

PATHWAYS FROM ACCULTURATION STRESS TO NEGATIVE FRIENDS AND
SUBSTANCE USE AMONG LATINO ADOLESCENTS

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ABSTRACT

RACHEL L. BUCHANAN: Pathways from acculturation stress to negative friends and substance use among Latino adolescents
(Under the direction of Paul R. Smokowski)

This dissertation is comprised of three separate studies that examine acculturation processes and their effects on negative friend associations and substance use among Latino adolescents. The purpose of the first study was to review methods used to measure acculturation and to examine the validity of a multidimensional acculturation scale – the Bicultural Involvement Questionnaire (BIQ). The second study examined how acculturation stress, family relationships, and adolescent mental health problems contribute to the development of negative friend associations for Latino adolescents. Finally, the third study examined the link between acculturation stress and substance use for Latino adolescents, taking into consideration the adolescent’s mental health problems, family, and friend relationships.

Data from the Latino Acculturation and Health Project, a longitudinal study of the acculturation experiences of Latino families in North Carolina and Arizona, were used in all three studies. Study one analyses were conducted using Mplus 4.2, while Amos 7.0 was used for analyses in studies two and three.

Results from study one indicate that the BIQ needs slight modification before being used with Latino adolescents and more extensive modification for use with Latino adults. Following modification, the scale was found to be an effective measure of acculturation for both populations.

For studies two and three, family relationships and adolescent mental health problems were significant mediators between acculturation stress and the outcome variables of negative friend associations and substance use.

The acculturation process and its relationship with adolescent outcomes is complex. Further exploration into acculturation measurement is needed in order to improve our understanding of this multifaceted construct. When considering the effects of acculturation for Latino adolescents, special attention must be paid to the roles of family relationships and mental health outcomes. Implications for practice and future research are discussed.

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CHAPTER I

VALIDATION OF THE BICULTURAL INVOLVMENT QUESTIONNAIRE FOR LATINO ADOLESCENTS AND THEIR PARENTS

Acculturation is generally defined as the process by which individuals from one independent cultural group experience cultural change resulting from contact with another autonomous cultural group (Berry, 1990; Sam, 2006). This is a complex process and there is debate on how to effectively measure it (Unger, Ritt-Olson, Wagner, Soto, & Baezconde-Garbanati, 2007). Two main approaches are generally taken; unidimensional and bi/multidimensional. There has been no agreement among researchers as to which measurement method is the best (see Kang, 2006; Unger et al., 2007) or even what concepts or domains are associated with acculturative change (Zane & Mak, 2003); however the influence each type of measurement has on research results has been discussed at length (Birman, 1998; Cabassa, 2003). The purpose of this study is to review methods used to measure acculturation and to examine the validity of a multidimensional scale designed to measure acculturation – the Bicultural Involvement Questionnaire (BIQ).

Acculturation Measurement

The unidimensional approach to acculturation measurement is commonly based on proxy variables such as age at time of immigration, place of birth, time in the U.S., language use, and generational status (Bámaca & Umaña-Taylor, 2006; Marín, 1992; Epstein, Botvin, & Diaz, 2000; McQueen, Getz & Bray, 2003; Unger et al., 2000) or on singular items that ask the respondent to indicate language and cultural preferences/values on a scale ranging

from exclusively Latino/Hispanic to exclusively Anglo/non-Hispanic/Latino or Spanish only to English only (Magaña et al., 1996). This approach does not consider the balancing of two cultures by the individual; instead it forces the person to indicate whether they have a stronger preference for one culture over the other (Unger et al., 2007). This corresponds with the assimilation theory of acculturation; that individuals take on characteristics associated with the new culture, while leaving those of the country of origin behind (LaFromboise, Coleman, & Gerton, 1993). As pointed out by Unger et al. (2007), language usage may not be a good proxy for adolescent acculturation as their own preferences may be overridden by outside factors such as the language spoken in the home, with friends, and required at school. Additionally, the unidimensional approach has been criticized for its inability to distinguish the subtleties of acculturation and its linear approach to the acculturation process (Abraído-Lanza et al., 2006; Cabassa, 2003; De La Rosa, 2002).

The bi-/multidimensional approach takes into account both maintenance of the culture of origin and adherence to the dominant culture using several different indicators (Birman, 1998; Martinez, 2006). This approach to measurement best fits with the alternation (or bicultural) theory of acculturation, which suggests that individuals are able to balance the characteristics of the new culture with those from the country of origin. Bi-/Multidimensional measures of acculturation consider not only language, but also food, entertainment, and cultural preferences (Lara, Gamboa, Kahramanian, Morales & Bautista, 2005) and consider these dimensions in relation to both the culture of origin and the dominant culture. The use of bi-/multidimensional scales allows for the respondent to categorize the level of identification they have with one, both, or neither culture (Unger et al., 2007). Identification with and participation in either culture is not mutually exclusive;

high levels of participation or identification with one culture does not necessarily indicate low levels of participation or identification with the other (Gonzalez, Knight, Morgan-Lopez, Saenz, & Sirolli, 2002; LaFromboise et al., 1993; Magaña et al., 1996). The BIQ is one of a few measures that consider the bidirectional nature of acculturation (Coatsworth, Maldonado-Molina, Pantin, & Szapocznik, 2005; Marín, 1992).

This multidimensional approach also comes with limitations, not the least of which is the difficulty associated with successfully translating the concepts related to the bidirectional process into a sound measurement instrument (Cabassa, 2003); however, these considerations affect unidimensional measures as well. There is evidence that acculturation experiences and attitudes can vary depending on the situation; specifically, an individual may favor biculturalism in their public life, but focus more on their culture of origin in their private life (Arends-Tóth & Van de Vijver, 2007; Berry, 1997). This separation of experiences and preferences complicates the measurement of an already complex construct. Another important consideration is the developmental stage of the individual respondent. As noted by Cabassa (2003), the stage in life when an individual begins the acculturation process may greatly influence their preferences for involvement in their culture of origin and/or the dominant culture.

The response format, scaling, and scoring methods used in either measurement type contribute to the measure's utility and interpretation. Three types of response formats have been noted in acculturation research: frequency (e.g., How often do you speak Spanish?), proficiency (e.g., How well do you speak English?), and endorsement (i.e., how much the person agrees or disagrees with a statement; Kang, 2006). Responses to the endorsement format are the only of these three for which the responses are independent of other items.

Agreeing with one statement does not necessarily imply disagreement with another, whereas frequency and proficiency methods imply a greater frequency and proficiency on one item than on another.

The scaling of the response scale is another important contributor to the interpretability of the measure. Many response scales follow a four or five point Likert scale. The use of a four point scale has been criticized as it does not allow for respondents to choose a neutral option; instead they must choose a positive or negative response (Cabassa, 2003). The interpretation of the five point scale has been the source of debate as well since researchers are in disagreement on how to interpret the midpoint (see Arends-Tóth & Van de Vijver, 2007). Question also remains on whether a response at the midpoint (no clear association with one side or the other) can be interpreted as indicating a bicultural or marginalized response (integrating or rejecting both the dominant culture and culture of origin; Arends-Tóth & Van de Vijver, 2007; Marín, 1992). Evidence also exists that describes a preference for Latino respondents, especially those who are less acculturated, to select extreme response categories (e.g., strongly agree or strongly disagree) over more neutral choices (e.g., somewhat agree or somewhat disagree) when compared to non-Latino Whites (Marín & Marín, 1991).

Finally, the methods used to score the measures (i.e., the use of sum or average scores) are also seen as a limitation in that some methods may decrease the ability to measure multiple dimensions of acculturation (Abraído-Lanza et al., 2006) or mask different patterns of acculturation by virtue of the fact that the score may not accurately reflect the pattern of responses (Magaña et al., 1996).

The aim of the current study was to validate a multidimensional measure of acculturation (the BIQ) across two samples: Latino adolescents and Latino adults. The following research questions were addressed: 1) How many factors underlie the items on the BIQ for both adolescents and adults; and 2) Do the resulting factors for the acculturation scales have good construct validity?

Methods

Data Collection

This study was part of the Latino Acculturation and Health Project, a longitudinal investigation of acculturation in Latino families in North Carolina and Arizona. In depth, community-based interviews were conducted with Latino adolescents and their parents. Families were recruited from churches, English and 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 generalizability. 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. Quantitative interviews were conducted in participants' homes, and typically lasted approximately two hours for each family.

The quantitative 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. 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 and 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, talking 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 their time.

Sample

The target population for this study was Latino adolescents (average age = 15) and their families. Sample size was 249 adolescents and 249 parents. Sixty-eight percent of the adolescents were born outside of the United States. Females made up the largest percentage of the adolescent sample (54%). Mothers made up 90% of the parent respondents; 75% reported being married. Ninety-three percent of the parents were born outside of the United States. The average age of the parent respondents was 39. The average length of time in the U.S. for adolescents was 8.43 years ($SD=5.53$); for parents it was 11.81 years ($SD=10.86$). Table 1.1 contains information on participant demographics.

Measure

The BIQ measure of cultural involvement was used to operationalize acculturation. Responses from both adolescents and parents were considered in analysis. *Cultural Involvement* was measured by the 40 item BIQ (Szapocznik, Kurtines, & Fernandez, 1980). Two items related to language usage at work were removed due to the low number of employed respondents. This approach has been used in previous studies using the BIQ (Coatsworth et al., 2005). The BIQ is divided into two subscales: Involvement in Latino Culture (one indicator of Ethnic Identity) and Involvement in non-Latino (U.S.) culture. Each section includes statements to determine preferences (country of origin or U.S.) for language, entertainment, food, cultural activities, and celebrations. Responses to items are on a five-point Likert scale from 1 to 5 with possible responses matched to the statement. Higher scores on either subscale indicate greater cultural involvement with that cultural group. See Table 1.2 for a description of the measure with answer responses.

Data Analysis

Confirmatory factor analysis was used for this study. The main purpose of confirmatory factor analysis (CFA) is to test a theory driven model, based either on results from EFA or previous theory and research (Pett, Lackey, & Sullivan, 2003). Construct validity is used to assess whether a scale actually measures the construct it was designed to evaluate (Kline, 2005). The CFA method for testing construct validity is a valid way to observe whether each factor has a significant loading on the expected construct (Kline, 2005). This method will be used for this study. Based on previous research findings, it is expected that items 1-4, 9-15, and 23-31 will load together to form the Involvement in Latino Culture subscale and items 5-8, 16-22, and 32-40 will load on the Involvement in non-Latino

(U.S.) Culture subscale for both the adolescent and parent samples. If the items from the BIQ scales load as expected, construct validity will be achieved.

Goodness of fit. CFA output produces several fit indices that can be used to determine whether the tested model is a good fit to the data. The statistics most commonly cited in the literature are model chi-square, comparative fit index (CFI), and root mean square error of approximation (RMSEA) with 90% confidence interval. These statistics along with the normed chi-square will be examined. A non significant value for the model chi-square is ideal; however, this statistic is sensitive to large sample sizes (greater than 200) and therefore may not be a good indicator of model fit (Kline, 2005). As long as the other fit indices indicate a good match to the data, the model can be accepted (Reitz, Dekovic, Meijer, & Engels, 2006). The normed chi-square does not share the same sample size sensitivity as the model chi-square; a normed chi-square statistic less than three can be used to indicate model fit when the model chi-square is significant. The ideal cutoff value for the CFI is 0.90 and for the RMSEA, less than 0.06 with the upper limit of the 90% CI under 0.08 (Hu & Bentler, 1999).

Missing data. An important tool in conducting CFA is the modification index; however, this tool can only be accessed when missing data is addressed. Methods to manage missing data vary based on whether the data are missing at random (MAR) or missing completely at random (MCAR). In order to test whether the missing data for this study were MAR or MCAR, the Missing Values Analysis option in SPSS 14.0 was used. The key statistic in this analysis is the Little's MCAR test, which is a chi-square test to determine whether data are MCAR. A non-significant result indicates the data are MCAR (Garson, n.d.) and allows for the use of listwise deletion (Allison, 2002). Results from Little's MCAR test

were not significant for the adolescent sample ($p=.16$); however, they were significant for the parent sample ($p=.000$). Due to the pattern of missing data for the parents and the need for modification indices to improve model fit, the Full Information Maximum Likelihood (FIML) approach was used for all analyses. FIML estimation uses all available data for parameter estimation without the need for imputation (Enders, 2001) and has been shown to be more effective than other estimation approaches when dealing with MAR and MCAR data in confirmatory factor analysis (Enders & Bandalos, 2001).

Results

CFA on the BIQ was completed for both the adolescent and parent samples using Mplus version 4.2. The means and standard deviations for each item are reported in Table 1.3. For the adolescent sample, the first CFA was conducted using all 40 items from the BIQ. The baseline model was not acceptable, $\chi^2 (739, N=249)=3424.98$, $p<0.00$, $NC=4.63$, $CFI=0.48$, $RMSEA=0.121$ (0.117-0.125). This initial model indicated that several items loaded below the $>.5$ criterion commonly applied to CFA (Kline, 2005). If parallel items had strong factor loadings on one subscale, but not the other, the item was retained (i.e., if the item measuring preference for books and magazines from the native country had a low factor loading, but the parallel item showing a preference for non-Latino (American) books and magazines was strong, both items were retained). Following this guideline, parallel items from the Latino and non-Latino subscales were removed (items 1, 5, 23, 30, 31, 32, 39, and 40).

The second model was run with items 1, 5, 23, 30, 31, 32, 39, and 40 removed; resulting in a 32 item scale. The resulting model did not improve much over the baseline model, $\chi^2 (463, N=249)=2301.67$, $p<0.00$, $NC=4.97$, $CFI=0.54$, $RMSEA=0.126$ (0.121-

0.131). Using modification indices and theory as a guide, several error terms were then correlated in order to develop the final model. The resulting model was a far better fit to the data, χ^2 (439, $N=249$)=1277.78, $p<0.00$, NC=2.91, CFI=0.79, RMSEA=0.088 (0.082-0.093). While the model chi-square remains significant, possibly due to the sample size, the normed chi-square is not significant and the remaining fit statistics are acceptable.

