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ORIGINAL ARTICLE

Acculturative Stress, Anxiety, and Depression in Latinx Youth: The Role of Behavioral Inhibition, Cultural Values, and Active Coping

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Abstract
Research highlights distinct temperamental, cultural, and behavioral characteristics that may contribute to the differential experience and impact of acculturative stress in Latinx youth. The current study aims to explain the risk of developing anxiety and depression by clarifying how acculturative stress interacts with individual temperamental (behavioral inhibition), cultural (values), and behavioral (active coping) characteristics in a sample of 161 Latinx youth. Main analyses included a separate hierarchical linear regression for each potential moderating variable with anxiety and depression as the outcome variable. Results indicated a significant and positive relationship between acculturative stress, anxiety, and depression. Furthermore, active coping moderated the relationship between acculturative stress and depression, such that higher levels of active coping resulted in a stronger relationship between acculturative stress and depression than at lower levels. Findings from the current study make advancements towards an understanding of individual characteristics that interact with the experience of acculturative stress, anxiety, and depression.

Keywords Acculturative stress · Latinx · Behavioral inhibition · Cultural values · Coping · Internalizing problems

Introduction

The Latinx population in the United States (U.S.) is rapidly growing, with over one third of the population under the age of 18 [1]. Latinx youth are at an increased risk of experiencing internalizing problems (i.e., anxiety and depression) compared to African American and White youth [2–4]. Although there is a growing body of research aimed at understanding the well-being of Latinx youth, few studies consider temperamental, cultural, and behavioral factors that place some youth at an elevated risk of developing internalizing problems. Given the growing population of Latinx youth in the U.S., it is critical to understand specific pathways of risk and resilience to best address and contextualize the well-being of Latinx youth in the U.S.

Latinx youth in the U.S. may be subject to numerous psychosocial challenges because of incongruent, and often conflicting, heritage and mainstream cultural values, traditions, and languages [5]. Acculturation is traditionally defined as the change that results from a dynamic and evolving process of contact between dominant and nondominant cultural groups, creating opportunities to learn and adapt [6, 7]. The stress that results from the acculturation process is termed acculturative stress, a stress response to events that occurs during the process of acculturation [8, 9]. Literature identifies several dimensions of acculturative stress, including loss of identity, language conflicts, and familial separation [10, 11]. A substantial body of literature suggests that acculturative stress is a robust predictor of anxiety and depression [12–15] and that Latinx youth experience elevated levels of acculturative stress [10]. However, not every individual who experiences acculturative stress appears to report psychological impairment [16, 17], suggesting the potential interplay of additional factors shape the experience of acculturative stress. We focus on acculturative stress as it may be particularly relevant to adolescent populations. Adolescence is a unique period of development associated with cognitive shifts [18], pressure to identify and belong to a cultural group [19–21], and changes in peer and family associations [18]. Furthermore, adolescence is a period of elevated risk of developing anxiety and depression [4, 22]. Unfortunately, most of the literature on acculturative

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stress and resulting psychological problems to date focuses on adult and immigrant populations [23–25].

Acculturative Stress, Individual Factors, Anxiety, and Depression

Garcia Coll et al.' [26] integrative model of ethnic minority youth development suggests that broad social position variables (e.g., race, segregation, social class, ethnicity, and gender) exert their influence by shaping the local environment and impacting daily experiences of youth. In the current study, we conceptualize acculturative stress as a key example of the ways broad social variables, such as race/ethnicity and social class, present repeatedly in the daily lives of some youth. In this study, we focus on explaining risk for anxiety and depression, specifically, and draw from this integrative model due to its inclusion of constructs that help explain unique variance for youth of color. Importantly, the model places considerable emphasis on the interaction of particular environments and contexts with more proximal factors for understanding youth outcomes. Here, we focus particular attention on child characteristics and adaptive culture. The interaction of child characteristics, such as age, temperament, and coping, with shared experiences, such as acculturative stress, lends to the possibility of unique experiences. Similarly, differences in adaptive culture, which includes traditions, migration, and cultural legacies, may result in varying experiences of a stressor—youth with a strong adaptive culture may be less vulnerable to the negative impact of stressful daily life experiences.

Behavioral Inhibition

Behavioral inhibition is a child characteristic that may provide insight into understanding the risk for developing anxiety and depression. It is a temperament trait characterized by high levels of restraint, avoidance, and social withdrawal and is found to be responsive to an individual's ecology [27]. Research suggests that behavioral inhibition is positively associated with youth internalizing problems [28–30]. It is important to distinguish behavioral inhibition from experienced anxiety—the former considered a measure of an individual's temperamental predisposition to punishment, loss of reward, and novelty that impacts behavior [31, 32].

Latinx culture traditionally emphasizes respect, obedience, and proper demeanor in public contexts [33, 34]. Youth who learn to value self-restraint and social inhibition may display elevated levels of inhibited behavior. However, research on behavioral inhibition with Latinx populations is limited. The few studies that exist suggest cultural values, like familism, respect, religion, and traditional gender roles, are positively associated with behavioral inhibition [35]. To our knowledge, no study has examined behavioral inhibition in the context of acculturative stress. It would make sense, however, that repeated exposure to acculturative stress would further condition the temperamental differences to punishment, reward, and novelty for youth with high levels of behavioral inhibition, and potentially lead to anxiety and depression. However, this connection may not be as strong for individuals with lower levels of behavioral inhibition.

