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Development and evaluation of a measure of drinking behavior in response to acculturation stressors for Latinx adults entering alcohol treatment

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ABSTRACT

Introduction: The current study presents the development of a scale to assess drinking behavior in response to acculturation and immigration stress.**Methods:** The study administered the 19-item Measure of Immigration and Acculturation Stressors (MIAS) and a parallel assessment, a Measure of Drinking in Response to Immigration and Acculturation Stressors (MDRIAS), at baseline, 6 months, and 12 months in a completed randomized controlled trial testing culturally adapted motivational interviewing to reduce heavy drinking and related problems in Latinx individuals who met criteria for heavy drinking (n = 149).**Results:** Exploratory factor analysis of the MIAS showed best fit for a four-factor solution (Relational Stress, Perceived Ethnic Discrimination, Attenuated Aspirations, and Sense of Alienation) with 15 items. The MIAS subscales and the four corresponding MDRIAS subscales had good reliability (i.e., internal consistency, intercorrelations, and test-retest) and criterion-related validity (i.e., concurrent, convergent, and predictive).**Conclusions:** These findings suggest that clinicians and researchers can use the MIAS to assess different types of immigration and acculturation stressors for Latinx adults and can use the MDRIAS to assess drinking in response to those experiences. The MIAS and MDRIAS could be used in the future to adapt alcohol interventions to relevant stressors that contribute to Latinx adults' alcohol use.

1. Introduction

Although Latinx adults are less likely to use alcohol than non-Latinx whites, those who do drink alcohol are more likely to binge drink and report negative consequences than non-Latinx whites (Chartier & Caetano, 2010; Mulia et al., 2009; Zemore et al., 2016). Latinx individuals who drink experience significantly greater likelihood of liver disease, more motor vehicle crashes, and more suicide related to alcohol use than their non-Latinx counterparts (Chartier et al., 2013). One study attributed disparities in alcohol consequences among Latino/as, to experiences of stressors unique to their minority status (Cheng & Mallinckrodt, 2015).

Research has shown that stressors related to immigration and acculturation that result from the process of acclimating to a new cultural environment (Alegría & Woo, 2009; Paulus et al., 2019) have negative effects on mental health of both US-born and foreign-born Latinx, especially on increased alcohol consumption (Cervantes et al., 2013; Hovey & King, 1996). For instance, acculturation and immigration stressors—such as social isolation and experiences of discrimination—increase Latinx adults' risk of heavy drinking (Bryant & Kim, 2012; Conn et al., 2017; Gil et al., 2000; Lee, Colby, et al., 2013; Paulus et al., 2019; Vaughan et al., 2014). However, no validated scale exists that measures Latinx adults' drinking that occurs in response to immigration and acculturation stressors.

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Existing measures assess acculturation/immigration stressors and general alcohol consumption as two separate constructs, without considering assessing how drinking may be uniquely related to these types of stressors. Drinking in response to minority-related stressors may be more important to developing alcohol problems than other reasons for drinking (e.g., positive drinking expectancies; [Hatzenbuehler et al., 2011](#)). [Kuerbis et al. \(2017\)](#) created a new measure of drinking in response to general stress, which research found to predict heavy drinking better than other predictors, like drinking because of loneliness. These findings suggest that using general alcohol measures may mask the substantial effects that acculturation stressors have on alcohol consumption behaviors. The authors further suggested that interventions addressing stressors in treatment are key to supporting better alcohol outcomes. In fact, stressors unique to the immigration and acculturation experience for Latinx adults can be measured appropriately and included as treatment targets ([Lee et al., 2019](#)). Thus, clinicians could use a specific measure that assesses the level of acculturation/immigration stressors and connects it to alcohol consumption behavior to address these specific triggers of heavy drinking, and researchers could use it to help eliminate Latinx disparities related to drinking consequences.

1.1. Development of the current measure

The original Measure of Acculturation Stress has been used to assess the effects of acculturation stress on alcohol use and mental health symptoms among Latinx adults ([Caetano et al., 2007](#); [Ehlers et al., 2009](#); [Ehlers et al., 2016](#); [Vaeth et al., 2012](#)). In the development of the current measure, a panel of Latinx alcohol use scholars (i.e., authors Lee, Cortés, Caetano, and Lopez) added additional items to the Measure of Acculturation Stress that were representative of the immigration/migration experience, such as “I miss my family and friends who are far from me” and “In this country, I (my family) have not yet found what I came searching for.” The panel also decided that items asking about one’s alcohol consumption specifically in response to experiencing these acculturation stressors would quantify the perceived effects of acculturation/immigration stressors on drinking and provide useful information for more targeted treatment to address this relationship in an intervention. The resulting scales contained 19 items measuring stressors (i.e., Measure of Immigration and Acculturation Stressors [MIAS]) and how often participants consumed alcohol in response to each of the 19 specific stressors (i.e., Measure of Drinking in Response to Immigration and Acculturation Stressors [MDRIAS]).

1.2. Psychometric evaluation and factor analysis hypotheses

In line with prior measures of acculturation and immigration stressors (e.g., Hispanic Stress Inventory [[Cervantes et al., 1991](#)] and Hispanic Stress Inventory Version 2; [Cervantes et al., 2016](#)), we hypothesized that a multi-factorial solution (i.e., multiple subscales) would emerge in the MIAS. Since the MDRIAS items were dependent on the MIAS items, we used the MIAS factor structure as the basis for the subscales of the MDRIAS. Second, we explored whether stressors existed that were more highly associated with drinking than others. Research with other acculturation stress measures has shown that different sources of stressors exert varying influences on Latinx adults’ mental health status. For example, greater responses on the occupational/economic stress subscale of the Hispanic Stress Inventory predicted significantly greater somatization symptom scores on the Symptom Checklist-90-Revised. In contrast, the parental stress subscales did not significantly predict responses to the depression, anxiety, or somatization symptom subscales of the SCL-90-R ([Cervantes et al., 1991](#)). Similarly, research has shown different forms of stressors, such as discrimination and immigration stress, predict unique pathways to mental health and drinking outcomes ([Acosta et al., 2015](#); [Lewis et al., 2016](#)). That is, discrimination and immigration stress were indirectly related to

drinking to cope and alcohol consumption through social isolation and peer influence ([Acosta et al., 2015](#); [Lewis et al., 2016](#)). Consequently, we hypothesized that the MIAS and MDRIAS subscales might have differing strengths of associations with mental health and drinking outcomes. Specifically, that the MIAS and MDRIAS would have a negative association with the concurrent validity measures (i.e., acculturation) and positive associations with convergent (i.e., Hispanic stress and discrimination) and predictive validity measures (i.e., alcohol use disorder symptoms, drinking consequences, anxiety symptoms, and depression symptoms).

