



Published in final edited form as:

J Adolesc. 2015 July ; 42: 31–39. doi:10.1016/j.adolescence.2015.03.017.

Depressive Symptoms and Externalizing Behaviors among Hispanic Immigrant Adolescents: Examining Longitudinal Effects of Cultural Stress

Miguel Ángel Cano¹, Seth J. Schwartz², Linda G. Castillo³, Andrea J. Romero⁴, Shi Huang², Elma I. Lorenzo-Blanco⁵, Jennifer B. Unger⁶, Byron L. Zamboanga⁷, Sabrina E. Des Rosiers⁸, Lourdes Baezconde-Garbanati⁶, Karina M. Lizzi², Daniel W. Soto⁶, Assaf Oshri⁹, Juan Andres Villamar¹⁰, Monica Pattarroyo⁶, and José Szapocznik²

¹Florida International University

²University of Miami

³Texas A&M University

⁴University of Arizona

⁵University of South Carolina

⁶University of Southern California

⁷Smith College

⁸Barry University

⁹University of Georgia

¹⁰Northwestern University

Abstract

This study examined longitudinal effects of cultural stress (a latent factor comprised of bicultural stress, ethnic discrimination, and negative context of reception) on depressive symptoms and a range of externalizing behaviors among recently (5 years in the U.S. at baseline) immigrated Hispanic adolescents. A sample of 302 adolescents (53% boys; mean age 14.51 years) completed baseline measures of perceived ethnic discrimination, bicultural stress, and perceived negative context of reception; and outcome measures of depressive symptoms, cigarette smoking, alcohol use, aggressive behavior, and rule-breaking behavior six months post-baseline. A path analysis indicated that higher cultural stress scores predicted higher levels of all outcomes. These effects were consistent across genders, but varied by study site. Specifically, higher cultural stress scores increased depressive symptoms among participants in Miami, but not in Los Angeles. Findings

© 2015 Published by Elsevier Ltd on behalf of The Foundation for Professionals in Services for Adolescents.

Correspondence concerning this manuscript should be addressed to Miguel Ángel Cano, Department of Epidemiology, Florida International University, 11200 SW 8th Street, AHC 5-488, Miami, FL 33199 (mcanojr@fiu.edu).

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

suggest that cultural stress is a clinically relevant predictor of depressive symptoms and externalizing behaviors among Hispanic immigrant adolescents.

Keywords

Hispanic adolescents; immigrants; cultural stress; depressive symptoms; substance use; conduct problems

The adolescent population of the United States is becoming increasingly diverse. Currently, about one in five adolescents in the U.S. is Hispanic, and this proportion is expected to reach nearly one in three adolescents by the year 2040 (U.S. Census Bureau, 2012). Both immigration and births are expected to serve as significant drivers of Hispanic population growth through the middle of this century (Bernstein, 2013; Fry & Passel, 2009). Given the growing proportion of Hispanic youth within the U.S. population, identifying and understanding factors associated with health among this population is a critical public health priority.

Compared to non-Hispanic Whites, Hispanics in *middle adolescence* (ages 14-17; Steinberg, 2008) have disproportionately higher rates of depressive symptoms (McLaughlin, Hilt, & Nolen-Hoeksema, 2007) and externalizing behaviors such as smoking cigarettes, binge drinking (Centers for Disease Control and Prevention, 2014), and conduct problems (Forster, Grigsby, Soto, Schwartz, & Unger, in press). To this end, theoretical models posit that the burden of cultural stressors (e.g., acculturative stress and ethnic discrimination) may increase the probability of poor mental health and externalized behaviors among Hispanic immigrants and Hispanics adolescents (Berry, 2003; Vega, Zimmerman, Warheit, Apospori, & Gil, 1997; Viruell-Fuentes, 2007).

Thus, the purpose of the present study was to examine the longitudinal effects of cultural stressors on depressive symptoms and externalizing behaviors (i.e., cigarette smoking, alcohol use, aggression, and rule-breaking) among recently immigrated Hispanics (5 years in the U.S. at baseline) in middle adolescence. The effects of cultural stressors on depressive symptoms and externalizing behaviors behavior may be especially applicable to adolescent immigrants. Bacallao and Smokowski (2007) suggest that immigrant adolescents may be more likely to respond negatively to cultural stressors because, unlike their parents who made the decision to migrate, adolescents may perceive that the costs of migration outweigh the benefits. Further, research has indicated that Hispanics who immigrate to the United States as adolescents report more cultural stressors compared to those who immigrate as young children (Padilla, Alvarez, & Lindholm, 1986) – suggesting that studies are needed to investigate effects of cultural stressors on health outcomes among recently immigrated Hispanic adolescents.

Cultural Stress and Health

In addition to normative stressors associated with adolescence, Hispanic adolescents may also face cultural stressors (Cervantes, Padilla, Napper, & Goldbach, 2013). Although cultural stressors such as *ethnic discrimination* (negative attitudes, beliefs, and differential

treatment toward members of minority ethnic groups; Williams & Mohammed, 2009), *negative context of reception* (the perception that the host culture is unwelcoming and hostile; Schwartz, et al., 2014a), and *bicultural stress* (perceived pressures emanating from interactions with both the heritage and receiving cultural communities; Romero & Roberts, 2003) are often treated as unique constructs, the conceptualization and measurement of these indicators suggests that they may have considerable overlap (Kulis, Marsiglia, & Nieri, 2009; Rudmin, 2009).

In the present study, *cultural stress* is defined as the constellation of multiple factors that contribute to the stress experience of being a Hispanic immigrant in the U.S. This includes three key facets of cultural stress that have been identified in previous literature: (a) subjective cognitive appraisal of bicultural stressors due to pressure to adopt the majority culture as well as to maintain the heritage culture (Romero & Roberts, 2003), (b) experiences of discrimination (Phinney et al., 1998; Viruell-Fuentes, 2007), and (c) a perception that the receiving culture is unwelcoming or presents limited opportunities (Portes & Rumbaut, 2006; Schwartz et al., 2014a). We propose that these three factors operationalized by cognitive appraisal, frequency, and perception of negative encounters with the receiving and heritage cultures will converge in a manner that will demonstrate the multifaceted reality of cultural stress as experienced by Hispanic adolescent immigrants in the United States. As part of the present study, we examined how these three indicators may contribute to a latent cultural stress factor.