The chi-square difference test was used to test the statistical difference between the hierarchical models (Kline, 2005). The difference in model chi-square statistics was 1023.89 (24 *df*) indicating that the final model was statistically better than the second model. As each of the items load only on their specified subscales, construct validity was supported. For adolescents, the Cronbach's alpha reliability for the Involvement in Latino Culture subscale was 0.85, and the Involvement in non-Latino (U.S.) Culture subscale was 0.90.

The BIQ was also tested with the parent sample. Testing of the 38 item scale (the two items regarding comfort speaking Spanish or English in school were dropped) indicated poor model fit and that several of the items did not have significant factor loadings (i.e., critical ratios below 1.96). The model fit indices yielded a model chi-square of χ^2 (664, $N=249$)=3589.79, $p<0.00$, NC=5.41, CFI=0.50, RMSEA=0.133 (0.129-0.137). The three non significant items (1, 3, and 4) were dropped from further analysis as were their parallel items (5, 7, and 8). Even with this reduced model, the fit statistics remained unacceptable, χ^2 (463, $N=249$)=2504.42, $p<0.00$, NC=5.41, CFI=0.57, RMSEA=0.133 (0.128-0.138). It was also indicated in this second model that several of the items loaded below the $>.5$ criterion. Parallel items from both the Latino and non-Latino subscales (items 9 through 22) were removed based on this observation, resulting in an 18 item scale. Fit indices for this third

model improved over the second, χ^2 (208, $N=249$)=1075.80, $p<0.00$, NC=5.17, CFI=0.74, RMSEA=0.129 (0.122-0.137), but remained unacceptable.

Using modification indices and theory, selected error terms were correlated resulting in a final model with acceptable fit, χ^2 (129, $N=249$)=360.72, $p<0.00$, NC=2.80, CFI=0.92, RMSEA=0.085 (0.075-0.095). The difference in chi-squares between the hierarchical models was 715.08 (79 *df*) indicating that the final model is statistically better than the third model. As with the adolescent sample, construct validity was supported as each item from the reduced model loaded only on the expected subscale. For parents, the Cronbach's alpha reliability for the reduced Involvement in Latino Culture subscale was 0.91, and the Involvement in non-Latino Culture subscale was 0.92. Table 1.4 indicates which items were retained from each subscale for both the adolescent and parent samples; factor loadings for the final BIQ scales are shown in Tables 1.5 and 1.6.

Discussion

CFA was completed in order to test the applicability of the BIQ to samples of Latino adolescents and adults. Results of the analysis did not support its use in the original form for either sample. For adolescents, eight items were removed due to low factor loadings. Two of the items asked about comfort speaking Spanish or English in the home, while the remainder concerned Latino or non-Latino cultural preferences as they relate to food, birthday, and wedding celebrations. A number of the other items retained in the final model had low factor loadings on one scale, but were retained if their parallel item on the other scale was strong. Looking over the factor loadings, it becomes evident that the items on the Latino subscale generally had lower factor loadings (below the $>.5$ criterion) than the items on the non-Latino

subscale, especially those related to Spanish language usage at school, with friends, and in general.

For the parent sample, several items were removed from the full BIQ measure either due to non-significance or low factor loadings. Ultimately only those items that asked about Latino or non-Latino cultural preferences were retained (items 23 through 40).

Important issues to consider when measuring acculturation are differences among countries of origin, implications for first generation immigrants as compared to second, third, or later generations, and exposure to U.S. culture prior to immigrating, as these groups could have vastly different experiences (Hunt, Schneider, & Comer, 2004; Zane & Mak, 2003). One limitation to this study is that U.S. and foreign-born respondents were combined for analysis due to sample size constraints. This may have skewed some responses on BIQ items. Larger samples of U.S. born respondents would be needed to further test the utility of the BIQ for that population.

Also combined were those individuals originating from different Latin American countries. The majority of the parents in this sample were foreign-born and emigrated from Mexico. Most of the adolescents in this sample were either immigrants themselves (mainly from Mexico) or among the first generation. However, as the BIQ has been validated and/or used with Latinos from several different cultural backgrounds (Coatsworth et al., 2005; Smokowski & Bacallao, 2007; Szapocznik et al., 1980) the results presented here should not have been greatly affected by this alone.

Regardless of immigrant status, it is difficult to ascertain when the adolescent or parent first came into contact with U.S. culture. As Hunt et al. (2004) point out; acculturation is predicated on the notion “that distinct groups are coming into new contact” (p. 978). They

go on to consider the unique relationship between Mexico and the U.S. As communication and travel between these two countries is fluid, it is difficult to measure just when Mexicans in the U.S. first came into contact with U.S. culture, as time of emigration may not be a valid measure. Moreover, if an individual resides in a country where news and entertainment from the U.S. is accessible, they may not be able to recall a time when they were not exposed to U.S. culture. This exposure may have an impact upon acculturation once the individual emigrates to the U.S. As the majority of the foreign-born sample originated in Mexico it is unknown whether or for how long the respondents were exposed to U.S. culture prior to emigration.

There are some limitations to this study that need to be considered. First, although the total sample size was sufficient to meet the minimum power criteria for CFA (> 200 ; Kline, 2005) insufficient subgroup sample sizes precluded the ability to test for between group differences on the BIQ for males vs. females, U.S. vs. foreign born, and younger vs. older adolescents. A larger sample is needed in order to complete these tests. Second, a few of the item factor loadings were well below the recommended criterion of between .5 and .6 (Kline, 2005); this brings into question the convergent validity of the items. These items remained in the models to ensure parallel forms for the Latino and non-Latino subscales; however, future research needs to be completed with varying samples in order to test whether this limitation is specific to this sample.

Conclusions

This study provided insight into the validity of the BIQ for a sample of Latino adolescents and their parents. Findings from the CFA on the BIQ for both adolescent and parent samples shed important light onto the use of multidimensional acculturation measures.

Those who are older (i.e., parents or the elderly) or are recent immigrants may require different measures to accurately ascertain their acculturation level. Future research is called for regarding these differences, especially in light of the growing Latino population in the U.S. and the need to explore how acculturation affects health and other important outcomes.

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CHAPTER II

PATHWAYS FROM ACCULTURATION STRESS TO NEGATIVE FRIEND ASSOCIATIONS AMONG LATINO ADOLESCENTS

Adolescence is an important time in human development. The transition from parents to friends to fulfill supportive, social, and informational needs is one of the main features of this developmental phase (Levitt et al., 2005). The friendships formed during this time can have important implications for adolescent outcomes such as substance use (Allen, Porter & McFarland, 2006), delinquent behavior (Samaniego & Gonzales, 1999), and academic achievement (Kaplan, 1999). Factors that contribute to the development of friendships are rarely considered in research with Latino adolescents. This may be due in part to the focus on the extended family within Latino culture. As families play such an important role, the transition from parents to friends that is so evident in mainstream American culture may not be as pronounced or normative among Latino adolescents, especially for those who have not been in the U.S. for very long (Bámaca & Umaña-Taylor, 2006). The purpose of this study is to examine factors that contribute to the development of friendships for Latino adolescents. Of specific interest are the roles acculturation stress, family relationships, and adolescent mental health problems play in prompting Latino adolescents to form relationships with negative friends.

Just as friendships provide a necessary context for the development of social and emotional skills (Crosnoe, 2000; Sherman, de Vries & Lansford, 2000), they also provide a context for the adoption of negative behaviors (see Allen et al., 2006). Adolescents who have

friends that endorse negative behaviors increase the likelihood that the adolescent will also engage in these behaviors (Prinstein & Wang, 2005). This may be due to the increased opportunities to participate in the behavior or to perceptions of pressure from friends. While there has not been a great deal of research conducted on negative friends associations and outcomes for Latino adolescents, there is evidence that these associations effect mental health (Barrera et al., 2002; Loukas, Prelow, Suizzo & Allua, 2008) and problem behavior (Barrera, Gonzales, Lopez & Fernandez, 2004; Eamon & Mulder, 2005; Frauenglass, Routh, Pantin & Mason, 1997) within this population. Research on resistance to peer pressure among Latino adolescents indicates that those whose families had been in the U.S. for longer periods of time and who have increased autonomy from their parents are less able to resist peer pressure (Bámaca & Umaña-Taylor, 2006; Umaña-Taylor & Bámaca-Gómez, 2003).

The reasons behind the formation of alliances with negative friends among Latino adolescents have not been extensively explored. Some researchers have examined the role different sources of stress play on these associations as part of larger studies on mental health outcomes (Barrera et al., 2002; Loukas et al., 2008; Nash, McQueen & Bray, 2005; Weisskirch & Alva, 2002). Loukas and colleagues found the combination of financial strain, neighborhood problems, and maternal psychological distress directly affects associations with deviant friends among Latino youth. In their study on the relative influence of family and friends on alcohol use, Nash and colleagues found that the stress from high levels of family conflict increases associations with negative friends. Barrera et al. also found key pathways between stress from outside the family and increased associations with deviant friends for this population. Finally, in a study looking at acculturation and language

brokering, Weisskirch and Alva found that adolescents who experience higher levels of acculturative stress were also more socially accepted by their peers.

While the research on negative friend associations among Latino adolescents is limited, there has been work done that explores some of the connections between concepts of interest for this study: acculturation stress, family relationships, and adolescent mental health. Acculturation stress, defined as “a response by people to life events that are rooted in intercultural contact” (Berry, 2006, p. 43), has been linked to several outcomes for Latino youth including mental health (Gil, Vega & Dimas, 1994), suicidal ideation (Hovey & King, 1996), delinquent behavior (Samaniego & Gonzales, 1999), and behavior problems (Vega, Khoury, Zimmerman, Gil & Warheit, 1995).

Family relationships are of key importance within Latino culture. Familism is a cultural value where family serves as the primary referent and source of emotional, informative, and instrumental support (Marín & Marín, 1991). The support that comes from the extended family unit serves as a mechanism for Latino adolescents to stay in touch with the cultural values of their country of origin, while also protecting them from engaging in risky behavior (Warner et al., 2006). However, there is evidence that familism decreases as acculturation and acculturation stress increases, thereby increasing the likelihood that the adolescent will engage in high-risk behaviors (Gil, Wagner & Vega, 2000; Martinez, 2006). Conflict between the adolescent and his or her parents also tends to increase as the adolescent becomes more acculturated to the U.S and experiences stress related to that experience (Gonzales, Deardorff, Formoso, Barr & Barrera, 2006; Pasch et al., 2006).

The association between family relationships and mental health outcomes for Latino adolescents has received some attention from researchers. Familism and family conflict serve

as strong mediators between acculturation stress and internalizing (Smokowski & Bacallao, 2007) and externalizing problems (Smokowski & Bacallao, 2006) among Latino adolescents. In their study on cumulative risk and internalizing and externalizing problems, Loukas and Prelow (2004) found that Latino boys and girls who experienced more risk factors (single-parent family, maternal distress, perceived financial strain, and neighborhood problems) had higher prevalence of internalizing and externalizing problems. Protective benefits of consistent family routines and secure family relationships were found to mitigate this relationship, even in the face of the adolescent experiencing multiple risk factors.

The effects of mental health problems on associations with negative friends have not been considered in past research on Latino adolescents. Studies conducted with a general population of adolescents indicate that the presence of externalizing problems is a good indicator of associations with negative friends (Buehler, 2006). When considering internalizing problems, it has been suggested that adolescents with higher levels of these types of problems are less likely to associate with peers in social situations thus decreasing the likelihood of their becoming involved in negative relationships (Fite, Colder & O'Connor, 2006; Siebenbruner, Englund, Egeland & Hudson, 2006; Windle, 1993). However, there is evidence that adolescents with internalizing problems are able to successfully establish friendships with other adolescents who have similar levels of internalizing problems (Reitz, Dekovic, Meijer & Engels, 2006; Hogue & Steinberg, 1995). Although these associations have not been tested among Latino youth, it is reasonable to believe that these patterns will apply to that population.

Theoretical Perspectives

Theories that consider the variables of interest to this study generally view them as links in the chain to predict behavioral outcomes for adolescents; friend associations are not generally considered as an outcome. Two examples of commonly referenced theories that consider friend associations as a link to problem behavior are Elliott's integrated theory of delinquency and drug use (Elliott, Huizinga & Ageton, 1985; Elliott, Huizinga & Menard, 1989; Elliott, 1994) and peer cluster theory (Oetting & Beauvais, 1986; 1987). These theories propose that environmental influences directly affect associations with negative friends for adolescents. In peer cluster theory, six components are associated with the formation of peer clusters (i.e., small groups, including best friend and couple dyads, which share attitudes, values, and beliefs; Oetting & Beauvais, 1986; Oetting & Beauvais, 1987): social structure, socialization links, psychological characteristics, attitudes and beliefs, rationales, and behaviors. Elliott's integrated theory uses components from strain, social control, and social learning theories to suggest that the social environment (early socialization and social disorganization) and strain from frustrated needs and wants influence both delinquent and conventional bonding. When considering its application to this study, one could posit that the strains and changes in social environment associated with the acculturation process decrease the level of conventional bonding to the family that is so important in Latino culture. This decrease in familial bonding, in turn, leads to an increase in mental health problems and negative friend associations.

There is little known about how acculturation stress, family relationships, and mental health outcomes affect negative friend associations among Latino adolescents. The purpose of this study is to examine how these pathways contribute to negative friend associations among Latino adolescents. In order to address this, the following hypotheses will be

considered: 1) high levels of acculturation stress lead to decreases in positive family functioning and increases in parent-adolescent conflict; 2) high levels of acculturation stress lead to increases in internalizing and externalizing problems; 3) high levels of familism decrease parent-adolescent conflict and negative friend associations; 4) high levels of parent-adolescent conflict increases internalizing and externalizing problems as well as negative friend associations; 5) higher incidence of internalizing problems decreases negative friend associations; and 6) higher incidence of externalizing problems increases negative friend associations. It is expected that family relationships, internalizing, and externalizing problems will mediate the associations between acculturation stress and negative friend associations, thereby increasing our understanding of the pathways between acculturation stress and negative friend associations for this sample of Latino adolescents. These hypothesized relationships are illustrated in the conceptual model depicted in Figure 2.1.

Methods

Data Collection

This study was part of the Latino Acculturation and Health Project, a longitudinal investigation of acculturation in Latino families in North Carolina and Arizona (Smokowski & Bacallao, 2006, 2007). In depth, community-based interviews were conducted with Latino adolescents and their parents at four time points spaced six months apart. Families were recruited from churches, English and 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 generalizability. 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. Quantitative interviews were conducted in participants' homes, and typically lasted approximately two hours for each family.

