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The Hispanic Stress Inventory-Adolescent Version: A Culturally Informed Psychosocial Assessment

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Abstract

A 2-phase study was conducted to develop a culturally informed measure of psychosocial stress for adolescents, the Hispanic Stress Inventory-Adolescent Version (HSI-A). Phase I involved item development through the collection of open-ended focus group interview data ($n=170$) from a heterogeneous sample of Hispanic youth residing in the southwest and northeast United States. Phase 2 examined the psychometric properties of the HSI-A ($n=1651$) involving the use of factor analytic procedures to determine the underlying scale structure of the HSI-A, for foreign-born and U.S.-born participants in an aggregated analytic approach. An eight factor solution was established with factors that include Family Economic Stress, Acculturation Gaps Stress, Culture and Educational Stress, Immigration Related Stress, Discrimination Stress, Family Immigration Stress, Community and Gang Violence Stress and Family Drug Related Stress. Concurrent related validity estimates were calculated to determine relationships between HSI-A and other measures of child psychopathology, behavioral and emotional disturbances. HSI-A Total Stress Appraisal Scores were significantly correlated with both the CDI and YSR ($p<.001$ respectively). Reliability estimates for the HSI-A were conducted and yielded high reliability coefficients for most all factor sub-scales with HSI-A Total Stress Appraisal score reliability at $\alpha=.92$.

Keywords

Hispanic; Adolescent; Assessment; Mental Health; Stress

The development of assessment tools specifically for Hispanic youth populations has largely been limited to translation and cultural adaptation of existing tools and measures and not to assess acculturation related stress exposure (e.g., Eisen et al., 2010). The New Freedom Commission's (NFC) Final Report (Health, 2003) affirms the need to eliminate disparities in behavioral health services, and expand and improve early mental health screening, assessment and referral in Hispanic populations. Culturally informed mental health assessment is crucial to accurate diagnosis and subsequent treatment selection and planning.

There have been numerous advances in the development of mental health assessment and diagnostic tests and inventories for children and adolescents (Kotsopoulos, Walker, Copping, Cote, & Stavrakaki, 1994). Most of this development and research focuses on psychological symptomatology and distinct emotional disorders. Self-report, parent-report, and teacher-report measures are now available to assess depression (Kovacs, 2006; Sitarenios & Kovacs, 1999), behavioral disorders (Achenbach, Dumenci, & Rescorla, 2002; Hogan, Quay, Vaughn, & Shaprio, 1989; Quay & Peterson, 1993, Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000), trauma (Bernstein, Ahluvalia, Pogge, & Handelsman, 1997), anxiety (Chorpita, Yim, Moffit, Umemoto, & Francis, 2000; Gerard & Reynolds, 1999; Reynolds & Richmond, 1985), and parenting stress (Sheras, Abidin, & Konold, 1998). Specific to adolescents, there exist tools to assess stress among parents of adolescents (Sheras et al., 1998), coping measure that focus on family crises management (McCubbin, Thompson, & McCubbin, 1996), dating violence (Hokoda et al., 2006), and anxiety and depression (Szabó, 2010).

Work has also been done in the area of development of culturally appropriate measures for assessing stress among Hispanic adults (Barona & Miller, 1994). Additionally, Cervantes, Padilla, Salgado de Snyder (1991), developed both immigrant and non-immigrant versions of the Hispanic Stress Inventory (HSI) to assess stress events across 6 life domains, including acculturation stress. In addition, culturally appropriate measures are now available to assess acculturation (Cuellar, Arnold, & Maldonado, 1995), biculturalism (Cortés & Rogler, 1994), mental health (Cortés et al., 2007), and physical activity (Martinez, Ainsworth, & Elder, 2008).

One gap, however, in assessment science is the lack of measures of psychological status specific to minority group adolescents in the U.S., more specifically Hispanic youth. In spite of the fact that Hispanics now constitute the largest ethnic minority group in the U.S. (Census, 2007), a dearth of mental health and stress assessment instruments exist that are culturally tailored to meet the needs of this highly overlooked and understudied population (Cervantes, Cordova, Fisher & Kilp, 2008). This is particularly relevant because Hispanic youth are at risk of exposure to increased community based challenges and acculturation related stressors, relative to their Euro-American counterparts (Cordova & Cervantes, 2010).

The current research suggests that negative aspects of acculturation can be viewed within a stressful life events paradigm (Rudmin, 2009). This research is based on theory that postulates that social organization plays a significant role in the origins and consequences of stressful life experiences (Aneshensel, 1992). Further, Lazarus and Folkman (1984) articulated the concept of stress appraisal, which is the subjective (negative) psychological reaction to a specific stress event or set of events. Similarly, negatively appraised stressor events related to acculturation within the Hispanic population are an important antecedent for mental health problems in both adults and children (Cervantes et al., 1991, Rogler, Cortes, & Malgady, 1991; Vega & Gil, 1998). Berry (1991), described “acculturation stress” as the result of one’s culture of origin interacting with host culture values, attitudes, customs and behaviors. Individuals and families from one cultural orientation who are constantly being exposed to new, novel, and challenging events and situations, require some form of psychological and behavioral adjustments. Exposure to racial/ethnic discrimination (negative behaviors toward Latino youth) can constitute a source of daily stress (Romero & Roberts, 2003).

