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Acculturation and Adjustment in Latino Adolescents: How Cultural Risk Factors and Assets Influence Multiple Domains of Adolescent Mental Health

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Abstract The purpose of this study was to examine the relationships among risk factors, cultural assets, and Latino adolescent mental health outcomes. We extend past research by using a longitudinal design and evaluating direct and moderated acculturation effects across a range of internalizing, externalizing, and academic engagement outcomes. The sample consisted of 281 Latino/a youths and one of their parents in metropolitan, small town, and rural areas within North Carolina and Arizona. The length of time the adolescent was in the U.S. was positively related to humiliation, aggression, and school bonding. Adolescent U.S. cultural involvement and parent culture of origin involvement were not significantly related to adolescent mental health or school bonding. Parent U.S. involvement had an inverse association with adolescent social problems, aggression, and anxiety. Adolescent culture of origin involvement was positively related to adolescent self-esteem 1 year later. Inverse relationships were found for the link between adolescent culture of origin involvement and hopelessness, social problems, and aggression 1 year later. Implications for prevention programming and policy development are discussed.

Keywords Latinos · Adolescents · Mental health · Immigrants · Acculturation · Culture

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Introduction

Few studies have examined how cultural risk factors and assets are related to multiple domains of Latino/a adolescent mental health (Berry 2006; Gonzales et al. 2002) and longitudinal studies on this topic are rare (Smokowski, David-Ferdon, & Stroupe, this issue). Acculturation is a process in which cultural change results from contact between at least two autonomous and independent cultural groups (Berry 1998). The overall acculturation process has two major components: culture of origin involvement, sometimes called enculturation, and host cultural involvement, sometimes called assimilation or Americanization (Gonzales et al. 2002). For clarity, we will use the terms culture of origin involvement and U.S. cultural involvement; however, various other terms have been used in the literature. In the following sections, we review how mental health might be linked to acculturation.

Acculturation and Latino Adolescents' Mental Health

National data indicate that Latino adolescents engage in high levels of several risky biopsychosocial behaviors that are related to negative long-term consequences for health and well being, which causes serious problems for themselves, their families, and communities. The Centers for Disease Control and Prevention's (CDC's) Youth Risk Behavior Surveillance System (YRBSS), a national sample of students in grades 9–12 in public and private schools in the United States, shows that Latino youth are engaging in a number of serious health risk behaviors at higher rates than Anglo or African American youth (CDC, 2008). Table 1 contains information on some of these risky behaviors as they relate to aggressive and internalizing behaviors.

Table 1 Negative health behaviors related to aggression and internalizing behavior: 2007 YRBS Data*

Behavior	Latino	Non-Hispanic black	Non-Hispanic white
In a physical fight	40.4 (37.9–42.9)	44.7 (42.1–47.4)	31.7 (29.8–33.7)
Being injured in a physical fight	6.3 (5.4–7.5)	5.3 (4.5–6.4)	3.0 (2.5–3.7)
In a physical fight on school property	15.5 (13.9–17.2)	17.6 (15.5–19.9)	10.2 (9.1–11.4)
Threatened or injured with a weapon on school property	8.7 (7.6–10.0)	9.7 (8.1–11.6)	6.9 (5.9–8.0)
Did not go to school because they felt unsafe at school or on their way to or from school	9.6 (7.8–11.8)	6.6 (5.4–8.0)	4.0 (3.2–4.9)
Carry a weapon	18.5 (16.2–21.1)	17.2 (15.2–19.4)	18.2 (15.8–21.0)
Carried a weapon on school property	7.3 (5.8–9.1)	6.0 (5.1–7.0)	5.3 (4.3–6.5)
Felt sad or hopeless	36.3 (33.8–38.8)	29.2 (27.4–31.1)	26.2 (24.5–28.0)
Attempted suicide	10.2 (9.0–11.6)	7.7 (6.1–9.7)	5.6 (5.0–6.3)

Note: * From Centers for Disease Control and Prevention (2008). Numbers in parentheses are the 95% confidence interval. If confidence intervals do not overlap, there are statistical differences between the groups

Externalizing Behaviors

Reviewing the literature on acculturation and mental health in Latino youth, Gonzales et al. (2002) identified ten empirical studies that examined the link between acculturation and adolescent aggression; eight focused on adolescent acculturation and two on parent acculturation. Six out of the eight empirical investigations of adolescent acculturation reported that higher adolescent U.S. cultural involvement (operationalized in different ways and sometimes referred to as "assimilation") was associated with increased delinquency and stronger relationships with antisocial peers. More recently, Smokowski, David-Ferdon, and Stroupe (this issue) reported that nine out of thirteen empirical investigations of Latino adolescent acculturation and youth violence reported that higher adolescent U.S. cultural involvement was associated with increased youth violence. This association between U.S. cultural involvement and aggressive behavior surfaced even when simple proxy measures, such as generational status, language use, time in the U.S., or nativity, were used to index complex cultural processes (Gonzales et al. 2002).

Two empirical studies examined parent, rather than adolescent, U.S. cultural involvement and found no significant relationship between parent U.S. cultural involvement and adolescent aggression (Dumka et al. 1997; Knight et al. 1994). A third study examining parent U.S. cultural involvement and adolescent total problems also found no relationship between these variables (Vega et al. 1995). Considering that the majority of prior studies have shown a link between higher adolescent—but not parent—U.S. cultural involvement and adolescent aggression, we hypothesized that adolescent U.S. cultural involvement would be positively associated with aggression and problem behavior. Based on prior studies of parent cultural involvement, we did not expect to find a relationship between parent U.S. cultural involvement and adolescent aggression and problem behavior.