The quantitative 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. 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 and 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, talking 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. Participants were compensated \$20 for their time.

Sample

The sample for this study was 286 Latino adolescents (average age = 15). Sixty-six percent of the adolescents were born outside of the United States, with the majority

emigrating from Mexico (52%). Females made up the largest percentage of the sample (54%). The average length of time in the U.S. for the adolescents was 8.49 years ($SD=5.55$). Table 2.1 contains information on participant demographics.

Measures

Acculturation stress. Four measures of acculturation stress were used for this study: acculturation conflict, language conflict, perceived discrimination, and time in the U.S. The first of these three measures are consistent with those used by Vega and colleagues (Vega et al., 1995). *Acculturation conflict* was measured by a four-item scale on the frequency of conflict that surrounds issues of acculturation. Questions include “How often have you had problems with your family because you prefer American customs?” and “How often do you feel uncomfortable having to choose between non-Latin and Latin ways of doing things?” Responses are measured on a five-point scale from 1 (not at all) to 5 (frequently). Lower scores reflect lower levels of acculturation conflict. Cronbach alpha reliability for this scale was 0.72. *Language conflict* was measured with two items that asked about difficulties with getting along with others and getting good grades because of problems understanding English. Responses were on a 5-point Likert scale (1=not at all, 3=sometimes, 5=frequently). Higher scores indicate greater language conflict. Cronbach alpha reliability was 0.76. *Perceived discrimination* was measured using three items. One item asked, “How often do people dislike you because you are Latino?” the other two asked about unfair treatment of themselves or their friends because they are Latino. Responses were on a 5-point Likert scale (1=not at all, 3=sometimes, 5=frequently). Higher scores indicate greater perceptions of discrimination. Cronbach alpha reliability was 0.75. *Time in the U.S.* was measured by one

item that asked “How long have you lived in the U.S.?” The number of years the adolescent reported having lived in the U.S. was noted.

Family relationships. Two measures were used for this study to measure family relationships: familism and parent-child conflict. *Familism* was measured with seven items assessed on a four-point Likert scale (1= strongly agree and 4= strongly disagree) consistent with that used by Gil and colleagues (2000). Examples from this scale are “You share similar values and beliefs as a family” and “You really do trust and confide in each other”. High scores indicate high familism. The Cronbach alpha reliability for this scale was 0.90. *Parent-adolescent conflict* was measured using a 15-item modified version of the Conflict Behavior Questionnaire-20 (Robin & Foster, 1989). Examples of the items include “My parent(s) don’t understand me” and “I enjoy spending time with my parent(s)”. Respondents indicate how true or false each statement is. A low score indicates lower levels of parent/adolescent conflict. Cronbach alpha reliability for this scale was 0.89.

Adolescent mental health. Two scales from the Youth Self Report (YSR; Achenbach & Rescorla, 2001) were used to measure adolescent mental health. The YSR consists of 112 items with 16 subscales measuring a range of mental health problems. Items are scored on a three point scale (0= “not true”, 1= “somewhat or sometimes true”, and 3= “very true or often true”). The *Internalizing Problems* scale consists of 24 items taken from the Affective Problems, Anxiety Problems, Anxious-depressed Problems, Withdrawn-depressed Problems, and Somatic Complaints subscales. Higher scores reflect more internalizing problems. Cronbach alpha reliability for this scale was 0.88. The *Externalizing Problems* scale from the YSR is made up of 32 items from the Aggressive Problems, Attention Deficit-hyperactivity

Problems, Conduct Problems, and Rule-breaking Behavior subscales. Higher scores reflect more externalizing problems. Cronbach alpha reliability for the scale was 0.89.

Negative friend associations were measured using a nine-item scale. The scale consists of items created for the Friend Support and Friend Behavior scales of the School Success Profile (for a full description of the scales see Bowen, Rose, & Bowen, 2005). Examples of statements from this scale include “My friends use drugs” and “My friends get in trouble at school”. Responses are marked either “true” or “false”. Four of the items were recoded so that higher scores are related to having more negative friend associations. Cronbach alpha reliability for this scale at time one was .68 and at time four it was 0.76.

Demographic data such as gender, age, and nativity was also collected for the adolescent sample.

Data Analysis

Path analysis using Amos 7.0 was used in order to test the mediating effects adolescent mental health and family relationships have between acculturation stress and negative friend associations among Latino adolescents. Path analysis was selected over the general structural equation modeling methods due to the large number of indicator variables for each scale. Prior to running the model, confirmatory factor analysis (CFA) was completed on each of the scales to test how well they fit the data. Results confirmed goodness of fit for all scales.

Time one data was used for the exogenous variables (acculturation conflict, language conflict, time in the U.S., perceived discrimination, and negative friend associations); time two data, collected six months later, was used for the mediating variables (externalizing and internalizing problems, parent-adolescent conflict, and familism); and time four data,

collected 18 months after time one, was used for the endogenous variable (negative friend associations). Initial path analysis was completed based on the hypothesized paths found in Figure 2.1. The exogenous variables were correlated based on theory and significant correlations in the data. Following testing of the original model, all non-significant paths were deleted. All remaining paths were significant and model fit statistics confirmed that the model was a good fit to the data. Further analysis was completed to test partial and full mediating effects using the Sobel test (Kline, 2005).

Goodness of fit. Path analysis output produces several fit indices that can be used to determine whether the tested model is a good fit to the data. The statistics most commonly cited in the literature are model chi-square, comparative fit index (CFI), and root mean square error of approximation (RMSEA) with 90% confidence interval. These statistics along with the normed chi-square will be examined. A non-significant value for the model chi-square is ideal; however, this statistic is sensitive to large sample sizes (greater than 200) and therefore may not be a good indicator of model fit (Kline, 2005). As long as the other fit indices indicate a good match to the data, the model can be accepted (Reitz et al., 2006). The normed chi-square does not share the same sample size sensitivity as the model chi-square; a normed chi-square statistic less than three can be used to indicate model fit when the model chi-square is significant. The ideal cutoff value for the CFI is 0.90 and for the RMSEA, less than 0.06 with the upper limit of the 90% CI under 0.08 (Hu & Bentler, 1999).

Missing data. The Full Information Maximum Likelihood (FIML) approach was used for all analyses. FIML estimation uses all available data for parameter estimation without the need for imputation or the deletion of incomplete cases (Enders, 2001). It has

been shown to be more effective than other estimation approaches when dealing with missing data in structural equation models (Enders & Bandalos, 2001).

Results

Table 2.2 contains information on the correlations, means, and standard deviations for each of the variables used in this study. The majority of the sample scored low on the negative friend associations scale both at time one ($M=1.62$, $SD=1.78$) and time four ($M=1.40$, $SD=1.86$), indicating that most of the adolescents had positive associations with their friends.

Correlations between the variables were not high enough to warrant concern over multicollinearity (i.e., $>.85$; Kline, 2005). There were strong positive correlations between perceived discrimination and language conflicts ($r=.80$, $p<.01$), parent-adolescent conflict and externalizing problems ($r=.59$, $p<.01$), negative friend associations at time one and time four ($r=.54$, $p<.01$), internalizing problems and externalizing problems ($r=.52$, $p<.01$), and externalizing problems and negative friend associations at time four ($r=.52$, $p<.01$). Strong negative correlations were found between time in the U.S. and language conflicts ($r=-.60$, $p<.01$) and parent-adolescent conflict and familism ($r=-.57$, $p<.01$). Moderate positive correlations existed between negative friend associations at time one and externalizing problems ($r=.34$, $p<.01$) and internalizing problems and parent-adolescent conflict ($r=.47$, $p<.01$). Moderate negative correlations were found between time in the U.S. and perceived discrimination ($r=-.36$, $p<.01$), internalizing problems and familism ($r=-.31$, $p<.01$), and familism and externalizing problems ($r=-.37$, $p<.01$). The remaining variables were weakly or not significantly correlated with one another.

The baseline model was an adequate fit to the data, χ^2 (df=6, $N=286$) = 5.80, $p = .45$, Normed $\chi^2 = .97$, CFI = 1.00, RMSEA = .000, 90% CI (.000-.076); however, several paths were not significant. Following deletion of the non-significant paths, the final model was found to be a good fit to the data, χ^2 (df=23, $N=286$) = 21.29, $p = .62$, Normed $\chi^2 = .88$, CFI = 1.00, RMSEA = .000, 90% CI (.000-.042). Standardized and unstandardized path estimates are shown in Table 2.3. See Figure 2.2 for the final analytical model.

Direct Effects

Several of the direct effect hypotheses were supported in this analysis. The acculturation stress variables had significant direct effects on familism, parent-adolescent conflict, and externalizing problems as hypothesized. With regard to the family relationships variables, acculturation conflict and perceived discrimination were related to parent-adolescent conflict, while time in the U.S. and acculturation conflict were associated with familism. The longer the adolescent resided in the U.S., the greater their reported externalizing problems. The hypothesis that acculturation stress would be directly associated with internalizing problems was not supported.

When considering the family relationship variables, negative friend associations at time one was related to familism at time two. As hypothesized, high levels of familism did lower parent-adolescent conflict, but did not have a direct significant impact on negative friend associations at time four. High levels of parent-adolescent conflict were associated with both internalizing and externalizing problems, but was not a significant direct contributor to negative friend associations at time four.

Finally, only one of the hypotheses regarding the influence of the mental health variables on negative friend associations at time four was supported. Higher levels of

reported externalizing problems were significantly associated with the likelihood of the adolescent having associations with negative friends at time four. Internalizing problems were not significant in predicting negative friend associations for this sample.

Mediation Effects

Mediation effects were examined to test which variables (parent-adolescent conflict, familism, internalizing, and externalizing problems) mediated the pathway from acculturation stress to negative friend associations at time four. Externalizing problems was the only direct mediator between acculturation stress (as indicated by time in the U.S.) and negative friend associations at time four ($Z=2.48$, $p<.05$). This corresponds with the hypothesis that acculturation stress increases externalizing problems, which increases negative friend associations.

Multiple Mediation Effects

When looking at instances of multiple mediation, parent-adolescent conflict proved to be the strongest mediator between indicators of acculturation stress, externalizing problems, and negative friend associations at time four. While there is no statistical test to examine multiple mediation effects, one widely accepted method is to determine whether every path in the chain is statistically significant therefore indicating that the entire indirect effect is significant (Kline, 2005). The following multiple mediated effects were significant. Time in the U.S., acculturation conflicts, and having negative friend associations at time one were all associated with lower familism at time two. In turn, this lower familism was related to higher parent-adolescent conflicts, which led to higher externalizing problems and ultimately to more negative friend associations at time four. Acculturation conflict, perceived discrimination, and language conflict at time one were all linked with parent-adolescent

conflict at time two. This risk chain then led from parent-adolescent conflict to externalizing problems, which in turn, was linked with negative friend associations at time four. These risk chains suggest that indicators of acculturation stress influence family relationships, which in turn affects externalizing problems and negative friend associations at time four, as hypothesized. See Table 2.4 for full information on the decomposition of mediation effects.

Discussion

The present study sought to extend knowledge of factors that contribute to negative friend associations among Latino adolescents. Of main interest was discovering what factors mediate the pathway from acculturation stress to negative friend associations for Latino youth. This is the first study to examine these pathways for Latino adolescents and provides an initial starting point to further explore these associations.

Findings from this study support the hypothesis that the effects of acculturation stress on negative friend associations are mediated by family relationships and mental health problems, particularly parent-adolescent conflict and externalizing problems. As previous research on Latino adolescents has not considered negative friend associations as an outcome, this is a novel finding and worthy of continued study. Acculturation stressors had strong effects on both of the family relationships variables. Acculturation conflict and perceived discrimination both increased parent-adolescent conflict, while a decrease was associated with language conflicts. It is possible that adolescents who primarily speak Spanish (i.e., they have more difficulty speaking English) may be low in acculturation and maintain stronger ties with their families. This would result in a decrease in parent-adolescent conflict; however, there was no significant effect between language conflict and an increase in familism. The acculturation stress variables of time in the U.S. and acculturation conflict

both decreased familism for this sample. Time in the U.S. was also associated with an increase in externalizing problems. These findings support the deleterious effects of acculturation stress that have been reported in previous studies (Gonzales et al., 2006; Martinez, 2006; Smokowski & Bacallao, 2006). While negative friend associations had not previously been considered as a predictor of familism, the study finding that the presence of these associations decreases familism is not surprising. Adolescents who are finding support from negative friends may not be relying on support from their families as much as those who have more limited or positive friend bonds.

Externalizing problems was the only variable that had a direct effect on negative friend associations at time four. This finding has support from previous literature on the general population of adolescents (Buehler, 2006). Externalizing problems was also a key mediator from both acculturation stress and family relationships to negative friend associations. Again, while previous research does not focus on friend associations, earlier studies on family conflict and adolescent mental health within the Latino adolescent population support the finding that this type of stress increases both parent-adolescent conflict and externalizing problems (Smokowski & Bacallao, 2006).

Even though friendships among Latino youth have not generally been researched, there has been some mention of the differences between associations with other Latino youth and associations with youth from other racial or ethnic groups. Quillian and Campbell (2003) found that friendships among Latino adolescents crosscut both racial and ethnic lines. They concluded that friendships among Latinos who consider themselves white Hispanics were more likely to have friends who were white, white Hispanic, or other Hispanic, whereas those who identify themselves as black Hispanics were more likely to have friends who were

black Hispanics or black. Finally, they note that even though there is solidarity related to ethnicity, Latino adolescents become divided in their friendships based on racial lines; this, Quillian and Campbell conclude, could be related to generational status as well as assimilation.

The idea of generational status influencing cross-ethnic friendships among Latino adolescents has also been considered in other studies (Hamm, Brown & Heck, 2005). In the study by Hamm and colleagues, the researchers found that the longer the adolescents were in the U.S. and the more comfortable they became with the English language, the more cross-ethnic friendships were reported. With whom the adolescent associates is also a product of economic, neighborhood, school, and parental resources (Barrera et al., 2002; Hamm et al., 2005; Updegraff, McHale, Whiteman, Thayer & Crouter, 2006); with those who have more resources relating more cross-ethnic friendships. Associations with different racial or ethnic groups may also ultimately contribute to the types of behavior the adolescent engages in.