Purpose of the Study

The purpose of this 2-phase study was to develop and determine the psychometric properties of the Hispanic Stress Inventory-Adolescent Version (HSI-A), a new culturally informed

psychosocial stress assessment instrument. Informed by previous research conducted on Hispanic stress (Cervantes et al., 1991), The specific aims of this study were to (1) create and test item content in specific domains of life events stress in adolescent Hispanics living in the U.S. and (2) assess both life event stress exposure (i.e. event incidence) and its appraisal in the resulting instrument. By including immigrant and Spanish speaking youth in each step of the sampling, we also expected to find unique immigration stressors, as well as stressors specific to the acculturation process.

Method

Phase I: Generation of Item Pool

An expert panel comprised of four recognized researchers in the field of Hispanic adolescent mental health was interviewed to determine current perspectives on Hispanic Life event stress domains and specific stressor events related to Hispanic minority status. These interviews were used in the construction of (a) operational definitions of conceptual life event stress domains, and (b) development of the open-ended focus group interview guide. The interview guide consisted of six grand tour areas of inquiry and potential probes related to these broad areas. Specifically, each of the grand tour open-ended questions asked participants about stressful life experiences and difficulties. The six grand tour areas of inquiry were consistent with the conceptual life event stress domains and included: 1) immigration stress, 2) communication and language stress, 3) school and academic stress, 4) peer and intimate relationships stress, 5) family stress, and 6) social and economic stress.

Subsequent to the development of the interview guide, focus groups were used to provide information about personal experiences of life event stress. The focus group methodology has been shown to be a useful investigative tool to facilitate collection of rich qualitative responses that provide details of individual experiences and perceptions (Denzin & Lincoln, 2005; Patton, 2002). Moreover, focus groups gather large amounts of data in a relatively short frame, yet produce insights that would not be obtained through individual interviews or quantitative methods (Morgan, 1997; Stewart, Shamdasani, & Rook, 2007). Guidelines established by Umaña-Taylor and Bámaca (2004) and found effective with Hispanic populations were implemented in the study design.

Phase 1 Sample

A total of $N=170$ youth participants were interviewed in 25 focus groups. Participants were recruited from middle schools, high schools and community-based clinical (i.e., behavioral health) programs in two research sites located in the northeast and southwest regions of the U.S., including Trenton, New Jersey ($n=70$), and Los Angeles, California, ($n=100$). A mixed stratified sampling strategy was designed to elicit information about stressors that are relevant to a wide range of Hispanic adolescents from diverse cultural origins, both immigrant and non-immigrant. An attempt was made to recruit an equal number of middle school and high school groups, as well as clinical and non-clinical groups. To be considered for this study, participants had to: (a) identify themselves as Hispanic or Latino, (b) be between the ages of 11 to 19 years old, and (c) give assent and provide parental consent. The exclusion criterion included those individuals who were identified by research staff as having more severe forms of adolescent mental health disorders such as developmental disorders (e.g., autism, mental retardation) and/or childhood/adolescent psychosis.

A descriptive analysis indicated that 42 % of the focus group participants were recruited from middle school, 35% from high school and 23% from clinics. The mean age of the sample was 14.8 ($SD=2.20$) years and more females (62%) than males (38%) participated in this study. About half of the sample (52%) reported Mexico as their family's country of

origin, followed by Guatemala (14%), and Puerto Rico (10%), respectively. The remainder of the sample's family country of origin included South America, Central American and Caribbean countries including Honduras, El Salvador, Costa Rica, and Ecuador. The majority of the participants were foreign born (52%). Sixty percent of the participants reported Spanish as their primary language, followed by bilingual (26%) and English (14%).

Phase I Item Development

Employing similar methods used in the development of the original HSI for adults (Cervantes et al., 1991), the first author along with trained research assistants identified salient life event stressors and appraisal coded text segments. A series of short statements that captured the meaning of the longer coded segments were developed in English in an easily comprehensible format. The first item development analytical procedure captured a full range of stressors and appraisals for both non-clinical and clinical adolescent groups. Next, the specificity of items for each group, with sensitivity for age, gender and most importantly for immigration status differences, was identified. The salient and high frequency stress experience statements and appraisals elicited were then reworded for inclusion in the HSI-A draft version. A total of 160 items were developed for this initial HSI-A item pool.

The rating sheet data and response validity data were quantified, as in the HSI adult content validity study (Cervantes et al., 1991). The content validity approach involved asking two expert clinicians to assign each item into one of six conceptual domains by filling in a Content Validity Rating Form. The experts were instructed to simply assign the number of the one domain that they thought the item best fits under. Statistical analysis used Cohen's kappa index of inter-rater agreement to measure the extent of consensus among the judges (Cohen, 1960) for each item and for the total scale. The researchers constructed a data file making use of a weight variable to specify the counts for each cell in the 6 (Expert 1 rating) \times 6 (Expert 2) contingency tables. The SPSS Count procedure reduced the total scale item data to a large contingency table that was input into the SPSS Crosstabs procedure where the kappa statistic was calculated. The Kappa was calculated on the basis of pair-wise contingency tables built from the responses of successive pairs of judges.