Internalizing Problems and Self-esteem

Smokowski, David-Ferdon, and Stroupe (this issue) report that low acculturation, language difficulties, and lack of a connection to a cultural group may be risk factors for fear of victimization and self-directed violence. Kao's (1999) analysis of National Educational Longitudinal Study data showed that first- and second-generation Latino immigrants displayed lower levels of self-efficacy and control, compared to third-generation Latinos. Glover et al. (1999) found that socio-economic status (SES), family composition, and linguistic fluency had a greater relative impact on the Youth Self Report Anxiety subscale than did all other factors. Being born outside of the United States and having low English language fluency were risk factors predicting adolescent anxiety. Carvajal et al. (2002) examined a sample of 1,119 high school students from northern California and reported that Latinos in the marginalized acculturation group (e.g., those with fewer attachments and adaptations to Latino and other cultures) displayed less desirable mental health outcomes (e.g., depression and low optimism) as compared to the bicultural group.

Despite this association with internalizing problems, researchers have consistently found a positive relationship between culture of origin involvement, in the

form of ethnic identity, and self-esteem (Martinez and Dukes, 1997; Phinney et al. 1997; 1995; Schwartz et al. 2007). For example, after examining Latinos, African American, and non-Latino Anglos, Phinney et al. (1997) reported that culture of origin involvement, in the form of ethnic identity, predicted higher self-esteem in all three ethnic groups. In contrast, U.S. cultural involvement only predicted self-esteem for White adolescents. Bat-Chava and Steen (2000) further confirmed this association in a meta-analysis that showed culture of origin involvement to have a moderately strong, positive relationship with self-esteem across ethnicities, genders, and age groups. Because of the evidence showing its salutary link to self-esteem, we hypothesized that higher culture of origin involvement would be inversely associated with adolescent aggression and problem behavior and positively associated with self-esteem.

Low Educational Attainment

Low educational attainment is a critical concern for Latinos. The estimated proportion of the U.S. Latino population age 25 and over with at least a bachelor's degree in 2000 ranged from 30% for Spaniards to 7.5% for Mexicans (United States Census Bureau 2004). This disparity is very serious because 59% of the Latino population in the U.S. is Mexican, and only 7.5% of this group is prepared for employment in skilled occupations (United States Census Bureau 2004). In 2003, 33% of Latino adolescents aged 15–17 were working below grade level in school (United States Census Bureau 2005). The annual high school dropout rate for Latinos in 10th to 12th grades in 2003 was 6.5%, higher than that of any other group; non-Latino Whites had an annual drop-out rate (3%), half the Latino rate (United States Census Bureau 2005).

Studies on educational outcomes have tended to consider acculturation in terms of language fluency rather than cultural involvement. Several studies have found that youths fluent in both their culture of origin language and English to achieve more than those who spoke only one language (e.g., English-alone or limited-English speakers; Feliciano 2001; Rumberger and Larson 1998; Stanton-Salazar and Dornbusch 1995) and to show fewer emotional/behavioral problems, less delinquency, and aggression (Toppleberg et al. 2002). For example, Feliciano (2001) used 1990 Census data to study the link between biculturalism and dropping out of school in more than 16,000 Mexican 18–21 year olds. Using bilingualism as a proxy indicator of biculturalism, multivariate odds ratios from logistic regression analyses showed that bicultural Mexican youths were less likely to drop out of school than either limited-English or English-only speakers. Compared to bicultural participants, Mexican youths were more than twice as likely to drop out of school if they spoke limited English and were 29% more likely to leave school if they spoke only English. Having bilingual individuals in the household was also a deterrent to dropping out. Mexican youths in bilingual households were half as likely to drop out of school as those in homes with no bilingual speakers.

The salutary effects for bilingualism underscore the importance of studying biculturalism in general. Most initial evidence indicates that biculturalism, or the integration of culture of origin and host culture involvement, is associated with

greater self-esteem, stronger social skills to interact with diverse groups, and heightened psychological well-being (Bautista de Domanico et al. 1994; LaFromboise et al. 1993). In a sample of 123 Latino immigrant adolescents, Birman (1998) found a trend relating biculturalism to positive self-perceptions of global self worth. Gil et al. (1994) found bicultural adolescents to have the lowest levels of acculturation stress and were less likely to report low family pride, compared to low- and high-assimilated Latino adolescents. These positive effects for biculturalism show how important it is to go beyond simple acculturation markers such as time in the country or language use in order to fully examine the multiple dimensions of acculturation (e.g., culture of origin involvement and U.S. cultural involvement).

Summary

National data, such as the CDC's Youth Risk Behavior Survey, indicate that Latino adolescents are at high risk for engaging in a range of negative health behaviors. One critical difference between Latino adolescents and their peers from other racial groups is that the former have to cope with the complexities inherent in the acculturation process. Adolescent, but not parent, U.S. cultural involvement has been found to be a risk factor for Latino adolescent youth violence. Conversely, culture of origin involvement and bicultural ability appear to be cultural assets associated with higher levels of self-esteem and academic persistence (Feliciano 2001; Soriano et al. 2004).

Unfortunately, extant literature is largely fragmented, either looking at assimilation and negative outcomes or ethnic identity and positive outcomes. Higher U.S. cultural involvement has shown a relationship with adolescent aggression; however, culture of origin involvement has rarely been examined in studies focusing on this outcome. The later concept has been investigated when studying positive outcomes such as self-esteem and has rarely been examined as a potential cultural asset associated with lower adolescent aggression. Recently Schwartz et al. (2007) examined how acculturation domains and ethnic identity were connected to multiple domains of adolescent behavior in 347 Latino adolescents living in the Midwestern United States. Results indicated that relationships of ethnic identity to academic grades and to externalizing symptoms were mediated by self-esteem and that both U.S. and Hispanic acculturation orientations were directly associated with prosocial behavior. The relationships of U.S. cultural orientation to academic grades and to behavior problems were mediated through acculturative stress and self-esteem. This type of study—using multiple acculturation measures to simultaneously predict a variety of domains of adolescent behavior—is rare. Further, even the Schwartz et al. (2007) study was cross-sectional, which leaves a dearth of information about longitudinal relationships. Consequently, we know little about the full complexity of how culture of origin and U.S. cultural involvement influence adolescent mental health across multiple domains of functioning over time. This creates an important need for a more comprehensive, longitudinal approach examining how disparate acculturation dimensions influence multiple outcomes from different domains of adolescent functioning.