Implications for Practice

Findings from this study point to several potential intervention areas. Acculturation stress, family relationships, and mental health problems are all key contributors to negative friend associations for Latino adolescents. While there are no interventions specifically targeted to decreasing negative friend associations, a few have been developed that address one or more of the salient issues within the context of decreasing problem behavior (e.g., *Entre Dos Mundos*: see Bacallao & Smokowski, 2005; *Brief Strategic Family Therapy*: see Santisteban et al., 2003; *Familias Unidas*: see Coatsworth, Pantin & Szapocznik, 2002; Pantin et al., 2003; *Family Effectiveness Training*: see Szapocznik et al., 1989). Many interventions designed specifically to address problem behavior in Latino adolescents are

family focused. The basis of these interventions is the belief that for Latino families, especially those who have recently immigrated to the United States, the family serves as the main source of support and influence. Through strengthening these relationships and helping family members bridge the acculturation gap, it is proposed that the incidence of problem behaviors (including negative friend associations) among the adolescent members of the family will decrease. The study finding on the importance of family relationships in decreasing negative friend associations lends theoretical support to these interventions.

In designing new interventions for this population, the use of a peer leadership component could be an effective way to further influence positive outcomes. Immigrant Latino youth face discrimination and feelings of powerlessness as they attempt to integrate themselves into their new environment (DeGarmo & Martinez, 2006; Holleran, Reeves, Dustman & Marsiglia, 2002). Peer leadership would provide the adolescents with the opportunity to become a part of a program that could help to alleviate some internalizing and externalizing problems, while also encouraging positive friend associations, enhancing communication skills, and possibly decreasing acculturative stress. The positive results that come with feeling connected to the community may also help with improving family relationships.

Implications for Research

This is the first predictive study of friendships among Latino youth and while it does further current knowledge, it also provides an innovative model on which to base future research. Vega and colleagues (1997) suggest that when looking at acculturation stress, one should also consider using a measure of acculturation. While this was not done in this study, future research should look at differences between these two concepts and how they affect

negative friend associations. This study also considered different indicators of internalizing and externalizing problems together. It would be interesting to see whether breaking out these two types of problems into smaller components (i.e., depression, anxiety, aggression, conflict behavior) and considering them separately would change the pathways.

Limitations

Some limitations of this study need to be taken into consideration. First, generational status (new immigrant, first generation, second generation, etc.; Chappin & Brook, 2001; Velez & Ungemack, 1995) may be important contributors to each of the variables included in this study. While this was not explicitly controlled for in this study, this sample of adolescents consists either of youth who are immigrants or among the first generation. Second, sample size limitations precluded the ability to test for differences among different groups. Future research should consider differences by gender, country of origin, and adolescent age (early vs. late adolescence). Finally, data were not collected on the ethnic/racial makeup of the adolescents' friendships. Future research should examine whether differences exist for adolescents who primarily identify with friends of the same or different racial/ethnic groups.

Conclusions

In 2006, 37% of the Latino population was age 19 or younger (Pew Hispanic Center, 2008). Latino adolescents are a large and growing segment of the Latino population and the issues facing them today are going to continue into the next generation. It is important to reach some understanding of the different roles acculturation stress, family relationships, and mental health outcomes play in determining associations with negative friends; especially in light of the negative outcomes related to these associations, many of which plague Latinos at

a higher rate than their Black or White peers. This study is an important initial step to understand these associations and identify important areas for intervention.

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CHAPTER III

PATHWAYS FROM ACCULTURATION STRESS TO SUBSTANCE USE AMONG LATINO ADOLESCENTS

While the use of some substances has been in decline since the 1990's (Johnston, O'Malley, Bachman & Schulenberg, 2007), substance use among adolescents continues to be of concern. It has been suggested that some level of experimentation with substances is normal during adolescence as teenagers try to figure out who they are and where they fit in (Baer, MacLean & Marlatt, 1998; Berk, 2007; Chassin, Ritter, Trim & King, 2003; Siebenbruner, Englund, Egeland, & Hudson, 2006). This process of self-discovery may be more complicated for Latino adolescents in the U.S., especially when they are also faced with stress associated with acculturation (i.e., the process by which individuals from one independent cultural group experience cultural change resulting from contact with another autonomous cultural group; Berry, 1990; Sam, 2006).

Results from research on the links between acculturation and substance use for Latino adolescents have been inconsistent. Some studies find high levels of acculturation to be predictive of substance use, while others find the reverse (Carvajal, Photiades, Evans & Nash, 1997; De La Rosa, 2002; Dinh, Roosa, Tein & Lopez, 2002; Gonzales, Knight, Morgan-Lopez, Saenz & Sirolli, 2002). The purpose of this study is to examine the link between acculturation stress and substance use for Latino adolescents, while taking into consideration the adolescent's mental health, family, and peer relationships.

Substance Use among Latino Adolescents

Findings from the 2005 Youth Risk Behavior Survey (YRBS) demonstrate the need for attention to Latino adolescent health issues, specifically those related to substance use behaviors. Latino students (in grades 9 through 12) are more likely than White or Black students to use cocaine, heroin, methamphetamines, and/or ecstasy, and ride with a driver who had been drinking alcohol; they are equally as likely to use cigarettes and marijuana as White or Black adolescents (Centers for Disease Control and Prevention, 2006a). When looking at gender differences some patterns emerge. The use of tobacco and illegal drugs tends to be higher for males, while inhalant use is slightly more prevalent for Latinas; lifetime alcohol use is roughly the same for both genders, but heavy and current alcohol use is slightly higher for males (Centers for Disease Control and Prevention, 2006b). This pattern is similar to that of the general population of adolescents. There is some evidence that past month alcohol use and illicit drug use is lower for foreign born Latino adolescents as compared to those who are U.S. born; however, rates of use between foreign born males and females are similar (National Survey on Drug Use and Health, 2005).

Links between Acculturation Stress and Substance Use

Acculturation stress has been defined as “a response by people to life events that are rooted in intercultural contact” (Berry, 2006, p. 43). Differences in acculturation between adolescents and their parents, language conflict, language behavior, perceived discrimination, lack of commitment to the family and culture of origin are all associated with increases in acculturation stress (Vega, Zimmerman, Gil, Warheit & Apospori, 1997). Previous research has uncovered links between acculturation stress and mental health (Gil, Vega & Dimas, 1994), suicidal ideation (Hovey & King, 1996), drug use (Romero, Martinez & Carvajal,

2007; Vega & Gil, 1999; Vega, Gil, Warheit, Zimmerman & Apospori, 1993), delinquent behavior (Samaniego & Gonzales, 1999), and behavior problems (Vega, Khoury, Zimmerman, Gil & Warheit, 1995) for Latino adolescents.

The call has been made for more researchers to include variables measuring the social environment when looking at the association between acculturation and substance use among Latino adolescents (De La Rosa, 2002; Gonzalez, Deardorff, Formoso, Barr & Barrera, 2006; McQueen, Getz & Bray, 2003; Oetting, 1993). Many studies that do include the social environment focus on family relationships and dynamics; few include measures of friend associations or influence. This is interesting due to the suggestion that as adolescents become more acculturated they are more likely to experience family conflict and be more greatly influenced by friends (Bámaca & Umaña-Taylor, 2006; Unger et al., 2000); which in turn is a strong contributor to substance use among Latino adolescents (Landrine, Richardson, Klonoff & Flay, 1994; Newcomb & Bentler, 1986; Velez & Ungemack, 1995).

Family relationships. Strong family relationships are a cornerstone of Latino culture. Family conflict and familism (a cultural value where family serves as the primary referent and source of emotional, informative, and instrumental support; Marín & Marín, 1991) are two key mediators in the association between adolescent acculturation and substance use. Family conflict tends to increase as acculturation increases (Gonzales et al., 2006; Pasch et al., 2006) and is a significant indicator of delinquency (Samaniego & Gonzales, 1999) and substance use (McQueen et al., 2003) among Latino adolescents. Familism is seen as a protective factor in the association between acculturation stress and substance use among Latino adolescents; however, there is evidence that as acculturation and acculturation stress increases, familism decreases, thereby increasing the likelihood that the adolescent will

engage in substance use behaviors (Gil, Wagner & Vega, 2000; Martinez, 2006). Familism and family conflict are also strong mediators between acculturation stress and both internalizing problems (Smokowski & Bacallao, 2007) and externalizing problems for Latino adolescents (Smokowski & Bacallao, 2006).

Adolescent mental health. Internalizing and externalizing problems have been linked to substance use among adolescents; however, this link has not generally been explored within the Latino population. Studies of the general adolescent population indicate that high externalizing problems are predictive of greater substance use (Helstrom, Bryan, Hutchison, Riggs & Blechman, 2004; King, Iacono & McGue, 2004). The reverse was true for internalizing problems, with higher rates of internalizing problems predicting lower rates of substance use (Fite, Colder & O'Connor, 2006; Siebenbruner et al., 2006). However, there have been inconsistent associations between internalizing problems and reported substance use depending upon the specific type of internalizing problem (Wittchen et al., 2007), substance used, and gender (King et al., 2004).

Theoretical Perspective

Several theories consider how different factors contribute to adolescent substance use (see Petraitis, Flay & Miller, 1995). One theory, Elliott's integrated theory (Elliott, Huizinga & Ageton, 1985; Elliott, Huizinga & Menard, 1989; Elliott, 1994), combines aspects of social control theory, social learning theory, and strain theory in order to better conceptualize the experiences that lead to adolescent delinquency and drug use. This theory suggests that the social environment (early socialization and social disorganization) and strain from frustrated needs and wants influence both delinquent and conventional bonding, which in turn influences delinquent and substance using behaviors. In pure control theory, it is

suggested that adolescents who do not have strong bonds to others are at the highest risk for involvement in substance use behaviors (Elliott et al, 1989). The integrated model takes a modified view of this; adolescents who are bonded, but to delinquent or substance using peers, are at the greatest risk for engaging in substance use or delinquent acts (Elliott et al., 1989). The social learning component of the integrated theory suggests that these bonds place the adolescent in a position to learn about delinquent behaviors within a setting that motivates and rewards participation in delinquent acts (Elliott et al., 1985). The influence of delinquent bonds combined with the interaction between strong delinquent bonds and weak conventional bonds to family or non-delinquent peers is seen as the primary pathway to delinquent and substance using behaviors among adolescents (Elliott et al., 1989).

In applying this theory to the present study, one could suggest that the strains and changes in the social environment associated with the acculturation process decreases the level of conventional bonding to the family that is so important in Latino culture. This decrease in familial bonding, combined with an increase in negative peer bonding places the adolescent in the position to learn more about delinquent and substance using behavior. Engaging in these behaviors then serves to further separate the adolescent from the dominant culture as well as their family and culture of origin, thus increasing the stress and strain felt by the adolescent. One critique of this theory is its exclusion of the adolescent's interpersonal characteristics, personality traits, and affective states (Petraitis et al., 1995). This study attempts to address this critique through the inclusion of adolescent mental health outcomes as a mediator between acculturation stress and substance use.

The cumulative effects of acculturation stress, family relationships, peer relationships, and mental health outcomes on substance use among Latino adolescents has not received

much attention in recent research. The purpose of this study is to examine how these pathways contribute to substance use among Latino adolescents. In order to address this issue, the following hypotheses will be considered: 1) high levels of acculturation stress lead to decreases in positive family functioning and increases in parent-adolescent conflict; 2) high levels of acculturation stress lead to increases in adolescent internalizing and externalizing problems; 3) high levels of acculturation stress lead to increased associations with negative friends; 4) high levels of familism decrease parent-adolescent conflict and negative friend associations; 5) high levels of parent-adolescent conflict increases internalizing and externalizing problems as well as negative friend associations; 6) higher incidence of externalizing problems increases negative friend associations; 7) parent-adolescent conflict increases substance use, while high levels of familism decreases use; 8) negative friend associations increase substance use; and 9) internalizing problems decrease substance use, while externalizing problems increase use. It is expected that family relationships, internalizing and externalizing problems, and negative friend associations will mediate the pathway between acculturation stress and substance use for this sample of Latino adolescents. Figure 3.1 is a graphic representation of the theoretical model to be tested.

Methods

Data Collection

This study was part of the Latino Acculturation and Health Project, a longitudinal investigation of acculturation in Latino families in North Carolina and Arizona (Smokowski & Bacallao, 2006, 2007). In depth, community-based interviews were conducted with Latino adolescents and their parents. Families were recruited from churches, English and 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 generalizability. 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. Quantitative interviews were conducted in participants' homes, and typically lasted approximately two hours for each family.

The quantitative 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. 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 and 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, talking 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 his or her time.

Sample

The sample for this study was 286 Latino adolescents (average age = 15). Sixty-six percent of the adolescents were born outside of the United States, with the majority emigrating from Mexico (52%). Females made up the largest percentage of the sample (54%). The average length of time in the U.S. for the adolescents was 8.49 years ($SD=5.55$). Table 2.1 contains information on participant demographics.

Measures

Acculturation stress. Four measures of acculturation stress were used for this study: acculturation conflict, language conflict, perceived discrimination, and time in the U.S. The first of these three measures are consistent with those used by Vega and colleagues (Vega et al., 1995). *Acculturation conflict* was measured by a four item scale on the frequency of conflict that surrounds issues of acculturation. Questions include “How often have you had problems with your family because you prefer American customs?” and “How often do you feel uncomfortable having to choose between non-Latin and Latin ways of doing things?” Responses are measured on a five-point scale from 1 (not at all) to 5 (frequently). Lower scores reflect lower levels of acculturation conflict. Cronbach alpha reliability for this scale was 0.72. *Language conflict* was measured with two items that asked about difficulties in getting along with others and getting good grades due to problems understanding English. Responses were on a 5-point Likert scale (1=not at all, 3=sometimes, 5=frequently). Higher scores indicate greater language conflict. Cronbach alpha reliability was 0.76. *Perceived discrimination* was measured using three items. One item asked “How often do people dislike you because you are Latino?” the other two asked about unfair treatment of themselves or their friends because they are Latino. Responses were on a 5-point Likert scale

(1=not at all, 3=sometimes, 5=frequently). Higher scores indicate greater perceptions of discrimination. Cronbach alpha reliability was 0.75. *Time in the U.S.* was measured by one item that asked “How long have you lived in the U.S.?” The number of years the adolescent reported having lived in the U.S. was noted.