Regardless of how cultural stress indicators are operationalized or measured, research has shown that higher reports of cultural stressors increase the probability of poor mental health and externalizing behaviors. For instance, among Hispanic adolescents, higher perceptions of ethnic discrimination have been linked with more depressive symptoms, cigarette smoking, alcohol use, and aggression (Araújo & Borrell, 2006; Delgado, Updegraff, Roosa, & Umaña-Taylor, 2011, Kulis, Marsiglia, & Nieri, 2009; Lorenzo-Blanco et al., 2013; Okamoto, Ritt-Olson, Soto, Baezconde-Garbanati, & Unger, 2009; Smokowski & Bacallao, 2006). Negative context of reception has been associated with conduct problems (Forster et al., in press). Similarly, bicultural stress has been associated with higher levels of depressive symptoms, cigarette smoking, alcohol use, and conduct problems (Forster et al., in press; Romero, Martinez, & Carvajal, 2007).

Gender, Environmental Factors, and Cultural Stress

The effects of cultural stressors on health outcomes may differ across gender (Berry, 2003). Some literature has indicated that girls may experience lower levels of cultural stressors because Hispanic parents tend to be more protective of adolescent girls than boys. As such, girls may be more likely to remain at home, whereas boys are given more freedom and have more opportunities for experiencing cultural stressors (Delgado et al., 2011). In addition, the health of girls may be less affected by cultural stressors because they are more likely to use constructive coping strategies and seek social support (Araújo & Borrell, 2006). Conversely, other literature (Phinney, Berry, Sam, & Vedder, 2006) suggest that boys and girls are equally exposed to both the receiving and heritage cultures and may thus experience similar

levels of cultural stressors. Further, cultural stressors may have a greater adverse effect on girls, especially in relation to depressive symptoms.

Lawton and Gerdes (2014) probed a conceptual model where environmental factors such as the geographic region of the U.S. may directly affect cultural stress, and in turn, influence health outcomes. This proposition is not surprising because geographic regions and communities of settlement (e.g., Miami vs. Los Angeles) within the United States have diverse characteristics such as attitudes toward Hispanic immigrants, sociopolitical history, ethnic density, public policies, and available resources. Similarly, geographic regions may also have different expectations regarding the manner in which immigrants should interact with and acculturate toward the receiving culture, and in turn, these expectations may affect levels of cultural stress (Berry, 2003b; Bourhis, Moïse, Perreault, & Senécal, 1999). To date, few multisite studies (Cervantes, Padilla, Napper, & Goldbach, 2013; Smokowski & Bacallao, 2006) have compared the effects of cultural stressors on health among Hispanic adolescents in different regions of the United States. A prior study that examined the effects of cultural stressors between study sites on conduct problems found no differences (Forster et al., in press). Thus, more prospective studies are needed that examine environmental differences in relation to mental health and other externalizing behaviors such as substance use. The present study is distinct from previous research because it tested an operationalization of cultural stress that accounted for cultural stressors from the receiving culture (e.g., negative context of reception, ethnic discrimination, bicultural stress) and the heritage culture (e.g., bicultural stress). In turn, this construct was used to estimate effects on outcomes of mental health, substance use, and conduct problems in a single model.

The Present Study

Aim 1 of the present study examined the effects of baseline cultural stress levels on depressive symptoms and externalizing behaviors six months post-baseline. Aim 2 examined whether gender and study site moderated these main effects. Based on the body of work reviewed above, the following hypotheses were proposed. *Hypothesis 1*, a higher degree of cultural stress would predict higher reports of depressive symptoms, substance use, aggression, and rule-breaking. *Hypothesis 2*, it is expected that both gender and study site would moderate the effects of cultural stress on all outcomes. Given the mixed findings with gender and the scarcity of multisite studies, we did not advance a priori hypotheses regarding moderated effects. Analyses in the study controlled for age, gender, study site, years in the U.S., parental education; as well as baseline levels of depressive symptoms, aggressive behavior, and rule-breaking behavior.

Method

Participants

The present analyses used the first two timepoints from a longitudinal cohort study of acculturation, family functioning, and risk behavior among Hispanic adolescents (Schwartz et al., 2012; 2014b). Participants included in the present analyses included Hispanic immigrant adolescents from Los Angeles ($n = 150$) and Miami ($n = 152$) who had resided in the United States for five years or less at baseline. Each adolescent participated in the study

with her/his primary parent (although only adolescent data were used in the present analyses). To be included in the study, adolescents had to be entering or completing the ninth grade. Baseline data were collected between May and November 2010, and data for the six-month follow-up were collected between February and June 2011.

At baseline, the mean adolescent age was 14.51 years ($SD = 0.88$ years, range 14 to 17), and 53% of adolescents were boys. Adolescents in Miami had resided in the United States for a significantly shorter period of time ($Mdn = 1$ year, interquartile range = 0-3 years) compared to those in Los Angeles ($Mdn = 3$ years, interquartile range = 1-4 years), Wilcoxon $Z = 6.39$, $p < .001$. A majority of adolescents in Miami had migrated from Cuba (61%), with others coming from the Dominican Republic (8%), Nicaragua (7%), Honduras (6%), and Colombia (6%). In Los Angeles, a majority of adolescents had migrated from Mexico (70%), with others from El Salvador (9%), and Guatemala (6%). Per parents' self-reports, the mean annual household income was \$30,854 (SD \$10,824) and the median was \$30,029 (interquartile range = \$22,815 to \$35,744). Twenty-seven percent of parents reported less than nine years of education, 18% attended high school but did not graduate, 33% completed high school, 12% attended college but did not graduate, and 10% reported having a bachelor's degree or higher.