Expert 1 and Expert 2 demonstrated an agreement in rating of 75% of the total 160 items. The kappa index coefficient was .59 and highly statistically significant ($p < .001$). On the basis of the kappa analysis of Expert 1 and Expert 2, all of the scale items were retained. While the kappa was lower than the .70 convention used for inter-item reliability of existing scales, we were dealing with a set of items generated from Hispanic adolescents in a first phase of scale development. We concluded that the kappa was sufficiently high enough not to warrant further item exclusion at this phase of the scale construction process. However, an item-level analysis of the patterns of disagreements indicated that the operational definitions of some of the domains upon which the ratings were based could be sharpened. For example, there were 16 disagreements concerning whether to rate a given item in domain 5 (family stress) or domain 6 (social and economic stress).

Phase II: Multi-site Sampling, Factor Analysis and Reliability Analysis of HSI-A

The research design included four data collection sites that represented the diversity of the national Hispanic adolescent population: Los Angeles, Miami, El Paso, and Boston. The total research sample consisted of 1,651 adolescents, ages 10 to 20. The sample was recruited from middle and high schools and clinics. In effort to assess the psychometric properties of the HSI-A for a range of acculturation levels and immigrant responses, a total of ($n=259$) self-identified immigrant adolescents were sampled.

Procedure

Site data coordinators identified middle schools, high schools where Hispanics represented over 50% of the school samples to be included in the sampling frame. Each school was provided an orientation of the study and a classroom teacher roster was provided by each participating school. These rosters were then separated by grade level, and all 6th–12th grade homeroom classrooms were assigned a consecutive number, and then randomly selected within grade level using the SPSS Randomizer program. Once selected, each classroom teacher was provided a more detailed orientation by the site data coordinators and an informed parental consent form was distributed to each potential adolescent participant. Once all consent forms were returned, the data site coordinator scheduled the group data administration. This procedure was used for all school-based data collection.

Measures

Participants completed the 160 item version of Hispanic Stress Inventory-Adolescent (HSI-A) items. To measure exposure to life event stress, for each item the participant was asked whether they had experienced the stressor (*Yes / No*). If participants reported experiencing a stressor, he or she was asked to rate the appraised stressfulness of the event on a 5-point Likert scale (1= *Not at all worried / tense*; 2 = *A little worried / tense*; 3 = *Moderately worried / tense*; 4 = *Very worried/ tense*; 5 = *Extremely worried tense*). Where participants reported they had not experienced a stressor, the appraisal score was coded to 1 (*not at all worried*). The factor analysis was performed on the appraisal scores. Translation of the HSI-A items into Spanish was conducted by two bilingual psychologists, including the first author. A translation and back-translation process was used (Brislin, 1970).

To examine the construct validity of the HSI-A, participants also completed the Children's Depression Inventory (CDI; Kovacs, 2003) and the Youth Self Report (YSR) portion of the Achenbach System of Empirically Based Assessment (ASEBA; Thomas M. Achenbach & Leslie A. Rescorla, 2001). It was hypothesized that participants who report experiencing higher levels of stress on the HSI-A would also report higher levels of psychopathology, including, symptoms of depression, anxiety, as well as social and behavioral problems. The CDI and YSR were selected a priori as measures of these psychopathologies. The CDI is a 27-item self-report measure of depression symptoms, which has previously been used in Hispanic populations (Cowell, Gross, McNaughton, Ailey, & Fogg, 2005; Worchel et al., 1990). The total CDI score was calculated, along with scores on the 5 subscales (negative mood, interpersonal problems, ineffectiveness, anhedonia, negative self-esteem).

The YSR provides a measure of children's psychopathology. The YSR total score was calculated, as well as 8 syndromes (anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behavior, aggressive behavior) and the Internalizing and Externalizing groups of syndromes.

Data Analysis Methods

The HSI-A was used to measure both whether an adolescent experienced a stressor and the appraised stressfulness of the event. The analysis of the psychometric properties of the HSI-A focused on the appraisal scores, not the exposure to stressors. The appraisal score reflects the intensity of the stressors experienced.

Some of the participants had missing data on the CDI and/or YSR. For the CDI, missing data values were replaced with the mean of the remaining items. Where more than 10% of the CDI items were missing the case was excluded from the validity analysis. For the YSR data, cases where more than 8 items were missing were excluded from the validity analysis.

Results

Demographic Characteristics

The HSI-A was completed by 1,651 participants. Participants who did not identify as Hispanic were excluded from any further analysis ($n = 84$). A small number of participants ($n = 18$), did not self-report being Hispanic, but did indicate their race to be, for example, Mexican, or that the parents were Mexican, or reported speaking Spanish at home and experiencing stress due to being Hispanic. These participants were retained in the analysis. Data from the clinical cases ($n = 299$) were not included in the final analysis because the factor structures of clinical and community samples are not always equivalent (for example, see Kovacs, 2003). In addition, the data were examined for completeness. Participants who did not complete 11 or more HSI-A appraisal items were excluded from further analysis ($n = 284$). Data from 992 participants were included in the factor analysis.