Considering the findings presented above, this study assessed the validity evidence based on the internal structure (i.e., factor intercorrelations) of the MIAS, and evaluated the reliability (internal consistency and test-retest reliability) and the criterion-related validity (concurrent, convergent, and predictive) of the MIAS and MDRIAS.

2. Method

2.1. Participants

Data for this study come from the assessments of a community sample of 149 Latinx adults participating in a randomized clinical trial on the effectiveness of culturally adapted motivational interviewing on alcohol consumption ([Lee et al., 2019](#)). The sample consists of only the participants who took part in the active culturally adapted motivational intervention ($n = 149$) because the trial used the MIAS and MDRIAS as treatment tools to help tailor the cultural adaptation ([Lee et al., 2020](#)). Thus, because the control group did not receive the MIAS and MDRIAS scales, this secondary data analysis does not use the participants in the control sample ($n = 147$). Participants were between 18 and 65 years of age ($M = 41.2$ years old), mostly male (61.7%), mostly single (52.4%), mostly immigrants from outside the US mainland (60.4%), from an urban Northeastern region, were heavy drinkers (>2 heavy drinking occasions/month of $\geq 4/5$ drinks per occasion for women/men), and mostly foreign-born (60.4%). [Table 1](#) provides more information about sample demographics.

2.2. Procedures

The study administered the MIAS and MDRIAS in English and Spanish at baseline, 6 months, and 12 months. Assessments at baseline were used to assess factor structure, validity, and internal consistency reliability. The study used assessments at follow up (6- and 12-months) exclusively for the test-retest reliability analyses. The university Institutional Review Board approved the original study, and the trial was registered with ClinicalTrials.gov (NCT [01996280]).

2.3. Measures

2.3.1. Measures of Immigration and Acculturation Stressors

Measure of Immigration and Acculturation Stressors (MIAS). The initial version of the MIAS comprised 19-items. Depending on the item, one of three different response scales was used to indicate either how stressful the stressor was perceived to be, how frequently the stressor was experienced, or how strongly the respondent agreed with the statement (see [Table 2](#) for exact wording). All three response scales were scored on a five-point Likert scale (i.e., 1] not at all stressful to 5] extremely stressful; 1] never to 5] always; and 1] strongly disagree to 5] strongly agree). (See a partial set of items in [Table 2](#).)

Measure of Drinking in Response to Immigration and Acculturation Stressors (MDRIAS). After each MIAS item, respondents answered the corresponding question “How often do you drink when you find yourself in that situation”, scored on a five-point Likert scale ranging from 1) never to 5) always.

Table 1
Study sample characteristics.

Characteristic	N	%
Gender		
Male	92	38.3
Female	57	61.7
Place of birth		
United States	59	39.6
Puerto Rico	39	26.2
Dominican Republic	17	11.4
Other	34	22.8
National origin		
Puerto Rican	74	49.7
Dominican	28	18.8
Central American	12	8.0
South American	22	14.8
Mexican	1	0.7
Cuban	1	0.7
Spaniard	2	1.3
Multi-national origin	9	6.0
Employment status		
Not employed	87	58.4
Part time	27	18.1
Full time	35	23.5
Educational attainment		
Elementary school	17	11.4
High school or equivalent	54	36.2
Some college	52	34.9
College	26	17.5

Characteristic	Mean	Standard deviation
Age	41.2	12.1

Characteristic	Median
Household income	\$15,001–\$30,000

Notes. Central American includes Honduran, Salvadoran, Costa Rican, Nicaraguan, and Guatemalan. South American includes Colombian, Brazilian, Venezuelan, Peruvian, Uruguayan, Ecuadorian, and Chilean. Median is provided for household income since it is a semi-continuous variable with 7 responses.

Table 2
Eigenvalues for the 4 factor MIAS solutions.

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	5.28155	3.66535	0.3521	0.3521
Factor 2	1.61620	0.36279	0.1077	0.4599
Factor 3	1.25342	0.09178	0.0836	0.5434
Factor 4	1.16163	0.38702	0.0774	0.6209
Factor 5	0.77462	0.01544	0.0516	0.6725

Note. Factors with an Eigenvalue above 1.0 were bolded because they were considered to be above the cutoff score for factor inclusion.

2.3.2. Concurrent validity measure

Short Acculturation Scale for Hispanics (SASH; Marín et al., 1987). The study used the 12-item SASH at baseline to assesses the level of acculturation to US mainstream culture using items on language use (e.g., “What language(s) do you usually speak at home?”), media language (e.g., “What language(s) are T.V. programs you usually watch?”), and ethnic social relations (e.g., “The persons you visit or who visit you are”). Responses for language use and media preference ranged from 1) only Spanish to 5) only English. Responses to the ethnic social relations items ranged from 1) all Latinx people to 5) all Americans. Summed scores on the SASH ranged from 12 to 55. Internal consistency reliability for the total SASH in this study was high (Cronbach's $\alpha = 0.91$). In this study, participants' total responses were mean scored and divided into more acculturated (≥ 2.99) or less acculturated (≤ 3.00) for analytic purposes.

2.3.3. Convergent validity measures

Hispanic Stress Inventory (HSI; Cervantes et al., 1991). At baseline, the 24-items from the HSI asked questions about immigration stress (e.g., “Not having the proper legal status”), health stress (e.g., “Because of my legal documentation, I could not get health care”), relationship stress (e.g., “I was separated from my partner”), and occupational stress (e.g., “I was unemployed”), using a 5-point Likert scale that ranges from 1) not at all to 5) extremely stressful (Lee et al., 2020). Summed scores ranged from 24 to 110 in this study, with greater scores indicating greater stress. Internal consistency reliability for the total HSI in this study was high (Cronbach's $\alpha = 0.91$).

Everyday Discrimination Scale (EDS; Williams et al., 1997). The study used the 8-item EDS at baseline. Participants were asked to report how often in their daily life they experience discrimination, including by addressing statements like “You are treated with less respect than other people are” and “People act as if they think you are dishonest”. Responses ranged from 0 “Never” to 5 “Almost every day”, with the summed scores ranging from 0 to 40. Internal consistency reliability for the total EDS in this study was high (Cronbach's $\alpha = 0.88$).

2.3.4. Predictive validity measures

Alcohol Use Disorder Identification Test (AUDIT; Bohn et al., 1995). The AUDIT assessed the level of hazardous drinking among participants at baseline. The 10-item AUDIT asks participants to report alcohol consumption, behaviors, and consequences. Responses to items ranged from 0 to 4, with the summed scores in this study ranging from 2 to 40. The internal consistency reliability for the total AUDIT in this study was high (Cronbach's $\alpha = 0.88$).

