to fear of immigration officials?                              | Yes | No | NA |

Perceived Discrimination

In your day-to-day life how often have any of the following things happened to you? (Would you say almost everyday, at least once a week, a few times a month, a few times a year, less than once a year?)

	Never	Less than once a year	A few times a year	A few times a month	At least once a week	Almost every day
1. You are treated with less courtesy than other people.	1	2	3	4	5	6
2. You are treated with less respect than other people.	1	2	3	4	5	6
3. You receive poorer service than other people at restaurants or stores.	1	2	3	4	5	6
4. People act as if they think you are not smart.	1	2	3	4	5	6
5. People act as if they are afraid of you.	1	2	3	4	5	6
6. People act as if they think you are dishonest.	1	2	3	4	5	6
7. People act as if you are not as good as they are.	1	2	3	4	5	6
8. You are called names or insulted.	1	2	3	4	5	6
9. You are threatened or harassed.	1	2	3	4	5	6

### Family Cohesion

Now I'd like to know how strongly you agree or disagree with the following statements about your family.

	Strongly disagree	Somewhat disagree	Somewhat agree	Strongly agree
1. Family members respect one another.	1	2	3	4
2. We share similar values and beliefs as a family.	1	2	3	4
3. Things work well for us as a family.	1	2	3	4
4. We really do trust and confide in each other.	1	2	3	4
5. Family members feel loyal to the family.	1	2	3	4
6. We are proud of our family.	1	2	3	4
7. We can express our feelings with our family.	1	2	3	4
8. Family members like to spend free time with each other.	1	2	3	4
9. Family members feel very close to each other.	1	2	3	4
10. Family togetherness is very important.	1	2	3	4

Please tell me how frequently the following situations have occurred to you.

	Often	Sometimes	Hardly ever or never
11. You have felt that being too close to your family interfered with your own goals.	1	2	3
12. Because you have different customs, you have had arguments with other members of your family.	1	2	3

- |   |   |   |   |
|---|---|---|---|
| 13. Because of the lack of family unity, you have felt lonely and isolated.                           | 1 | 2 | 3 |
| 14. You have felt that family relations are becoming less important for people that you are close to. | 1 | 2 | 3 |
| 15. Your personal goals have been in conflict with your family.                                       | 1 | 2 | 3 |

Social Network

	Most every day	A few times a week	A few times a month	Once a month	Less than once a month
1. How often do you talk on the phone or get together with family or relatives who do not live with you?	1	2	3	4	5
2. How often do you talk on the phone or get together with friends?	1	2	3	4	5
	Never	Rarely	Sometimes	Often	Always
3. When you have a problem or worry, how often do you let your (husband/wife/partner) know about it?	1	2	3	4	5
4. When you have a problem or worry, how often do you let someone (else) know about it?	1	2	3	4	5
	Not at all	A little	Some	A lot	
5. How much can you rely on relatives who do not live with you for help if you have a serious problem?	1	2	3	4	
6. How much can you open up to relatives who do not live with you if you need to talk about your worries?	1	2	3	4	
7. How much can you rely on your friends for help if you have a serious problem?	1	2	3	4	
8. How much can you open up to your friends if you need to talk about your worries?	1	2	3	4	
	Often	Sometimes	Rarely	Never	
9. How often do your relatives or children make too many demands on you?	1	2	3	4	

10. How often do your family or relatives argue with you?	1	2	3	4
11. How often do your family or relatives make too many demands on you?	1	2	3	4
12. How often do your friends make too many demands on you?	1	2	3	4