The Current Study

To contribute to current research knowledge, we prospectively examined cultural risk factors and assets and adolescent mental health in a sample of Latino/a youths in metropolitan, small town, and rural areas within North Carolina and Arizona. Adolescent participants came from a wide range of socioeconomic backgrounds and represented a variety of Latino subgroups. Parent and adolescent cultural involvement was measured and modeled as a multidimensional phenomenon using scales that indexed participation in both the cultures-of-origin and U.S. culture. A variety of adolescent mental health indicators were included as outcomes to examine how cultural risk factors and assets longitudinally influence adolescent mental health across domains of functioning. Our hypotheses were as follows: (a) higher adolescent, but not parent, U.S. cultural involvement would be a risk factor positively associated with aggressive behavior and poorer mental health outcomes; and (b) higher adolescent and parent culture of origin involvement would be cultural assets associated with higher self-esteem and better mental health outcomes.

Methods

Procedures

This investigation was part of the Latino Acculturation and Health Project, a longitudinal investigation of acculturation in Latino families in North Carolina and Arizona. Community-based interviews were conducted with Latino adolescents and their parents at four time points over the course of 2 years. Families were recruited from churches, English as a Second Language programs, and at Latino community events. Special effort was made to recruit approximately equal proportions of Latino families from metropolitan (30%), small town (35%), and rural areas (35%) to increase heterogeneity in the sample. Two-thirds of the interviews were conducted in central North Carolina and the remainder was conducted in areas surrounding Phoenix, Arizona. During recruitment, families were told that the purpose of the study was to help us understand how Latino adolescents and their parents adjust to life in the United States. Interviews were conducted in participants' homes and lasted approximately 2 hours for each family.

The interview protocol consisted of commonly used psychosocial measures asking about cultural involvement, discrimination, familism, parent-adolescent conflict, and a wide range of adolescent mental health issues (e.g., aggression, depression, anxiety, suicidality). Measures were translated from English to Spanish and back-translated from Spanish to English by bilingual research staff members. The protocol was field tested and revised until linguistic and cultural equivalence was attained (see Rogler 1989 for a discussion of the methodology). Interviews were conducted in person using the participants' preferred language; both Spanish and English versions were available. Parents and adolescents were interviewed separately. All interviewers were bilingual graduate students in social work or public health who had spent time abroad in Central and South America. They

received extensive training in interviewing skills to supplement their substantial field experience. Weekly supervision sessions were held to ensure that the protocol was appropriately administered. Interviewers worked in pairs and talked with adolescents and parents separately and simultaneously to reduce the time it took to complete the interviews. All consent forms and interview protocols were read to participants in order to minimize missing data and standardize administration across a wide range of literacy levels. Each participant was compensated $20 for time spent completing the interview. The interview protocol was approved by Institutional Review Boards at both sites and participants' responses were protected by a Certificate of Confidentiality issued by the U.S. Centers for Disease Control and Prevention.

Sample

The sample included 281 Latino adolescents and one of their parents. Fifty-four percent of the families lived in North Carolina and 46% lived in Arizona. Fifty-five percent of the adolescents were female, and the adolescents' average age was 15 (SD = 1.8; minimum = 11, maximum = 18). The average time spent living in the United States was 7 years, with a range of 1 month to 18 years. Ninety-four percent of the adolescents attended school and the median grade was ninth grade. Fifty-eight percent of the adolescent participants were from Mexico, 21% were U.S.-born, and the remainder was from Central and South American countries. Seventy-eight percent of the adolescents lived with two parents and 18% lived with a single parent. The remaining 4% lived either with other relatives or independently. The average annual household income reported by participating Latino parents was $23,644; the median was $19,200 (SD = $13,542).

Eighty-eight percent of participating parents were mothers. Seventy-two percent of parents were married and working at least one job. The most common occupations were house cleaner and child-care worker. Parents had an average age of 39 years (SD = 6.5) and had lived in the United States for an average of 9 years (SD = 9). Sixty-nine percent of parents had not graduated from high school, and 37% had less than a seventh-grade education.

Results from chi-square tests illustrated that there were significant differences between the sample from North Carolina and from Arizona across nativity and gender for both the parents and adolescents. The North Carolina sample had significantly more foreign-born adolescents ($\chi^2 = 56.18$, $p < 0.00$) and parents ($\chi^2 = 13.07$, $p < 0.00$) than the Arizona sample. When looking at gender, the North Carolina sample had more male adolescents ($\chi^2 = 6.56$, $p < 0.01$) and parents than the Arizona sample ($\chi^2 = 5.54$, $p < 0.02$).

Independent Variables

Analyses were conducted using measures of the following independent variables: adolescents' time of residency in the U.S., adolescents' reports of culture of origin and U.S. cultural involvement, and parents' reports of U.S. and culture of origin

involvement. Data on each independent measure were collected at baseline assessment in 2004 (hereafter called T1) and are described below.

Adolescent culture of origin involvement was measured using the Bicultural Involvement Questionnaire (BIQ; Szapocznik et al. 1980). The BIQ's Culture of Origin Involvement subscale (originally called the "Hispanicism" subscale) has 20 items measuring language, food, recreation, and media use on a 5-point Likert scale with anchors labeled *not at all* to *very much*. The scale score ranges from 20 to 100, with higher scores indicating more culture of origin involvement. Sample questions include: How comfortable do you feel speaking Spanish (at home, with friends, in general); How much do you enjoy… music, television programs, books, and magazines from your native country? In this sample, internal consistency reliability was 0.87 for the adolescent culture of origin involvement scale.

Adolescent U.S. cultural involvement was also measured using the Bicultural Involvement Questionnaire (BIQ; Szapnocznik et al. 1980). Exactly parallel to the culture of origin involvement scale above, the BIQ's U.S. cultural involvement subscale (originally called the "Americanism" subscale) has 20 items measuring language, food, recreation, and media use on a 5-point Likert scale with anchors labeled *not at all* to *very much*. The scale range goes from 20 to 100 with higher scores indicating more U.S. cultural involvement. Sample questions include: How comfortable do you feel speaking English (at home, with friends, in general); and How much do you enjoy (non-Latino) U.S.… music, television programs, books, and magazines? In this sample, internal consistency reliability was .90 for the adolescent U.S. cultural involvement scale.