Drinker Inventory of Consequences (DrInC; Miller, 1995). The study used the 45-item DrInC at baseline, 6 months, and 12 months. It assessed the level of drinking consequences among participants. The DrInC asks participants to report physical, intrapersonal, social responsibility, interpersonal, and impulse control consequences. Responses to items ranged from 0 to 3, indicating either frequency of occurrence or strength of agreement with the item, with the summed scores in this study ranging from 0 to 129. The internal consistency reliability for the total DrInC in this study was high (Cronbach's $\alpha = 0.97$).

Beck Anxiety Inventory (BAI; Beck et al., 1988). At baseline, 6 months, and 12 months, the study used the 21-item BAI. It measured the level of anxiety symptoms among participants. Participants reported whether in the last month they had experienced anxiety symptoms, such as feeling hot and wobbliness in legs. Responses to items ranged from 0 “not at all” to 3 “severely – it bothered me a lot”, with the summed scores in this study ranging from 0 to 54. The internal consistency reliability for the total BAI in this study was high (Cronbach's $\alpha = 0.95$).

Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The study used the 20-item CES-D at baseline, 6 months, and 12 months. It rated past-week frequency of depressive symptoms among participants, including questions like “I felt fearful” and “I felt lonely”. Responses to items ranged from 0 “rarely or none of the time (less than 1 day)” to 3 “most or all of the time (5–7 days)”, with the summed scores in this study ranging from 0 to 54. The internal consistency reliability for the total CES-D in this study was high (Cronbach's $\alpha = 0.92$).

2.4. Analytic plan

The study team conducted all analyses using Stata version 16 (StataCorp, 2019). The study used listwise deletion to manage the missing cases (no >3 cases in each model) throughout the analysis. First, we conducted an exploratory factor analysis (EFA) on the baseline MIAS. The study used eigenvalues and interpretability to determine the number of factors to retain and, anticipating that factors would be correlated and not orthogonal, we chose a Promax rotation to estimate the factor loadings. Factors with an eigenvalue above 1.0 that were interpretable

according to prior literature and theory were considered for inclusion in the final factor solution (Nunnally & Bernstein, 1994). The correlations between the rotated factors were all above 0.32, which shows that the Promax rotation was the appropriate rotation for this analysis (Tabachnick & Fidell, 2007). We set an a priori criterion that items needed to have a factor loading of ≥ 0.6 (rounded to the nearest tenth) on only one factor to be retained in the scale. A factor loading of 0.6 has been shown to provide a good fit with population patterns when the study sample is around 150 participants (Guadagnoli & Velicer, 1988). Because the MDRIAS items were contingent on the MIAS responses (i.e., people reporting drinking if they also reported acculturation/immigration stress), the study made the baseline MDRIAS subscales parallel to the MIAS subscales.

Second, the study evaluated model fit using confirmatory factor analysis (CFA) to assess whether the second-order latent MIAS and MDRIAS, measured by their respective first-order subscales, had a good fit with our data and represented the same construct. We present the model χ^2 , comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR) model fit indices to establish whether the data were a good fit to the specified model. We used maximum likelihood and the following cut-off scores to further evaluate the second-order latent factor model of the MIAS: 1) CFI ≥ 0.90 ; 2) RMSEA < 0.07 , and 3) SRMR < 0.08 (Hooper et al., 2008).

Third, to assess the internal structure, we assessed the factor intercorrelations using Spearman correlations between baseline subscales. These intercorrelations helped to evaluate whether the subscales measure a similar construct.

Fourth, to assess the reliability of the overall baseline MIAS, baseline MDRIAS, and all subscales, we analyzed: 1) internal consistency and 2) test-retest reliability. The study estimated Cronbach's alpha scores to assess the internal consistency reliability. Test-retest reliability used pairwise Spearman correlations between baseline and each follow up (i.e., 6 and 12 months) of the MIAS and MDRIAS. We present Spearman correlation coefficients because the study found the scales to be non-normally distributed, and transformation did not correct issues with skewness.

Fifth, the study carried out three types of criterion-related validity analyses for all factors using pairwise Spearman correlations at the baseline assessment (Trochim & Donnelly, 2001). Concurrent validity, which assesses whether the baseline MIAS and MDRIAS could distinguish between acculturation groups, was analyzed by *t*-tests with acculturation level (more vs. less acculturated) using the baseline SASH. Convergent validity, which assessed whether the baseline MIAS and MDRIAS are associated with theoretically similar constructs, was analyzed by correlations with the Hispanic Stress Inventory and the Everyday Discrimination Scale assessed at baseline. Predictive validity was analyzed by correlations with DrInC, BAI, and CES-D at baseline, 6 months, and 12 months. The study also used the AUDIT in predictive validity analyses, but only at baseline since none of the follow up sessions measured it. The study used Cohen's (1988) interpretation of effect sizes (i.e., small = 0.10, moderate = 0.30, and large = 0.50, when rounded to the nearest tenth) to evaluate the correlation coefficients in this study.

Finally, the study conducted a drinking sensitivity analysis where the MIAS total scores and subscales were correlated with their corresponding baseline MDRIAS total scores and subscales to assess whether the MIAS has a larger strength of association with alcohol consumption, as assessed by the MDRIAS, versus other alcohol variables. The study compared the coefficients from this correlation to the correlation coefficients from the predictive validity for the baseline MIAS measure (i.e., correlations with the AUDIT, DrInC, BAI, CES-D). The study found greater correlation coefficients between the baseline MIAS and MDRIAS when compared with the baseline MIAS and the predictive validity measures indicate that the baseline MDRIAS is a more sensitive measure of drinking in response to acculturation and immigration stress.

3. Results

3.1. Measure of Immigration and Acculturation Stressors (MIAS)

3.1.1. Exploratory factor analysis

The coefficients for the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy analysis showed that all 19 items of the original baseline MIAS merited inclusion in the scale (>0.80 ; Kaiser, 1974). Table 3 shows the eigenvalues for the possible factor solutions. Four subscales met the 1.0 cutoff score for eigenvalues.

Due to the complexity of the 1–3 factor solutions and the relative simplicity and interpretability of the 4-factor solution, the study retained the 4-factor solution. We omitted four items because they cross-loaded on two factors. The final 15-item MIAS met our criteria for ensuring factor saturation, with all items loading higher than 0.6 on only one of four factors (see Table 2). The first and last author reviewed and discussed the factor solution and the items under each factor, and generated factor names that mirrored their content. The factors are called: 1) Relational Stress, 2) Perceived Ethnic Discrimination, 3) Attenuated Aspirations, and 4) Sense of Alienation.

