Published in final edited form as:

J Ethn Subst Abuse. 2010 January ; 9(1): 40–63. doi:10.1080/15332640903539252.

Gender Differences in the Effect of Linguistic Acculturation on Substance Use Among Mexican-Origin Youth in the Southwest United States

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Abstract

This study tested for gender differences in the impact of linguistic acculturation on pro-drug norms, substance use intentions, and actual substance use among youth of Mexican heritage in a large metropolitan area in the Southwest United States. The authors analyzed baseline survey data provided by 2,487 middle school students of Mexican heritage who were part of a larger, multiethnic randomized efficacy trial of a drug abuse prevention program. Using multi-group structural equation modeling, the authors found that linguistic acculturation was positively and directly related to adherence to pro-drug norms, substance use intentions, and recent alcohol use, controlling for age, poor grades, and socioeconomic status. In addition, linguistic acculturation had an indirect effect on substance use intentions and recent alcohol use through pro-drug norms. The direct effect of linguistic acculturation on pro-drug norms was stronger for girls than for boys, as was its indirect effect on substance use intentions.

Keywords

acculturation; gender differences; Mexican American youth; substance use; substance use norms

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INTRODUCTION

This study investigates possible gender differences in the substance use norms, intentions, and behaviors of U.S. youth of Mexican heritage as they become proficient in English language (linguistic acculturation). There is some evidence that traditional gender norms of less acculturated females of Mexican origin have a protective effect on their drug use norms and behaviors but less is known about how they compare with their male counterparts as they navigate through the acculturation process. This article summarizes existing literature on the topic and is aimed at advancing knowledge by testing whether linguistic acculturation increases vulnerability to pro-drug norms and drug use more intensely for girls than for boys.

Acculturation, Language, and Identity

Acculturation is a form of “social change” that causes “cultural change” in individuals when they come into contact with different cultures on a continuous basis (Bean & Tienda, 1987; Laroche, Kim, & Tomiuk, 1998). The outcomes of the change process are varied. Some groups may assimilate or become integrated into society (Bean & Tienda, 1987; Keefe, 1980, Keefe & Padilla, 1987; Penaloza, 1994); other groups may become marginalized or separated from society or their culture of origin (Berry, 1980, 1985, 1990, 1997). Although the host culture’s response to newcomers influences acculturation outcomes, newcomers’ acquisition and utilization of cultural competence also matters. Cultural competence is linked to insider status, which is accompanied by acceptance and integration (Padilla & Perez, 2003).

The ability to communicate successfully is an aspect of cultural competence that involves knowing when, how, and what to say in a situation. To successfully communicate with a person is to participate in an inter-subjective reality, a sharing of meaning (Taylor, 1976). Therefore, language is highly malleable and adaptable, especially for children, whose day-to-day interactions may not involve conscious enactment of historical and cultural symbols but which nonetheless reveals their identity. Children are able to consciously or unconsciously express dual identities by the linguistic choices they make. Studies of cross-cultural variations in language learning demonstrate both the importance of language and its integral impact on learning, culture, and socialization, especially for children from ethnic minority or non-Western communities (Heath, 1983, 1989; Ochs, 1988; Philips, 1983; Schieffelin, 1990). Non-English speaking immigrant children learn English through involvement in social interactions, thereby constructing identities, beliefs, and cultural symbols in ways that vary distinctly from native children (Alvesson & Karreman, 2000).

English language use by Latino immigrants in the United States has often been used as a measure of acculturation because English language fluency affects the ability to communicate and interact with the majority culture (Unger, Ritt-Olsen, Wagner, Soto, & Baezconde-Garbanati, 2007). Although language measures only one dimension of acculturation, previous studies have found that English language use is comparable to multi-dimensional measures, accounting for approximately 65% of the variance in acculturation status (Epstein, Botvin, & Diaz, 1998; Rogler, Cortes & Malgady, 1991; Samaniego & Gonzales, 1999; Serrano & Anderson, 2003). Therefore, linguistic acculturation will be used in this study as a measure of acculturation (Epstein, Botvin, & Diaz, 2000, 2001).

Acculturation and Substance Use

Studies of acculturation among different populations have demonstrated its significant impact on psychological and behavioral changes (Berry, 1970; Witkin & Berry, 1975). Higher acculturation among Latino groups has been widely implicated with an increase in substance use and dependence (Amaro, Zuckerman, Stiffman, & Feldman, 1990; Burnham, Hough, Karno, Escobar, & Telles, 1987; Epstein et al., 2000, 2001; Harrison & Kennedy, 1994; Vega,

Gil, Warheit, Zimmerman, & Apospori, 1993; Wagner-Echeagaray, Schütz, Chilcoat, & Anthony, 1994; Zayas, Rojas, & Malgady, 1998).