Parent culture of origin and U.S. cultural involvement were measured using parent reports from the BIQ scales described above. In this sample, internal consistency reliability was 0.87 for parent culture of origin involvement and 0.91 for the parent U.S. cultural involvement scale.

Time in the U.S. was assessed with one item that asked "How long have you lived here (in the U.S.)?" Length of time was noted in years and months as reported by the adolescent. For U.S.-born adolescents, time in the U.S. is the same as their age. The average time spent living in the United States was 7 years, with a range of 1 month to 18 years.

Dependent Variables

Data on dependent measures were collected approximately 1 year after baseline assessment (hereafter called T2). All dependent variables come from adolescent self-reports.

Self-Esteem

The Rosenberg Self-Esteem Scale (SES; Rosenberg 1989) is widely used in social science research and was our first dependent variable. We retained seven of the scale's original ten items. Scores were measured on a 4-point scale ranging from (1) *strongly agree* to (4) *strongly disagree*. Possible scores ranged from 7 to 28. For this data set, the calculated reliability of the seven-item Rosenberg SES was 0.83.

Reliability from prior studies cannot be compared because we dropped items. The three items we deleted were *I wish I could have more respect for myself; At times, I think I am no good at all*; and *I am able to do things as well as most other people*. We chose to drop these items because they did not have significant factor loadings when factor analyses were conducted, and scale reliability was enhanced when they were deleted. We believe these items were problematic because they did not have straightforward translations from English to Spanish. Further, the meaning of these items was complicated for disadvantaged immigrants who experienced daily discrimination. It was unclear whether these particular items would measure low self-esteem or form a realistic appraisal of participants' low status in U.S. society.

Hopelessness was assessed using the Beck Hopelessness Scale (BHS: Beck et al. 1974). This instrument measures adolescents' and adults' negative attitudes about the future using 20 *true-false* items such as "the future seems dark to me." Item scores are summed to form a continuum from 0, least hopelessness, to 20, severe hopelessness. Internal consistency reliability was estimated to be 0.82 in this dataset. Prior research suggests strong correlations with suicidal ideation ($r = 0.59$), attempted suicide ($r = 0.68$), alcohol dependence ($r = 0.74$), and major depressive disorder ($r = 0.62$), indicating high construct validity (Rush et al. 2000).

Humiliation was measured with seven items on a 5-point scale (from "not at all" to "extremely"), and the scores ranged from 7 to 35. Items on the humiliation scale include "At this point in your life, how concerned are you about—being teased?" "—Discounted as a person?"—Unfairly denied access to some activity, opportunity, or service?" (Hartling and Luchetta 1999). The internal consistency reliability for this scale was 0.90.

Social problems were assessed using the Youth Self-Report (YSR; Achenbach and Rescorla 2001). The YSR social problems scale consisted of 11 items measured using a 3-point Likert scale (*not true, sometimes true, often true*). The score had a possible range from 0 to 22, with a higher score indicating a higher number of and greater severity of social problems. Items on the YSR social problems scale included the following: I don't get along with other kids; I am jealous of others; I feel that others are out to get me; I get teased a lot; and I am poorly coordinated or clumsy. The internal consistency reliability for this scale is 0.69.

Youth aggression scores were also collected using the Youth Self-Report. The YSR aggression scale consists of 17 items measured using a 3-point Likert scale (*not true, sometimes true, often true*). The scale included the following items: (a) I argue a lot; (b) I destroy my own things; and (c) I get in many fights. The scale scores had a possible range from 3 to 51. Internal consistency reliability for this sample was 0.85.

Adolescent anxiety was also evaluated using the YSR. The YSR anxiety scale was derived from six items measured using a 3-point Likert scale (*not true, sometimes true, often true*). The scale scores had a possible range from 3 to 18 and included the following items: (a) I am nervous or tense; (b) I am afraid of going to school; and (c) I worry a lot. The internal consistency reliability for this sample was 0.85.

School bonding was measured by eight items from the School Success Profile (Bowen et al. 2005). Each item was scored true or false, and the possible scores

ranged from 0 to 8. Some examples of items on the school bonding scale include: I look forward to going to school; I get along well with my teachers; My teachers care about the grades I make. The internal consistency reliability for this scale was 0.84.

Data Analyses

The current analyses were longitudinal and examined how length of U.S. residency and T1 cultural involvement scales were associated with T2 adolescent mental health measures. Structural Equation Modeling (SEM) was performed using Maximum Likelihood Estimation in Amos version 6.0. Scale scores were entered as observed, rather than latent, constructs. This path analytic strategy was adopted over a general SEM approach with both structural and measurement elements because of the large number of indicator variables for each scale. The four parent and adolescent cultural involvement scales each include 20 items and the YSR scales each have more than ten indicators. A general SEM with both structural and measurement components would have over 100 indicator variables in the model. For parsimony, we chose the path analytic approach using the scale scores as observed variables. However, confirmatory factor analyses (CFA) performed on the four cultural involvement and the dependent measures showed that all these scales fit the data adequately. Full CFA information is available from the first author upon request.

Missing data did not pose a serious problem in this analysis. Missing data were handled in this analysis using the Maximum Likelihood algorithm for estimating incomplete data in Amos 6.0. Compared to listwise and pairwise deletion, researchers reported that Maximum Likelihood estimates of missing data are consistent, efficient, and asymptotically unbiased (Byrne 2001). Models were estimated with and without missing data imputation and the results were not significantly different. No variable had more than 15% of its cases missing.

The initial model estimated all hypothesized paths from independent variables at T1 to T2 dependent variables 1 year later. Independent variables were allowed to be correlated based on theory and significant observed correlations in the data (e.g., culture of origin and U.S. cultural involvement were associated; parent cultural involvement scales were related to adolescent cultural involvement scales). Some dependent variable error terms were also allowed to be correlated, assuming that external biases affecting one scale would also impact other scales from the same set of self-report instruments. Nonsignificant paths were deleted in a subsequent process of "model-trimming" (Byrne 2001). The final structural model had path coefficients all of which were statistically significant and theoretically sound.