The demographics of the final sample ($n = 992$) and those excluded from the analysis ($n = 659$) are presented in Table 1. Of the participants retained in the analysis, 44.7% ($n=443$) were from Los Angeles, California, 25.5% ($n=253$) Lawrence, Massachusetts, 20.8% ($n=207$) Miami, Florida, and 9% ($n=89$) El Paso, Texas, respectively. The research sites were selected to afford a sample that is representative of the heterogeneity of U.S. Hispanic adolescents in terms of nationality, generation status and geographic location. The final sample represented at least 16 national origins, including Mexican (47.0%), Dominican (13.8%), Cuban (12.4%), and Puerto Rican (7.6%). The majority of the final sample reported that they were born in the U.S. (84.9%), but that their mother (72.0%) and/or father (77.3%) was born outside the U.S. Participants were more likely to report speaking Spanish at home (27.1%) than with friends (3.4%). The sample ranged in age from 11 to 20 years of age ($M = 14.8$, $SD = 1.83$). Participants were given the choice to complete the HSI-A in either English or Spanish. Only 2.0% of the final sample elected to complete the booklet in Spanish. We wanted to create a tool that would be appropriate to all acculturation levels and that would capture immigration related issues, including those that affect non-immigrants. For that reason we decided not to separate immigrant from non-immigrant samples as was done in the original HSI adult development study.

Item Relevance and Analysis

Items were examined for relevance and were excluded from the factor analysis where less than 5% of the sample reported having experienced a stressor. Based on these exclusion criteria, 41 items out of the original 160 item pool set were not included in further analyses.

The remaining 119 HSI-A items were examined for skewness. All items were found to be positively skewed. This is likely to reflect the nature of the measure and sample, and not a bias in the observed data; therefore, we opted not to correct for skew. For the exploratory factor analysis, a principal factors extraction method was used as it does not assume a normal distribution (Fabrigar, Wegener, MacCallum & Strahan, 1999). The exploratory factor analysis was performed on a correlation matrix with correlations between complete-item pairs. Two pairs of gender-specific items (e.g. "I got pregnant", "My girlfriend got pregnant") were combined into single items. Inter-item correlations were examined, and two items were deleted that had very similar item content and were highly correlated with other items ($r = .78$).

Exploratory Factor Analysis

The item pool was subjected to exploratory principal factor analysis with the square of the multiple correlation coefficient (SMC) used to obtain preliminary estimates of

communalities. Both orthogonal and oblique rotations were examined and factor solutions were compared for interpretability (Pett, Lackey & Sullivan, 2003).

The decision to delete items from the item pool was based on several factors, including item loading, cross-loading and internal consistency. Items with factor loadings less than .32 on all factors were removed first (Tabachnick & Fidell, 2001). After several iterations of deleting items on the basis of low item loadings, items that had multiple loadings greater than .32 on two or more factors were deleted (Costello & Osborne, 2005). Through this iterative process the item pool was reduced from 111 items to 72 items. This pool of items was subjected to a final principal factor analysis using a promax rotation (see Table 2). A total of eight factors were extracted on the basis of Velicer's Minimum Average Partial (MAP) Test, the scree test, eigenvalues greater than 1 and interpretability (Costello & Osborne, 2005). These eight factors accounted for 81.6% of item variance.

The first factor, *Family Economic Stress* (12 items), reflects family financial struggles, including problems paying bills and having access to medical care. The second factor, *Culture and Educational Stress* (14 items), includes stress experienced due to Hispanic culture not being recognized at school and racial tensions at school. The third factor, *Acculturation Gap Stress* (12 items), includes items assessing intercultural and intergeneration conflict. Factor 4, *Immigration-Related Stress* (7 items), reflects personal experiences of stress due to immigration.

The fifth factor, *Discrimination Stress* (6 items), includes experiences of racism, bullying and disrespect at school. The sixth factor, *Family Immigration Stress* (7 items), reflects stress due to legal problems experienced by family members when immigrating. The seventh factor, *Community and Gang-Related Stress* (8 items), includes items relating to both personal experiences of violence and gangs, and stress related to violence in the community. The final factor, *Family and Drug Related Stress* (6 items), reflects stress associated with violence, drug use in the family.

Reliability

Coefficient alphas were calculated to examine whether removing further items would improve the internal consistency of the subscales (Table 3). The Family Economic Stress, Culture and Educational Stress, Acculturation-Gap Stress and Immigration-Related Stress subscales had very good internal consistency (DeVellis, 2003). The Discrimination Stress and Family Immigration Stress subscales also had good estimates of internal consistency. The Community and Gang-Related Stress scale had acceptable internal consistency, while the Family and Drug Related Stress scale ($\alpha = .64$) had lower but not unacceptable internal consistency (DeVellis, 2003). After reviewing the item-total correlations and coefficient alphas only one item was identified to be removed from the scale. The final item of the Family and Drug Related Stress scale (Hard to switch from English to Spanish) was not interpretable and had a low item-total correlation ($r = .25$) and therefore was removed from the subscale (Field, 2005). Removing the item did not reduce the coefficient alpha for the subscale. The final HSI-A consisted of 71 items measuring 8 subdomains. The total scores on the HSI-A subscales were moderately correlated ($.07 < r < .47$; see Table 6). The mean and standard deviations for scale and the subscales are presented in Table 3.