Immigrants' substance use patterns tend to mimic those of their country of origin (Arciniega, Arroyo, Miller, & Tonigan, 1996; Vega & Gil, 1998), whereas substance use among more acculturated Latinos is more consistent with the native-born ethnic majority's use (Farabee, Wallisch, & Maxwell, 1995). Among youth from immigrant families, language use is a better indicator of substance use risk than their national origin. In surveys across different groups of Latino youth (e.g., those of Cuban, Mexican, Puerto Rican, South American and Central American origin), language use accounts for large and consistent variations in alcohol consumption while there is comparatively little variation by national origin (Nielsen & Ford, 2001). The more respondents use English, the more likely they are to drink alcohol and drink it more frequently. Studies in different regions of the United States show that Latino youth using Spanish at home report significantly less substance use than students who speak English with their parents and those who are bilingual are at a somewhat greater risk of substance use than monolingual Spanish speaking students (Epstein et al., 2000, 2001; Marsiglia & Waller, 2002).

Several explanations have been offered for the connection between linguistic acculturation and substance use. Due to contact with majority culture systems such as schools, immigrant children and children of immigrants tend to learn English faster than adults (Marsiglia, Miles, Dustman, & Sills, 2003; Rogler, Cortes, & Malgady, 1991). The acquisition of and preference for English by children in non-English proficient families has been identified as a main source of erosion of family communication and protective ties. Spanish language dominance appears to protect adolescents by sheltering them from an expansion of their social networks that puts them at a greater risk for encountering pro-drug peers and opportunities to use substances (Escobar, 1998). English language acquisition enables them to access the broader English speaking community and enter new situations and peer networks where substances are offered while also distancing them from the protective effects of family and culture of origin (Chilcoat, Breslau, & Anthony, 1996; Duncan, Duncan, Biglan, & Ary, 1998; Feiring & Lewis, 1993; Flannery, Williams, & Vazsonyi, 1999).

English language acquisition can be a risk factor for reasons other than access to different social networks. First, it may introduce and reinforce behaviors of the mainstream culture, causing value conflicts with the culture of origin (Gilbert & Cervantes, 1986; Vega, Zimmerman, Warheit, Apospori, & Gil, 1997). The acquisition of English language skills has been associated with more consumption of pro-substance use images in mainstream English language media (Caetano, 1986; Dalton et al., 2003). Second, English language acquisition may induce stress as the individual attempts to resolve conflicting cultural differences, leading to negative attempts to reduce stress through drug use (Barnes, 1979; Beauvais, 1998; Bonnheim & Korman, 1985; Gil & Wagner, 2000). Third, English language acquisition increases their familiarity with the host culture. As Latino youth become more proficient in English, they may be more readily exposed to ethnic discrimination directed against them. These youth may also begin to recognize their status as a devalued minority group and the social implications of their lower status and begin to internalize mainstream ethnic stereotypes and prejudices that are associated with ethnic self-denigration and risk behaviors (Vega & Gil, 1998).

Although less studied, a fourth reason for the connection between English acquisition and substance use concerns the protective, identity enhancing effects of maintaining cultural ties through continued use of Spanish. Among Latinos, a multi-racial group with many different national origins, the shared Spanish language may be an especially crucial aspect of identity. Retaining connections to Spanish allows Latinos to express dual identities through an array of linguistic choices, especially in the southwest where an English and Spanish "interlanguage"

has developed (Ardila, 2005). Reinforcement through continued Spanish language use can help preserve certain protective aspects of traditional Latino culture, including emphasis on familism, which places primary importance on the family of origin and strengthens family pride, respect for parents, and family closeness, trust, and cohesion (Chandler, Tsai, & Wharton 1999; Olson, McCubbin, Barnes, Larsen, Muxen, & Wilson, 1983; Suarez-Orozco & Suarez-Orozco, 1995). This family orientation is accompanied by greater parental monitoring and involvement with children (Chandler et al., 1999; Denner, Kirby, & Coyle, 2001), which can protect against substance use (Duncan et al., 1998; Flannery et al., 1999). In addition, Latino youth from immigrant families may be protected from risk behaviors by a sense of hope and expectation that is commonly associated with recent immigrants (Portes & Rumbaut, 2001).

Gender Socialization and Substance Use Among Mexican Americans

The major goal of this study was to investigate the intersection of linguistic acculturation and gender, specifically how gender may moderate the impact of acculturation on substance use norms and behaviors. It is important to examine the intersection of linguistic acculturation and gender for several reasons, including gender differences in the cultural expectations governing substance use, the nature of gender roles in traditional Mexican culture, and gender differences in the way that acculturation changes substance use norms, behaviors, and opportunities. Although culture is dynamic and changes over time, traditional Mexican cultural values tend to support different alcohol use norms by gender, such that men are allowed, even encouraged, to drink when and where they feel it is necessary whereas women can drink only within the safe confines of masculine boundaries (e.g., in a mixed sex environment where their actions can be monitored) (Wycoff, 2000). A study of substance use in Mexico found that 66% of men who drink alcohol consume 5 to 6 drinks at a time compared to 16% of women who consume alcohol (Medina-Mora & Rojas-Guiot, 2003). Traditionally, Mexican women tend to be socialized to adopt a collectivist approach that promotes abstinence by stressing the risks that their substance use would pose for family and friends and deemphasizing the value of their individual needs and desires (Perea & Slater, 1999). These gender norms appear to impact substance use among Mexican American adolescents (Kulis, Marsiglia, & Hecht, 2002).