3.1.2. Confirmatory factor analysis model fit

The model fit indices for the second-order latent MIAS factor, when modeling all first order factors, showed an overall good fit with the data

Table 3
Four factor solution Principal Component for the MIAS, Promax rotation (N = 148).

Variable	Factor Loading			
	RS	PED	AA	SA
1. It bothers me that family members I am close to do not understand my new values ^a	0.812	-0.083	-0.252	0.267
2. Close family members and I have conflicting expectations about my future ^a	0.781	0.011	-0.018	-0.055
3. It is hard to express to my friends how I really feel ^a	0.773	0.192	-0.074	-0.234
4. I have more barriers to overcome than most people ^a	0.593	0.188	0.057	-0.003
5. When I feel defeated, I feel angry ^c	0.669	-0.196	0.236	-0.013
6. It bothers me when people pressure me to be Americanized ^d	0.050	0.581	0.169	0.181
7. Because of my ethnicity, I feel that others often exclude me from participating in their activities ^a	0.148	0.678	0.138	-0.119
8. People look down upon me if I practice customs of my culture ^a	0.106	0.741	-0.018	0.070
9. Some people dislike me because I am Hispanic ^a	-0.077	0.899	-0.083	0.069
12. The longer I live in this country, the more hard-hearted I become ^c	0.226	-0.191	0.645	0.230
13. In this country, I (my family) have not yet found what I came searching for ^c	-0.164	0.104	0.886	-0.075
14. You come to this country full of hopes to get ahead and realize that what you do is fall behind ^b	-0.088	-0.003	0.898	-0.032
10. I don't feel at home here in the United States ^a	-0.050	0.136	-0.055	0.778
11. People think I'm unsociable when in fact I have trouble communicating in English ^a	-0.004	0.153	0.011	0.661
15. I miss my family and friends who live far from me ^b	0.030	-0.093	0.033	0.755

Notes. Items are numbered according to the order in the finalized MIAS (see Appendix A). RS = Relational Stress; PED = Perceived Ethnic Discrimination; AA = Attenuated Aspirations; SA = Sense of Alienation; Range of responses: a 1 (not at all stressful) to 5 (extremely stressful), b 1 (never) to 5 (always), c 1 (strongly disagree) to 5 (strongly agree). Factor loadings ≥ 0.6 are bolded to illustrate which factor each item loaded on to.

$\chi^2(86) = 126.819, p = .003; CFI = 0.94; RMSEA = 0.057; SRMR = 0.061$.

3.1.3. *Intercorrelations*

The 4 MIAS factors were correlated with each other above 0.46 (Mean $\rho = 0.56$; Table 4) and ranged from moderate ($\rho = 0.47$) to large ($\rho = 0.65$) correlations, indicating that the factors measure a similar underlying construct yet account for separate variance.

3.1.4. *Reliability*

The baseline MIAS showed acceptable internal consistency: Total score ($\alpha = 0.86$), Relational Stress ($\alpha = 0.79$), Perceived Ethnic Discrimination ($\alpha = 0.80$), Attenuated Aspirations ($\alpha = 0.76$), and Sense of Alienation ($\alpha = 0.65$) subscales. Test-retest reliability (Table 5) was excellent, with large positive correlations between baseline and 6-month follow up responses (ranging from $\rho = 0.43$ to $\rho = 0.59$), and moderate to large positive correlations with 12-month follow up responses (ranging from $\rho = 0.34$ to $\rho = 0.58$).

3.1.5. *Criterion-related validity*

Concurrent validity. *t*-Test analyses showed that only the MIAS total scores and Sense of Alienation subscale were significantly associated with acculturation levels. Specifically, less acculturated participants reported greater frequency of drinking due to a sense of alienation (see Table 6).

Convergent validity. The baseline MIAS total score and each of its subscales had moderate to large positive correlations with the Hispanic Stress Inventory (ranging from $\rho = 0.26$ to $\rho = 0.46$) and small to large positive correlations with Everyday Discrimination Scale scores (ranging from $\rho = 0.20$ to $\rho = 0.42$; see Table 6).

Predictive validity. In terms of predictive validity with alcohol-related variables, the baseline MIAS total score and its subscales had small to moderate positive correlations with the AUDIT (ranging from $\rho = 0.24$ to $\rho = 0.36$), small to large positive correlations with the baseline DrInC (ranging from $\rho = 0.20$ to $\rho = 0.46$). Additionally, the baseline MIAS total score and all its subscales, except the Sense of Alienation (nonsignificant), had small to moderate positive correlations with the 6-month DrInC (ranging from $\rho = 0.22$ to $\rho = 0.33$) and small to moderate positive correlations with the 12-month DrInC (ranging from $\rho = 0.21$ to $\rho = 0.33$).

In terms of predictive validity with mental health variables, the baseline MIAS total score and its subscales had moderate to large

Table 4
Standardized intercorrelations among the MIAS and MDRIAS factors.

	Measure of Immigration and Acculturation Stressors			
	RS	PED	AA	SA
RS	–			
PED	0.60***	–		
AA	0.51***	0.58***	–	
SA	0.47***	0.65***	0.57***	–

	Measure of Drinking in Response to Immigration and Acculturation Stressors			
	DRRS	DRPED	DRAA	DRSA
DRRS	–			
DRPED	0.68***	–		
DRAA	0.68***	0.62***	–	
DRSA	0.67***	0.70***	0.66***	–

Note. RS = Relational Stress; PED = Perceived Ethnic Discrimination; AA = Attenuated Aspirations; SA = Sense of Alienation; DRRS = Drinking in Response to Relational Stress; DRPED = Drinking in Response to Perceived Ethnic Discrimination; DRAA = Drinking in Response to Attenuated Aspirations; DRSA = Drinking in Response to the Sense of Alienation.

correlations with the baseline BAI (ranging from $\rho = 0.30$ to $\rho = 0.52$), small to moderate correlations with the 6-month BAI (ranging from $\rho = 0.23$ to $\rho = 0.44$), and small to moderate correlations with the 12-month BAI (ranging from $\rho = 0.21$ to $\rho = 0.41$) with only Sense of Alienation being not significantly related at 12 months. The baseline MIAS total score and its subscales also had moderate to large correlations with baseline CES-D scores (ranging from $\rho = 0.32$ to $\rho = 0.61$; see Table 6), moderate to large correlations with 6-month CES-D scores (ranging from $\rho = 0.27$ to $\rho = 0.56$), and small to large correlations with 12-month CES-D scores (ranging from $\rho = 0.23$ to $\rho = 0.54$) with only Sense of Alienation being not significantly related at 12 months.