Concurrent Validity Estimates

Pearson correlation coefficients were calculated to examine the relation between the HSI-A total score (the mean of all HSI-A items), HSI-A subscales and scores on the CDI and YSR (Tables 4 and 5). The HSI-A total score was positively correlated with the total CDI score ($r = .41, p < .001$), indicating that higher appraisals of stress were associated with more

frequent and intense depressive symptoms. The total score was most strongly associated with scores on anhedonia ($r = .41, p < .001$) and negative mood ($r = .36, p < .001$). The HSI-A Acculturation-Gap subscale was most highly correlated with scores on the CDI subscales ($.16 > r > .40$).

The HSI-A total score was positively correlated with the YSR total score ($r = .49, p < .001$), and was more strongly associated with Internalizing ($r = .49, p < .001$) than Externalizing ($r = .41, p < .001$). The HSI-A total score was most strongly associated with the anxious/depressed YSR syndrome scale ($r = .45, p < .001$) and the thought problems scale ($r = .45, p < .001$), followed by somatic problems ($r = .44, p < .001$), and social problems ($r = .43, p < .001$). The Acculturation-Gap Stress, Discrimination Stress, and Family and Drug Related Stress HSI-A subscales were most strongly associated with anxiety and depression on the YSR. The HSI-A Acculturation-Gap Stress Family and Drug Related Stress and Community and Gang-Related Stress subscales were most strongly associated with aggressive behavior. Of the HSI-A subscales, the Acculturation-Gap subscale was most highly correlated with the YSR syndrome scales ($.37 > r > .51$). The Immigration-Related Stress scale was the HSI-A subscale most weakly associated with the YSR syndrome scales ($.06 > r > .16$).

Discussion

Hispanic adolescents experience significant health disparities and are exposed to intense contextual challenges (Cordova & Cervantes, 2010; Santisteban & Mena, 2009). The purpose of this study was to systematically develop an instrument that would have high utility to both professionals and researchers who conduct research or practice with foreign-born and U.S.-born Hispanic adolescents. Specifically, this study aimed to establish the psychometric properties and factor structure of the HSI-A, a culturally-informed stress assessment specifically tailored to Hispanic adolescents. Our development of the Hispanic Stress Inventory-Adolescent version was grounded on the previous pioneering work of Cervantes et. al. (1991) in the area of assessment in Hispanic populations.

Exploratory factor analysis procedures were implemented and yielded an interpretable eight-factor solution, with factors labeled Family Economic Stress, Acculturation-Gap Stress, Culture and Educational Stress, Immigration Related Stress, Community and Gang-Related Stress, Discrimination Stress, Family and Drug Stress, and Family Immigration Stress. Further, our study demonstrated that the HSI-A has strong concurrent validity with measures of psychological symptomatology. The HSI-A total and sub scale stress appraisal scores also show well acceptable estimates of internal consistency. Future research on the HSI-A final 71 item version is needed to determine the utility of the tool and whether it is appropriate for use in clinical settings. Findings from the study suggest that appraisals of stress as measured by the HSI-A is associated with higher levels of symptoms related to psychopathology, behavioral and conduct problems, as well as higher levels of emotional disturbance among youth participants. Separately, many of the HSI-A subscales show unique relationships with particular behavioral and emotional syndromes. One sub-scale factor, Acculturation Gaps, appears to be one of the more robust measures of psychosocial stress in Hispanic adolescents with high scores corresponding to increased risk for childhood depression as measured Kovacs' Children's Depression Inventory. The HSI-A, when compared to other assessment measures, has the unique ability to screen for culturally based stressor events such as acculturation gaps, family immigration stress, and discrimination stress. The role of acculturation gaps and related problems among youth and their potential for increasing depression in this population is in need of much more study. Additionally, we noted that the Family and Drug Stress sub-scale factor corresponded with increased reports of aggressive behavior, reinforcing previous research on the link between family instability, poor parenting practices and conduct related problems in Hispanic youth (Santisteban & Mena,

2009). Again, research into the nature of this relationship and the HSI-A's potential as a screening and early detection tool is needed. Culturally informed early screening and assessment with tools such as the HSI-A may prove beneficial to school personnel, as well as trained clinicians desiring more relevant diagnostic information for treatment planning purposes.

Limitations

The study has several limitations that merit attention. In Phase I, the study design consisted of a convenience sample and thus participants were not randomly selected. The study sample was school based, predominately of Mexican-origin with fewer participants representative of Central and South America. With regard to Phase II study limitations, a limited number of Hispanic immigrant adolescents were recruited, relative to non-Immigrant. This may be in part because of the current sociopolitical and anti-immigrant climate. Nevertheless, recruiting a larger immigrant sample would be useful. Finally, the clinic-based sample was collected at two sites and not sufficient to conduct separate analysis for this study.