Polarized gender roles in traditional Mexican culture are epitomized in notions of *machismo* and *marianismo*. From a Mexican cultural and psychological perspective, *machismo* is a male gender role emphasizing emotional invulnerability, patriarchal dominance, and aggressive or controlling responses to stimuli but masking more deeply rooted feelings of inferiority and ambivalence toward women (Goldwert, 1983). Another side of *machismo* emphasizes more positive masculine traits centered around honor, earned respect, bravery, dignity, and a sense of family responsibility (Neff, 2001). These two aspects of *machismo* appear to coexist in the cultural norms espoused by many Mexican American adolescents of the southwest (Kulis, Marsiglia, & Hurdle, 2003; Marsiglia & Holleran, 1999). *Marianismo*, the complement to *machismo*, is said to govern female gender roles in Mexican culture (Gil & Vazquez, 1996). It reflects a cultural view of women as spiritually superior to men because of their supposed greater capacity for humility, selflessness, and forbearance for the imperfections of men (Stevens, 1973). Like *machismo*, the expectations encoded in *marianismo* can be divided into more and less desirable traits, one focusing on a sense of collectivism, self-sacrifice, devotion to family, and nurturance and another encouraging dependency, submissiveness, passivity, and resignation in the face of oppression. *Marianismo* socializes Mexican American women to adopt behaviors that exemplify their subordinate positions within the society, including gender roles that encourage women to concentrate their energies on the domestic sphere and discouraging their career aspirations and any interference of work outside the home with their family responsibilities (Stephens & Greer, 1995; Valentine & Mosley, 1998, 2000).

These well defined and relatively rigid gender roles in Mexico carry over into Mexican American culture significantly (Kranau, Green, & Valencia-Weber, 1982). Passive attitudes and behaviors are seen as a more “natural” expectation of girls than of boys (Pineda et al., 1999). The operation of gender norms is one reason that Mexican American boys are often rated significantly more hyperactive, impulsive, and oppositional than are Mexican American girls (Bauermeister, Bird, Canino, & Rubio-Stipec, 1995; Pineda et al., 1999). However, the transfer of Mexican gender role expectations into Mexican American communities differs between men and women. Mexican American men tend to follow traditional roles more readily than Mexican American women, especially with respect to career and family issues (Gonzalez, 1982). This difference in adherence to traditional gender roles among Mexican heritage men and women is manifested clearly when comparing men and women who are undergoing the acculturation process.

Although studies have found that substance use tends to increase for both male and female immigrants as they become more acculturated to the United States (Alaniz, Treno & Saltz, 1999; Galvan & Caetano, 2003), their acculturation has an especially strong impact on immigrant women’s substance abuse norms. Immigrant women who either did not drink or drank small amounts of alcohol in their native countries show patterns of excessive drinking over time after adopting the drinking norms of native-born U.S. women from the majority culture (National Institute on Alcohol Abuse and Alcoholism, 1997). Among first-generation Latinos in the United States, drinking patterns seem to change more dramatically for women than men, in part due to the women’s initially high rates of abstaining from alcohol and relatively low rates of heavy drinking (Collins & McNair, 2002). Although Mexican American women who have not been highly acculturated have high abstention rates, they show a convergence in drinking status approximating the proportion of male drinkers as they become more acculturated (Alaniz et al., 1999). On arrival, Mexican American immigrants, especially women, tend to report rates of abstinence equal to or even surpassing those of their counterparts remaining in Mexico. Abstinence rates decrease steadily for succeeding generations, however, such that third generation Mexican Americans report drinking patterns similar to those found in the general population, including patterns of occasional or moderate social drinking and more problematic heavy drinking (Gilbert & Collins, 1997). Latinos who have become highly immersed in dominant culture, particularly women, are at significant risk for substance use and related problems (Caetano & Clark, 2003; Gilbert & Cervantes, 1986; Zapata & Katims, 1994). There are numerous explanations for these acculturation-linked changes in substance use and their gendered nature. Acculturation appears to weaken collectivism, increasing the use rate of alcohol for Mexican American women but not for Mexican American men (Alaniz et al., 1999; Marsiglia & Waller, 2002; Randolph, Stroup-Benam, Black, & Markides, 1998).

Acculturation stress also has been identified as influencing alcohol use among middle school students, primarily through the deterioration of traditional Latino family values and familial behaviors (Gil, Wagner, & Vega, 2000). Mexican American women’s involvement in the maintenance of the Spanish language and Mexican culture plays a key role in the long-term adaptation of Mexican immigrant families (Hondagneu-Sotelo, 1994). However, as the acculturation process unfolds, behavioral norms that reflect the traditional values of *machismo* and *marianismo* do not necessarily change in the same way for boys and girls or with the same ramifications. *Machismo* grants greater social freedom to boys than to girls, while at the same time instilling a sense of responsibility and accountability. *Marianismo* restricts the social experiences of girls, emphasizes their obligations to family, and subjects them to a greater degree of parental monitoring. Even in the absence of acculturation, Mexican American boys have greater freedom of movement within their neighborhoods and peer networks and less familial monitoring than girls experience.