3.2. *Measure of Drinking in Response to Immigration and Acculturation Stressors (MDRIAS)*

3.2.1. *Choice of subscales*

The study created four baseline MDRIAS subscales to parallel the MIAS subscales: Drinking in Response to Relational Stress; Drinking in Response to Perceived Ethnic Discrimination; Drinking in Response to Attenuated Aspirations; and Drinking in Response to the Sense of Alienation.

3.2.2. *Confirmatory factor analysis model fit*

The model fit indices for the second-order latent MDRIAS factor, when modeling all first order factors, showed an overall good fit with the data ($\chi^2(86) = 207.101, p < .001; CFI = 0.94; RMSEA = 0.098; SRMR = 0.049$).

3.2.3. *Intercorrelations*

The 4 baseline factors were correlated with each other above 0.62 (Mean $\rho = 0.67$; Table 4), indicating that the factors measure a similar underlying construct yet account for separate variance.

3.2.4. *Reliability*

The baseline total score and subscales showed excellent internal consistency: total MDRIAS ($\alpha = 0.96$), Drinking in Response to Relational Stress ($\alpha = 0.90$), Drinking in Response to Perceived Ethnic Discrimination ($\alpha = 0.94$), Drinking in Response to Attenuated Aspirations ($\alpha = 0.88$), and Drinking in Response to the Sense of Alienation ($\alpha = 0.85$). Test-retest reliability was excellent (Table 5), with large positive correlations between baseline and 6-month follow up values (ranging from $\rho = 0.50$ to $\rho = 0.63$), and moderate to large positive correlations with 12-month follow up values (ranging from $\rho = 0.28$ to $\rho = 0.53$).

3.2.5. *Criterion-related validity*

Concurrent validity. *t*-Test analyses showed that only the Sense of Alienation subscale was significantly associated with acculturation levels. Specifically, less acculturated participants reported greater MDRIAS total scores and sense of alienation.

Convergent validity. The baseline MDRIAS total and its subscales had moderate to large positive correlations with the Hispanic Stress Inventory (ranging from $\rho = 0.29$ to $\rho = 0.44$) and moderate positive correlations with the Everyday Discrimination Scale scores (ranging from $\rho = 0.26$ to $\rho = 0.36$; see Table 6).

Predictive validity. In terms of predictive validity with alcohol-related variables, the baseline MDRIAS total scores and its subscales had large positive correlations with the AUDIT (ranging from $\rho = 0.50$ to $\rho = 0.62$), large positive correlations with the baseline DrInC (ranging from $\rho = 0.52$ to $\rho = 0.67$), moderate to large positive correlations with the 6-month DrInC (ranging from $\rho = 0.36$ to $\rho = 0.52$), and moderate to large positive correlations with the 12-month DrInC (ranging from $\rho = 0.30$ to $\rho = 0.49$).

In terms of predictive validity with mental health-related variables, MDRIAS total scores and its subscales had moderate to large positive correlations with the baseline BAI scores (ranging from $\rho = 0.39$ to $\rho =$

Table 5

Test-retest reliability correlations for the MIAS, MDRIAS, and subscales.

Dependent variable	Measure of Immigration and Acculturation Stressors									
	MIAS total score		RS		PED		AA		SA	
	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p
6-Months MIAS/subscale	0.59(116)	<.001	0.58(116)	<.001	0.43(116)	<.001	0.51(116)	<.001	0.56(116)	<.001
12-Months MIAS/subscale	0.55(106)	<.001	0.58(107)	<.001	0.34(107)	<.001	0.45(107)	<.001	0.51(106)	<.001

Dependent variable	Measure of Drinking in Response to Immigration and Acculturation Stressors									
	MDRIAS total score		DRRS		DRPED		DRAA		DRSA	
	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p
6-Months MDRIAS/subscale	0.59(118)	<.001	0.63(118)	<.001	0.51(118)	<.001	0.50(118)	<.001	0.55(118)	<.001
12-Months MDRIAS/subscale	0.49(109)	<.001	0.53(109)	<.001	0.28(109)	.003	0.46(109)	<.001	0.44(109)	<.001

Notes. MIAS = 15-item Measure of Immigration and Acculturation Stressors total scores; MIAS/Subscale = MIAS or respective subscale; RS = Relational Stress; PED = Perceived Ethnic Discrimination; AA = Attenuated Aspirations; SA = Sense of Alienation; MDRIAS = Measure of Drinking in Response to Immigration and Acculturation Stressors total scores; DRRS = Drinking in Response to Relational Stress; DRPED = Drinking in Response to Perceived Ethnic Discrimination; DRAA = Drinking in Response to Attenuated Aspirations; DRSA = Drinking in Response to the Sense of Alienation; rs = Spearman r statistic; df = degrees of freedom, p = p-value.

0.51), moderate positive correlations with the 6-month BAI scores (ranging from $\rho = 0.29$ to $\rho = 0.39$), and small to moderate positive correlations with the 12-month BAI scores (ranging from $\rho = 0.21$ to $\rho = 0.40$). They also had large positive correlations with the baseline CES-D (ranging from $\rho = 0.50$ to $\rho = 0.63$), moderate to large positive correlations with the baseline CES-D (ranging from $\rho = 0.29$ to $\rho = 0.54$), and moderate to large positive correlations with the baseline CES-D (ranging from $\rho = 0.25$ to $\rho = 0.52$; see Table 6).

3.2.6. Drinking sensitivity analyses

Table 7 presents the correlations between the baseline MIAS total score and subscales and the corresponding baseline MDRIAS total score or subscale. Results showed that all of the baseline MIAS components (i.e., total scores and subscales) had significant, positive, and large relations with their baseline MDRIAS counterparts. A larger strength of association occurred between the baseline MIAS and the baseline MDRIAS components when compared to the relationships between the baseline MIAS components and the drinking outcome variables (i.e., AUDIT and DrInC; Table 6).

4. Discussion

This study presents the development and psychometric evaluation of a Measure of Immigration and Acculturation Stress (MIAS) and a corresponding Measure of Drinking in Response to Immigration and Acculturation Stress (MDRIAS). The MIAS items were determined to comprise four underlying factors, measured by: Relational Stress, Perceived Ethnic Discrimination, Attenuated Aspirations, and the Sense of Alienation. Meanwhile, the MDRIAS measures alcohol consumption in response to each of these types of immigration and acculturation stressors. This study suggests that the MIAS is a psychometrically reliable and valid Measure of Immigration and Acculturation Stressors and the MDRIAS is a reliable and psychometrically valid measures of stressor-related alcohol consumption within this sample.