Notwithstanding these limitations, the study resulted in an important step toward providing health and mental health researchers and clinicians with a more precise and culturally informed assessment tool for Hispanic adolescents. Future studies using the HSIA are suggested in clinical and high risk groups of youth, as well as studies on the HSIA utility as a treatment planning tool.

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Table 1

Participant Demographics

Variable	EFA sample (<i>n</i> = 992)	Excluded cases (<i>n</i> = 659)
Mean Age	14.8y (1.83 <i>SD</i>)	14.6y (1.74 <i>SD</i>)
Sex of Subject		
Male	44.5% (<i>n</i> = 440)	53.2% (<i>n</i> = 347)
Female	55.5% (<i>n</i> = 548)	46.8% (<i>n</i> = 305)
Data collection site		
Los Angeles, CA	44.7% (<i>n</i> = 443)	41.6% (<i>n</i> = 274)
El Paso, TX	9.0% (<i>n</i> = 89)	27.2% (<i>n</i> = 179)
Miami, FL	20.8% (<i>n</i> = 207)	19.1% (<i>n</i> = 126)
Lawrence, MA	25.5% (<i>n</i> = 253)	12.1% (<i>n</i> = 80)
National origin		
Mexican / Mexican American	47.0% (<i>n</i> = 455)	60.9% (<i>n</i> = 343)
Central American	5.3% (<i>n</i> = 51)	8.0% (<i>n</i> = 45)
South American	3.6% (<i>n</i> = 35)	1.4% (<i>n</i> = 8)
Cuban	12.4% (<i>n</i> = 120)	7.3% (<i>n</i> = 41)
Puerto Rican	7.6% (<i>n</i> = 74)	3.7% (<i>n</i> = 21)
Dominican	13.8% (<i>n</i> = 134)	7.3% (<i>n</i> = 41)
Mixed	8.9% (<i>n</i> = 86)	10.7% (<i>n</i> = 60)
Other	1.4% (<i>n</i> = 14)	0.7% (<i>n</i> = 4)
Born in the U.S.	84.9% (<i>n</i> = 840)	83.0% (<i>n</i> = 528)
Parent(s) born outside U.S.	84.7% (<i>n</i> = 833)	82.8% (<i>n</i> = 528)
Language spoken at home		
English	24.3% (<i>n</i> = 239)	27.0% (<i>n</i> = 175)
Spanish	27.1% (<i>n</i> = 267)	31.3% (<i>n</i> = 203)
Both English and Spanish	48.4% (<i>n</i> = 476)	37.8% (<i>n</i> = 245)
Living in house / apartment	95.7% (<i>n</i> = 943)	95.5% (<i>n</i> = 617)
Both parents unemployed	5.9% (<i>n</i> = 54)	10.7% (<i>n</i> = 61)
Parent(s) graduated high school /GED	60.6% (<i>n</i> = 547)	44.8% (<i>n</i> = 254)

Table 2

Factor Loadings of Hispanic Stress Inventory-Adolescent Items

	I	II	III	IV	V	VI	VII	VIII
I. Family Economic Stress								
Family could not afford medications	.69	.02	-.12	-.01	.07	-.08	.06	.03
Family struggled paying bills	.65	-.14	-.03	-.04	.06	.14	-.03	.19
Family had problems paying rent	.64	-.14	.01	.01	.02	.22	.01	.11
Family could not afford to pay doctors	.64	.04	-.07	-.02	.01	-.02	.03	.01
Not enough money for everyone in family	.56	.12	.07	.00	-.06	.19	.00	-.07
Could not afford to buy good clothes	.55	-.07	.16	.00	.10	-.03	-.08	-.09
Money problems interfered with school	.54	.07	.11	-.10	.04	.09	-.18	.09
Could not afford to move	.52	.08	.04	.04	.02	-.02	.06	-.09
Parents could not get a good job	.48	.10	.01	.06	-.10	.17	.09	-.01
Family's needs came before my needs	.44	-.06	.12	.03	.02	-.05	.04	.13
No money to plan for college	.41	.04	-.02	.03	-.02	-.05	-.02	.14
Money problems made me want to leave school	.39	.03	-.03	.00	.02	.09	.01	.09
II. Culture and Educational Stress								
People were suspicious of me when I spoke Spanish	-.03	.68	-.02	-.03	.07	.01	.00	-.09
Racial tensions at school	-.05	.56	-.09	-.15	.14	.21	-.01	.12
Had to translate personal information for parents	.29	.54	-.05	-.04	-.04	.00	-.02	.08
School ignored cultural history	.09	.51	-.19	-.09	-.09	.08	.17	.08
Latinos at school not accepted	-.11	.49	-.02	.09	-.02	.07	-.01	.13
Teachers think I am cheating when I am speaking Spanish	-.03	.47	.02	.06	.19	-.03	.05	.01
Arguments with non-Hispanic students	-.11	.46	.22	-.07	.04	-.08	.02	.08
Customs and holidays not recognized at school	-.03	.45	.08	.01	-.06	.01	.05	-.06
Family members were rejoined	.06	.45	.13	.13	-.14	-.09	.02	-.16
Negative stereotypes of Latinos in neighborhood	-.04	.44	.05	-.04	.00	.04	.17	.05
Ridiculed because of clothes	.15	.41	.12	-.01	.21	-.14	.05	-.16
Did not mix with other cultures / races	-.05	.39	-.02	-.02	.06	.09	-.08	.00
Embarrassed because parents do not speak good English	.16	.36	.18	.11	-.08	-.15	-.11	-.02
Things taught at school irrelevant to me	.14	.36	-.04	-.02	.09	.02	.04	-.03
III. Acculturation-Gap Stress								