Family relationships. Two measures were used for this study to measure family relationships: familism and parent-adolescent conflict. *Familism* was measured with seven items assessed on a four-point Likert scale (1= strongly agree and 4= strongly disagree) consistent with that used by Gil, Wagner, & Vega (2000). Examples from this scale are “You share similar values and beliefs as a family” and “You really do trust and confide in each other”. High scores indicate high familism. The Cronbach alpha reliability for this scale was 0.90. *Parent-adolescent conflict* was measured using a 15-item modified version of the Conflict Behavior Questionnaire-20 (Robin & Foster, 1989). Examples of the items include “My parent(s) don’t understand me” and “I enjoy spending time with my parent(s)”. Respondents indicate how true or false each statement is. A low score indicates lower levels of parent-adolescent conflict. Cronbach alpha reliability for this scale was 0.89.

Adolescent mental health. Two scales from the Youth Self Report (YSR; Achenbach & Rescorla, 2001) were used to measure adolescent mental health. The YSR consists of 112 items with 16 subscales measuring a range of mental health problems. Items are scored on a three point scale (0= “not true”, 1= “somewhat or sometimes true”, and 3= “very true or often true”). The *Internalizing Problems* scale consists of 24 items taken from the Affective Problems, Anxiety Problems, Anxious-depressed Problems, Withdrawn-depressed Problems, and Somatic Complaints subscales. Higher scores reflect more internalizing problems. Cronbach alpha reliability for this scale was 0.88. The *Externalizing Problems* scale from the

YSR is made up of 32 items from the Aggressive Problems, Attention Deficit-hyperactivity Problems, Conduct Problems, and Rule-breaking Behavior subscales. Higher scores reflect more externalizing problems. Cronbach alpha reliability for the scale was 0.89.

Negative friend associations were measured using a nine item scale. The scale consists of items created for the Friend Support and Friend Behavior scales of the School Success Profile (for a full description of the scales see Bowen, Rose, & Bowen, 2005). Examples of statements from this scale include “My friends use drugs” and “My friends get in trouble at school”. Responses are marked either “true” or “false”. Four of the items are recoded so that higher scores are related to having more negative friend associations. Cronbach alpha reliability for this scale was 0.70.

The *substance use* measure consisted of seven items concerning the frequency of the adolescent’s substance use. The items mirror those questions asked in the YRBS. Examples of items include “During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?”, “How many times have you smoked cigarettes in the last 30 days”, and “How many times have you smoked marijuana in your lifetime?” All items are scored on a seven point scale with the type of responses being matched to the specific question (i.e., 0=0days, 1=1 day, 2=2 days, 3=3-5 days, 4=6-9 days, 5=10-19 days, and 6=20 or more days; 0=0 times, 1=1-2 times, 2=3-5 times, 3=6-9 times, 4=10-19 times, 5=20-39 times, and 6=40 or more times). Higher scores indicate more frequent and higher amounts of substance use. Cronbach alpha reliability for this scale was 0.79 at time one and 0.85 at time four.

Demographic data such as gender, age, and nativity was also collected for the adolescent sample. This information will be used to test for moderating effects.

Data Analysis

Path analysis using Amos 7.0 was used in order to explore the mediating effects adolescent mental health, family relationships, and negative friend associations have between acculturation stress and substance use among Latino adolescents. Path analysis was selected over the general structural equation modeling methods due to the large number of indicator variables for each scale. Prior to running the model, confirmatory factor analysis was completed on each of the scales to test how well they fit the data. Results confirmed goodness of fit for all scales.

Time one data was used for the exogenous variables (acculturation conflict, language conflict, time in the U.S., perceived discrimination, and substance use); time two data, collected six months later, was used for the mediating variables (externalizing and internalizing problems, parent-adolescent conflict, familism, and negative friend associations); and time four data, collected 18 months after time one, was used for the endogenous variable (substance use). The exogenous variables were correlated based on theory and significant correlations in the data. Following testing of the original model, all non-significant paths were deleted. All remaining paths were significant and model fit statistics confirmed that the model was a good fit to the data. Further analysis was completed to test partial and full mediating effects using the Sobel test (Kline, 2005).

Goodness of fit. Output from path analysis produces several fit indices that can be used to determine whether the tested model is a good fit to the data. The statistics most commonly cited in the literature are model chi-square, comparative fit index (CFI), and root mean square error of approximation (RMSEA) with 90% confidence interval. These statistics along with the normed chi-square will be examined. A non significant value for the model

chi-square is ideal; however, this statistic is sensitive to large sample sizes (greater than 200) and therefore may not be a good indicator of model fit (Kline, 2005). As long as the other fit indices indicate a good match to the data, the model can be accepted (Reitz, Dekovic, Meijer, & Engels, 2006). The normed chi-square does not share the same sample size sensitivity as the model chi-square; a normed chi-square statistic less than three can be used to indicate model fit when the model chi-square is significant. The ideal cutoff value for the CFI is 0.90 and for the RMSEA, less than 0.06 with the upper limit of the 90% CI under 0.08 (Hu & Bentler, 1999).

Missing data. The Full Information Maximum Likelihood (FIML) approach was used for all analyses. FIML estimation uses all available data for parameter estimation without the need for imputation or the deletion of incomplete cases (Enders, 2001). It has been shown to be more effective than other estimation approaches when dealing with missing data in structural equation models (Enders & Bandalos, 2001).

Results

Table 3.1 contains information on the correlations, means, and standard deviations for each of the variables used in this study. Reported substance use was low for the sample both at time one ($M=2.25$, $SD=4.21$) and time four ($M=3.48$, $SD=5.98$) with a range of 0-32. The majority of the adolescents indicated no substance use of any kind in the 30 days prior to completing the survey or over their lifetimes both at time one and time four; however, there was an increase in reported use across all three substances (alcohol, cigarettes, and marijuana) at time four.

The correlations between the variables were not high enough to warrant concerns over multicollinearity (i.e., $>.85$; Kline, 2005). There was a strong correlation between

language conflict and perceived discrimination ($r=.81$, $p<.01$), language conflict and time in the U.S. ($r=-.60$, $p<.01$), externalizing problems and parent-adolescent conflict ($r=.52$, $p<.01$), and substance use at time one and substance use at time four ($r=.69$, $p<.01$). Internalizing problems were moderately correlated with parent-adolescent conflict ($r=.44$, $p<.01$) and externalizing problems ($r=.47$, $p<.01$). In turn, externalizing problems were moderately correlated with negative friend associations ($r=.44$, $p<.01$) and substance use at time four ($r=.46$, $p<.01$). Negative friend associations were also moderately correlated with substance use at time four ($r=.31$, $p<.01$). Moderate and negative correlations exist between familism and parent-adolescent conflict ($r=-.31$, $p<.01$) and length of time in the U.S. and perceived discrimination ($r=-.36$, $p<.01$). Other variables were either weakly or not significantly correlated with one another.

The baseline model based on Figure 3.1 was an adequate fit to the data χ^2 ($df=7$, $N=286$) = 5.69, $p=.58$, NC = .81, CFI = 1.00, RMSEA = .000, 90% CI (.000-.064); however, several paths were not statistically significant. Following the deletion on non-significant paths, the new model was found to be a good fit to the data, χ^2 ($df=30$, $N=286$) = 26.97, $p=.63$, NC = .90, CFI = 1.00, RMSEA = .000, 90% CI (.000-.039). Standardized and unstandardized path estimates are shown in Table 3.2. See Figure 3.2 for the final analytical model.

Direct Effects

The acculturation stress variables had direct effects on the family, friend, and mental health indicators in the model. Time in the U.S. and acculturation conflict were both negatively associated with familism; as stress increased, familism decreased. Different indicators of acculturation stress varied in their effects on parent-adolescent conflict.

Acculturation conflict and perceived discrimination were both associated with greater levels of parent-adolescent conflict, whereas language conflict lowered parent-adolescent conflict. This partially confirms hypothesis 1. Acculturation stress did lower familism, but only two of the indicators were significantly associated with greater parent-adolescent conflict. When looking at negative friend associations, perceived discrimination was negatively linked with these associations and language conflict was positively related to them. This partially supports hypothesis 2. The hypothesis that acculturation stress would affect internalizing and externalizing problems (hypothesis 3) was not supported.

There were significant effects between the family, friend, and mental health variables. High levels of familism were negatively related to parent-adolescent conflict as stated in hypothesis 4; however, familism did not affect negative friend associations as thought. One unexpected finding was that negative friend associations were actually positively linked to familism. Hypothesis 5 was supported in that parent-adolescent conflict was associated with greater internalizing and externalizing problems, as well as negative friend associations. Finally, externalizing problems were linked with more negative friend associations as hypothesized (hypothesis 6), but internalizing problems were not significant (hypothesis 7).

Only two hypothesized direct effects were significant in predicting substance use at time four. Internalizing problems did lower use at time four and externalizing problems were associated with greater substance use at time four (hypothesis 10). The hypotheses that parent-adolescent conflict, familism, and negative friend associations would directly affect substance use at time four were not supported (hypotheses 8 and 9). While specific hypotheses regarding the effects of substance use at time one were not stated, it was found to

be significantly associated with greater parent-adolescent conflict, externalizing problems, and substance use at time four, and negatively associated with familism.

Mediation Effects

Family and friends. Mediated effects were examined to test if the family and friend variables (familism, parent-adolescent conflict, negative friend associations) mediated the effects of the acculturation stress variables on substance use at time four. See Table 3.3 for information on the decomposition of the direct and indirect effects. Family and friend variables were important mediators in a pathway from acculturation stressors to substance use. In a reflection of complex ecological processes, these variables did have several direct effects on one another and all had a direct connection with at least two of the variables measuring acculturation stress.

Parent-adolescent conflict proved to be a strong mediator between the acculturation stress variables, negative friend associations, and adolescent mental health variables (internalizing and externalizing problems). The mental health variables in turn were directly related to substance use at time four (parent-adolescent conflict → internalizing problems → substance use at time four, $Z=-1.99$, $p<.05$; parent-adolescent conflict → externalizing problems → substance use at time four, $Z=4.79$, $p<.001$). Seventy-six percent of parent-adolescent conflict's total effect on substance use at time four is through externalizing problems (.24/.32) and 25% was indirect through internalizing problems (.08/.32).

Adolescent mental health effects. The two mental health variables, internalizing and externalizing problems, each had a direct effect on substance use at time four for this sample of Latino adolescents. The only singularly mediated effect from any of the exogenous variables was that from substance use at time one to externalizing problems to substance use

at time four ($Z=2.68$, $p<.01$). Other pathways were more complex with multiple mediation effects forming a risk chain that was transmitted through adolescent mental health to subsequent substance use.

Multiple Mediation Effects

There were several multiple mediation effects found as a result of this analysis. While there is no statistical test to examine these multiple mediation effects, one accepted method to determine whether the entire path is significant is to see if every path in the chain is statistically significant; if so, the entire indirect effect is considered significant (Kline, 2005). As summarized in Table 3.3 and Figure 3.2, parent adolescent conflicts at time two mediated the effects of time one acculturation conflicts, perceived discrimination, language conflict, and substance use. All of these variables were related to higher levels of parent adolescent conflicts except language conflicts which was inversely associated. In turn, these higher levels of parent-adolescent conflicts led to increases in internalizing problems, externalizing problems, and negative friend associations. Heightened internalizing and externalizing problems ultimately were connected to adolescent substance use at time four.

Familism mediated a second risk chain. Time in the U.S., acculturation conflict, and substance use at time one were all associated with lower levels of familism, which led to higher parent-adolescent conflict, more externalizing and internalizing problems, and ultimately higher levels of adolescent substance use at time four.

Negative friend associations mediated a long risk chain beginning with time one perceived discrimination and language conflict, leading to negative friend associations, familism, parent-adolescent conflict, internalizing and externalizing problems, and finally substance use at time four.

Finally, adolescent substance use at time one was directly related to time four substance use or was singly mediated by externalizing problems at time two. In the most complicated risk chain, adolescent substance use at time one led to time two externalizing problems, negative friend associations, changes in familism, parent-adolescent conflict, internalizing and externalizing mental health difficulties, and finally to heightened substance use at time four. These risk chains clearly demonstrate that acculturation stressors influence dynamics with family and friends which, in turn, impact adolescent mental health in the form of internalizing and externalizing problems. These mental health difficulties then lead to adolescent substance use.

Discussion

The purpose of this study was to explore the pathways from acculturation stress to substance use for Latino adolescents. Of particular interest was examining the mediating effects of parent-adolescent conflict, familism, negative friend associations, internalizing, and externalizing problems on these pathways. Previous research has not considered these variables together when exploring this problem, therefore; this study provides new insight into the multiple pathways that contribute to substance use for Latino adolescents.

As hypothesized, acculturation stress had several direct effects on family and friend outcomes; however, it did not directly influence adolescent mental health. Adolescent mental health, as measured by internalizing and externalizing problems, had the only direct effects on substance use at time four for this sample. The presence of internalizing problems decreased substance use, whereas the presence of externalizing problems increased use. When looking at mediated effects, parent-adolescent conflict played the strongest role in the

pathway from acculturation stress to substance use, as it was the only variable that connected acculturation stress with adolescent mental health, then substance use.

While no other study has considered these variables together, support for many of the findings can be found in recent research. Increased acculturation stress has been linked to decreases in familism and increases in conflict behavior, which leads to increases in both internalizing and externalizing problems among Latino adolescents (Smokowski & Bacallao, 2006; Smokowski & Bacallao, 2007). Parent-adolescent conflict has also been tied to negative friend associations (Bámaca & Umaña-Taylor, 2006; Unger et al., 2000) and substance use (McQueen et al., 2003) among Latino youth. While there have not been studies that look directly at the effect internalizing and externalizing problems have on substance use for Latino adolescents, previous studies on adolescents in general support the findings that internalizing and externalizing problems have opposite effects on substance use (Fite et al., 2006; Helstrom et al., 2004).