4.1. MIAS factor structure

The multidimensional factor structure of the MIAS converges with prior research showing that acculturation stress comprises different subtypes of stressors that result from the immigration experience as well as from adapting to another culture (Cervantes et al., 1991; Rodriguez et al., 2002; Suh et al., 2016). For instance, the 5-item Relational Stress subscale measures stressors that can result from being in relationships with others. The 4-item Perceived Ethnic Discrimination subscale measures level of awareness of prejudicial treatment due to ethnic or

immigrant status. Although this subscale was significantly correlated with the Everyday Discrimination Scale (Williams et al., 1997), the items in the Perceived Ethnic Discrimination subscale focus on discrimination due to being Latinx, rather than discrimination for other reasons such as race or gender. The 3-item Attenuated Aspirations subscale consists of items that measure diminished expectations that immigrants may experience between first arrival in the United States and then living in the United States over time (Alegria et al., 2017; Finch & Vega, 2003; Lee, Colby, et al., 2013; Lee, López, et al., 2013; McKeever & Klineberg, 1999). Finally, the 3-item Sense of Alienation subscale assesses the social impacts of immigration such as loneliness.

4.2. MIAS reliability

The MIAS total and all four of its subscales demonstrated good reliability. The internal consistency of the Sense of Alienation subscale was the only MIAS subscale below 0.7, possibly because only three items loaded on this factor. Post-hoc analyses showed that the reliability scores for the MIAS were lower for participants born in the US mainland ($\alpha = 0.51$) than immigrant participants ($\alpha = 0.65$). It is likely that these questions pertain more to immigrants' experiences.

4.3. MIAS criterion-related validity

The findings for the MIAS criterion-related validity analyses suggest that, overall, the MIAS is a psychometrically valid measure for Latinx heavy drinkers, with some exceptions. In terms of concurrent validity, the Sense of Alienation subscale likely was the only subscale significantly different between acculturation groups because the items assessed experiences that mostly immigrant participants would have experienced, meanwhile the rest of the subscales included experiences that could be general to all Latinx people. Also, differences existed in the strength of associations between the convergent validity measures and the MIAS. For example, the Perceived Ethnic Discrimination scale had the largest strength of association with the Everyday Discrimination Scale compared to the rest of the MIAS subscales and the MIAS total score, which suggests that the Perceived Ethnic Discrimination scale also measures discrimination (Williams et al., 1997).

Finally, the predictive validity analyses showed that meaningful differences existed in the strengths of associations with the MIAS subscales. For example, the findings showing that Relational Stress had the strongest relationship with drinking consequences, anxiety symptoms, and depression symptoms support past research showing that Latinx adults who are sensitive to peer influences drink more alcohol when they have conflicts with friends or family (Rodriguez et al., 2020;

Table 6
Criterion-related validity correlations and *t*-tests for the MIAS, MDRIAS, and subscales.

Dependent variable	Measure of Immigration and Acculturation Stressors									
	MIAS total score		RS		PED		AA		SA	
	t(df)	p	t(df)	p	t(df)	p	t(df)	p	t(df)	p
<i>Concurrent validity</i>										
Acculturated (SASH)	2.72(146)	.007	0.93(147)	.353	1.30(146)	.194	1.70(147)	.091	6.56(147)	<.001

Dependent variable	Measure of Immigration and Acculturation Stressors									
	MIAS total score		RS		PED		AA		SA	
	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p
<i>Convergent validity</i>										
HSI	0.46(145)	<.001	0.43(146)	<.001	0.32(145)	<.001	0.32(146)	<.001	0.26(146)	.002
EDS	0.38(146)	<.001	0.34(147)	<.001	0.42(146)	<.001	0.21(147)	.009	0.20(147)	.016
<i>Predictive validity</i>										
AUDIT	0.36(146)	<.001	0.25(147)	<.001	0.34(146)	<.001	0.31(147)	<.001	0.24(147)	.003
Baseline DrInC	0.46(146)	<.001	0.42(147)	<.001	0.37(146)	<.001	0.35(147)	<.001	0.20(147)	.014
6-months DrInC	0.33(117)	<.001	0.32(117)	<.001	0.22(117)	.016	0.27(117)	.003	0.06(119)	.523
12-months DrInC	0.31(107)	.001	0.33(109)	<.001	0.21(109)	.027	0.30(107)	.001	0.06(109)	.549
Baseline BAI	0.52(115)	<.001	0.50(116)	<.001	0.35(115)	<.001	0.30(116)	.001	0.32(116)	<.001
6-months BAI	0.42(119)	<.001	0.44(119)	<.001	0.29(119)	.002	0.23(119)	.012	0.25(119)	.007
12-months BAI	0.38(109)	<.001	0.41(109)	<.001	0.21(109)	.027	0.30(109)	.002	0.14(109)	.137
Baseline CES-D	0.61(146)	<.001	0.57(147)	<.001	0.44(146)	<.001	0.37(147)	<.001	0.32(147)	<.001
6-months CES-D	0.51(119)	<.001	0.56(119)	<.001	0.30(119)	.001	0.28(119)	.002	0.27(119)	.003
12-months CES-D	0.48(109)	<.001	0.54(109)	<.001	0.23(109)	.019	0.30(109)	.002	0.15(109)	.115

Dependent Variable	Measure of Drinking in Response to Immigration and Acculturation Stressors									
	MDRIAS total score		DRRS		DRPED		DRAA		DRSA	
	t(df)	p	t(df)	p	t(df)	p	t(df)	p	t(df)	p
<i>Concurrent validity</i>										
Acculturated (SASH)	0.49(147)	.628	-0.04(147)	.679	-0.10(147)	.925	1.07(147)	.285	2.04(147)	.043