Procedure

Families were recruited from 23 randomly selected schools (10 in Miami-Dade County and 13 in Los Angeles County) where the student body was at least 75% Hispanic. The study was approved by the Institutional Review Boards of the sponsoring academic institutions and by the Research Review Committees for each of the school districts that participated in the study. Initially 632 families that met inclusion criteria were referred, 435 families were reached via phone to schedule the baseline assessment, and 302 families completed the baseline assessment.

During the initial meeting with each family, the primary caregiver was asked to provide informed consent for her/himself and the adolescent to participate, and adolescents were asked to provide informed assent. During this visit, the parent and adolescent also completed the assessment battery in English or Spanish, according to their respective preferences. Parent and adolescent assessments were conducted in separate rooms using an audio computer-assisted interviewing (A-CASI) system (Turner et al., 1998). At baseline, 66% of Miami families were assessed at a research center and 34% at the school that the adolescent attended. In Los Angeles, 46% of assessments were completed in participants' homes, and the remainder were conducted in locations convenient to participants (e.g., community centers and libraries). The same procedures were followed at the six-month follow-up. For their participation, parents received \$40 at baseline and \$45 at the six-month follow-up. Each adolescent received a voucher for a movie ticket at each timepoint. The retention rate at the six-month follow-up was 96% in Miami and 88% in Los Angeles. More information on the study procedures can be found in Schwartz et al. (2012, 2014b).

Measures

Cultural Stressors—*Perceived ethnic discrimination* was assessed using seven items (Phinney et al., 1998) referring to being called names, followed around stores, and generally viewed with suspicion. A sample item from this measure is, “I feel that others behave in an unfair or negative way toward my ethnic group.” Response choices were on a 5-point Likert scale ranging from 0 (*Not at all*) to 4 (*Almost always*). The mean of the items was used to calculate scores, with higher scores indicating a greater perception of perceived ethnic discrimination. At baseline, the alpha coefficient was .90 in Miami and .88 in Los Angeles.

Perceived negative context of reception was measured using a 6-item scale (Schwartz et al., 2014a). Items assess the perception to which the opportunity structure (e.g., employment or grades) do not favor one’s ethnic group. A sample item is “People from my country are not welcome here.” Response choices were on a 5-point Likert scale ranging from 0 (*Strongly Disagree*) to 4 (*Strongly Agree*). Items were summed to calculate scores, with higher scores indicating a greater perception of negative context of reception. At baseline, the alpha coefficient was .74 in Miami and .75 in Los Angeles. Schwartz et al. (2014a) have demonstrated discriminant validity between perceived discrimination and perceived context of reception.

Bicultural stress, the perception of stressful interactions with both the heritage and receiving cultural contexts, were assessed using the Bicultural Stress Scale (BSS; Romero & Roberts, 2003). The BSS consists of 20 items, each of which is responded to using a 5-point Likert scale ranging from 0 (*Never happened to me*) to 4 (*Very stressful*). Items were summed to calculate scores, with higher scores indicating higher levels of bicultural stress. A sample item is, “I have worried about family members or friends having problems with immigration.” At baseline, the alpha coefficient was .90 in Miami and .88 in Los Angeles

Depressive Symptoms—Symptoms of depression were measured using the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977), a validated measure of depressive symptomatology for use with Hispanic subgroups (Roberts, 1980). This 20-item measure asks respondents to report how they have felt during the past week on a 4-point Likert-type scale ranging from 0 (*Strongly disagree*) to 4 (*Strongly agree*). Items were summed to calculate scores, with higher scores indicating higher levels of depressive symptoms. A sample item is “I felt sad.” Higher scores are indicative of greater depressive symptoms. The alpha coefficients in Miami for CES-D were .93 at baseline and .92 at six months post-post-baseline. The alpha coefficients in Los Angeles for CES-D were .94 at baseline and .91 at six months post-post-baseline.

Externalizing Behaviors—*Cigarette smoking* and *binge drinking* were measured using a modified version of the Monitoring the Future survey (Johnston et al., 2011). Participants responded to questions regarding frequency of cigarette use and alcohol use in the 90 days prior to assessment. For each substance use behavior, participants typed in the number corresponding to how many times they had engaged in that behavior during the 90 days prior to assessment. Substance use variables were dichotomized: for each substance,

participants were coded regarding whether they reported using (1) or not using (0) in the past 90 days.

Aggressive and rule-breaking behavior with corresponding subscales from the Youth Self-Report (Achenbach & Rescorla, 2002). The aggressive behavior and rule-breaking behavior subscales consist of 17 and 15 items, respectively. Sample items include “I physically attack people” (aggressive behavior) and “I set fires” (rule-breaking behavior). Items were summed to calculate scores for each respective scale, with higher scores indicating higher levels of aggressive or rule-breaking behavior. The alpha coefficients in Miami for aggressive behavior were .89 at baseline and .94 at six months post-post-baseline. The alpha coefficients in Los Angeles for aggressive behavior were .88 at baseline and .87 at six months post-post-baseline. The alpha coefficients in Miami for rule-breaking behavior were .89 at baseline and .93 at six months post-post-baseline. The alpha coefficients in Los Angeles for rule-breaking behavior were .86 at baseline and .84 at six months post-post-baseline.

Analytic Plan—The analytic plan included four steps. First, we computed descriptive statistics for key variables used in the model. Second, using Mplus 7 (Muthén & Muthén, 2012), we conducted a first-order confirmatory factor analysis (CFA) to estimate the fit of a latent construct including perceived ethnic discrimination, perceived negative context of reception, and bicultural stress. Using maximum likelihood to estimate the effect of a latent factor on a dichotomous outcome requires 15 dimensions of mathematical integration per outcome. Therefore, we saved a factor score from the CFA back to the dataset and used this score as an observed predictor in subsequent analyses. It should be noted that Ram et al. (2005) found that latent variables correlate at .97 with observed scores saved back to the dataset – suggesting a minimal loss of information.