Cultural Values

Cultural values, like *familismo* (familism), *respeto* (respect), and spirituality and faith in a higher power, may influence an individual's response to acculturative stress and serve as a cultural resource to bolster the well-being of Latinx youth. It is postulated that individuals with high levels of cultural values may draw from their perceived heritage resources, including family support and spiritual protection, to adaptively respond to acculturation stressors. Research suggests aspects of Latinx culture may buffer the harmful effects of acculturative stress [12, 36]. However, the relationship between aspects of the Latinx culture and internalizing symptoms is less straightforward. Some research suggests cultural values, such as family orientation and cohesion [37], are positively associated with internalizing symptoms. For example, Martinez, Polo, and Carter [37] found that family orientation, which included obedience, family obligation, and familism, was positively associated with anxiety in a sample of Latinx youth. Other research finds specific aspects of Latinx culture, like familism and respect, protective against anxiety and depression [38, 39]. Using the same sample as the current study, Schneider and Gudiño [35] examined the moderation effect of Latinx cultural values on the relationship between behavioral inhibition and posttraumatic stress disorder avoidance symptoms and found that this relationship was stronger as cultural values increased. However, no significant main effect of cultural values on avoidance symptoms was found, which suggests that cultural values themselves are not directly associated with internalizing problems and that associations between culture and youth mental health are likely more complex.

Active Coping

Coping is a developmental competency that is proximal to youth mental health outcomes and is directly relevant to understanding the impact of stress. Specifically, coping encompasses aspects of an individual's resilience and competence in response to stressful events and cultural interactions [25, 40]. In the context of acculturative stress, active coping, traditionally defined as an assortment of purposeful and volitional efforts that promote action-based, problem-solving behaviors and assistance-seeking, warrants particular attention due to its potential to buffer the harmful effects

of stressors [41]. In fact, research generally finds that active coping is associated with fewer internalizing problems [14, 25, 42].

Unfortunately, most of the literature on coping and internalizing problems traditionally focuses on depression. The dearth of information available on the relationship between acculturative stress, active coping, and anxiety presents an opportunity to expand the literature on pathways linking acculturative stress to specific internalizing problems. Another area of research that is limited is the impact that culture has on youth coping styles—even fewer studies have explored this in relation to the well-being of Latinx youth. Findings on the protective nature of active coping on anxiety and depression appear complex. Gonzales et al. [43] examined the association between active coping and family stress on depression and interestingly found that active coping only buffered the harmful effect of family stress when the stress was low. In a different study, Gudiño, Stiles, and Diaz [44] found that while active coping buffered the impact of violence exposure on internalizing symptoms, active coping was associated with increased posttraumatic stress symptoms when violence exposure was high. Thus, while the coping style is important, the context and type of stressor must also be considered.

Current Study

In an effort to increase our understanding of the relationship between acculturative stress and the development of anxiety and depression in Latinx youth, the current study aims to (1) examine the longitudinal relationship between acculturative stress, anxiety, and depression. We hypothesize that acculturative stress will have a positive relationship with anxiety and depression at Time 2, which is consistent with foundational research in the area.

The main analyses investigate (2) the potential moderating effects of temperamental (behavioral inhibition), cultural (cultural values), and behavioral (active coping) characteristics on the longitudinal relationship between acculturative stress and internalizing problems (anxiety and depression). First, we hypothesize (2a) behavioral inhibition will serve as a risk factor for anxiety and depression in the context of acculturative stress. Second, we hypothesize (2b) cultural values will buffer the relationship between acculturative stress, anxiety, and depression. Finally, we hypothesize (2c) active coping will weaken the relationship between acculturative stress, anxiety, and depression. The longitudinal nature of this study and the focus on theoretically relevant moderator variables contributes to our understanding of the processes that impact the development of internalizing problems in Latinx youth following acculturative stress.

Method

Participants

Participants in the current study were 161 Latinx adolescents between the ages of 11 to 13 (M = 11.35, SD = 0.54) and were recruited from an urban public middle school in Southern California [45]. While most adolescent participants were in the sixth grade, seven students (4.3%) were in the seventh grade, and three (1.9%) students were in the eighth grade. Additionally, the sample included slightly more girls than boys (55.3%). Fifty-six (34.8%) students were born outside of the U.S. and had resided in the U.S. for an average of 4.01 years (SD = 2.93). The majority of students who were born outside of the U.S. were born in Mexico (n = 36; 65.5%), followed by El Salvador (n = 13; 23.6%); about 9% (n = 5) of students were born in other Latin American countries including Honduras, Ecuador, Columbia, and Guatemala. Almost all of the students' mothers (95.6%) and fathers (96.1%) were born outside of the U.S.