Dependent Variable	Measure of Drinking in Response to Immigration and Acculturation Stressors									
	MDRIAS total score		DRRS		DRPED		DRAA		DRSA	
	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p	rs(df)	p
<i>Convergent validity</i>										
HSI	0.42(146)	<.001	0.40(146)	<.001	0.29(146)	<.001	0.44(146)	<.001	0.30(146)	<.001
EDS	0.35(147)	<.001	0.36(147)	<.001	0.30(147)	<.001	0.26(147)	.002	0.29(147)	<.001
<i>Predictive validity</i>										
AUDIT	0.62(147)	<.001	0.59(147)	<.001	0.50(147)	<.001	0.51(147)	<.001	0.52(147)	<.001
Baseline DrInC	0.67(147)	<.001	0.64(147)	<.001	0.52(147)	<.001	0.57(147)	<.001	0.55(147)	<.001
6-months DrInC	0.51(119)	<.001	0.52(117)	<.001	0.36(119)	<.001	0.41(119)	<.001	0.38(119)	<.001
12-months DrInC	0.46(109)	<.001	0.49(109)	<.001	0.30(109)	.002	0.36(109)	<.001	0.32(109)	<.001
Baseline BAI	0.51(116)	<.001	0.50(116)	<.001	0.42(116)	<.001	0.39(116)	<.001	0.42(116)	<.001
6-months BAI	0.38(119)	<.001	0.39(119)	<.001	0.29(119)	.002	0.31(119)	<.001	0.31(119)	<.001
12-months BAI	0.36(109)	<.001	0.34(109)	<.001	0.21(109)	.027	0.40(109)	<.001	0.28(109)	.003
Baseline CES-D	0.63(147)	<.001	0.60(147)	<.001	0.53(147)	<.001	0.53(147)	<.001	0.50(147)	<.001
6-months CES-D	0.51(119)	<.001	0.54(119)	<.001	0.29(119)	<.001	0.41(119)	.001	0.43(119)	<.001
12-months CES-D	0.46(109)	<.001	0.47(109)	<.001	0.25(109)	.008	0.52(109)	<.001	0.28(109)	.003

Notes. MIAS = 15-item Measure of Immigration and Acculturation Stressors Total Scores; RS = Relational Stress; PED = Perceived Ethnic Discrimination; AA = Attenuated Aspirations; SA = Sense of Alienation; Acculturated (SASH) = More acculturated group determined by the Short Acculturation Scale for Hispanics; HSI = Hispanic Stress Inventory; EDS = Everyday Discrimination Scale; AUDIT = Alcohol Use Disorders Identification Test; DrInC = Drinking Inventory of Consequences; BAI = Beck Anxiety Inventory; CES-D = Center for Epidemiologic Studies Depression Scale; MDRIAS = 15-item Measure of Drinking in Response to Immigration and Acculturation Stressors Total Scores; DRRS = Drinking in Response to Relational Stress; DRPED = Drinking in Response to Perceived Ethnic Discrimination; DRAA = Drinking in Response to Attenuated Aspirations; DRSA = Drinking in Response to the Sense of Alienation; rs = Spearman r statistic; df = degrees of freedom, p = p-value.

Sudhinaraset et al., 2016). The lack of significant findings between the Sense of Alienation subscale and the follow-up predictive measures is likely due to the treatment ameliorating the effects this stressor has on behavioral health outcomes.

4.4. MDRIAS reliability

The MDRIAS total score and all four of its subscales demonstrated good internal reliability. Although the MDRIAS subscales were highly correlated with each other, none of the correlations were >0.7, indicating that <49 % of variance is shared between each pair. These findings show the subscales are assessing somewhat different constructs

Table 7
Correlations between MIAS and MDRIAS subscales.

Correlations between MIAS and MDRIAS	rs	df	p
	(df)		
MIAS total scores → MDRIAS total scores	0.72	146	<.0001
Relational Stress → Drinking in Response to Relational Stress	0.66	147	<.0001
Perceived Ethnic Discrimination → Drinking in Response to Perceived Ethnic Discrimination	0.73	146	<.0001
Attenuated Aspirations → Drinking in Response to Attenuated Aspirations	0.76	147	<.0001
Sense of Alienation → Drinking in Response to Sense of Alienation	0.56	147	<.0001

Note. RS = Relational Stress; PED = Perceived Ethnic Discrimination; AA = Attenuated Aspirations; SA = Sense of Alienation; DRRS = Drinking in Response to Relational Stress; DRPED = Drinking in Response to Perceived Ethnic Discrimination; DRAA = Drinking in Response to Attenuated Aspirations; DRSA = Drinking in Response to the Sense of Alienation; rs = Spearman r statistic; df = degrees of freedom, p = p-value.

(Tabachnick & Fidell, 2007).

4.5. MDRIAS criterion-related validity

In terms of concurrent validity, only the Drinking in Response to the Sense of Alienation was negatively associated with acculturation levels. These findings are in line with the MIAS Sense of Alienation subscale and acculturation findings, indicating that less acculturated individuals drink in response to the greater negative effects of immigration and acculturation.

The convergent validity analyses showed that the MDRIAS total and its subscales were associated with greater Hispanic Stress Inventory and Everyday Discrimination Scale scores, but with different strengths of relationships. The Hispanic Stress Inventory had the largest strength of association with Drinking in Response to Attenuated Aspirations compared to all the MDRIAS factors, indicating that Latinx adults who experienced overall ethnic-specific stressors (measured by the HSI) were more likely to drink when they experience attenuated aspirations. Second, Drinking in Response to Relational Stress had the largest strength of association with the Everyday Discrimination Scale compared to the rest of the MDRIAS subscales and the MDRIAS total score, which may indicate that Latinx heavy drinkers who experience greater conflict with others (i.e., relational stress) and who experience discrimination (i.e., Everyday Discrimination Scale) may drink in response.

The predictive validity analyses showed that the MDRIAS total and all subscales were associated with greater AUDIT, DrInC, BAI, and CES-D scores at baseline. The MDRIAS total score had a larger strength of association with all of these measures than do any of the MDRIAS subscales. The large positive correlations between the MDRIAS total score and with the AUDIT and DrInC suggest that more frequent drinking in response to immigration and acculturation stressors is associated with more serious negative consequences of drinking, supporting the validity of this measure. However, the correlation effects were lower than the 0.8 rule of thumb used to assess multicollinearity (Berry & Feldman, 1985). Although small, drinking in response to immigration and acculturation stress may measure variance in drinking that the AUDIT and DrInC do not measure. The reason for the strong relationship between the MDRIAS total score and these depression and anxiety outcome measures may be due to the fact that more instances of drinking place participants at greater risk of negative mental health outcomes. In fact, research shows that excessive drinking is associated with greater mental health symptoms than are lower levels of drinking (Bellos et al., 2013; Ferusson et al., 2009).

4.6. Drinking sensitivity analyses

The analyses between the MIAS components (i.e., total scores and

subscales) and their corresponding MDRIAS components showed that the MIAS and MDRIAS are correlated, but not to the level of multicollinearity (<0.8; Berry & Feldman, 1985). These findings show that although the MIAS is a strong predictor of MDRIAS, they are two unique constructs that must be measured together to assess the association between immigration/acculturation stressors and drinking in response.