Third, using a path analyses with maximum likelihood (ML) and a cultural stress factor score derived from the CFA, we estimated the effects of cultural stress at Time 1 on depressive symptoms and externalizing behaviors at Time 2. Fourth, we tested the moderating effects of gender and study site in relation to cultural stress and all the outcomes. In addition to testing interaction effects, conditional effects of statistically significant interactions were examined. PROCESS v2.13 for SPSS (Hayes, 2013) was used to estimate unstandardized conditional effects for gender (boys vs. girls) and study site (Miami vs. Los Angeles). Age, study site, gender, years in the U.S., and parental education were included as covariates in the path analysis. These covariates were included in the path analysis because prior research has indicated they are associated with the predictors and outcomes; thus, may confound the effects of cultural stress. Moderation analyses also controlled for these variables unless they were included in the interaction term. For instance, analyses that tested gender as a moderator controlled for all covariates including study site, but excluded gender.

All outcomes were included in one model to minimize Type I error risk. It has been recommended that longitudinal models also control for prior levels of each outcome variable (Cole & Maxwell, 2003); therefore, we controlled for Time 1 levels of depressive symptoms, aggressive behavior, and rule-breaking behavior. We did not control for baseline levels of cigarette smoking or binge drinking because these categorical variables can remain the same over time even though developmental change has occurred (Agresti, 2007).

Controlling for prior levels of categorical variables may result in inflated standard errors for model parameters, potentially rendering baseline-adjusted results unstable or invalid (Glymour, Weuve, Berkman, Kawachi, & Robins, 2005). A sandwich covariance estimator (Kauermann & Carroll, 2001) was also used to adjust standard errors for the effects of multilevel nesting (families within schools).

Results

Descriptive Statistics

Means and standard deviations for the baseline demographics and cultural stress indicators are provided in Table 1. Prevalence of cigarette smoking and binge drinking in the past 90 days; along with the mean and standard deviation for depressive symptoms and externalizing behaviors six months post-baseline, are also reported in Table 1. A cross tabulation indicated no statistically significant differences by study site or gender in relation to the cultural stress indicators and outcomes. The three cultural stress variables were significantly intercorrelated: negative context of reception with ethnic discrimination ($r = .36, p < .01$); negative context of reception with bicultural stress ($r = .30, p < .01$); and ethnic discrimination with bicultural stress ($r = .46, p < .01$).

The reliability coefficient of the latent cultural stress factor was acceptable (.65). This reliability coefficient was calculated using the formula proposed by Fornell and Larcker (1981), which computes reliability as the ratio of the variability explained by the latent factor to the total reliability among the indicators. A CFA using Time 1 data indicated that the standardized factor loadings were acceptable (perceived ethnic discrimination, .74; perceived negative context of reception, .49; bicultural stress, .62). According to Brown (2006), a standardized factor loading of .40 or higher is acceptable in questionnaire-based research.

Cultural Stress Predicting Outcomes

Consistently, higher scores of cultural stress predicted higher reports of depressive symptoms and externalizing behaviors. Cultural stress predicted higher odds of cigarette smoking ($OR = 1.24, p < .001$), odds of binge drinking ($OR = 1.2, p < .001$), levels of aggressive behavior ($\beta = .28, p < .001$), levels of rule-breaking ($\beta = .25, p < .001$), and levels of depressive symptoms ($\beta = .38, p < .01$).

Moderation Analyses

Moderation analyses were conducted to examine whether gender influenced the direction and/or strength of effects of cultural stress in relation to depressive symptoms and externalizing behavior. Results did not indicate any statistically significant moderating effects of gender. Similarly, we tested if study site moderated the effect of cultural stress on all outcomes. Results indicated that study site significantly moderated the effect of cultural stress on depressive symptoms ($\beta = -.08, p < .05$). Conditional effects indicate that higher reports of cultural stress had a statistically significant effect on depressive symptoms among participants in Miami ($b = 1.15, p < .001, 95\% CI [.57, 1.73]$), but not among participants in

Los Angeles ($b = .56, p = .12, 95\% \text{ CI } [-.15, 1.27]$). Study site did not significantly moderate effects of cultural stress on externalizing behaviors.

Discussion

In the current study, we tested the fit of a latent cultural stress factor and examined its effects on depressive symptoms and externalizing behaviors that included cigarette smoking, alcohol use, aggression, and rule-breaking among recently immigrated Hispanic adolescents. We also examined whether gender and study site moderated the effects of cultural stress on depressive symptoms and externalizing behaviors. The key study findings can be summarized as follows. First, using independent measures for perceived ethnic discrimination, bicultural stress, and perceived negative context of reception, our data support a first-order latent cultural stress factor. Second, higher cultural stress scores predicted increased odds of smoking and binge drinking, as well as higher levels of depressive symptoms and conduct problems. Third, moderation analyses indicated that gender did not moderate the effects of cultural stress on any of the outcomes. However, study site did moderate the effect of cultural stress on depressive symptoms. The conditional effects indicated that higher reports of cultural stress increased depressive symptoms among participants in Miami, but not among participants in Los Angeles.

Findings suggest that cultural stress may be a clinically relevant factor associated with depressive symptoms and externalizing behaviors among Hispanic immigrant adolescents. Thus, existing evidence-based, culturally tailored interventions to prevent health risk behavior among Hispanic adolescents, such as *Keepin' it REAL* (Hecht et al., 2003), *Family Effectiveness Training* (Szapocznik, Santisteban, Rio, Perez-Vidal, Santisteban, & Kurtines, 1989), and *Familias Unidas* (Coatsworth, Pantin, & Szapocznik, 2002) may benefit from integrating modules or exercises that help Hispanic immigrant adolescents develop constructive coping strategies to manage cultural stress (Zayas, 2001). Although the present study did not examine coping strategies, existing literature has suggested that active coping/engagement coping such as reflecting, problem solving, planning, and positive reframing may weaken the effects of cultural stress on depressive symptoms and externalizing behaviors among Hispanic adolescents (Edwards & Romero, 2008).