The one finding not previously examined in detail is that of negative friend associations increasing familism; however, there is evidence that the presence of high levels of familism can serve as a protective factor even in the presence of risk factors, such as associations with negative friends (Ramirez et al., 2004). This finding may also characterize some low acculturated Latino adolescents. Low acculturated adolescents who are highly invested in their Latino ethnic identities and having trouble integrating into the host culture may choose other high risk, low acculturated youths as friends for protection (Bacallao & Smokowski, in press). This is one explanation for why Latino adolescents form Latino gangs (Barrera et al., 2002). In this case, these negative friend associations with other low acculturated but high-risk youth may actually heighten the importance of ethnic identity and

familism. This is plausible, but clearly speculative because the cultural backgrounds of negative friends were not known in the current study. Future research is needed in this area.

Implications for Practice

Adolescent acculturation stress significantly affects parent-adolescent conflict, adolescent mental health, negative friend associations, and substance use for Latino adolescents. Previous interventions have been developed to address one or more of these issues (e.g., *Entre Dos Mundos*: see Bacallao & Smokowski, 2005; Brief Strategic Family Therapy: see Santisteban et al., 2003; Family Effectiveness Training: see Szapocznik et al., 1989; *Familias Unidas*: see Coatsworth, Pantin & Szapocznik, 2002; Pantin et al., 2003; *keepin' It REAL*: see Gosin, Marsiglia & Hecht, 2003a). Most of these interventions are focused on increasing skills and communication among family members. Brief Strategic Family Therapy, Family Effectiveness Training, and *keepin' it REAL* are all SAMHSA model programs for the reduction of substance use among Latino adolescents.

Reducing family conflict and increasing cohesion should play a key role in any intervention directed towards Latino adolescents. One approach not typically used to meet this end in interventions for Latinos is the use of peer leadership. As seen in this study's results, friend associations increase familism and are related to parent-adolescent conflict. As parent-adolescent conflict is tied to mental health, and in turn substance use, incorporating peer leadership into interventions with Latino adolescents may be a valid approach. Evidence has been presented that suggests peer-led interventions are equal to or better than adult- or teacher-led interventions when it comes to decreasing adolescent substance use (Black, Tobler & Sciacca, 1998; Mellanby, Rees & Tripp, 2000; Stigler, Perry, Komro, Cudeck & Williams, 2006; Turner & Shepherd, 1999). A key aspect of this success may be that

interventions with a peer leadership component have the ability to provide adolescents with relevant information presented in a manner with which they can relate (Valente et al., 2007). Keepin' It REAL, while being teacher-led, does include a peer component in the development of the intervention through its use of actual middle school students' experiences with substance use offers and refusals (Gosin, Dustman, Drapeau & Harthun, 2003b; Hecht & Krieger, 2006).

The combination of an approach similar to that of keepin' It REAL with an active peer leadership component in the intervention would not only ensure that the curriculum was relevant to the adolescent, but also allows them to have ownership of the process. Immigrant Latino youth face discrimination and feelings of powerlessness as they attempt to integrate themselves into schools and their new environment (DeGarmo & Martinez, 2006; Holleran, Reeves, Dustman & Marsiglia, 2002). Allowing them to carve out a place where they can feel their voices are being heard and that they are having a positive impact not only for themselves, but for their friends as well might help to lessen these feelings while also encouraging positive friend associations, enhancing communication skills, alleviating some internalizing and externalizing problems, and decreasing the use of substances.

Implications for Research

The findings from this study serve as a first step in understanding the role social relationships and mental health outcomes play in the pathways between acculturation stress and substance use for Latino adolescents. Further research is necessary to understand not only the pathways from acculturation stress to substance use, but also those paths that affect friendships, mental health outcomes, and family relationships for Latino adolescents. Peer influence has been a topic of interest among researchers studying the general population of

adolescents, but has not been a focus of research on Latino youth. As peers play a large role in influencing both positive and negative outcomes, their role should be further explored. Mental health outcomes have received greater attention in recent research, but as an outcome and not a predictor of subsequent behavior. Considering how different types of mental health problems affect substance use or other behavioral outcomes may be another method to increase our understanding of behavior patterns among this population of adolescents.

Limitations

Some limitations need to be taken into consideration. Generational status (new immigrant, first generation, second generation, etc.; Chappin & Brook, 2001; Velez & Ungemack, 1995) may be important contributors to each of the variables included in this study. Future research should consider the role of generational status in the pathways from acculturation stress to substance use for this population. Additionally, if the adolescent were an immigrant it would be important to know whether they used substances in their country of origin (Hunt, Schneider & Comer, 2004). Finding out this information was not part of the current project, but would be an interesting variable to consider in future research.

Sample size precluded the ability to test for multi-group comparisons between genders, nativity, and age (early or late adolescence). Larger sample sizes would allow for these tests to be completed, thereby increasing knowledge of the pathways between acculturation stress and substance use for different segments of the Latino adolescent population.

While steps were taken to enhance the reliability of the responses provided by the adolescents and their parents, the absolute veracity of the responses cannot be guaranteed, especially those related to adolescent substance use. It has been reported that the level of

respondent's substance use may influence his or her response, with more infrequent users underreporting their level of use (Wish, Hoffman & Nemes, 1997). Recanting, or disavowing previous substance use, has been reported to be higher among African American and Hispanic adolescents as compared to White adolescents, and among younger teens (Fendrich & Rosenbaum, 2003; Johnson & Bowman, 2003). This phenomenon has great potential to influence the outcome of a study by decreasing the reported rate of substance use among the sample. It is not clear whether this issue is present in this sample of adolescents. Generally, the adolescents in this study did not report high rates of substance use. This could be due to actual lower rates of use, fear that their parents would learn their answers, recanting, or misrepresentation of use.

The format of the questionnaire and methods used to collect the information may contribute to the veracity of the responses, especially as they relate to sensitive information. There is some evidence that the use of self-administered questionnaires yield responses indicating higher rates of sensitive behaviors than face-to-face or telephone interviews (Aquilino, 1994; Stone & Latimer, 2005). This study utilized a face-to-face interview structure that followed a questionnaire format. One way to combat this possible limitation is to decrease demographic discrepancies between interviewer and interviewee, as was done in this study. This may significantly increase reports of sensitive behavior (Richter & Johnson, 2001). Another issue to take into consideration when surveying on sensitive behaviors is the assumption of confidentiality or anonymity the respondent has regarding his or her responses (Aquilino, 1994; Richter & Johnson, 2001). As this was a longitudinal study where the same respondents were interviewed at each time point, full anonymity was not possible; however,

certificates of confidentiality were obtained and the respondents were told their responses would remain confidential.

Conclusions

The association between acculturation stress and substance use is complex. Findings from this study indicate that while adolescent mental health outcomes directly affect substance use, family and peer relationships are important mediators between acculturation stress and these direct effects. As 37% of the U.S. Latino population is below the age of 19 (Pew Hispanic Center, 2008), the issues facing today's generation of Latino youth will continue. Future research is necessary to explore these associations further, especially in light of the growing adolescent Latino population in the U.S.

Table 1.1.

Participant Demographics

	Adolescents		Parents	
	(n=249)		(n=249)	
	Frequency	Percent	Frequency	Percent
Gender				
Male	114	45.8	26	10.4
Female	135	54.2	223	89.6
Age group				
11-14	92	36.9	NA	NA
15-18	157	63.1		
Place of birth				
United States	81	32.5	18	7.2
Latin America	168	67.5	231	92.8
Time in the United States	8.43 (5.53)		11.81 (10.86)	

Table 1.2.

Items and Response Categories for the Full BIQ

Item	Not at all				Very
	Comfortable				Comfortable
How comfortable do you feel speaking Spanish...					
1. at Home	1	2	3	4	5
2. in School	1	2	3	4	5
3. with Friends	1	2	3	4	5
4. in General	1	2	3	4	5
How comfortable do you feel speaking English...					
5. at Home	1	2	3	4	5
6. in School	1	2	3	4	5
7. with Friends	1	2	3	4	5
8. in General	1	2	3	4	5
	Not at All		Some	Very Much	
How much do you enjoy...					
9. music from my native country	1	2	3	4	5
10. dances from my native country	1	2	3	4	5
11. places with a flavor of my native country	1	2	3	4	5
12. recreation activities from my native country	1	2	3	4	5
13. TV programs from my native country	1	2	3	4	5
14. radio stations from my native country	1	2	3	4	5
15. books and magazines from my native country	1	2	3	4	5
16. Non-Latino (American) music	1	2	3	4	5
17. Non-Latino (American) dances	1	2	3	4	5
18. Non-Latino (American) oriented places	1	2	3	4	5
19. Non-Latino (American) type recreation	1	2	3	4	5

20. Non-Latino (American) TV programs	1	2	3	4	5
21. Non-Latino (American) radio stations	1	2	3	4	5
22. Non-Latino (American) books and magazines	1	2	3	4	5
	Not at All		Sometimes		All the Time
I would want...					
23. food to be from my native country	1	2	3	4	5
24. language to be Spanish	1	2	3	4	5
25. music to be from my native country	1	2	3	4	5
26. TV programs to be from my native country	1	2	3	4	5
27. books & magazines to be from my native country	1	2	3	4	5
28. dances to be from my native country	1	2	3	4	5
29. radio programs to be from my native country	1	2	3	4	5
30. the way of celebrating birthdays to be from my native country	1	2	3	4	5
31. the way of celebrating weddings to be from my native country	1	2	3	4	5
32. food to be Non-Latino (American)	1	2	3	4	5
33. language to be English	1	2	3	4	5
34. music to be Non-Latino (American)	1	2	3	4	5
35. TV programs to be Non-Latino (American)	1	2	3	4	5
36. books & magazines to be Non-Latino (American)	1	2	3	4	5
37. dances to be Non-Latino (American)	1	2	3	4	5
38. radio programs to be Non-Latino (American)	1	2	3	4	5
39. the way of celebrating birthdays to be Non- Latino (American)	1	2	3	4	5
40. the way of celebrating weddings to be Non- Latino (American)	1	2	3	4	5

Table 1.3.

Means and Standard Deviations of Items on the Full BIQ for Both Adolescents and Parents

Item	Adolescent		Parent	
	Mean	SD	Mean	SD
How comfortable do you feel speaking Spanish...				
1. at Home	4.61	.86	4.79	.75
2. in School	3.78	1.21	NA	NA
3. with Friends	4.26	1.14	4.65	.89
4. in General	4.24	1.03	4.54	1.05
How comfortable do you feel speaking English...				
5. at Home	3.59	1.47	2.31	1.56
6. in School	4.41	.99	NA	NA
7. with Friends	4.13	1.25	2.45	1.58
8. in General	3.99	1.22	2.60	1.52
How much do you enjoy...				
9. music from my native country	4.08	1.16	4.20	1.17
10. dances from my native country	3.87	1.34	3.95	1.46
11. places with a flavor of my native country	4.31	.97	4.21	1.26
12. recreation activities from my native country	4.16	1.09	4.09	1.16
13. TV programs from my native country	3.96	1.24	4.21	1.18
14. radio stations from my native country	3.59	1.44	3.69	1.59
15. books and magazines from my native country	3.59	1.34	4.08	1.31
16. Non-Latino (American) music	4.07	1.10	2.98	1.34
17. Non-Latino (American) dances	3.37	1.43	2.16	1.39
18. Non-Latino (American) oriented places	3.48	1.23	3.29	1.47

19. Non-Latino (American) type recreation	3.70	1.20	3.25	1.45
20. Non-Latino (American) TV programs	4.15	1.08	3.26	1.35
21. Non-Latino (American) radio stations	4.10	1.22	2.71	1.49
22. Non-Latino (American) books and magazines	3.88	1.24	2.43	1.38
I would want...				
23. food to be from my native country	3.61	.90	3.62	1.03
24. language to be Spanish	3.16	.94	3.53	1.15
25. music to be from my native country	3.22	1.06	3.50	1.17
26. TV programs to be from my native country	3.19	1.08	3.40	1.22
27. books & magazines to be from my native country	3.10	1.00	3.68	1.23
28. dances to be from my native country	3.41	1.22	3.46	1.23
29. radio programs to be from my native country	3.12	1.12	3.37	1.29
30. the way of celebrating birthdays to be from my native country	3.97	1.15	4.00	1.26
31. the way of celebrating weddings to be from my native country	3.95	1.13	4.08	1.19
32. food to be Non-Latino (American)	2.66	.84	2.57	.99
33. language to be English	2.96	1.01	2.57	1.15
34. music to be Non-Latino (American)	3.10	1.11	2.53	1.08
35. TV programs to be Non-Latino (American)	3.14	1.08	2.64	1.06
36. books & magazines to be Non-Latino (American)	3.02	1.06	2.34	1.20
37. dances to be Non-Latino (American)	2.68	1.10	2.32	1.05
38. radio programs to be Non-Latino (American)	3.13	1.12	2.41	1.11
39. the way of celebrating birthdays to be Non-Latino (American)	2.52	1.11	2.22	1.12
40. the way of celebrating weddings to be Non-Latino (American)	2.46	1.10	2.20	1.12

Table 1.4.

Final Subscale Items for the Adolescent and Parent Samples ('X' Indicates Retained Item)

Item	Adolescent	Parent
How comfortable do you feel speaking Spanish...		
1. at Home		
2. in School	X	
3. with Friends	X	
4. in General	X	
How comfortable do you feel speaking English...		
5. at Home		
6. in School	X	
7. with Friends	X	
8. in General	X	
How much do you enjoy...		
9. music from my native country	X	
10. dances from my native country	X	
11. places with a flavor of my native country	X	
12. recreation activities from my native country	X	
13. TV programs from my native country	X	
14. radio stations from my native country	X	
15. books and magazines from my native country	X	
16. Non-Latino (American) music	X	
17. Non-Latino (American) dances	X	
18. Non-Latino (American) oriented places	X	
19. Non-Latino (American) type recreation	X	

20. Non-Latino (American) TV programs	X	
21. Non-Latino (American) radio stations	X	
22. Non-Latino (American) books and magazines	X	
I would want...		
23. food to be from my native country		X
24. language to be Spanish	X	X
25. music to be from my native country	X	X
26. TV programs to be from my native country	X	X
27. books & magazines to be from my native country	X	X
28. dances to be from my native country	X	X
29. radio programs to be from my native country	X	X
30. the way of celebrating birthdays to be from my native country		X
31. the way of celebrating weddings to be from my native country		X
32. food to be Non-Latino (American)		X
33. language to be English	X	X
34. music to be Non-Latino (American)	X	X
35. TV programs to be Non-Latino (American)	X	X
36. books & magazines to be Non-Latino (American)	X	X
37. dances to be Non-Latino (American)	X	X
38. radio programs to be Non-Latino (American)	X	X
39. the way of celebrating birthdays to be Non-Latino (American)		X
40. the way of celebrating weddings to be Non-Latino (American)		X
Cronbach alphas:		
Latino subscale	0.85	0.91
Non-Latino subscale	0.90	0.92

Table 1.5.