As a result of different gender role expectations exemplified by *machismo* and *marianismo*, acculturation can lead to more profound social changes for girls than for boys in terms of access to a wider and more diverse set of social contacts, including those who espouse less conservative substance use norms. These are reasons to expect that acculturation may eventually lead to a greater gender convergence in substance use attitudes and behaviors among Mexican American adolescents, similar to the narrowing gender gap emerging in the general population (Blake, Amaro, Schwartz, & Flinchbaugh, 2001; CASA, 2003; Dakof, 2000; Kauffman, Silver, & Poulin, 1997).

Study Hypotheses

The study's hypotheses are based on the theoretical and empirical connections between acculturation processes and substance use and on the findings from past research that suggest that acculturation results in more profound shifts in the normative and social environments of Mexican-heritage girls than Mexican-heritage boys. We hypothesize the following:

1. Higher degrees of linguistic acculturation will be associated with stronger pro-drug norms for boys and girls.
2. Pro-drug norms will mediate the relationship between linguistic acculturation and intentions to use substances and between linguistic acculturation and actual substance use.
3. Gender will moderate the relationship between linguistic acculturation and pro-drug norms, intentions, and use; the influence of linguistic acculturation on pro-drug norms, intentions to use substances, and substance use will be stronger for girls than for boys.

METHODS

Data and Sample

The data for this study come from a randomized trial of a drug use prevention program that was conducted in a large urban city in the southwest United States and involved 7th grade students from 35 public middle schools in the city's central corridor (for details, see Hecht et al., 2003). The current study uses only the baseline survey data collected in the fall of 1998 before the prevention program was implemented. The sample is comprised of the 2,487 students who self-identified as "Mexican, Mexican American, or Chicano" in response to a mark-all-that-apply question about their ethnicity in the baseline (or pre-test) survey. There were 1,292 (52%) boys and 1,195 (48%) girls.

Measures

SUBSTANCE USE—Two alcohol use outcomes—recent use and lifetime use—were measured separately. These items were modeled after Likert scales used by Flannery, Vazsonyi, Torquati, and Fridrich (1994) with a similar age population. Students indicated the number of alcoholic drinks they consumed alcohol in the past 30 days (score range: 1 = None to 9 = More than 30) and in their lifetime (score range: 1 = None to 10 = More than 100). The mean for recent alcohol use was 1.97 (standard deviation [*SD*] = 1.752) and for lifetime alcohol use was 3.27 (*SD* = 2.40). Approximately 30% of the respondents reported alcohol use in the past 30 days and 35% reported lifetime use. In this analysis, we focus on alcohol use because it was the substance used most frequently by the respondents; only approximately 15% were users of cigarettes and marijuana. Although self-reports of drug use are neither perfectly valid nor reliable, they are in agreement with approximately 95% of reports based on saliva samples (Ellickson & Bell, 1990). The validity of self-reported data is especially strong when recall of

activity does not extend beyond the past 30 days, as is the case in this study (Graham, Flay, & Johnson, 1984; Johnston, 1989; O'Malley, Bachman, & Johnston, 1983).

Preliminary analysis led us to restrict further analysis to recent alcohol use. We could not establish measurement invariance for lifetime alcohol use. In addition, given that we model the adoption of pro-drug norms as causally prior to alcohol use, predicting lifetime use with cross-sectional data would be problematic because of the uncertain causal ordering of that outcome.

SUBSTANCE USE INTENTIONS—Use intentions, which have been shown to be strong predictors of eventual substance use (Andrews, Tildesley, Hops, Duncan, & Severson, 2003), were measured by three items that asked “What would you say if someone offered you ...” “alcohol (beer, wine, hard liquor),” “a cigarette,” and “marijuana” (score range: 1 = Definitely no to 4 = Definitely yes). The means and SDs (alcohol: mean = 1.82, *SD* = .862; cigarettes: mean = 1.64, *SD* = .760; marijuana: mean = 1.63, *SD* = .867) indicated that most of the respondents would refuse an offer. Twenty percent said they would say “definitely” or “probably” yes to an alcohol offer, 11% for a cigarette offer, and 15% for a marijuana offer.

PRO-DRUG NORMS—Pro-drug norms were measured using three items: “Is it Ok for someone your age to ...” “drink alcohol,” “smoke cigarettes,” or “smoke marijuana,” all with the same response categories (1 = Definitely not Ok; to 4 = Definitely Ok) (alcohol: mean = 1.733, *SD* = 0.858; cigarettes: mean = 1.621, *SD* = 0.824; marijuana: mean = 1.643, *SD* = 0.917).

LINGUISTIC ACCULTURATION—Students reported the languages they use with family and with friends. Both items were scored identically (1 = Spanish only, 2 = mostly Spanish, 3 = Spanish and English equally, 4 = mostly English, to 5 = English only) and were combined to construct a mean score. There was substantial inter-item reliability (Cronbach's $\alpha = 0.86$). Higher scores indicated higher levels of linguistic acculturation. Approximately 20% of the sample spoke only Spanish with family and 8% spoke only Spanish with friends. The mean acculturation score was 3.1—close to the “bilingual” scale mid-point (*SD* = 1.1).