Our results did not support the hypothesis that gender would moderate the effects of cultural stress on depressive symptoms and externalizing behaviors. One reason for this null finding is that, contrary to other studies (Delgado et al., 2011), in the present study boys and girls reported similar levels of cultural stress. This null finding also suggests that the effects of cultural stress on depressive symptoms and externalizing behaviors unfold similarly for boys and girls. Although some literature has suggested that there may be gender differences in cultural stress exposure and in coping with cultural stress, a majority of studies have been focused on Hispanic adults (Umaña-Taylor & Alfaro, 2009). Thus, more research is needed with adolescent populations. In addition to examining differences between gender, future studies may be more effective in informing prevention interventions by examining coping strategies that moderate the relation between cultural stress and health outcomes among boys and girls (Araújo & Borrell, 2006). Similarly, future research may benefit from examining adaptive and maladaptive aspects of gender roles (e.g., *machismo* and *marianismo*) that have been

linked with health outcomes among Hispanic adolescents (Kulis, Marsiglia, & Nagoshi, 2012).

The data partially support the hypothesis that study site would moderate the effects between cultural stress and the outcomes. Although findings indicate that levels of cultural stress were similar among participants in Miami and Los Angeles; higher cultural stress scores were related to higher levels of depressive symptoms among participants in Miami, but not in Los Angeles. One explanation for this difference is that participants in Miami had resided in the United States for a shorter duration, compared to participants in Los Angeles. Thus, encounters of cultural stress may have been more evident or more taxing as a function of the brief length of stay in the United States.

In this study, 70% of the families in Los Angeles immigrated from Mexico. This is noted again because another explanation for this site difference is that Mexican families may exert a higher degree of parental control than other Latin American/Hispanic nationalities (Halgunseth et al., 2006), which may weaken the effect of cultural stress on depressive symptoms. In addition to conducting more multisite studies, future studies may benefit from examining more contextual characteristics of the geographic region and community of settlement, such as neighborhood social cohesion (Rios, Aiken, & Zautra, 2012), that may be more responsive to interventions. This field of research may also advance by examining if country of origin (e.g., Mexico vs. Cuba) contributes to the within-group differences among Hispanic immigrants regarding the association between cultural stress and outcomes.

Limitations

Although the present results provide some important advances, some limitations should be considered when interpreting the findings. First, a significant majority of the Miami sample was Cuban and a significant majority of the Los Angeles sample was Mexican. Other Hispanic nationalities were represented in much smaller numbers. The extent to which findings from this study would generalize to other Hispanic nationalities is therefore not known. Second, because the sample was comprised of recent-immigrant high school students, we do not know the extent to which our results generalize to early or late adolescence, immigrants who have lived in the United States for a longer period of time, or second-generation immigrants who were born in the United States. Third, we did not collect data on documentation status; therefore, we do not know the extent to which undocumented participants may have been less likely to enroll in the study or more likely to experience cultural stress. Fourth, both study sites and all schools had a high proportion of Hispanics, which may have, affected the degree of exposure to cultural stress and its effects on the outcomes. Future studies may benefit from multisite designs that compare geographic regions with low and high proportions of Hispanics. Fifth, all data were self-report. However, it should be noted that self-reports of substance use tend to converge well with biological measures among the general population (Del Boca & Darkes, 2003; Patrick, Cheadle, Thompson, Diehr, Koepsell, & Kinne, 1994) and among Hispanic adolescents (Dillon, Turner, Robbins, & Szapocznik, 2005). Lastly, cultural stress is not limited to the three indicators used in the study. Future studies should examine how other indicators (e.g., immigration stress and minority stress) fit with a latent construct of cultural stress.

Conclusion

Despite these and other limitations, the present study offers several contributions to the literature. First, our data support a first-order factor of cultural stress composed of ethnic discrimination, negative context of reception, and bicultural stress. Second, our study adds to the limited body of work using longitudinal data to examine the potential effects of cultural stress on depressive symptoms and externalizing behaviors. Cultural stress appears to serve as a risk factor for all the outcomes among Hispanic immigrant adolescents, but this effect may not vary across gender. Conversely, environmental factors such as the geographic region may function as a moderator in the relation between cultural stress and health outcomes. In sum, our findings suggest that cultural stress is pertinent to health among Hispanic immigrant adolescents, and that this mechanism may be relevant to preventing health disparities among this population.

Acknowledgments

Preparation of this article was supported by Grant DA026594, co-funded by the National Institute on Drug Abuse and the National Institute on Alcoholism and Alcohol Abuse; and R25 DA026401 funded by the National Institute on Drug Abuse.

References

- Achenbach, TM.; Rescorla, L. Manual for the ASEBA school-age forms and profiles: An integrated system of multi-informant assessment. Department of Psychiatry, University of Vermont; Burlington: 2001. doi:10.1007/s00127-013-0685-z
- Agresti, A. An introduction to categorical data analysis. 2nd ed. Wiley; New York: 2007.
- Araújo BY, Borrell LN. Understanding the link between discrimination, mental health outcomes, and life chances among Latinos. *Hispanic Journal of Behavioral Sciences*. 2006; 28:245–266. doi: 10.1177/0739986305285825.
- Bernstein, R. [Retrieved November 1, 2013] U.S. Census Bureau projections show a slower growing, older, more diverse nation a half century from now. 2013. from <https://www.census.gov/newsroom/releases/archives/population/cb12-243.html>
- Berry, JW. Stress perspectives on acculturation. In: Sam, DL.; Berry, JW., editors. *The Cambridge Handbook of Acculturation Psychology*. Cambridge University Press; New York, NY: 2003. p. 43-57.
- Berry, JW. Contexts of acculturation. In: Sam, DL.; Berry, JW., editors. *The Cambridge Handbook of Acculturation Psychology*. Cambridge University Press; New York, NY: 2003b. p. 27-42.
- Berry JW, Kim U, Minde T, Mok D. Comparative studies of acculturative stress. *International Migration Review*. 1987; 21:491–511.
- Brown, TA. *Confirmatory factor analysis for applied research*. Guilford Press; New York, NY: 2006.
- Bourhis RY, Moïse LC, Perreault S, Senécal S. Towards an interactive acculturation model: A social psychological approach. *International Journal of Psychology*. 1997; 32:369–386.
- Bacallao ML, Smokowski PR. The costs of getting ahead: Mexican family system changes after immigration. *Family Relations*. 2007; 56:52–66. doi:10.1111/j.17413729.2007.00439.
- Centers for Disease Control and Prevention. *Youth Risk Behavior Surveillance — United States, 2013*. *Morbidity and Mortality Weekly Report*. 2014; 63:1–168. [PubMed: 24402465]
- Cervantes RC, Padilla AM, Napper LE, Goldbach JT. Acculturation-related stress and mental health outcomes among three generations of Hispanic adolescents. *Hispanic Journal of Behavioral Sciences*. 2013; 35:451–468. doi:10.1177/0739986313500924.
- Coatsworth JD, Pantin H, Szapocznik J. *Familias Unidas: A family-centered ecodevelopmental intervention to reduce risk for problem behavior among Hispanic adolescents*. *Clinical Child and*