Standardized Factor Loadings for the Adolescent Sample on the Final BIQ Subscales

Item	Factor Loading
How comfortable do you feel speaking Spanish...	
in school	.31
with friends	.32
in general	.29
How comfortable do you feel speaking English...	
in school	.60
with friends	.53
in general	.55
How much do you enjoy...	
music from my native country	.70
dances from my native country	.59
places with a flavor of my native country	.49
recreation activities from my native country	.51
TV programs from my native country	.76
radio stations from my native country	.74
books and magazines from my native country	.69
Non-Latino (American) music	.53
Non-Latino (American) dances	.51
Non-Latino (American) places	.50
Non-Latino (American) recreation activities	.51

Non-Latino (American) TV programs	.57
Non-Latino (American) radio stations	.52
Non-Latino (American) books and magazines	.56
I would want...	
language to be Spanish	.36
music to be from my native country	.54
TV programs to be from my native country	.42
books and magazines to be from my native country	.38
dances to be from my native country	.38
radio programs to be from my native country	.51
language to be English	.63
music to be Non-Latino (American)	.70
TV programs to be Non-Latino (American)	.72
books and magazines to be Non-Latino (American)	.72
dances to be Non-Latino (American)	.66
radio programs to be Non-Latino (American)	.75

Table 1.6.

Standardized Factor Loadings for the Parent Sample on the Final BIQ Subscales

Item	Factor Loading
I would want...	
food to be from my native country	.54
language to be Spanish	.69
music to be from my native country	.87
TV programs to be from my native country	.87
books and magazines to be from my native country	.79
dances to be from my native country	.73
radio programs to be from my native country	.85
the way of celebrating birthdays to be from my native country	.48
the ways of celebrating weddings to be from my native country	.49
food to be Non-Latino (American)	.50
language to be English	.76
music to be Non-Latino (American)	.83
TV programs to be Non-Latino (American)	.80
books and magazines to be Non-Latino (American)	.74
dances to be Non-Latino (American)	.75
radio programs to be Non-Latino (American)	.84
the way of celebrating birthdays to be Non-Latino (American)	.61
the ways of celebrating weddings to be Non-Latino (American)	.63

Table 2.1.

Participant Demographics

Adolescents (n=286)		
	Frequency	Percent
Gender		
Male	131	45.8
Female	155	54.2
Age group		
11-14	92	36.7
15-18	159	63.3
Place of birth		
United States	98	34.3
Latin America	188	65.7
Time in the United States	8.49 (5.55)	

Table 2.2.

Correlations, Means, and Standard Deviations of Study Variables

	1	2	3	4	5	6	7	8	9	10
1	-									
2	.01	-								
3	-.36**	.14*	-							
4	-.60**	.10	.80**	-						
5	-.10	.14*	.23**	.22**	-					
6	.08	.11	.17**	.07	.17*	-				
7	.16*	.22**	.16*	-.01	.28**	.47**	-			
8	-.12	-.18**	-.09	-.01	-.18**	-.31**	-.57**	-		
9	.18**	.13	.18**	.02	.34**	.52**	.59**	-.37**	-	
10	.10	.01	.17*	.09	.54**	.28**	.29**	-.25**	.52**	-
Mean	8.49	7.66	11.44	4.51	1.62	10.01	2.80	20.30	11.53	1.40
SD	5.55	3.20	4.37	2.43	1.78	6.97	3.62	3.30	7.94	1.86

*p<.05, **p<.01, ***p<.001

1= Time in the U.S.; 2= Acculturation Conflict; 3= Perceived Discrimination; 4= Language Conflict; 5= Negative Friend Associations (T1); 6= Internalizing Problems; 7= Parent-Adolescent Conflict; 8= Familism; 9= Externalizing Problems; 10= Negative Friend Associations (T4)

Table 2.3.

Standardized and Unstandardized Path Coefficients

	<i>N</i> = 286		
	Unst.	S.E.	St.
Time in the U.S. → Familism	-.09*	.04	-.15
Time in the U.S. → Externalizing Problems	.18**	.07	.13
Acculturation Conflict → Familism	-.16*	.07	-.16
Acculturation Conflict → Parent-Adolescent Conflict	.12*	.06	.11
Perceived Discrimination → Parent-Adolescent Conflict	.25***	.07	.34
Language Conflict → Parent-Adolescent Conflict	-.41***	.13	-.31
Negative Friend Associations (T1) → Familism	-.11*	.05	-.13
Negative Friend Associations (T1) → Negative Friend Associations (T4)	.09***	.03	.19
Parent-Adolescent Conflict → Internalizing Problems	.90***	.10	.47
Parent-Adolescent Conflict → Externalizing Problems	1.29***	.11	.58
Familism → Parent-Adolescent Conflict	-.58***	.05	-.53
Externalizing Problems → Negative Friend Associations (T4)	.12***	.01	.50

NOTES: Unst. = Unstandardized, S.E. = Standard Error, St. = Standardized

p*<.05, *p*<.01, ****p*<.001

Table 2.4.

Decomposition of Direct and Indirect Effects

Indirect Effect	<i>A</i>	S.E. _a	<i>B</i>	S.E. _b	<i>ab</i>	S.E. _{ab}	<i>Z</i>
Time in US → Familism → Parent-Adolescent Conflict	-.09	.04	-.58	.05	.05	.02	2.35
Time in US → Externalizing Problems → Negative Friend Associations (T4)	.18	.07	.12	.01	.02	.01	2.48
Acculturation Conflict → Parent-Adolescent Conflict → Internalizing Problems	.12	.06	.90	.10	.11	.06	2.04
Acculturation Conflict → Parent-Adolescent Conflict → Externalizing Problems	.12	.06	1.29	.11	.16	.08	2.07
Acculturation Conflict → Familism → Parent-Adolescent Conflict	-.16	.07	-.58	.05	.09	.04	2.36
Perceived Discrimination → Parent-Adolescent Conflict → Internalizing Problems	.25	.07	.90	.10	.23	.07	3.34
Perceived Discrimination → Parent-Adolescent Conflict → Externalizing Problems	.25	.07	1.29	.11	.33	.09	3.46
Language Conflict → Parent-Adolescent Conflict → Internalizing Problems	-.41	.13	.90	.10	-.37	.12	-3.07
Language Conflict → Parent-Adolescent Conflict → Externalizing Problems	-.41	.13	1.29	.11	-.53	.17	-3.17
Negative Friend Associations (T1) → Familism → Parent-Adolescent Conflict	-.11	.05	-.58	.05	.07	.03	2.07
Parent-Adolescent Conflict → Externalizing Problems → Negative Friend Associations (T4)	1.29	.11	.12	.01	.15	.02	7.08
Familism → Parent-Adolescent Conflict → Internalizing Problems	-.58	.05	.90	.10	-.52	.08	-6.73

Familism → Parent-Adolescent Conflict →	-.58	.05	1.29	.11	-.74	.09	-7.93
Externalizing Problems							

NOTES: Z-values are computed using Sobel's Test for indirect effects. ± 1.96 are the critical values for $p < .05$. A=path coefficient from initial variable to mediator, B=path coefficient from mediator to final variable, ab=indirect coefficient, S.E.=standard error, $S.E._{ab} = \sqrt{(b^2 \times S.E._a^2) + (a^2 \times S.E._b^2)}$. The square root is taken for the entire term. $Z = ab / S.E._{ab}$.

Table 3.1.

Correlations, Means, and Standard Deviations for Study Measures

	1	2	3	4	5	6	7	8	9	10	11
1	-										
2	.01	-									
3	-.36**	.14*	-								
4	-.60**	.10	.80**	-							
5	.13*	.03	.09	-.02	-						
6	.07	.10	.14*	.06	.81	-					
7	.11	.20**	.17**	.02	.24**	.44**	-				
8	-.17**	-.15*	-.07	-.01	-.13*	-.10	-.31**	-			
9	-.04	.09	.11	.13*	.17**	.29**	.29**	.16**	-		
10	.14*	.15*	.14*	.01	.23**	.47**	.52**	-.15*	.44**	-	
11	.11	.02	.05	.01	.69**	.12	.21**	-.07	.31**	.46**	-
M	8.49	7.66	11.44	4.51	2.25	9.47	2.69	19.85	1.31	10.39	3.48
SD	5.55	3.20	4.37	2.43	4.21	7.20	3.62	4.47	2.21	8.39	5.98

NOTES: 1=Time in the U.S.; 2=Acculturation Conflict; 3=Perceived Discrimination; 4=Language Conflict; 5= Substance Use at Time One; 6=Internalizing Problems; 7=Parent-adolescent conflict; 8=Familism; 9= Negative Friend Associations; 10=Externalizing Problems; 11= Substance Use at Time Four

* <.05; ** <.01

Table 3.2.

Standardized and Unstandardized Path Coefficients

	<i>N</i> = 286		
	Unst.	S.E.	St.
Time in U.S. → Familism	-.11*	.05	-.13
Acculturation Conflict → Parent-adolescent conflict	.13*	.07	.12
Acculturation Conflict → Familism	-.24**	.09	-.17
Perceived Discrimination → Parent-adolescent conflict	.24**	.08	.29
Perceived Discrimination → Negative Friend Associations	-.10*	.05	-.19
Language Conflict → Parent-adolescent conflict	-.36*	.15	-.24
Language Conflict → Negative Friend Associations	.24**	.09	.26
Substance Use at Time One → Parent-adolescent conflict	.14**	.05	.17
Substance Use at Time One → Familism	-.19**	.06	-.18
Substance Use at Time One → Externalizing Problems	.30**	.10	.16
Parent-adolescent conflict → Internalizing Problems	.90***	.11	.45
Substance Use at Time One → Substance Use at Time Four	.94***	.06	.68
Internalizing Problems → Substance Use at Time Four	-.08*	.04	-.10
Externalizing Problems → Substance Use at Time Four	.21***	.04	.28
Negative Friend Associations → Familism	.68***	.14	.33
Externalizing Problems → Negative Friend Associations	.11***	.02	.41
Parent-adolescent conflict → Externalizing Problems	1.19***	.12	.51
Familism → Parent-adolescent conflict	-.29***	.05	-.36
Parent-adolescent conflict → Negative Friend Associations	.12**	.04	.19

NOTES: Unst. = Unstandardized, S.E. = Standard Error, St. = Standardized

p*<.05, *p*<.01, ****p*<.001

Table 3.3.

Decomposition of Direct and Indirect Effects

Indirect Effect	<i>A</i>	S.E. _a	<i>B</i>	S.E. _b	<i>ab</i>	S.E. _{ab}	<i>Z</i>
Acculturation Conflict → Parent-adolescent conflict → Externalizing Problems	.13	.07	1.19	.12	.16	.08	1.99
Acculturation Conflict → Parent-adolescent conflict → Internalizing Problems	.13	.07	.90	.11	.12	.06	1.97
Acculturation Conflict → Familism → Parent-adolescent conflict	-.24	.09	-.29	.05	.07	.03	2.42
Substance Use at Time One → Parent-adolescent conflict → Externalizing Problems	.14	.05	1.19	.12	.16	.06	2.74
Substance Use at Time One → Parent-adolescent conflict → Internalizing Problems	.14	.05	.90	.11	.12	.05	2.70
Substance Use at Time One → Parent-adolescent conflict → Negative Friend Associations	.14	.05	.12	.04	.02	.01	1.96
Substance Use at Time One → Externalizing Problems → Substance Use at Time Four	.30	.10	.21	.04	.06	.02	2.68
Substance Use at Time One → Externalizing Problems → Negative Friend Associations	.30	.10	.11	.02	.03	.01	2.79
Substance Use at Time One → Familism → Parent- adolescent conflict	-.19	.06	-.29	.05	.06	.02	2.78
Parent-adolescent conflict → Internalizing Problems → Substance Use at Time Four	.90	.11	-.08	.04	-.08	.04	-1.99
Parent-adolescent conflict → Externalizing Problems → Substance Use at Time Four	1.19	.12	.21	.04	.24	.05	4.79
Parent-adolescent conflict → Negative Friend	.12	.04	.68	.14	.08	.03	2.36

Associations → Familism

Familism → Parent-adolescent conflict → Internalizing	-.29	.05	.90	.11	-.26	.06	-4.73
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Problems

Familism → Parent-adolescent conflict → Externalizing	-.29	.05	1.19	.12	-.35	.07	-5.01
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Problems

Language Conflict → Parent-adolescent conflict →	-.36	.15	1.19	.12	-.43	.18	-2.40
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Externalizing Problems

Language Conflict → Parent-adolescent conflict →	-.36	.15	.90	.11	-.32	.14	-2.37
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Internalizing Problems

Language Conflict → Negative Friend Associations →	.24	.09	.68	.14	.16	.07	2.34
--	-----	-----	-----	-----	-----	-----	------

Familism

Negative Friend Associations → Familism → Parent-	.68	.14	-.29	.05	-.19	.05	-3.59
---	-----	-----	------	-----	------	-----	-------

adolescent conflict

Perceived Discrimination → Parent-adolescent conflict	.24	.08	1.19	.12	.29	.10	2.85
---	-----	-----	------	-----	-----	-----	------

→ Externalizing Problems

Perceived Discrimination → Parent-adolescent conflict	.24	.08	.90	.11	.22	.08	2.81
---	-----	-----	-----	-----	-----	-----	------