Fit indices obtained in the path analysis output were used to determine how well the model fit the data. The model chi-square, normed chi-square, comparative fit index (CFI), and root mean square error of approximation (RMSEA) with 90% confidence interval were used in this study to assess model fit. A non-significant model chi-square value, a normed chi-square value of <3, a CFI statistic of 0.90 or greater, and an RMSEA statistic <0.06 with the upper limit of the 90% CI under 0.08 are ideal (Hu and Bentler 1999; Kline 2005).

Moderation Effects

Multi-group comparisons were conducted to test for moderation effects by gender, nativity, and site (North Carolina versus Arizona). Using the chi-square difference test, baseline and constrained models were tested to see if the model fit these subgroups adequately or if subgroup characteristics moderated the effects of T1 acculturation variables on T2 mental health outcomes.

Results

Correlations along with means and standard deviations for the observed variables are presented in Table 2. None of the variables were highly correlated with each other; therefore, multicolinearity is not a serious concern (e.g., $r > 0.85$; Kline 2005). Some of the most intriguing correlations are as follows. Length of time in the U.S. was significantly correlated with both adolescent culture of origin involvement ($r = -0.18$, $p < 0.01$) and adolescent U.S. involvement ($r = 0.48$, $p < 0.01$). Parent culture of origin involvement was significantly correlated with the adolescent's culture of origin involvement ($r = 0.18$, $p < 0.01$). Parent U.S. involvement was significantly correlated with adolescent U.S. involvement ($r = 0.23$, $p < 0.01$). Not surprisingly, parent culture of origin involvement was negatively correlated with parent U.S. involvement ($r = -0.41$, $p < 0.01$) as was adolescent culture of origin involvement and adolescent U.S. involvement ($r = -0.27$, $p < 0.01$). Additionally, length of time in the U.S. was strongly correlated with school bonding ($r = 0.53$, $p < 0.01$) and weakly correlated with adolescent aggression ($r = 0.12$, $p < 0.05$). Finally, adolescent aggression was related to anxiety ($r = 0.60$, $p < 0.01$).

Structural Equation Modeling

The model found in Fig. 1 was fitted using Amos 6.0's maximum likelihood estimation procedure. Based on model fit statistics, this model was shown to be an excellent fit to the data, χ^2 ($df = 33$, $N = 281$) $= 42.5$, $p = 0.12$, normed $\chi^2 = 1.29$, CFI $= 0.99$, RMSEA $= 0.03$, 90% CI (0.00–0.06). Maximum likelihood path estimates for the model are shown in Table 3.

U.S. Involvement and Adolescent Mental Health

Adolescent U.S. cultural involvement was not significantly related to any adolescent mental health outcome. Parent U.S. involvement had an inverse association with adolescent social problems, aggression, and anxiety. This suggests that increased parental involvement with U.S. culture is related to a decrease in these negative adolescent mental health outcomes. The cultural asset effect linking parent U.S. cultural involvement to lower aggression was salient for all subgroups. The inverse association between parent U.S. cultural involvement and social problems was

Table 2 Bivariate correlations, means, and standard deviations of study variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. U.S. residency (years)	–											
2. T1 adolescent CO involvement	−0.18**	–										
3. T1 adolescent US involvement	0.48**	−0.27**	–									
4. T1 parent CO involvement	−0.11	0.18**	−0.04	–								
5. T1 parent US involvement	0.15*	−0.13*	0.23**	−0.41**	–							
6. T2 self-esteem	−0.13*	0.13*	−0.02	0.11	−0.06	–						
7. T2 hopelessness	0.13*	−0.13*	0.06	−0.06	0.03	−0.50**	–					
8. T2 humiliation	0.17**	−0.10	0.12*	0.04	0.00	−0.25**	0.16**	–				
9. T2 social problems	−0.00	−0.11	−0.08	0.05	−0.13*	−0.34**	0.36**	0.42**	–			
10. T2 aggression	0.12*	−0.12*	−0.01	0.01	−0.14*	−0.26**	0.25**	0.25**	0.60**	–		
11. T2 anxiety	−0.07	0.05	−0.08	0.10	−0.17**	−0.22**	0.24**	0.37**	0.60**	0.46**	–	
12. T2 school bonding	0.53**	0.01	0.11	−0.04	0.13*	−0.02	0.05	0.04	−0.03	−0.04	−0.05	–
Mean	7.08	3.79	3.36	3.99	2.49	3.48	0.08	1.87	0.31	0.40	0.51	2.72
Standard deviation	5.19	0.61	0.68	0.60	0.75	0.46	0.13	0.86	0.25	0.29	0.37	2.94

Note: *CO* Country-of-Origin, *T1* Baseline data collection, *T2* Time two data collection one year after baseline. ** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)

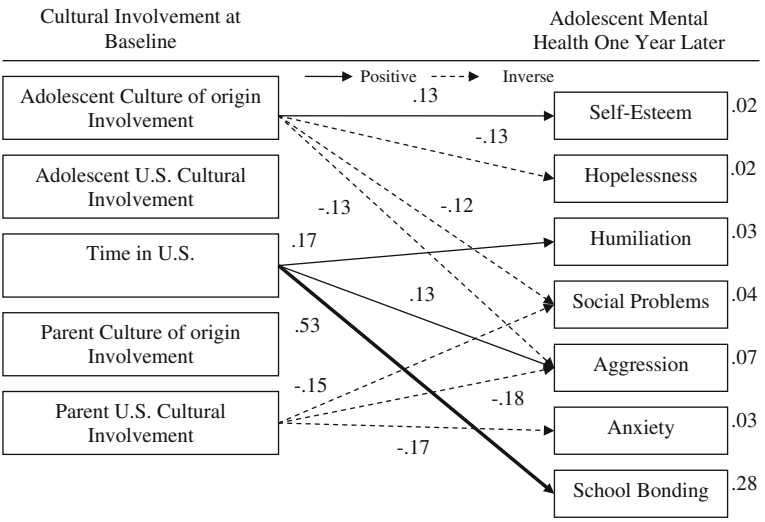

Fig. 1 Standardized regression weights for baseline cultural involvement and adolescent mental health 1 year later. *Note*: $N = 281$, $\chi^2 = 42.5$, df = 33, $p = 0.124$, normed $\chi^2 = 1.29$; CFI = 0.987; RMSEA = 0.032 (0.000–0.057)