At the time of the study, 2135 students were enrolled in the school and 1951 (91.4%) of these students were Latinx. In addition, 912 of the total students were classified as English Learners (96.71% Spanish-speaking). In order to sample a high proportion of immigrant individuals, 10 sixth grade classrooms and two mixed-grade homeroom classrooms with the highest proportion of English Learners were targeted (n = 331). Two-hundred and seventy-three (82.48%) parents returned a signed consent form; of those parents, 170 (62.27%) gave permission for their child to participate in the research study. Two students withdrew from the school prior to the beginning of the study, which resulted in a sample of 168 participants at Time 1. At Time 2, 161 students provided data to the research team; the retention rate for the study was 95.83% (n = 161). The current study relies on secondary analyses of these data, including all students who provided complete data at Time 2.

Measures

Demographic Information

Youth participants completed a questionnaire at Time 1 that collected information about age, sex, current grade in school, racial/ethnic background, and place of birth of youth and caregiver. Those participants who indicated being born outside of the U.S. were asked to provide the time (in years and months) spent in the U.S. since arrival.

Acculturative Stress

Stress that results from the acculturation process was assessed by an abbreviated eight-item version of the

Bicultural Stressors Scale [BSS; 46. The original 20-item scale is comprised of items that assessed family stressors, discrimination stressors, language stressors, and peer stressors, and has demonstrated strong internal consistency (α = 0.92) with Mexican origin middle-school students [46]. An abbreviated version was used for this study to retain items that apply to both immigrant and non-immigrant populations and assessed discrimination stressors (5 items; "I feel uncomfortable when others make jokes about or put down people of my ethnic background"), relevant language stressors (2 items inquiring about difficulties with English; "I have had problems at school because of my poor English"), and a relevant peer stressor (1 item; "I have felt that others do not accept me because of my ethnic group"). The abbreviated version of the MACVS has been previously used with Latinx youth and demonstrated adequate internal consistency (0.76) [45, 47]. Participants responded to each item on a 5-point scale that inquired about the intensity of the stressor (1 "not stressful at all" to 4 "very stressful") and had the option of selecting "does not apply." A mean acculturative stress score was generated for each participant by averaging the ratings for the eight items. Participants completed this measure at Time 1. The abbreviated version of the BSS demonstrated adequate internal consistency (English α = 0.79; Spanish α = 0.67; Overall α = 0.75) in the current sample.

Internalizing Problems

Youth symptoms of internalizing problems (anxiety and depression) were assessed with the relevant DSM-IV oriented scales from the well-established Youth Self Report [YSR; 48. Participants read a series of statements and were asked to report, in the last six months, the extent that the statement was true for them, on a 3-point scale (0 "not true" to 2 "very true"). The current study used the Anxiety Problems scale of the YSR which has six items (e.g., "I am afraid of certain animals, situations, or places") and assesses for symptoms of separation anxiety, generalized anxiety, and specific phobia. The Anxiety Problems scale demonstrated internal consistency below conventional guidelines (Time 1: English α = 0.63; Spanish α = 0.63; Overall α = 0.63; Time 2: English α = 0.66; Spanish α = 0.67; Overall α = 0.66) in the current sample. However, the internal consistencies reported in the present study are likely impacted by the brief nature of the measure (six items) and are comparable to the internal consistency (0.67) reported by the developers of the measure [48]. In addition, the Affective Problems scale of the YSR was used, which is comprised of 11 items (e.g., "I feel worthless or inferior") that assess for symptoms of major depression and dysthymia. In the current sample, the Affective Problems scale demonstrated adequate internal consistency (Time 1: English α = 0.77; Spanish α = 0.73; Overall α = 0.75; Time 2: English α = 0.79; Spanish α = 0.79; Overall α = 0.79). Participants completed this measure at Time 1 and Time 2. A composite score for each scale was calculated by adding the rating of each item together.

Behavioral Inhibition

The 20-item Behavioral Inhibition System/Behavioral Approach System Scales [BIS/BAS; 49 was used to measure behavioral inhibition. The BIS/BAS Scales include one seven-item scale that measures behavioral inhibition ("I worry about making mistakes") and three scales (i.e., Drive, Reward Responsiveness, Fun Seeking) that measure behavioral activation. The BIS/BAS Scales have been previously used with youth between the ages of 8 and 12 and demonstrated adequate reliability (α = 0.82) [49]. Individuals rated the extent to which they agree with the statement on a four-point scale (1 "strongly agree" to 4 "strongly disagree"). The present study focuses on the 7-item BIS subscale due to the scope of the research question. Gudiño et al. [45] found that the wording of an item on the BIS scale negatively impacted the internal consistency; therefore, this item was omitted (final scale includes 6 items). The BIS scale demonstrated adequate internal consistency (English α = 0.76; Spanish α = 0.82; Overall α = 0.79) in the current sample. Participants completed this measure at Time 1.