CONTROL VARIABLES—Age was computed in years based on the student's reported birth date. There was little variation in age; the mean age was 12.89 years (*SD* = .61). Ages ranged from 9 to 16 years old, but more than 80% were either 12 or 13 years old on their last birthday. Gender was self-reported (0 = boy, 1 = girl). Poor academic performance was captured by a measure of the students' report of the usual grades they receive (1 = Mostly As, 9 = Mostly Fs). Socioeconomic status was measured with a dummy variable based on participation in the federal school lunch program for low-income students. Higher values indicated a higher socioeconomic status. Approximately 85% of the respondents received a free or reduced price lunch.

Analytic Procedures

The analysis was conducted using LISREL 8.54, which features Efficient Full Information Maximum Likelihood procedures and Expected Maximization multiple imputation techniques for handling missing data. We used the Expected Maximization procedure to impute data missing on the dependent variables and to estimate the structural model. One percent of the cases had values missing on the dependent variables. All variables in the structural model were included in the covariance matrix used for imputation.

The analysis explored two primary questions: How is linguistic acculturation related to intentions to use substances and actual substance use? and Do these relationships differ by

gender? To answer these questions, we used latent structural equation modeling (SEM) procedures. Multigroup SEM models are preferable to multiple regression analyses because they can test a model for its applicability to different groups simultaneously by estimating group differences in path coefficients and model fit (Hoyle, 1995). SEM provides the researcher with greater flexibility not only to model relationships among multiple predictor and criterion variables and construct unobservable latent variables (such as drug use norms and intentions), but also to model the measurement error for observed variables and statistically test through confirmatory analysis a priori substantive/theoretical and measurement assumptions (Chin, 1998). Another major advantage of SEM is its capability to correct estimates of measurement errors as they introduce bias in the regression coefficients and lower the power of statistical tests for interaction effects (Li, Harmer, Acock, & Boles, 1998). Thus, in this analysis, we built simultaneous models for boys and girls, testing them to determine whether the paths in the models differed significantly across gender. Details of the modeling procedures appear below.

The Figure 1 presents the conceptual model used to guide our specification of analytic models. We hypothesized three gender-based between-group models: one predicting substance use intentions, one predicting lifetime alcohol use, and one predicting recent alcohol use. Each of the three models had six constructs for each group. Linguistic acculturation, age, poor grades, and socioeconomic status were exogenous in the model, each as latent variables with a single indicator. Pro-drug norms and substance use intentions were latent, endogenous constructs with multiple indicators. Recent and lifetime alcohol use were also latent, endogenous constructs but with only a single indicator. We could not model a path between use intentions and actual substance use because the data are cross-sectional and we would have been predicting backward—an earlier behavior with a later intention. For this reason, although we have a single conceptual model, we tested it through two separate structural models: one for use intentions and one for actual substance use.

To test for gender differences, we applied the same model to two groups: boys and girls. In this approach, models assuming no gender differences (i.e., models with paths constrained to be equal for boys and girls) were statistically compared to models in which the paths were allowed to vary for boys and girls. A significant difference between the models indicated that gender differences existed.

We adopted a systematic approach. First, we tested for the equality of factor structures across gender groups in a measurement model. Second, we examined the paths in the structural model, applying constraints to one path at a time. Where we found no significant gender differences, the paths were constrained to be equal. To assess model fit throughout the analyses, we relied on the root mean square error of approximation (RMSEA), Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), and the chi-square statistic to a lesser extent, which is sensitive to sample size (Widaman & Thompson, 2003). Tests for gender differences in the effects of acculturation are subject to constraints that compromise the ability of conventional tests at a p value of less than .05 to detect group differences. Key constructs (personal norms and substance use intentions) were measured with error (i.e., latent variables) and the lack of perfect reliability reduces statistical power for detecting gender interaction effects or multiple group differences (Aiken & West, 1991; Busemeyer & Jones, 1983). Therefore, we report results in instances where structural models showed gender differences in the direct or indirect effects of acculturation at a p value of less than .10.

RESULTS

Measurement Model Fit

We tested the fit of the measurement model ($N = 2,487$; 1,292 boys and 1,195 girls), which describes the relationship between the indicators and their corresponding latent variables. First,

we assessed the convergent and discriminant validity of the latent constructs of pro-drug norms and substance use intentions. All latent factor loadings ranged between 0.77 and 0.90, indicating convergent validity. Discriminant validity was assessed by constraining to 1 the correlation between the two latent constructs and comparing the resulting chi-square to the chi-square of an unconstrained model. The chi-square difference was significant, indicating that the constraint worsened the model fit and that the latent factors measured two distinct constructs.