→ Internalizing Problems

Perceived Discrimination → Parent-adolescent conflict	.24	.08	.12	.04	.03	.01	2.00
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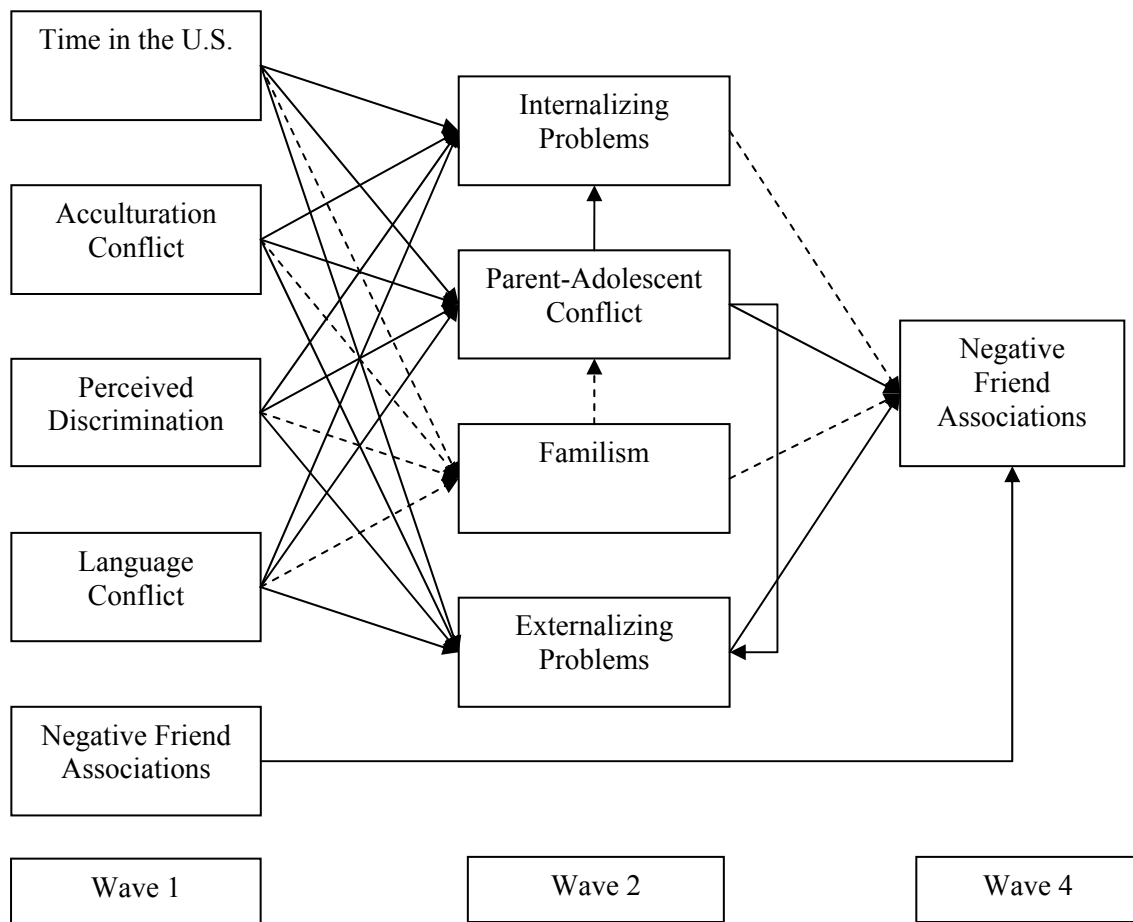
→ Negative Friend Associations

Time in U.S. → Familism → Parent-adolescent conflict	-.11	.05	-.29	.05	.03	.02	2.06
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NOTES: Z-values are computed using Sobel's Test for indirect effects. ± 1.96 are the critical values for $p < .05$. A=path coefficient from initial variable to mediator, B=path coefficient from mediator to final variable, ab=indirect coefficient, S.E.=standard error, $S.E._{ab} = \sqrt{(b^2 \times S.E._a^2) + (a^2 \times S.E._b^2)}$. The square root is taken for the entire term. $Z = ab / S.E._{ab}$.

Figure Caption

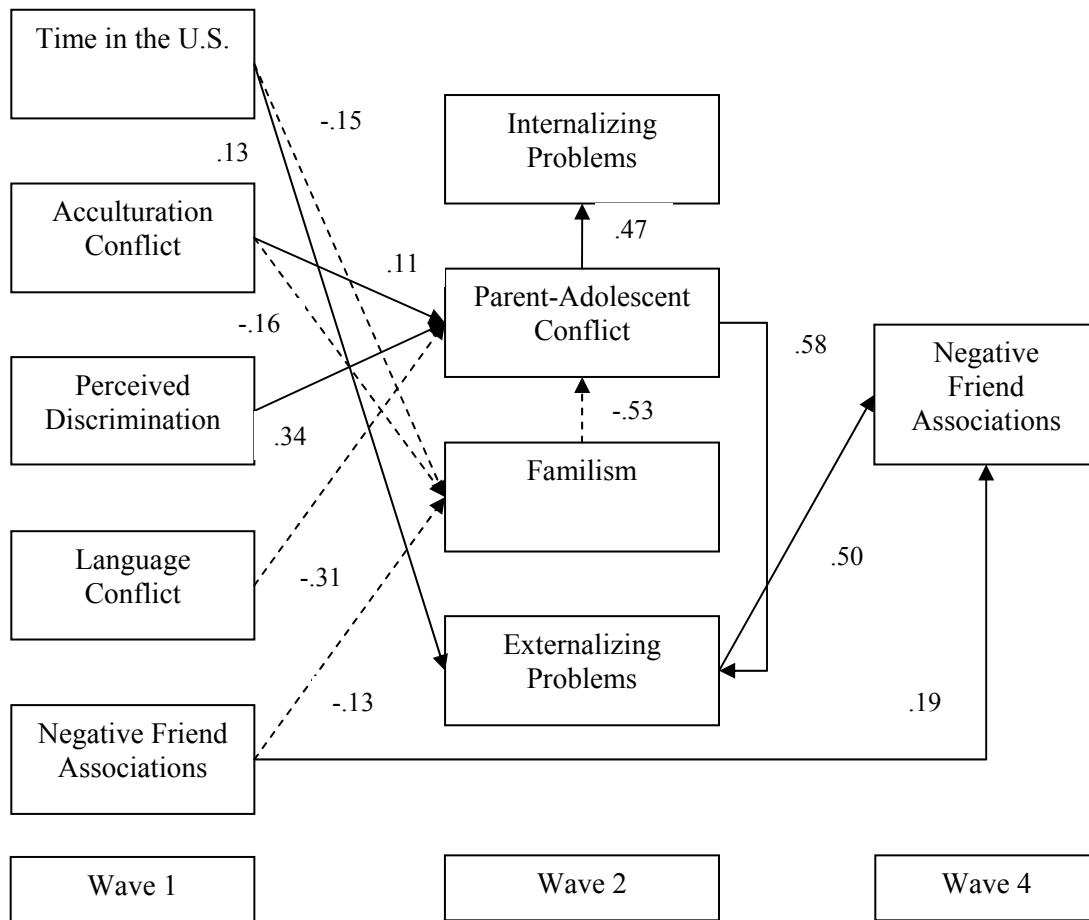
Figure 2.1. Theoretical model of mediational paths from acculturation stress to negative friend associations for Latino adolescents



NOTE: solid lines indicate a positive relationship; dashed lines indicate a negative relationship

Figure Caption

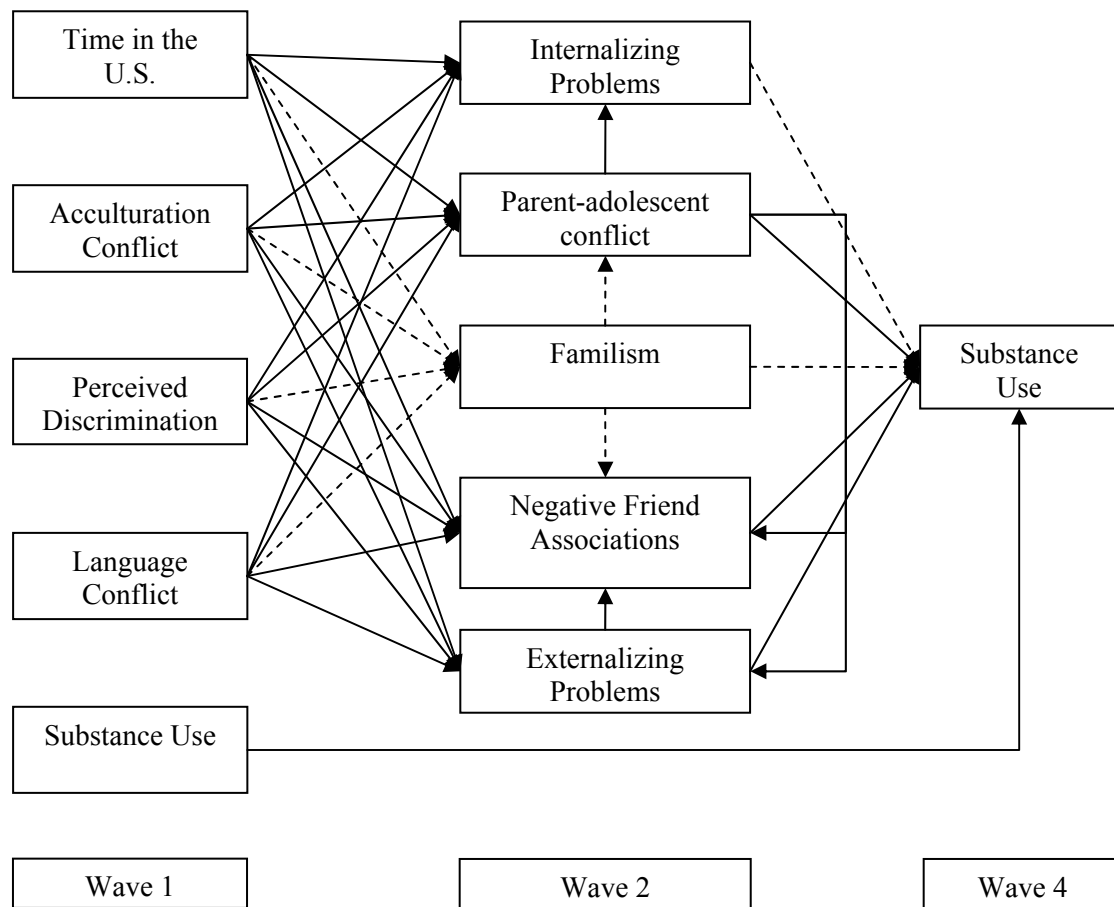
Figure 2.2. Final analytical model of mediational paths from acculturation stress to negative friend associations for Latino adolescents



NOTE: solid lines indicate a positive relationship; dashed lines indicate a negative relationship. χ^2 (df=23, $N=286$) = 21.29, $p = .62$, Normed $\chi^2 = .88$, CFI = 1.00, RMSEA = .000, 90% CI (.000-.042)

Figure Caption

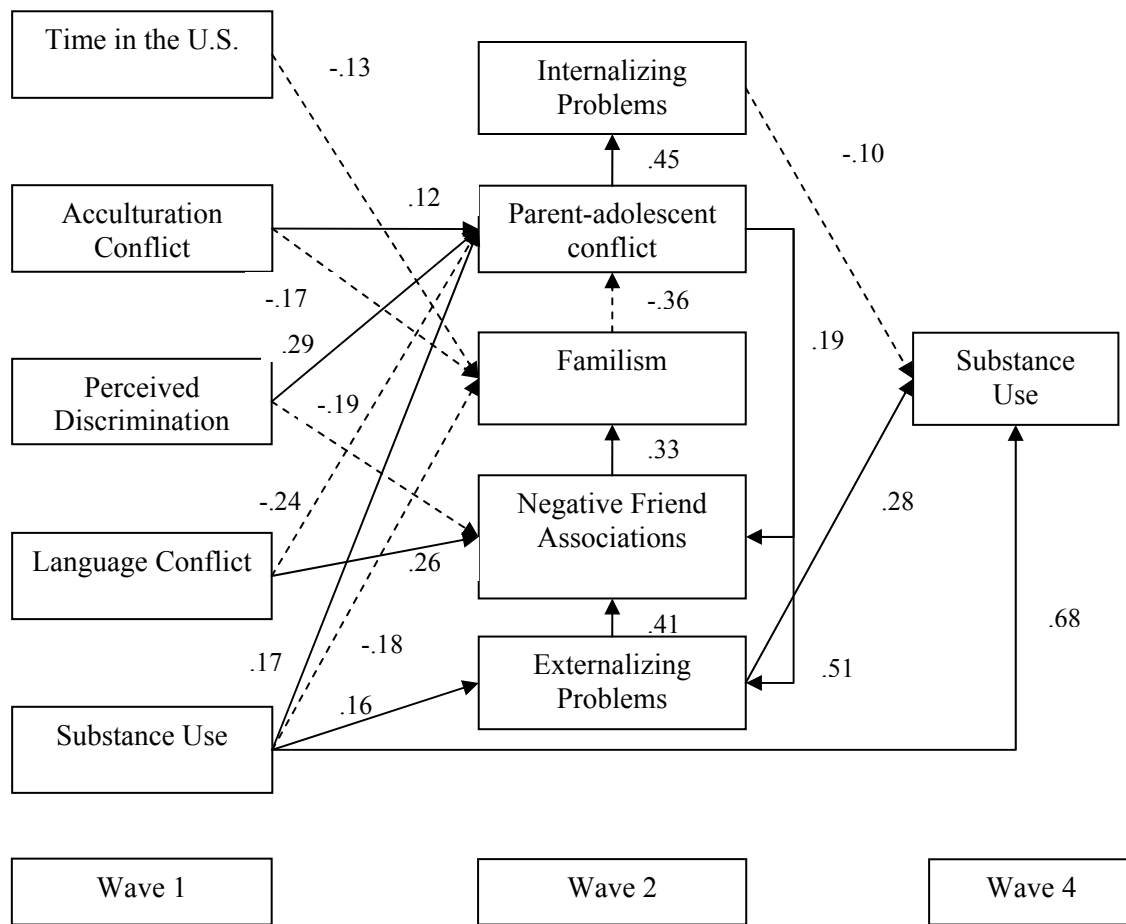
Figure 3.1. Theoretical model of mediational paths from acculturation stress to substance use for Latino adolescents.



NOTE: solid lines indicate a positive relationship; dashed lines indicate a negative relationship

Figure Caption

Figure 3.2. Final analytic model of mediational paths from acculturation stress to substance use for Latino adolescents.



NOTE: solid lines indicate a positive relationship; dashed lines indicate a negative relationship. χ^2 (df=30, $N=286$) = 26.97, $p=.63$, NC = .90, CFI = 1.00, RMSEA = .000, 90% CI (.000-.039).

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