Cultural Values

The 50-item Mexican American Cultural Values Scale [MACVS; 50 was used to assess cultural values. The cultural values domain (36 items) is comprised of six subscales (i.e., Familism Support, Familism Obligations, Familism Referents, Respect, Religion, and Traditional Gender Roles) and the mainstream American values domain (14 items) is comprised of three subscales (i.e., Material Success, Independence & Self-Reliance, Competition & Personal Achievement). This measure has been validated with Mexican American youth and their families [50] and demonstrated adequate reliability (α = 0.89). The MACVS Scale has also been used with other Latin American populations [51, 52] and demonstrated good reliability. Given the specific interest in the protective value of cultural values, the current study only included the subscales that comprise the heritage cultural values domain (36 items). Using a five-point scale (1 "Not at all" to 5 "Completely"), participants rated the extent to which they agree with the statement. A composite score for the cultural values domain was generated by averaging the respondent's ratings, as recommended by the developer [50]. The cultural values domain demonstrated strong internal consistency (English α = 0.93; Spanish α = 0.93; Overall α = 0.93) in the current sample. Participants completed this measure at Time 2.

Coping Style

Coping style was assessed by the 44-item Children's Coping Strategies Checklist [CCSC; 53, which assesses the respondent's problem-solving strategy or response on a four-point scale from 1 ("never") to 4 ("most of the time"). The CCSC is comprised of 10 subscales that load onto four coping style factors (i.e., active coping, avoidance, distraction, and support seeking). Gonzales et al. [43] administered the CCSC to a sample of inner-city adolescents (ages 12 to 15) and reported acceptable psychometric properties. We focus on the Active coping factor, which includes Cognitive Decision Making (4 items; $\alpha = 0.87$), Positive Cognitive Restructuring (4 items; $\alpha = 0.81$), Direct Problem Solving (4 items; $\alpha = 0.86$), and Seeking Understanding (4 items; $\alpha = 0.89$) subscales. A composite score for Active coping was developed by first calculating a standardized score (z-score) for each subscale and then averaging the standardized scores. This method is consistent with the approach taken by the developers of the measure to create a composite score for Active coping [53]. The Active coping domain demonstrated strong internal consistency (English $\alpha = 0.93$; Spanish $\alpha = 0.93$; Overall $\alpha = 0.93$) in the current sample. Participants completed this measure at Time 1.

Procedures

Researchers made recruitment announcements in English and Spanish to 10 sixth grade homerooms with the largest proportion of English language learners and two mixed-grade homerooms conducted in Spanish because they included students with the lowest levels of English language proficiency. Students were provided a recruitment letter and a consent form (in English and Spanish) to bring home to their parent or legal guardian. The consent form included an option for parents to state whether they agreed for the youth to participate. Youth were incentivized to return the consent forms (regardless of decision to participate) through small prizes and a classroom party.

Given the high proportion of Spanish-speaking students at the middle school, the researchers ensured that all study materials were available in English and Spanish. Students provided their preferred language for the study materials. The translations team included the principal investigator, two undergraduate research assistants, and a bilingual elementary school teacher. Material that was not already available in Spanish was translated and back-translated. This approach is consistent with the recommendations from Marin and Marin [54].

Questionnaire administration occurred in small groups of students at a time. Students were grouped based on their language preference. Then, research assistants read the assent form aloud to students who received parental consent to participate and emphasized the voluntary nature of their participation. After youth assent was collected, the researchers administered measures by reading items aloud to groups of students while students followed along and provided responses on their own copy of the survey. While items were read aloud to support comprehension, additional research staff were also available to offer individual assistance during the administration. The questionnaire lasted about 45 min. Upon completion of the questionnaire at Time 1, students received one $10 merchandise gift card.

Six months after Time 1, researchers returned to the middle school and administered a similar questionnaire to the students who participated at Time 1. Student assent was again collected to give the students the option of opting out of participating at Time 2. Similar to Time 1, the researchers administered the questionnaire by reading items aloud to groups of students. Participants received a $15 merchandise gift card at Time 2.

Data Analytic Plan

Data were analyzed using the statistical software package Statistical Package for the Social Sciences [SPSS; 55]. We examined univariate outliers and removed data points with an absolute value greater than $z = 3.29$ and multivariate outliers using Mahalanobis distances with a criterion of $p < 0.001$. In addition, we examined the variance inflation factor (VIF) to identify potential issues of multicollinearity. Missing data were addressed using listwise deletion during analyses and the sample size needed to have appropriate power was considered. Aiken, West, and Reno [56] recommend a minimum sample size of 155 to detect moderate effect sizes ($f^2 > 0.15$; power = 0.80; a = 0.05), assuming a reliability of 0.70, interpredictor correlation (r) of 0.50, and an r^2 of 0.20 for the main effects model. Given the current study's sample size ($n = 161$), this study has the power to detect moderate to large effect sizes. However, it was not powered to detect small effect sizes ($f^2 > 0.02$; power = 0.80; a = 0.05).

Data Analysis

Descriptive statistics, including means, standard deviations, and bivariate correlations, were calculated to characterize the study variables. We calculated a Pearson correlation coefficient to examine the strength of the relationship between acculturative stress and internalizing problems (anxiety and depression), separately. Interpretations focused on describing the strength and statistical significance of the longitudinal association between acculturative stress, anxiety, and depression.