Table 3 Significant maximum likelihood estimates for path coefficients

	$N = 281$		
	Unst.	S.E.	St.
Adolescent country-of-origin involvement: self-esteem	0.10*	0.04	0.13
Adolescent country-of-origin involvement: hopelessness	−0.03*	0.01	−0.13
Adolescent country-of-origin involvement: social problems	−0.05**	0.02	−0.12
Parent US cultural involvement: social problems	−0.05**	0.02	−0.15
Adolescent country-of-origin involvement: aggression	−0.06*	0.03	−0.13
Parent US cultural involvement: aggression	−0.07***	0.02	−0.18
Adolescent time in the US: aggression	0.01**	0.003	0.13
Parent US cultural involvement: anxiety	−0.08**	0.03	−0.17
Adolescent time in the US: humiliation	0.03***	0.01	0.17
Adolescent time in the US: school bonding	0.30***	0.03	0.53

Notes: *Unst.* Unstandardized, *S.E.* Standard error, *St.* Standardized. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

significant for foreign-born males and females; the inverse relationship with anxiety was characteristic of foreign-born females.

Time in the U.S. and Adolescent Mental Health

The length of time the adolescent was in the U.S. was positively related to humiliation, aggression, and school bonding. This indicates that the level of

humiliation and aggression appears to increase as the adolescents' length of time in the U.S. increases. Adolescents are also more likely to form positive bonds to their school the longer they reside in the U.S. Moderation effects showed that the positive relationship between time in the U.S. and aggression was characteristic of foreign-born and U.S.-born males. Humiliation increased with time in the U.S. for foreign-born females. School bonding increased with time in the U.S. for foreign-born, but not U.S.-born, males and females.

Culture of Origin Involvement and Adolescent Mental Health

T1 adolescent culture of origin involvement was positively related to T2 adolescent self-esteem. Inverse relationships were found for the link between adolescent culture of origin involvement and T2 hopelessness, social problems, and aggression.

Moderation Effects

Subgroup effects for males, females, foreign-born, and U.S.-born adolescents are displayed in Table 4. The results of subgroup analyses showed that the overall model was not significantly different for the subgroups; it fit the data well when applied to foreign-born and U.S.-born adolescents, and males and females from North Carolina and Arizona. However, there were differences in the significance of some path coefficients between the groups. Subgroup difference by site were identical to those for foreign-born versus U.S.-born subgroups. This was because U.S. born adolescents overwhelmingly came from Arizona and foreign-born adolescents came from both sites, but largely characterized North Carolina adolescents.

Subgroup analyses indicated that the effects for culture of origin involvement promoting self-esteem and lowering aggressive behavior were characteristic of U.S.-born adolescents (from Arizona). Further, culture of origin involvement was associated with lower social problems for foreign-born females (from North Carolina or Arizona). Parent culture of origin involvement was not significantly related to any of the adolescent mental health outcomes in the overall or subgroup models.

Discussion

The purpose of this study was to examine the relationships among cultural risk factors and assets and Latino adolescent mental health outcomes. We extended past research by using a longitudinal design and evaluating direct and moderated acculturation effects across a range of internalizing, externalizing, and school bonding outcomes.

Acculturation Risk Factors

The structural model shown in Fig. 1 had an excellent fit with the data and captured a number of important acculturation risk and asset effects. Our first hypothesis—that

Table 4 Maximum likelihood estimates for path coefficients: males vs females and U.S. vs foreign born

	Males			Females			U.S. born			Foreign born		
	Unst.	S.E.	St.	Unst.	S.E.	St.	Unst.	S.E.	St.	Unst.	S.E.	St.
ACOI: self-esteem	0.11	0.06	0.16	0.07	0.06	0.09	0.21*	0.09	0.25	0.05	0.05	0.07
ACOI: hopelessness	−0.02	0.02	−0.12	−0.03	0.02	−0.12	−0.03	0.03	−0.10	−0.02	0.01	−0.12
ACOI: social problems	−0.03	0.03	−0.08	−0.06*	0.03	−0.13	−0.03	0.05	−0.07	−0.05*	0.02	−0.13
PUSCI: social problems	−0.05*	0.03	−0.15	−0.05*	0.02	−0.14	−0.02	0.03	−0.07	−0.06**	0.02	−0.17
ACOI: aggression	−0.05	0.04	−0.10	−0.06	0.04	−0.12	−0.13*	0.05	−0.28	−0.05	0.03	−0.11
PUSCI: aggression	−0.07*	0.03	−0.17	−0.08**	0.03	−0.21	−0.10**	0.04	−0.31	−0.06**	0.03	−0.14
ATUS: aggression	0.02***	0.004	0.26	0.003	0.003	0.06	0.02**	0.01	0.28	0.01*	0.004	0.11
PUSCI: anxiety	−0.05	0.04	−0.11	−0.10**	0.03	−0.22	−0.04	0.04	−0.08	−0.10**	0.09	−0.19
ATUS: humiliation	0.02	0.01	0.13	0.03**	0.01	0.19	0.04	0.03	0.14	0.04*	0.01	0.15
ATUS: school bonding	0.21***	0.05	0.39	0.36***	0.04	0.61	0.15	0.12	0.17	0.14**	0.05	0.21

Note: *Unst.* Unstandardized, *S.E.* Standardized error, *St.* Standardized, *ACOI* Adolescent culture of origin involvement, *PUSCI* Parent U.S. cultural involvement, *ATUS* Adolescent time in the U.S. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

adolescent, but not parent, U.S. cultural involvement would be a risk factor positively associated with aggressive behavior and poorer mental health outcomes—was not supported in the data. Adolescent U.S. cultural involvement was not significantly associated with any aspect of Latino adolescent mental health. This confirms earlier cross-sectional findings (Bird et al. 2006; Carvajal et al. 2002; Smokowski and Bacallao 2006) and adds longitudinal evidence that participation in U.S. culture is not necessarily the deleterious component of assimilation.