- Family Psychology Review. 2002; 5:113–132. doi:10.1023/A:1015420503275. [PubMed: 12093012]
- Cole DA, Maxwell SE. Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*. 2003; 112:558–577. doi: 10.1037/0021-843X.112.4.558. [PubMed: 14674869]
- Del Boca FK, Darkes J. The validity of self-reports of alcohol consumption: state of the science and challenges for research. *Addiction*. 2003; 98:1–12. doi:10.1046/j.1359-6357.2003.00586.x. [PubMed: 14984237]
- Delgado MY, Updegraff KA, Roosa MW, Umaña-Taylor AJ. Discrimination and Mexican-origin adolescents' adjustment: The moderating roles of adolescents', mothers', and fathers' cultural orientations and values. *Journal of Youth and Adolescence*. 2011; 40:125–139. doi:10.1007/s10964-009-9467-z. [PubMed: 19882238]
- Dillon FR, Turner CW, Robbins MS, Szapocznik J. Concordance among biological, interview, and self-report measures of drug use among African American and Hispanic adolescents referred for drug abuse treatment. *Psychology of Addictive Behaviors*. 2005; 19:404–413. doi: 10.1037/0893-164X.19.4.404. [PubMed: 16366812]
- Edwards LM, Romero AJ. Coping with discrimination among Mexican descent adolescents. *Hispanic Journal of Behavioral Sciences*. 2008; 30:24–39. doi:10.1177/0739986307311431.
- Fornell CR, Lacker DF. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*. 1981; 18:39–50. doi:10.2307/3151312.
- Forster M, Grigsby T, Soto DW, Schwartz SJ, Unger JB. The role of bicultural stress and perceived context of reception in the expression of aggression and rule breaking behaviors among recent-immigrant Hispanic youth. *Journal of Interpersonal Violence*. (in press). doi: 10.1177/0886260514549052.
- Fry, R.; Passel, JS. Latino children: A majority are U.S.-born offspring of immigrants. Pew Hispanic Center; Washington, DC: 2009.
- Glymour MM, Weuve J, Berkman LF, Kawachi I, Robins JM. When is baseline adjustment useful in analyses of change? An example with education and cognitive change. *American Journal of Epidemiology*. 2005; 162:267–278. doi:10.1093/aje/kwi187. [PubMed: 15987729]
- Halgunseth LC, Ispa JM, Rudy D. Parental control in Latino families: An integrated review of the literature. *Child Development*. 2006; 77:1282–1297. doi:10.1111/j.1467-8624.2006.00934.x. [PubMed: 16999798]
- Hayes, AF. Introduction to mediation, moderation, and conditional analysis: A regression-based approach. Guilford Press; New York, NY: 2013.
- Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, Miller-Day M. Culturally grounded substance use prevention: an evaluation of the keepin' it REAL curriculum. *Prevention Science*. 2003; 4:233–248. doi:10.1023/A:1026016131401. [PubMed: 14598996]
- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975–2010. Vol. Volume I, Secondary school students. Ann Arbor University of Michigan, Institute for Social Research; 2011.
- Kauermann G, Carroll RJ. A note on the efficiency of sandwich covariance matrix estimation. *Journal of the American Statistical Association*. 2001; 96:1387–1396. doi:10.1198/016214501753382309.
- Kulis S, Marsiglia FF, Nagoshi JL. Gender roles and substance use among Mexican American adolescents: a relationship moderated by acculturation. *Substance Use and Misuse*. 2012; 47:214–229. doi:10.3109/10826084.2011.630438. [PubMed: 22136419]
- Kulis S, Marsiglia FF, Nieri T. Perceived ethnic discrimination versus acculturation stress: Influences on substance use among Latino youth in the Southwest. *Journal of Health and Social Behavior*. 2009; 50:443–459. doi:10.1177/002214650905000405. [PubMed: 20099450]
- Lawton KE, Gerdes AC. Acculturation and Latino Adolescent Mental Health: Integration of Individual, Environmental, and Family Influences. *Clinical Child and Family Psychology Review*. 2014:1–14. doi:10.1007/s10567-014-0168-0. [PubMed: 23645343]
- Lorenzo-Blanco EI, Unger JB, Ritt-Olson A, Soto D, Baezconde-Garbanati L. A longitudinal analysis of Hispanic youth acculturation and cigarette smoking: The Roles of gender, culture, family, and