To examine the potential main and moderating effects of behavioral inhibition, cultural values, and active coping

strategies on youth anxiety and depression at Time 2, we ran a separate hierarchical linear regression for each potential moderating variable with Time 2 anxiety and depression as the outcome variables. Continuous variables were centered prior to creating the interaction terms for multicollinearity purposes [56]. In the first step of each model, we included the covariates of sex and age. Step 2 included the main effect of acculturative stress and one of the potential moderating variables—(a) Behavioral Inhibition, (b) Cultural Values, or (c) Active Coping. Finally, in Step 3, the respective interaction term—(a) Acculturative Stress × Behavioral Inhibition, (b) Acculturative Stress × Cultural Values, or (c) Acculturative Stress × Active Coping—was included. Results were interpreted by examining the statistical significance of the predictor variables and the variance (R^2) accounted for in each step of the model. Testing for moderation effects specifically focused on whether the interaction term was statistically significant and whether inclusion of interaction terms in Step 3 of the model significantly increased the variance in anxiety and depression symptoms accounted for. To interpret the nature of statistically significant interaction effects, we conducted post hoc probing following guidelines provided in Holmbeck [57]. Significance level for all analyses was set at $p < 0.05$.

Results

Preliminary Analyses

Four youth between the ages of 14 and 15 were identified as outliers due to age (z-score ± 3.29 or greater) and were removed from the sample. In addition, we omitted three youth from the final sample based on outlying data in the anxiety and depression outcome variables (z-score ± 3.29 or greater). Mahalanobis distances revealed no multivariate outliers using the criterion of $p < 0.001$, and no issues of multicollinearity presented among the study variables. Therefore, the subsequent analyses were limited to 161 youth.

Descriptive statistics and bivariate correlations among study variables are presented in Table 1. Girls were more likely to report behavioral inhibition ($r = 0.23$, $p < 0.01$), active coping ($r = 0.20$, $p = 0.01$), Time 2 (T2) anxiety ($r = 0.19$, $p = 0.02$), and T2 depression ($r = 0.16$, $p = 0.05$). Contrastingly, youth age was negatively associated with active coping ($r = -0.19$, $p = 0.01$). With respect to the main independent variable, acculturative stress was positively associated with behavioral inhibition ($r = 0.44$, $p < 0.001$), T2 anxiety ($r = 0.33$, $p < 0.001$), and T2 depression ($r = 0.40$, $p < 0.001$). Finally, preliminary analyses revealed a significant association between behavioral inhibition and T2 anxiety ($r = 0.38$, $p < 0.001$), and T2 depression ($r = 0.37$, $p < 0.001$).

We also conducted independent samples t-tests to identify significant mean differences across grouping variables. Including the entire youth sample, significant differences between U.S.-born and foreign-born youth were found, such that foreign-born youth were more likely to be older ($t(159) = 3.54$, $p < 0.01$) and report higher levels of acculturative stress ($t(156) = 2.98$, $p < 0.01$) and behavioral inhibition ($t(157) = 2.23$, $p = 0.03$), than U.S.-born youth.

Primary Analyses

Anxiety

To test the longitudinal impact of the moderating variables on the relationship between acculturative stress and anxiety at Time 2, we ran three separate hierarchical linear regressions controlling for youth sex and age (Table 2).

With respect to the behavioral inhibition model, there was a significant main effect of acculturative stress (β = 0.22, $p = 0.01$) and behavioral inhibition (β = 0.26, $p < 0.01$)

Table 1 Bivariate correlations between study variables

Construct	1	2	3	4	5	6	7	8
1. Youth sex (Female)								
2. Youth age	−0.10							
3. Acculturative stress	0.00	0.15						
4. Behavioral inhibition	0.**23****	0.04	**0.44****					
5. Cultural values	0.14	0.00	0.10	**0.24****				
6. Active coping	**0.20***	−0.**19***	0.09	**0.42****	**0.24****			
7. T2 anxiety	**0.19****	0.06	**0.33****	**0.38****	0.12	0.08		
8. T2 depression	**0.16***	0.04	**0.40****	**0.37****	0.00	0.06	**0.68****	
M (SD)	55.3%	11.35 (0.54)	1.07 (0.73)	13.01 (3.99)	3.87 (0.62)	2.70 (0.70)	2.75 (2.21)	4.49 (3.73)

Bold font indicates a significant interaction

*$p < 0.05$. **$p < 0.01$

on anxiety at Time 2. However, we did not find a significant interaction effect of behavioral inhibition at Time 2 (β = 0.01, $p = 0.93$).

Regarding the cultural values model, we found a significant main effect of youth sex (β = 0.17, $p = 0.03$) and acculturative stress (β = 0.32, $p < 0.001$) on T2 anxiety. Cultural values did not moderate the relationship between acculturative stress and anxiety at Time 2 (β = 0.03, $p = 0.73$).

Finally, the active coping model yielded a significant main effect of youth sex (β = 0.18, $p = 0.03$) and acculturative stress (β = 0.31, $p < 0.001$) on anxiety at Time 2. However, we did not find a significant moderation effect of active coping at Time 2 (β = 0.05, $p = 0.55$).