Second, we assessed whether the measurement models varied by gender. We were unable to establish measurement invariance in the model predicting lifetime alcohol use. Thus, we proceeded with only the models predicting substance use intentions and recent alcohol use. We tested for measurement invariance (i.e., equal factor loadings) between gender groups by constraining the paths and covariances across gender groups to be equal and compared the model fit to that of the unconstrained model. The chi-square difference was not significant for use intentions ($\chi^2_{\text{unconstrained}}=428.64$, $df=48$; $\chi^2_{\text{constrained}}=437.79$, $df=52$; $\chi^2_{\text{difference}}=9.15$, $df=4$; $p=.057$). Similarly, the chi-square difference was not significant for recent alcohol use ($\chi^2_{\text{unconstrained}}=56.14$, $df=18$; $\chi^2_{\text{constrained}}=60.97$, $df=20$; $\chi^2_{\text{difference}}=4.83$, $df=2$; $p=.089$). These results indicated that the model fit did not worsen with constraints, satisfying the measurement invariance criterion and demonstrating that the latent constructs were measured in sufficiently similar ways for females and males.

Third, we assessed the fit of the measurement models. The fit of the substance use intentions model was acceptable ($\chi^2=428.64$, $df=48$, RMSEA = 0.079, NFI = 0.959, NNFI = 0.931). For the alcohol use model, initial modification indices suggested that we correlate the errors of the cigarette and marijuana indicators within the pro-drug norms latent construct. After making this modification, the model had good fit ($\chi^2=56.14$, $df=18$, RMSEA = 0.041, NFI = 0.989, NNFI = 0.976).

Structural Model of Substance Use Intentions

We then assessed the structural models, starting with substance use intentions and testing the hypothesized relationships for gender differences with one-degree-of-freedom chi-square-difference tests. Table 1 presents the total, direct, and indirect effects of the predictors on substance use intentions. The model had a good fit.

Linguistic acculturation had a significant direct effect on pro-drug norms. Higher acculturation was associated with stronger pro-drug norms. This effect appeared to be stronger for girls than for boys and this difference was significant at a p value of less than .10, as indicated by the italicized coefficients ($\chi^2_{\text{constrained}}=455.51$, $df=59$; $\chi^2_{\text{unconstrained}}=452.09$, $df=58$; $\chi^2_{\text{difference}}=3.42$, $df=1$; $p=0.06$). Linguistic acculturation also had a significant direct effect on substance use intentions. Higher acculturation was associated with stronger intentions to use substances, although this direct effect did not differ significantly by gender. In addition to its direct effect, linguistic acculturation had a significant indirect effect on use intentions through pro-drug norms, indicating that the association of higher linguistic acculturation with greater use intentions was partially mediated by pro-drug norms. We tested for a gender difference in this indirect effect by simultaneously constraining to be equal across gender the paths from linguistic acculturation to pro-drug norms and from pro-drug norms to use intentions. The difference was significant at a p value of less than .05, as indicated in the table by the two bolded coefficients ($\chi^2_{\text{constrained}}=458.71$, $df=60$; $\chi^2_{\text{unconstrained}}=452.09$, $df=58$; $\chi^2_{\text{difference}}=6.62$, $df=2$; $p=0.036$).

Age and poor grades had a significant direct effect on pro-drug norms. Youth who were older and had poorer grades espoused stronger adherence to pro-drug norms. In addition, age, poor grades, and socioeconomic status had significant effects on substance use intentions. Youth who were older, had poorer grades, were of higher socioeconomic status, and had stronger pro-drug norms reported stronger intentions to use substances. The effects of age and poor grades were partially mediated by pro-drug norms, as indicated by the significant indirect paths to use intentions. However, none of these other effects differed by gender.

Structural Model of Recent Alcohol Use

Table 2 presents the total, direct, and indirect effects of the predictors on recent alcohol use. Significant gender differences in effects are highlighted in the table by the bold-type or italicized coefficients. The goodness-of-fit measures indicated good fit for the model. Linguistic acculturation had a significant direct effect on pro-drug norms. Higher acculturation was associated with espousal of stronger pro-drug norms. As in the model of use intentions, this effect was stronger for girls than for boys and was again significant at the $p < .10$ level ($\chi^2_{\text{constrained}} = 81.5$, $df = 29$; $\chi^2_{\text{unconstrained}} = 78$, $df = 28$; $\chi^2_{\text{difference}} = 3.5$, $df = 1$, $p = 0.06$). Linguistic acculturation also had a significant direct effect on recent alcohol use. Higher acculturation was associated with greater use, but this direct effect did not differ by gender. In addition to its direct effect, linguistic acculturation had a significant indirect effect on recent alcohol use, indicating that the association of higher linguistic acculturation with greater recent alcohol use was partially mediated by pro-drug norms. Although the size of the coefficients for the indirect effects was larger for girls than boys, this effect did not differ significantly by gender.

Age and poor grades had significant direct effects on pro-drug norms. Youth who were older and had poorer grades espoused stronger pro-drug norms. In addition, pro-drug norms had a significant direct effect on recent alcohol use. Youth with stronger pro-drug norms reported greater recent alcohol use.