	I	II	III	IV	V	VI	VII	VIII
Parents overprotective	-.07	-.07	.72	-.08	-.01	.10	.1	.5
My parents were too traditional	.10	-.02	.69	-.05	.00	.09	-.11	-.09
Parents did not understand me	-.11	.18	.58	-.01	.02	.06	.08	.04
Parents disapproved of friends	-.05	.05	.56	-.03	.08	.06	.07	.12
Parents want me to maintain customs and traditions	.11	.03	.44	.07	-.12	-.02	.05	-.06
No privacy at home	.20	-.01	.42	-.04	-.03	.02	.02	.16
Parents upset that I wanted to date outside my race /ethnicity	-.01	.11	.38	-.07	-.06	-.04	-.03	.01
Broke up with boyfriend / girlfriend	-.02	-.10	.38	.01	-.03	.10	.15	.01
Parents used different rules for daughters / sons	.01	-.02	.37	.05	-.04	.05	.03	.26
Expected to do many chores at home	.11	-.04	.36	.07	.09	.01	.07	.05
Forgot some Spanish	.02	.14	.36	-.01	.08	-.06	-.02	.02
Expected to be like a parent to siblings	.15	-.07	.34	-.03	.05	.15	-.04	.06
IV. Immigration-Related Stress								
Left close friends in home country	-.02	-.10	.01	.86	.04	-.01	.06	-.05
Thought about life in home country	.00	-.07	-.04	.77	.03	-.03	.00	.03
Hard leaving people in home country	-.06	-.08	.05	.74	-.03	.07	.03	.00
Separated from some family members	.03	.11	.05	.73	-.02	.00	.05	-.02
Had to leave family behind in home country	.01	-.02	-.17	.73	.03	.02	.01	.12
Members of family "homesick"	.03	.15	.10	.40	-.02	.11	-.10	.05
Learning English was a struggle	.03	.01	-.15	.38	.08	.15	-.08	.17
V. Discrimination Stress								
Students made racist comments	-.02	-.01	-.13	.00	.75	.14	.02	-.05
Students said racist things	-.10	.07	-.14	.02	.71	.25	.09	-.11
Picked on by other students	.09	.08	.14	-.02	.57	-.14	-.07	.08
Pointed at and called names	.19	-.05	.05	-.02	.56	-.04	.07	-.07
Not liked because of looks	.02	.19	.18	.09	.51	-.11	.05	-.13
Disrespected by other students	.08	.01	.17	.07	.42	-.13	-.06	.22
VI Family Immigration Stress								
Family afraid of getting caught by immigration officials	.08	-.04	-.01	.00	.10	.64	-.01	.00
Family had problems with immigration papers	.12	-.08	.08	-.02	.01	.63	.06	-.11
Family had problems finding work after migrating	.17	.16	.06	.07	-.04	.52	.04	-.14

	I	II	III	IV	V	VI	VII	VIII
Family had to pay a lot of money to migrate	.01	.18	.07	.13	-.11	.48	-.02	-.05
Family were caught when migrating	-.01	-.17	.13	-.04	.14	.46	.15	-.09
Family was forced to migrate	-.08	.26	.07	.11	-.14	.36	-.02	.13
Family started all over after migrating	.04	.18	.04	.23	.03	.36	-.09	.02
VII Community and Gang Violence Stress								
A lot of pressure to get involved with gangs	.02	.01	-.02	.07	.02	.03	.49	-.03
Neighborhood dangerous	.05	.20	.05	.00	.00	.00	.46	.05
Saw drive-by shooting	-.02	.03	.07	-.03	-.09	.08	.43	.02
Boyfriend / girlfriend in gang	.04	-.01	.07	-.03	.07	.04	.41	.12
Involved in physical fights	-.11	-.03	.17	.00	.18	.02	.37	.09
Stereotyped as a gang member	.10	.08	-.15	.03	.07	.02	.36	.12
Saw weapons at school	.14	.29	-.04	-.06	.04	-.12	.34	.08
Fought with other students	-.19	.00	.18	.00	.11	.07	.33	.15
VIII. Family and Drug Related Stress								
Violence in family	.17	-.12	.15	.05	-.04	-.11	.16	.47
Family member sold drugs	.09	.01	.00	-.01	-.10	-.12	.22	.45
Family member had a drug problem	.17	-.06	.01	.02	-.11	-.07	.19	.40
Too little contact with parents	.11	.06	.15	.02	-.08	.03	-.01	.40
Hard to speak with family	-.09	.18	.28	.01	.10	.04	-.05	.35
Hard to switch from English to Spanish ^a	.03	.12	.03	.20	.12	-.10	-.16	.34

^aThis item was deleted from the final scale.