Instead of U.S. cultural involvement, adolescents' time spent in the U.S. was a simple acculturation proxy variable that appeared to capture the deleterious effects of assimilation. Time spent in the U.S. was positively associated with aggression for foreign-born and U.S.-born males and increasing feelings of humiliation for foreign-born females. This supports past research that has found length or residency or generational status to be related to increased youth violence and delinquency (Bui and Thongniramol 2005; Buriel et al. 1982; Samaniego and Gonzales 1999). It also prompts us to ask what these variables are actually measuring and if we need to develop new measures that more accurately gauge cultural change. Assimilation theorists posit that individuals discard aspects of their culture of origin identity to take on norms, behaviors, and beliefs valued and tolerated by the host society. If U.S. cultural involvement, measured primarily with items on language and media use, is not the problem, there is a pressing need to devise measures of adoption of prosocial and antisocial host society norms, behaviors, and beliefs. We will need more sophisticated measures to discern if the risk effect for time in the U.S. on aggression is due to segmented assimilation of antisocial norms that are tolerated or even valued by certain disadvantaged segments of American society (e.g., street gangs) or if Latino adolescent males are lashing out from the frustration of acculturation stress, discrimination, and marginalization (Bacallao and Smokowski in press). Further research and scale development in this area is clearly warranted to assess assimilation processes.

Acculturation Assets

Time in the U.S. was also an asset positively associated with increased school bonding. This is a promising finding in light of previous reports of the high rate of school drop out among Latino youth. School bonding increased with time in the U.S. for foreign-born, but not U.S.-born, males and females. One possible explanation for this finding could be that those adolescents who have spent more time in the U.S., and therefore are more acculturated, have a greater sense of belonging and an increased understanding of the importance of staying in school than those who are less acculturated (Ibañez et al. 2004; Valencia and Johnson 2006). It is difficult to fully accept this explanation of heightened belonging when time in the U.S. was also associated with feelings of humiliation and aggression. Alternately, adolescents in the country longer may simply be more proficient speaking English. They may feel more comfortable, competent, and bonded to school without the formidable language barrier that plagues low acculturated adolescents. This explanation is in line with several studies that have found youths fluent in both their culture of origin language and English achieve more than those who speak only one language (e.g., English-alone or limited-English

speakers; Feliciano 2001; Rumberger and Larson 1998; Stanton-Salazar and Dornbusch 1995). However, the feelings of humiliation and aggressive behavior related to time spent in the U.S. remain problematic, potentially negating the opportunities for growth afforded by higher levels of school bonding. Academic success that often follows school bonding may be undermined for these Latino adolescents by aggressive behavior that is a coping strategy to respond to feelings of humiliation, discrimination, and marginalization (Bacallao and Smokowski in press). Further research investigating the link between acculturation and school bonding that includes intervening variables (such as school climate, peer processes, cultural supports, and marginalization in schools and neighborhood environments) is needed.

Contrary to our hypothesis of null effects, parent U.S. cultural involvement was inversely related to Latino adolescent aggression for all subgroups, anxiety for foreign-born females, and social problems for foreign-born males and females. This effect lowering aggression contradicts past research reports that parent acculturation is unrelated to Latino adolescent mental health (Dumka et al. 1997; Knight et al. 1994; Vega et al. 1995) or that youth conduct problems increase when parents are more highly acculturated than children (Lau et al. 2005). Our results lend support to Eamon and Mulder (2005) who reported that youth with mothers who were more highly acculturated exhibited less antisocial behavior and Smokowski and Bacallao (2006) who found that parent U.S. cultural involvement influenced adolescent aggression indirectly by lowering parent-adolescent conflict. Many of these prior studies do not unpackage acculturation into its constituent components. It was critical for us to do so because parent U.S. cultural involvement was an asset, but parent culture of origin involvement had no significant longitudinal effects on adolescent mental health. Prior studies were all cross-sectional, highlighting the important contribution made by the current study's longitudinal effects.

The inverse relationship between parent U.S. cultural involvement and adolescent anxiety and social problems is interesting and has not been considered in previous quantitative research. Qualitative studies have emphasized how immigrant children worry about their low-acculturated parents being vulnerable and easily victimized in the new cultural environment (Bacallao and Smokowski 2007). It is understandable that foreign-born daughters with parents more highly involved in U.S. culture would be less anxious. Their parents would be less dependent on them, more competent in carrying out daily activities, and better able to serve as a resource for their children when problems arose. The same reasoning applies to the salutary effect on social problems. Parents who are more engaged, better understand the U.S. culture, and speak more English are in a better position to proactively help their adolescents with peer relations and forming friendships, decreasing the chances of social problems arising.

Our second hypothesis—that higher adolescent culture of origin involvement would be positively associated with self-esteem and inversely associated with adolescent aggression and problem behavior—was largely upheld. Greater culture of origin involvement was associated with decreases in adolescents' feelings of hopelessness, social problems, and level of aggression while positively contributing to self-esteem. The salutary effect on self-esteem lends support to previous research (Bat-Chava and Steen 2000; Phinney et al. 1997). The association between

adolescent culture of origin involvement and lower aggression has been reported in a previous study (Smokowski and Bacallao 2006); these results confirm that it has a longitudinal influence 1 year later and is most salient for U.S.-born adolescents. U.S.-born adolescents arguably have less socialization to culture of origin involvement compared to foreign-born adolescents who have memories of life in their native countries. Consequently, when U.S.-born adolescents are able to immerse themselves in their cultural heritage, it is a strong new asset, increasing their self-esteem and lowering aggressive behavior.