- discrimination. *Nicotine & Tobacco Research*. 2013; 15:957–968. doi:10.1093/ntr/nts204. [PubMed: 23109671]
- Lorenzo-Blanco EI, Unger JB, Ritt-Olson A, Soto D, Baezconde-Garbanati L. Acculturation, gender, depression, and cigarette smoking among US Hispanic youth: The mediating role of perceived discrimination. *Journal of Youth and Adolescence*. 2011; 40:1519–1533. doi:10.1007/s10964-011-9633-y. [PubMed: 21293915]
- McLaughlin KA, Hilt LM, Nolen-Hoeksema S. Racial/ethnic differences in internalizing and externalizing symptoms in adolescents. *Journal of Abnormal Child Psychology*. 2007; 35:801–816. doi:10.1007/s10802-007-9128-1. [PubMed: 17508278]
- Muthén, LK.; Muthén, BO. *Mplus User's Guide, Version 7*. Muthén and Muthén; Los Angeles: 2012.
- Okamoto J, Ritt-Olson A, Soto D, Baezconde-Garbanati L, Unger JB. Perceived discrimination and substance use among Latino adolescents. *American Journal of Health Behavior*. 2009; 33:718–727. [PubMed: 19320620]
- Padilla AM, Alvarez M, Lindholm KJ. Generational status and personality factors as predictors of stress in students. *Hispanic Journal of Behavioral Sciences*. 1986; 8:275–288. doi: 10.1177/07399863860083006.
- Patrick DL, Cheadle A, Thompson DC, Diehr P, Koepsell T, Kinne S. The validity of self-reported smoking: a review and meta-analysis. *American Journal of Public Health*. 1994; 84:1086–1093. doi:10.2105/AJPH.84.7.1086. [PubMed: 8017530]
- Phinney, JS.; Berry, JW.; Sam, DL.; Vedder, P. Understanding immigrant youth: conclusion and implication. In: Berry, JW.; Phinney, JS.; Sam, DL.; Vedder, P., editors. *Immigrant Youth in Cultural Transition: Acculturation, Identity, and Adaptation Across National Context*. Lawrence Erlbaum Associates, Publishers; Mahwah, NJ: 2006. p. 211-234.
- Phinney JS, Madden T, Santos LJ. Psychological variables as predictors of perceived ethnic discrimination among minority and immigrant adolescents. *Journal of Applied Social Psychology*. 1998; 28:937–953. doi:10.1111/j.1559-1816.1998.tb01661.x.
- Portes, A.; Rumbaut, RG. *Immigrant America: A portrait*. 3rd ed. University of California Press; Berkeley, CA: 2006.
- Radloff L. The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 7:385–401. doi:10.1177/01466216770010030.
- Ram N, Chow SM, Bowles RP, Wang L, Grimm K, Fujita F, Nesselroade JR. Examining interindividual differences in cyclicity of pleasant and unpleasant affects using spectral analysis and item response modeling. *Psychometrika*. 2005; 70:773–790. doi:10.1007/s11336-001-1270-5.
- Rios R, Aiken LS, Zautra AJ. Neighborhood contexts and the mediating role of neighborhood social cohesion on health and psychological distress among Hispanic and non-Hispanic residents. *Annals of Behavioral Medicine*. 2012; 43:50–61. doi:10.1007/s12160-011-9306-9. [PubMed: 22037963]
- Roberts RE. Reliability of the CES-D Scale in Different Ethnic Contexts. *Psychiatry Research*. 1980; 2:125–134. doi:10.1016/0165-1781(80)90069-4. [PubMed: 6932058]
- Romero AJ, Martinez D, Carvajal SC. Bicultural stress and adolescent risk behaviors in a community sample of Latinos and non-Latino European Americans. *Ethnicity and Health*. 2007; 12:443–463. doi:10.1080/13557850701616854. [PubMed: 17978943]
- Romero AJ, Roberts R. Stress within a bicultural context for adolescents of Mexican descent. *Cultural Minority and Ethnic Minority Psychology*. 2003; 9:171–184. doi:10.1037/1099-9809.9.2.171.
- Rudmin FW. Constructs, measurements and models of acculturation and acculturative stress. *International Journal of Intercultural Relations*. 2009; 33:106–123. doi:10.1016/j.ijintrel.2008.12.001.
- Schwartz SJ, Des Rosiers S, Huang S, Zamboanga BL, Unger JB, Knight GP, Pantin H, Szapocznik J. Developmental trajectories of acculturation in Hispanic adolescents: Associations with family functioning and adolescent risk behavior. *Child Development*. 2013; 84:1355–1372. doi:10.1111/cdev.12047. [PubMed: 23848416]
- Schwartz SJ, Park IJ, Huynh QL, Zamboanga BL, Umana-Taylor AJ, Lee RM, Agocha VB. The American identity measure: Development and validation across ethnic group and immigrant generation. *Identity: An International Journal of Theory and Research*. 2012; 12:93–128. doi: 10.1080/15283488.2012.668730.