Depression

Next, we included depression as an outcome variable to investigate the relationship between the study variables (i.e., behavioral inhibition, cultural values, active coping) and acculturative stress; as in the previous models, we controlled for youth sex and age (Table 2). In the behavioral inhibition model, acculturative stress (β = 0.29, $p < 0.01$) and behavioral inhibition (β = 0.22, $p = 0.01$) had a significant main effect on depression. Behavioral inhibition did not moderate the relationship between acculturative stress and T2 depression (β = 0.08, $p = 0.29$).

The cultural values model resulted in a significant main effect of youth sex (β = 0.16, $p = 0.04$) and acculturative stress (β = 0.40, $p < 0.001$) on depression at Time 2. However, cultural values did not moderate the relationship between acculturative stress and depression (β = − 0.01, $p = 0.95$) at Time 2.

Lastly, the active coping model yielded a significant main effect of youth sex (β = 0.16, $p = 0.04$) and acculturative stress on T2 depression (β = 0.35, $p < 0.001$). Analyses indicated that active coping moderated the relationship between acculturative stress and T2 depression (Fig. 1; β = 0.17, $p = 0.03$). We followed the recommendations by Holmbeck [57] and conducted post hoc probing to further elucidate the interaction. Simple slope analyses indicated that the relationship between acculturative stress and T2 depression was stronger at high levels of active coping (b = 2.59, $p < 0.001$) than at low levels of active coping (b = 1.03, $p = 0.10$). These findings indicate that the longitudinal relationship between acculturative stress and depression is especially strong for youth who report high levels of active coping.

Discussion

The present study aimed to clarify the longitudinal relationship between acculturative stress, a response to events during the acculturation process, and internalizing problems

Table 2 Hierarchical regression results for acculturative stress predicting youth anxiety at Time 2

	Anxiety			Depression		
Construct	*B*	*SE*	β	*B*	*SE*	β
Model 1						
Youth sex	0.56	0.34	0.13	0.73	0.57	0.10
Youth age	0.19	0.31	0.05	0.08	0.51	0.01
Acculturative stress (AS)	0.66	0.26	**0.22****	1.46	0.43	**0.29****
Behavioral inhibition (BI)	0.14	0.05	**0.26****	0.21	0.08	**0.22****
Interaction (AS × BI)	0.01	0.06	0.01	0.10	0.09	0.08
Model 2						
Youth sex	0.75	0.34	**0.17***	1.19	0.57	**0.16***
Youth age	0.19	0.32	0.05	0.09	0.52	0.01
Acculturative stress (AS)	0.96	0.24	**0.32*****	2.06	0.40	**0.40*****
Cultural values (CV)	0.24	0.27	0.07	− 0.33	0.45	− 0.06
Interaction (AS × CV)	0.14	0.40	0.03	−0.05	0.66	− 0.01
Model 3						
Youth sex	0.78	0.35	**0.18***	1.17	0.57	**0.16***
Youth age	0.24	0.32	0.06	0.14	0.53	0.02
Acculturative stress (AS)	0.94	0.24	**0.31*****	1.80	0.40	**0.35*****
Active coping (AC)	0.14	0.25	0.04	0.07	0.41	0.01
Interaction (AS × AC)	0.20	0.33	0.05	1.18	0.55	**0.17***

Bold font indicates a significant interaction

SE standard error

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$

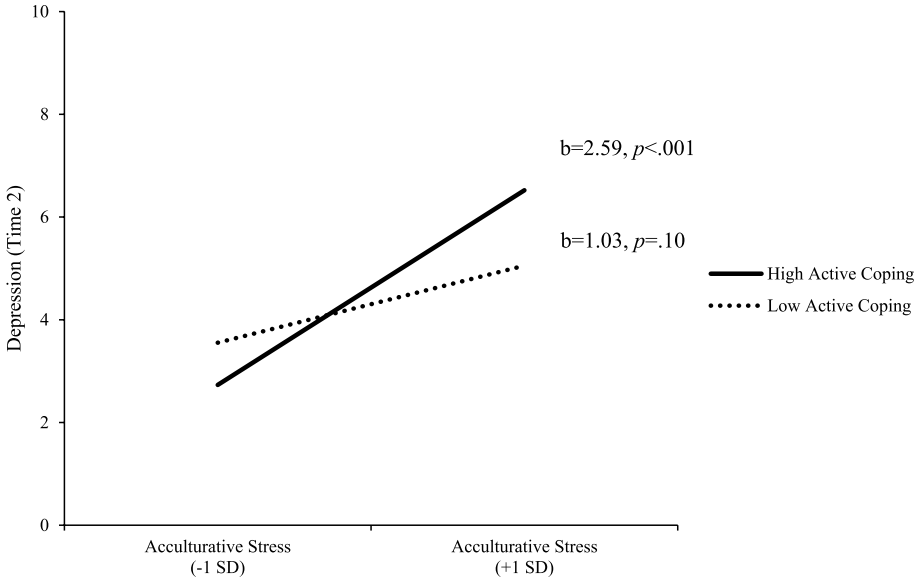

Fig. 1 Mean estimates of significant regression interaction for the effect of active coping on the relationship between acculturative stress and depression at Time 2

(anxiety and depression) in Latinx youth. Specifically, we investigated the main effect of acculturative stress and moderating effects of individual temperamental (behavioral inhibition), cultural (Latinx values), and behavioral (active coping) factors on anxiety and depression.