Age had a significant direct effect on recent alcohol use, but only for boys ($\chi^2_{\text{constrained}} = 85.66$, $df = 29$; $\chi^2_{\text{unconstrained}} = 78$, $df = 28$; $\chi^2_{\text{difference}} = 7.66$, $df = 1$; $P = .005$). Older boys reported greater recent alcohol use. Age also had a significant indirect effect on recent alcohol use for both boys and girls. These results indicated that the effect of age was partially mediated by pro-drug norms for boys and totally mediated for girls.

Poor grades and socioeconomic status had significant direct effects on recent alcohol use. Youth who had poorer grades and were of higher socioeconomic status reported greater recent alcohol use. Poor grades also had a significant indirect effect, indicating a relationship with alcohol use that is partially mediated by pro-drug norms. Other than linguistic acculturation and age, no effects differed by gender.

DISCUSSION

In structural models predicting intentions to use substances and recent alcohol use, all of the hypothesized associations were detected and in the expected direction. Differences in the effects of linguistic acculturation suggest people develop stronger pro-drug norms as they convert from use of their native language to English. Age, grades, and socioeconomic status (the hypothesized control variables) were found to be significant predictors of intentions to use and actual alcohol use, which was mediated through the adoption of pro-drug norms. Total effects for boys and girls varied, with girls demonstrating stronger undesirable effects of linguistic acculturation compared to boys.

Although the direct path from linguistic acculturation to use intentions and actual use did not vary significantly by gender, linguistic acculturation mediated through personal pro-drug norms had a pattern of effects similar to that of control variables. Both total and direct effects were stronger for girls than boys, mediated through pro-drug norms. These findings suggest that girls with higher levels of linguistic acculturation develop more pro-drug norms and, as a result, develop higher drug use rates than their less acculturated counterparts. Although the same process occurs for boys, it has a less acute impact on their adoption of pro-drug norms and subsequent alcohol use.

The findings are consistent with depictions of gender differences that are rooted in Mexican cultural traditions. Less acculturated Mexican and Mexican American girls appear to start at a lower risk level, due in part to the sheltering effects of more traditional cultural norms and greater parental monitoring and restrictions, which may result in relative isolation from drug using peers, drug offers, and opportunities. However, that sheltering experience may inhibit the acquisition and mastery of the refusal skills needed to handle risky situations later in their acculturation process. On the other hand, Mexican and Mexican American boys experience more encouragement to be out in the world and to be risk takers. Their different pre-acculturation socialization may provide boys with an opportunity to develop resistance skills and resistance language over time. As girls coming from traditional Mexican homes acquire English and become exposed to an unsupervised bilingual or English monolingual social network, their risk level increases. They appear to become not only more vulnerable to drug offers and actual use than less acculturated girls, but also even more at risk than Mexican boys at the same level of linguistic acculturation.

Several studies have been inconclusive about the effects of socioeconomic status and acculturation; however, there are many studies that examine the effects of socioeconomic status and substance use. In the current study, socioeconomic status and linguistic acculturation were covaried and there was no path from socioeconomic status to linguistic acculturation. Therefore, several interpretations are possible when we find socioeconomic status and linguistic acculturation influencing use intentions and actual substance use. One explanation is that Mexican American parents with a higher socioeconomic status may devote “less effort ... to maintain their culture,” resulting in less proficiency in Spanish among their offspring (Phinney, Romero, Nava, & Huang, 2001, p. 150). Secondly, in our results the effects of socioeconomic status on intentions to use substances and on recent alcohol use were not mediated by the acquisition of pro-drug norms. Some other mechanism associated with loss of connection to the Spanish language is at work, such as greater ability to purchase substances.

Although English language acquisition is only one facet of Latino acculturation processes in the United States, it appears to be an important indicator of social and cultural dynamics. Language acquisition enables students to access the broader community and perhaps put themselves in situations where drugs are offered. Another well documented explanation noted consistently by epidemiologists, media analysts, and psychologists is the association between substance abuse and media consumption, whether through music, videos, advertisements, and popular movies (DuRant, Rome, Rich, Allred, Emans, & Woods, 1997; Robinson, Chen, & Killen, 1998; Wallack, Grube, Madden, & Breed, 1990). Although we do not have any measures to empirically establish this in our study, we know that the dominant mode of communication in the United States is English. Acquisition of the English language may provide an opportunity for both men and women to tap into newer networks that may put them at risk. Furthermore, English language use may trigger or help sustain assimilation imageries among new immigrant children, irrespective of parental monitoring and changes in the composition of their social networks. It also enables reconstruction of identity through use of a new language (Spanglish) and the behaviors associated with it. To “fit in” or be “cool,” adolescents may engage in experimentation that leads to abuse of substances. This study’s

findings suggest that Mexican American adolescent girls may be particularly vulnerable because English language serves as an outlet to experience their new gender identity.

A limitation of the statistical analysis is that we could not model a path between use intentions and actual substance use due the particular operationalization of the variables. The cross-sectional nature of the data inhibited the ability to test a single structural model. Longitudinal data would be more suited to a test of the path between intentions to use and actual use. Having said this, other research has already established this link (Andrews et al., 2003) and it was not the focus of this current study, which treated intentions as an outcome in its own right.