4.7. Limitations

This study has five limitations that should be considered. First, due to the cross-sectional nature of the data, we cannot make causal inferences about the correlations among the baseline measures. Second, respondents participated in a motivational intervention aimed to address social stressors between baseline and the 6-month follow-up assessments (Lee et al., 2019). The intervention may have decreased the strength of relationship between the baseline and follow-up measures due to treatment effects, lowering test-retest reliability. Third, since the sample consists of heavy drinkers, we do not know whether these findings would apply to Latinx adults who are not heavy drinkers. Fourth, Latinx adults are not a homogenous group, especially in their experiences with immigration and acculturation stressors. Future research should assess whether the MIAS and MDRIAS work similarly for different Latinx national groups. Fifth, variance in the responses between immigrant and nonimmigrant participants in our study may be due to the differences in how these participants experience immigration and acculturation stressors. Our sample of US mainland-born and foreign-born participants would not meet the requirement of at least 100 participants per group needed for cross-cultural analyses (Kline, 2015). Thus, future work with a larger sample should use factor invariance methods to assess whether these factors vary by immigration status.

4.8. Future directions

We expect that the MIAS and MDRIAS subscales will help researchers to assess how different immigration and acculturation stressors and drinking in response to those stressors affect mental health outcomes and consequences. For instance, using this subscale can help to document whether Latinx adults drink heavily because of attenuated aspirations or other forms of stress. This knowledge might help to develop multilevel interventions to mitigate the effects of this experience on heavy drinking. At the individual level, clinicians could tailor treatment to the form of stress being experienced that results in the most drinking. At the policy level, funds aimed at eliminating the connection between stress and alcohol use could be used to create infrastructure that would help give immigrants resources to meet their goals and aspirations.

5. Conclusion

Our findings show that the MIAS—in its totality—and its subscales are valid and reliable Measures of Immigration and Acculturation Stressors with heavy drinking Latinx adults. Additionally, the MIAS subscales allow for the identification of specific forms of immigration and acculturation stressors (i.e., Relational Stress, Perceived Ethnic Discrimination, Attenuated Aspirations, and the Sense of Alienation). This study also shows that the MDRIAS and its subscales are valid and reliable measures of drinking in response to immigration and acculturation stressors with heavy drinking Latinx adults. The MDRIAS subscales allow the measurement of drinking in response to specific forms of immigration and acculturation stressors (i.e., Drinking in Responses to Relational Stress, Drinking in Responses to Perceived Ethnic Discrimination, Drinking in Responses to Attenuated Aspirations, and the Drinking in Responses to Sense of Alienation). Both measures provide subscales that correlate with mental health and drinking measures at different levels of strength.

Although other studies have assessed the relationship between acculturation stressors and drinking outcomes, they have been limited

by the absence of a measure that only quantifies Latinx adults' unique amount of drinking in response to acculturation stress. Using the MIAS and MDRIAS together allows assessment of the level of acculturation (MIAS) and whether that level of acculturation is associated with a unique level of drinking (MDRIAS).

Researchers who aim to assess the effects of only one type of immigration and acculturation stressor on drinking should use the validated subscale from the MIAS that assesses the stressor of interest and the corresponding MDRIAS subscale. For example, a research project with an aim of assessing drinking in response to attenuated aspiration should include the Attenuated Aspirations subscale of the MIAS to assess the extent to which a person experiences this type of stressor and the Drinking in Response to Attenuated Aspirations of the MDRIAS to assess the drinking in response to that stressor.

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CRedit authorship contribution statement

Robert Rosales: Conceptualization, Methodology, Software, Data Curation, Formal analysis, Writing- Original draft, Visualization **Christina S. Lee:** Conceptualization, Methodology, Investigation, Resources, Writing – Reviewing and Editing, Project Administration, Funding acquisition. **Dharma Cortes:** Conceptualization of the original measure, Writing – Reviewing and Editing. **Raul Caetano:** Conceptualization of the original measure, Writing – Reviewing and Editing. **Damaris J. Rohsenow:** Writing – Reviewing and Editing, Investigation, Supervision. **Steven R. Lopez:** Conceptualization of the original measure, Writing – Reviewing and Editing. **Suzanne M. Colby:** Conceptualizing, Methodology, Validation, Investigation, Writing- Reviewing and Editing, Supervision.

Declaration of competing interest

The authors have no conflicts of interest to disclose.

Appendix A. The Final MIAS and MDRIAS

Please tell me how stressful each of the following situations is for you:					
	Not at all stressful	Not very stressful	Somewhat stressful	Very stressful	Extremely stressful
1. It bothers me that family members I am close to do not understand my new values	1	2	3	4	5
1a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
2. Close family members and I have conflicting expectations about my future	1	2	3	4	5
2a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
3. It is hard to express to my friends how I really feel	1	2	3	4	5
3a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
4. I have more barriers to overcome than most people	1	2	3	4	5
4a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
5. When I feel defeated, I feel angry	1	2	3	4	5
5a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
6. It bothers me when people pressure me to be Americanized	1	2	3	4	5
6a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
7. Because of my ethnicity, I feel that others often exclude me from participating in their activities	1	2	3	4	5
7a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5

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(continued)

Please tell me how stressful each of the following situations is for you:					
8. People look down upon me if I practice customs of my culture	Not at all stressful 1	Not very stressful 2	Somewhat stressful 3	Very stressful 4	Extremely stressful 5
8a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
9. Some people dislike me because I am Hispanic	Not at all stressful 1	Not very stressful 2	Somewhat stressful 3	Very stressful 4	Extremely stressful 5
9a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
10. I don't feel at home here in the United States	Not at all stressful 1	Not very stressful 2	Somewhat stressful 3	Very stressful 4	Extremely stressful 5
10a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
11. People think I'm unsociable when in fact I have trouble communicating in English	Not at all stressful 1	Not very stressful 2	Somewhat stressful 3	Very stressful 4	Extremely stressful 5
11a. How often do you drink when you find yourself in that situation?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
Please tell me how much you agree or disagree with the following statements:					
12. The longer I live in this country, the more hard-hearted I become	Strongly Disagree 1	Somewhat Disagree 2	Neither Agree nor Disagree 3	Agree 4	Strongly Agree 5
12a. How often do you drink when you feel this way?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
13. In this country, I (my family) have not yet found what I came searching for	Strongly Disagree 1	Somewhat Disagree 2	Neither Agree nor Disagree 3	Agree 4	Strongly Agree 5
13a. How often do you drink when you feel this way?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
14. You come to this country full of hopes to get ahead and realize that what you do is fall behind	Strongly Disagree 1	Somewhat Disagree 2	Neither Agree nor Disagree 3	Agree 4	Strongly Agree 5
14a. How often do you drink when you feel this way?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
15. I miss my family and friends who live far from me	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5
15a. How often do you drink when you feel this way?	Never 1	Rarely 2	Sometimes 3	Most of the time 4	Always 5

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