Consistent with previous literature [13–15] and hypotheses, acculturative stress was positively associated with anxiety and depression at Time 2. Despite the shared symptomology (e.g., negative affectivity, impaired cognitive processes) and comorbidity between anxiety and depression, research alludes to unique differences in the etiology of the problems [58]. In the current study, we investigated anxiety and depression, separately, to contribute to a more robust understanding of individual factors associated with specific internalizing problems.

Behavioral Inhibition

Behavioral inhibition was positively associated with anxiety and depression, which paralleled existing literature [28, 29]. Behavioral inhibition is traditionally characterized by a heightened predisposition to punishment avoidance and selective attention towards potential danger [27]. Thus, it is likely that behavioral inhibition facilitates and reinforces thoughts, moods, and behaviors (e.g., rumination, avoidance of normal familial and social contacts, withdrawal, and restlessness) associated with the onset of anxiety and depression.

We were interested in understanding the impact of behavioral inhibition on the relationship between acculturative stress and internalizing problems (anxiety and depression).

Contrary to expectations, behavioral inhibition did not moderate the relationship between acculturative stress and anxiety or depression. To our knowledge, these are the first findings to relate behavioral inhibition to acculturative stress and any resulting psychological impact.

Cultural Values

Existing literature on the protectiveness of cultural values against the onset of anxiety and depression is mixed [37, 39]. Contrary to expectations, the current study did not find a significant relationship between cultural values, anxiety, and depression. The lack of finding in the current study, and general research consensus, alludes to the complexity in measuring cultural values as a construct. We believe there exists considerable heterogeneity in values within a culture, which contributes to the mixed findings emergent in the literature. Future research should continue to investigate the protectiveness of individual cultural values on mental health symptoms.

We predicted that strong Latinx cultural values would attenuate the relationship between acculturative stress, anxiety, and depression. Contrary to expected findings, cultural values did not moderate the relationship between acculturative stress, anxiety, and depression at Time 2. Future studies should consider investigating specific aspects of the Latinx culture on the relationship between acculturative stress and mental health symptoms. To our knowledge, the present study was the first to investigate the moderating effect of cultural values on the experience of acculturative stress with anxiety as the outcome variable.

Active Coping

The current study did not find a significant relationship between active coping, anxiety, and depression at Time 2, which contrasted much of the existing literature [14, 25,

42]. While our findings did not replicate previous findings, we focused on a stressor experienced by many Latinx youth [10, 59] to further understand the protective nature of active coping and the onset of anxiety and depression. By focusing on acculturative stress, we make advancements towards clarifying the bidirectional relationship between culture and youth coping behaviors and importantly, relate the interaction between culture and youth coping to youth mental health.

We predicted that a reliance on active coping would buffer the positive relationship between acculturative stress, anxiety, and depression. Contrary to the hypothesis, active coping did not moderate the relationship between acculturative stress and anxiety at Time 2. Interestingly, findings revealed that active coping moderated the relationship between acculturative stress and depression at Time 2. Specifically, active coping appeared to strengthen the relationship between acculturative stress and depression. In other words, the relationship between acculturative stress and depression was stronger for youth with elevated levels of active coping than youth with lower levels of active coping. While the directionality of the finding was contrary to expectations, this finding importantly suggests that the nature, intensity, and controllability of a stressor may impact which behavioral responses are adaptive. Active coping strategies do not appear to be effective in buffering against acculturative stress—a chronic stressor that occurs in the environment of the individual. Future research should investigate the personalization and tailoring of coping strategies while considering the controllability and persistence of stressors.

We provide evidence that suggests that acculturative stress poses as a significant risk pathway to anxiety and depression for Latinx youth. While anxiety and depression share considerable overlap in symptomatology and comorbidity [58, 60], we offer an explanation that considers the cognitive and behavioral etiology of each problem. Anxiety is considered to emerge from a persistent abnormal worry state that is associated with difficulties regulating stress and responding to fear [61, 62]. In the context of repeated exposure to acculturative stress, an individual's cognitive appraisal of the cultural stressor may shape future interactions and reinforce maladaptive cognitions and behaviors. For example, an individual who is treated badly because of their accent may be more likely to think about these previous experiences during future interactions with their environment, simultaneously reinforcing anxious thoughts and behaviors. While worry and hypervigilance may be introduced as ways to mitigate anxiety in the short-term, such responses can maintain and exacerbate the anxiety across time.