- Schwartz SJ, Unger JB, Des Rosiers SE, Lorenzo-Blanco EI, Zamboanga BL, Huang S, Szapocznik J. Domains of acculturation and their effects on substance use and sexual behavior in recent Hispanic immigrant adolescents. *Prevention Science*. 2014b; 15:385–396. doi:10.1007/s11121-013-0419-1. [PubMed: 23828449]
- Schwartz SJ, Unger JB, Lorenzo-Blanco E, Des Rosiers SE, Villamar JA, Soto DW, Pattarroyo M, Baezconde-Garbanati L, Szapocznik J. Perceived context of reception among recent Hispanic immigrants: Conceptualization, instrument development, and preliminary validation. *Cultural Diversity and Ethnic Minority Psychology*. 2014a; 20:1–15. doi:10.1037/a0033391. [PubMed: 24099485]
- Smokowski PR, Bacallao ML. Acculturation and aggression in Latino adolescents: A structural model focusing on cultural risk factors and assets. *Journal of Abnormal Child Psychology*. 2006; 34:657–671. doi:10.1007/s10802-006-9049-4.
- Smokowski, PR.; Bacallao, M. *Becoming bicultural: Risk, resilience and Latino youth*. New York University Press; New York, NY: 2011.
- Steinberg, L. *Adolescences*. 8th ed. McGraw Hill; Boston, MA: 2008.
- Szapocznik J, Santisteban D, Rio A, Perez-Vidal A, Santisteban D, Kurtines WM. Family effectiveness training: An intervention to prevent drug abuse and problem behaviors in Hispanic adolescents. *Hispanic Journal of Behavioral Sciences*. 1989; 11:4–27. doi: 10.1177/07399863890111002.
- Umaña-Taylor, AJ.; Alfaro, EC. Acculturative stress and adaption. In: Villarruel, FA.; Carlo, G.; Grau, JM.; Azmitia, M.; Cabrera, NJ.; Chahin, TJ., editors. *Handbook of U.S. Latino Psychology: Developmental and Community-based Perspectives*. Sage Publication, Inc.; Thousand Oaks, CA: 2009. p. 135-152.
- U.S. Census Bureau. [Retrieved August 29, 2013] 2012 National Population Projections: Summary Tables. 2012. from <http://www.census.gov/population/projections/data/national/2012/summarytables.html>
- Vega WA, Zimmerman R, Gil A, Warheit GJ, Apospori E. Acculturation strain theory: Its application in explaining drug use behavior among Cuban and other Hispanic youth. *Substance Use & Misuse*. 1997; 32:1943–1948.
- Viruell-Fuentes EA. Beyond acculturation: immigration, discrimination, and health research among Mexicans in the United States. *Social Science and Medicine*. 2007; 65:1524–1535. doi:10.1016/j.socscimed.2007.05.010. [PubMed: 17602812]
- Williams DR, Mohammed SA. Discrimination and racial disparities in health: evidence and needed research. *Journal of Behavioral Medicine*. 2009; 32:20–47. doi:10.1007/s10865-008-9185-0. [PubMed: 19030981]
- Zayas LH. Incorporating struggles with racism and ethnic identity in therapy with adolescents. *Clinical Social Work Journal*. 2001; 29:361–373. doi:10.1023/A:1012267230300.

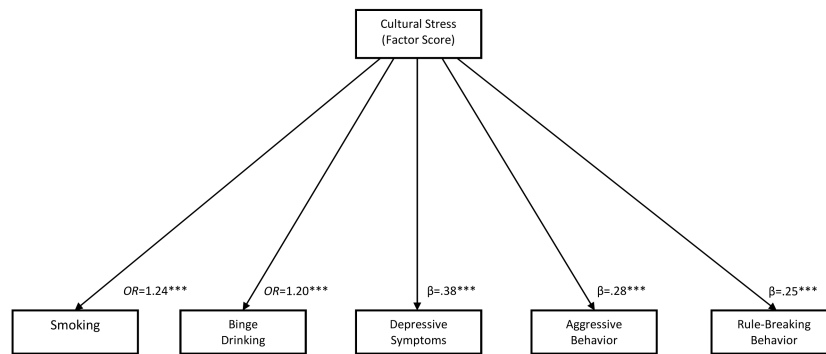


Figure 1.

Conceptual model tested in the present study with the full sample.

Note. This model controlled for age, study site, gender, years in the U.S., parental education; and baseline levels of depressive symptoms, aggression, and rule-breaking behavior; β = standardized regression coefficient, *OR* = odds ratio; *** $p < .001$

Table 1

<i>Descriptive Statistics for Study Variables</i>	
Variable	
	Baseline Predictors
	<i>n (%)</i>
Gender	
Boys	161 (53.3)
Site	
Los Angeles	150 (49.7)
	<i>M (SD), Range</i>
Age	14.51 (.88), 14-17
Year in the U.S.	2.08 (1.87), 0-5
Parental Education	9.27 (9.83), 0-17
Cultural Stress Indicators	
Ethnic Discrimination	.78 (.78), 0-4
Negative Context of Reception	8.74 (4.75), 0-24
Bicultural Stress	18.49 (14.35), 0-76
	Outcome Variables 6 Months Post-Baseline
	<i>n (%)</i>
Substance Use (at least once in past 90 days)	
Cigarette Smoking	16 (5.8)
Binge Drinking	25 (9.0)
	<i>M (SD), Range</i>
Depressive Symptoms (last 7 days)	30.57 (14.32), 0-64
Aggressive Behavior	5.40 (6.24), 0-34
Rule-breaking Behavior	4.10 (5.18), 0-30

Table 2

Bivariate Correlations for Variables Used in Path Analysis (n = 302)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Negative Context of Reception	-															
2. Bicultural Stress	.30**	-														
3. Discrimination	.36**	.46**	-													
4. Rule-Breaking (T1)	.27**	.56**	.35**	-												
5. Rule-Breaking (T2)	.18**	.36**	.32**	.38**	-											
6. Aggressive Behavior (T1)	.22**	.56**	.30**	.83**	.29**	-										
7. Aggressive Behavior (T2)	.15*	.40**	.34**	.37**	.88**	.39**	-									
8. Depressive Symptoms (T1)	.38**	.45**	.30**	.38**	.26**	.48**	.32**	-								
9. Depressive Symptoms (T2)	.25**	.36**	.29**	.28**	.37**	.30**	.47**	.51**	-							
10. Smoking (T2)	.05	.14*	.18**	.28**	.34**	.23**	.28**	.22**	.20**	-						
11. Binge Drinking (T2)	.08	.10	.25**	.08	.22**	.06	.20**	.08	.17*	.35**	-					
12. Age	.04	.06	.06	.00	.01	-.05	-.40	.03	00	.08	.07	-				
13. Gender	-.11*	-.08	-.05	-.16**	-.12*	-.02	-.04	.04	.14*	.07	.08	.00	-			
14. Site	.04	.07	-.02	.06	-.11	.08	-.06	-.03	-.09	-.02	-.05	-.07	-.08	-		
15. Years in the U.S.	.09	.05	.06	.15**	.05	.12*	.08	-.02	.02	.06	.02	-.05	-.03	.36**	-	
16. Parent Education	-.23**	-.09	.01	-.03	.02	-.07	.03	-.04	-.01	-.02	-.02	-.08	.05	-.28**	-.05	-

* $p < .05$,

** $p < .01$; T1 = Baseline, T2 = Six-month follow-up