The inverse effect of culture of origin involvement on social problems was significant for foreign-born females. Very little research has been done on Latino adolescents' peer dynamics. It is likely that Latinas with higher involvement in their culture of origin would seek out other Latinas to socialize with. This would decrease problematic cultural barriers and lower the probability of social problems occurring due to discrimination. More research is needed to more fully understand Latino adolescent peer dynamics.

To summarize, the main cultural assets were parent U.S. cultural involvement and adolescent culture of origin involvement, especially for U.S.-born adolescents. It is interesting to note that both of these cultural assets are attainable, but require effort and investment. Parent culture of origin involvement is plentiful, but had no significant effect. Conversely, parent U.S. cultural involvement is quite difficult for many immigrant parents to develop (English language skills, new values and traditions, foreign media), but once cultivated has wide-ranging benefits for adolescent mental health. Similarly, seeking out culture of origin involvement for U.S.-born adolescents takes effort, devotion, and determination. It is harder than immersing oneself in the omnipresent dominant culture; however, once nurtured, it is a valuable resource for identity development, heightening self-esteem and lowering aggression.

Implications for Policy and Practice

Our findings have two straightforward implications for policy and practice. Latino adolescent mental health would significantly benefit from the development or maintenance of adolescent culture of origin involvement and parent U.S. cultural involvement. U.S.-born Latino adolescents would reap the most benefit from becoming involved in their cultures of origin. Unfortunately, few programs or policies have been crafted with this goal in mind. Dual immersion educational programs where half of the instruction is in English and half in Spanish would be one example, giving U.S.-born Latino adolescents the chance to learn their parents' native language and some aspects of Latin American cultures. These programs are not as politically popular as English-only language instruction and funding for these initiatives is often cut under the pressure of assimilationist angst. Based on our findings, it would be useful to evaluate whether dual immersion programs connecting youth to culture of origin language and traditions would benefit the mental health, self-esteem, and aggressive behavior of U.S.-born Latino adolescents.

Mental health prevention programs have also tried to strengthen culture of origin involvement. Cuento therapy for Puerto Rican children ages 5 to 8 and Hero/

Heroine Modeling for Puerto Rican adolescents were developed and tested (Costantino et al. 1986; Malgady et al. 1990). In this treatment model, therapists presented Puerto Rican folktales (Cuento therapy) or biographies of famous Puerto Rican men and women (Hero/Heroine Modeling) as models of adaptive behavior. These authors reported that the intervention significantly decreased anxiety, and increased ethnic identity and self-concept. Program effects varied by grade level, sex, and household composition. This intervention was particularly effective for high- risk Puerto Rican adolescents from single parent families.

Although evidence supporting the importance of adolescent culture of origin involvement is clear, linking to decades of research on ethnic identity as a cultural asset (Martinez and Dukes 1997; Phinney et al. 1997; Phinney et al. 1995), policy and programmatic initiatives lag behind. Greater investment is warranted in this area.

The second policy and practice recommendation that flows from our results centers on encouraging U.S. cultural involvement for Latino parents. Parent U.S. cultural involvement was related to lower aggression 1 year later in foreign- and U.S.-born males and females. It also was related to lower anxiety in foreign-born females and fewer social problems in foreign-born male and female adolescents. This contributes to the theoretical rationale for the development and implementation of family-oriented bicultural skills training programs (Bacallao and Smokowski 2005; Coatsworth et al. 2002; Szapocznik et al. 1986; Szapocznik et al. 1989), which were created to help Latino parents and adolescents to address areas of familial conflict, decrease intercultural conflict and acculturation stress, and heighten bicultural competencies within family systems. There are two empirically evaluated bicultural skills training programs for Latino families—Familias Unidas (Coatsworth et al. 2002) and Entre Dos Mundos (Bacallao and Smokowski 2005).

Bicultural skills training models have shown promising initial results on a variety of outcome measures (see Bacallao and Smokowski 2005 for a review). Consequently, based on clinical trials and the risk and cultural asset research presented in our results above, bicultural skills training programs deserve further attention to examine how these programs might benefit acculturating adolescents and their families. At the same time, prevention program evaluations need to measure parent and family processes, not just adolescent outcomes that are impacted by program strategies. None of these bicultural skills training programs have been widely disseminated. Without further investment, promising initial strategies will be unable to make a lasting impact on public health.

Limitations

Although the unique sampling frame for this investigation provides previously unknown information about acculturation processes, it also limits our ability to generalize. Caution is warranted in applying the results in other contexts. In addition, we recognize that there are important differences between countries-of-origin. Although a range of Latino subgroups were represented in the sample, we were unable to compare country-of-origin subgroups. These comparisons quickly become unwieldy and suffer from sample size limitations. Nevertheless, it is critical

to acknowledge that Latinos are not a homogenous group and acculturation processes are likely to vary by country-of-origin.

Our model contributed to research knowledge on Latinos by using a longitudinal design to examine how direct and moderated acculturation factors influence a range of adolescent mental health indicators. Despite these strengths, the model would have been more sophisticated if we integrated data from multiple reporters. Parent reports of their culture of origin and U.S. cultural involvement were included, but no parent reports of adolescent mental health were used. Future studies should include data from multiple sources.

Our model also did not control for the dependent variables measured at T1. This would have been helpful; however, controlling for past reports on the multiple domains would have made the model far too complicated. Estimating all of these extra path coefficients would have severely limited how many other independent variables we could include due to sample size constraints.

Conclusions

This paper explored cultural risk factors and assets related to Latino adolescents' mental health and school bonding. Although some of our findings did not support our proposed hypotheses, important new findings were uncovered. Parental involvement in U.S. culture was inversely associated with Latino adolescents' anxiety, aggression, and social problems. Adolescent culture of origin involvement was also found to improve self-esteem and lower aggression, social problems, and hopelessness, especially for adolescents born in the U.S. Nurturing these cultural involvements through interventions such as Familias Unidas and Entre Dos Mundos or through the development of localized programs designed to address the needs of acculturating Latino families is essential. Further exploration into the dynamics of acculturation and the construct validity of existing measures is also required. Future research should consider possible variables that mediate the associations between acculturation, mental health, and school bonding for Latino adolescents.

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