Table 3

Summary of Coefficient Alphas, Means and Standard Deviations for Scores on the Hispanic Stress Inventory-Adolescent

	α	Items	SUM	MEAN
HSI-A Total Stress-Appraisal Score	.92	71	86.12 (19.74)	1.20 (.28)
Family Economic Stress	.85	12	14.83 (5.61)	1.24 (.47)
Culture and Educational Stress	.84	14	15.20 (3.46)	1.09 (.25)
Acculturation-Gap Stress	.82	12	16.10 (6.06)	1.34 (.51)
Immigration-Related Stress	.84	7	8.18 (3.30)	1.17 (.47)
Discrimination Stress	.78	6	6.88 (2.46)	1.15 (.41)
Family Immigration Stress	.77	7	8.36 (3.23)	1.19 (.46)
Community and Gang-Related Stress	.69	8	9.62 (3.13)	1.20 (.39)
Family and Drug Stress	.64	5	6.30 (2.50)	1.26 (.50)

Table 4
 Summary of intercorrelations of the Hispanic Stress Inventory-Adolescent and Children's Depression Inventory (CDI)

<i>N</i> = 786	CDI Total	CDI Negative Self	CDI Anhedonia	CDI Ineffectiveness	CDI Interpersonal	CDI Negative Mood
HSI-A Total Stress-Appraisal Score	.41***	.32***	.41***	.30***	.15***	.36***
Family Economic Stress	.28***	.22***	.31***	.19***	.04	.25***
Culture and Educational Stress	.23***	.18***	.22***	.19***	.07*	.18***
Acculturation-Gap Stress	.40***	.30***	.37***	.29***	.16***	.37***
Immigration-Related Stress	.15***	.11**	.18***	.09*	.02	.12***
Discrimination Stress	.36***	.35***	.33***	.20***	.18***	.33***
Family Immigration Stress	.14***	.07	.18***	.12***	.05	.10**
Community and Gang-Related Stress	.23***	.18***	.17***	.21***	.20***	.19***
Family and Drug Stress	.27***	.20***	.26***	.19***	.15***	.24***

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 5
 Summary of intercorrelations of the Hispanic Stress Inventory-Adolescent and Youth Self Report (YSR)

N = 824	YSR Total	Int	Ext	I	II	III	IV	V	VI	VII	VIII
HSI-A Total Stress-Appraisal Score	.49**	.49**	.41**	.45**	.38**	.44**	.43**	.45**	.37**	.37**	.38**
Family Economic Stress	.32**	.35**	.24**	.30**	.29**	.31**	.25**	.29**	.25**	.22**	.22**
Culture and Educational Stress	.29**	.27**	.23**	.22**	.20**	.27**	.29**	.30**	.23**	.20**	.22**
Acculturation-Gap Stress	.51**	.51**	.43**	.50**	.38**	.43**	.44**	.43**	.41**	.37**	.41**
Immigration-Related Stress	.11*	.15**	.06	.12**	.10*	.16**	.13**	.10*	.06	.06	.06
Discrimination Stress	.34**	.36**	.21**	.35**	.28**	.30**	.37**	.32**	.22**	.19**	.21**
Family Immigration Stress	.22**	.21**	.20**	.16**	.20**	.20**	.14**	.21**	.18**	.18**	.18**
Community and Gang-Related Stress	.29**	.23**	.33**	.19**	.18**	.23**	.22**	.24**	.21**	.31**	.29**
Family and Drug Stress	.36**	.32**	.35**	.31**	.24**	.27**	.25**	.35**	.26**	.32**	.32**

Note. Int = Internalizing; Ext = Externalizing; I = Anxious/Depressed; II = Withdrawn/Depressed; III = Somatic complaints; IV = Thought problems; V = Attention problems; VII Rule-breaking behavior; VIII Aggressive behavior.

* $p < .01$.

** $p < .001$.

Table 6

Inter-correlations between Hispanic Stress Inventory-Adolescent Subscales

	1	2	3	4	5	6	7	8
<i>N</i> = 992								
1. Family Economic Stress	1.0							
2. Culture and Educational Stress	.41**	1.0						
3. Acculturation-Gap Stress	.46**	.45**	1.0					
4. Immigration-Related Stress	.22**	.21**	.19**	1.0				
5. Discrimination Stress	.30**	.44**	.41**	.11**	1.0			
6. Family Immigration Stress	.46**	.35**	.37**	.33**	.21**	1.0		
7. Community and Gang-Related Stress	.34**	.45**	.38**	.07*	.35**	.28**	1.0	
8. Family and Drug Stress	.42**	.31**	.45**	.15**	.25**	.25**	.36**	1.0

* $p < .01$.** $p < .001$.