We draw from the hopelessness theory of depression [63] to inform our understanding of the relationship between acculturative stress and depression. The hopelessness theory of depression posits that repeated exposure to an aversive and seemingly uncontrollable environment or situation will gradually lead to the belief that the aversive environment or situation is inescapable. In turn, this feeling of inescapability will promote a sense of hopelessness, resulting in depression [63]. Acculturative stress may be conceptualized as a stressor that occurs in the environment of the individual and beyond their control. We expect that repeated exposure to acculturative stress may signal to some youth that the stressor is inescapable, increasing their risk of experiencing depression. In line with the hopelessness theory of depression, we expect that youth with repeated experiences of acculturative stress will be more likely to experience depression than youth who seldom experience acculturative stress. It is recommended that future studies on acculturative stress and depression include a longitudinal measure of hopelessness and controllability. To our knowledge, research has not examined the perceived controllability of acculturative stress in relation to depression.

We also found active coping to be a maladaptive behavioral response to address acculturative stress and depression in the current sample. Active coping is characterized by volitional and active efforts to confront a stressor and acculturative stress is traditionally conceptualized as a cultural stressor that is beyond an individual's immediate control and a byproduct of one's immediate and distal environment. Therefore, employing action-based and volitional efforts to address the cultural stressor may not yield the intended outcome and instead, lead to frustrated efforts and promote behaviors and feelings associated with depression, including decreases in self-esteem, feelings of hopelessness, and a loss of energy.

The current study expanded the current literature on acculturative stress by investigating impact of potential adverse cultural experiences (acculturative stress) on anxiety and depression across time. Moreover, we present several temperamental, cultural, and behavioral characteristics that may impact the relationship between acculturative stress, anxiety, and depression. While the current study investigated the individual impact of each characteristic, future research would benefit from exploring the combined effect of varying levels of various temperamental, cultural, and behavioral characteristics on the relationship between acculturative stress and youth well-being. Lastly, to our knowledge, this was the first study to relate behavioral inhibition, a temperamental characteristic characterized by a predisposition to avoid punishment and pain, to acculturative stress as it relates to mental health.

While the current study had many strengths, we acknowledge several limitations that can be improved upon in future studies. First, participants in the overall study were restricted

to students from Latinx descent and most of the sample was of Mexican origin (62.9%); however, the sample also included non-Mexican Latinx students. For that reason, the results presented may not be generalized to specific Latin American populations. Second, the current study did not account for predictors of acculturative stress, such as age of arrival and time residing in the U.S. (for immigrant families) and family discord and distancing. However, establishing predictors of acculturative stress was not the intended aim of the present study; rather, it intended to clarify the interplay between the direct experience of acculturative stress with individual characteristics in Latinx youth. Third, all analyses in the current study relied on self-report data provided by the middle-school students, which increases the probability of obtaining significant relationships through shared-method variance. Subsequent studies on acculturative stress and youth well-being would benefit from employing a multi-informant and multi-assessment approach. Fourth, the ecological context of the study should be considered in the interpretation of the results. Participants in the current study were recruited from a middle school with a high proportion of Latinx and English-Learning students. It is likely that the mean levels of acculturative stress found in the current study are different than those in a more diverse environment. Regardless, participants in the current study reported high levels of acculturative stress, suggesting comparable experiences across ecological contexts. Finally, although the Anxiety Problems scale was related to key constructs in expected ways, the scale had low internal consistency reliability in the current study. These results should be replicated with a more reliable measure to determine the robustness of these results.

Despite the limitations acknowledged above, the current study expands the literature by clarifying pathways through which acculturative stress leads to anxiety and depression and how temperamental, cultural, and behavioral factors can shape development. Findings highlight the importance of considering the controllability and persistence of a stressor to determine the adaptiveness of a mechanism against the stressor. Moreover, we offer evidence to suggest that active coping strategies, while traditionally considered adaptive, may in fact be harmful in the context of certain stressors. Finally, results from the current study highlight the importance of considering risk for anxiety and depression within a cultural context and can inform personalized adaptations to address mental health of Latinx youth. Intervention approaches could focus on promoting adaptive behavioral responses towards acculturation stressors, informing psychoeducational initiatives on the acculturation process for Latinx youth, and encouraging researchers to move beyond studying proxies of acculturative stress and towards direct stressors of the acculturation process.

Summary

Existing research indicates that not every individual is equally susceptible to the harmful effect of experiencing acculturative stress and resulting anxiety and depression. Literature identifies temperamental (behavioral inhibition), cultural (values), and behavioral (active coping) characteristics worth investigating to further understand the relationship between acculturative stress and potential psychological impairment. The current study aims to elucidate the interplay of behavioral inhibition, cultural values, and active coping strategies with the relationship between acculturative stress and internalizing problems (anxiety and depression) among Latinx youth. Participants were 161 Latinx middle-school students between the ages of 11 and 13 and provided information about various psychosocial outcomes at two timepoints with a six-month interim in between. Findings indicated a strong and positive relationship between acculturative stress, anxiety, and depression. Furthermore, active coping emerged as a significant moderator between acculturative stress and depression. Specifically, elevated levels of active coping appeared to strengthen the relationship between acculturative stress and depression. We provide preliminary evidence to suggest active coping strategies may not be adaptive in the context of a chronic, uncontrollable stressor like acculturative stress. Findings from the current study highlight specific points of intervention for Latinx youth and call for future studies to continue investigating factors associated with acculturative stress and mental health in Latinx populations.

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