Although based on a large sample, the sample was drawn from one region of the country, and a major metropolitan area of one US–Mexico border state. Thus, its findings cannot be generalized to all Latino subgroups or to Mexican origin youth residing in other parts of the country. Comparative studies are needed to test these findings across different subgroups and geographic locations. Another limitation is that the study sample was relatively homogeneous in terms of socioeconomic status; greater variation would benefit future analyses of the impact of socioeconomic status. Furthermore, no data about family characteristics and immigration history were available, limiting our ability to control for these influences. Despite these limitations, this study provided important information on gender differences in the influence of linguistic acculturation on two critical substance use outcomes, use of substance consumed most prevalently (alcohol) and future intentions to use substances, which is one of the best predictors of later use.

Acknowledgments

Supported by the National Institutes of Health/National Institute on Drug Abuse grants funding the Southwest Interdisciplinary Research Center (R24 DA13937), the Drug Resistance Strategies III project (R01 DA05629), and the DRS Next Generation project (R01 DA14825).

REFERENCES

- Aiken, LS.; West, SG. Multiple regression: Testing and interpreting interactions. Newbury Park, CA: SAGE Publications; 1991.
- Alaniz ML, Treno AJ, Saltz RF. Gender, acculturation, and alcohol consumption among Mexican Americans. *Substance Use & Misuse* 1999;34:1407–1426. [PubMed: 10446767]
- Alvesson M, Karreman D. Taking the linguistic turn: Challenges, responses, consequences. *The Journal of Applied Behavioral Science* 2000;36:136–158.
- Amaro, H.; Zuckerman, BS.; Stiffman, AR.; Feldman, RA. Patterns and prevalence of drug use among adolescent mothers. In: Stiffman, AR.; Feldman, RA., editors. *Contraception, pregnancy, and parenting. Advances in adolescent mental health. Vol. vol. 4.* Oxford, England: Jessica Kingsley Publishers; 1990. p. 203–221.
- Andrews JA, Tildesley E, Hops H, Duncan S, Severson HH. Elementary school age children's future intentions and use of substances. *Journal of Clinical Child & Adolescent Psychology* 2003;32:556–567. [PubMed: 14710464]
- Arciniega LL, Arroyo JA, Miller WR, Tonigan JS. Alcohol, drug use and consequences among Hispanics seeking treatment for alcohol-related problems. *Journal of Study of Alcohol* 1996;57:613–618.
- Ardila A. An anglicized Spanish dialect. *Hispanic Journal of Behavioral Sciences* 2005;27:60–81.
- Barnes GE. Solvent abuse: A review. *International Journal of the Addictions* 1979;14:1–26. [PubMed: 381216]
- Bauermeister JJ, Bird HR, Canino G, Rubio-Stipec M. Dimensions of attention deficit hyperactivity disorder: Findings from teacher and parent reports in a community sample. *Journal of Clinical Child Psychology* 1995;24:264–271.
- Bean, FD.; Tienda, M. *The Hispanic population of the United States.* New York: Russell Sage Foundation; 1987.

- Beauvais F. Cultural identification and substance use in North America: An annotated bibliography. *Substance Use and Misuse* 1998;33:1315–1336. [PubMed: 9603273]
- Berry JW. Marginality, stress, and ethnic identification in an acculturated Aboriginal community. *Journal of Cross-Cultural Psychology* 1970;1:17–22.
- Berry, JW. Acculturation as varieties of adaptation. In: Padilla, AM., editor. *Acculturation: Theory, models and some new findings*. Boulder, CO: Westview; 1980. p. 9-25.
- Berry, JW. Psychological adaptation of foreign students in Canada. In: Samuda, R.; Wolfgang, A., editors. *Intercultural counseling*. Toronto: Hogrefe; 1985. p. 235-248.
- Berry, JW. Cultural variations in cognitive style. In: Wapner, S., editor. *Bio-psycho-social factors in cognitive style*. Hillsdale, NJ: Earlbaum; 1990. p. 289-308.
- Berry JW. Immigration, acculturation and adaptation. *Applied Psychology: An International Review* 1997;46:5–68.
- Blake SM, Amaro H, Schwartz PM, Flinchbaugh LJ. A review of substance abuse prevention interventions for young adolescent girls. *Journal of Early Adolescence* 2001;21:294–324.
- Bonnheim ML, Korman M. Family interaction and acculturation in Mexican-American inhalant users. *Journal of Psychoactive Drugs* 1985;17:25–33. [PubMed: 3981303]
- Burnham MA, Hough RL, Karno M, Escobar JJ, Telles CA. Acculturation and lifetime prevalence of psychiatric disorders among Mexican Americans in Los Angeles. *Journal of Health and Social Behavior* 1987;28:89–102. [PubMed: 3571910]
- Busemeyer JR, Jones LE. Analysis of multiplicative combination rules when the causal variables are measured with error. *Psychological Bulletin* 1983;93:549–562.
- Caetano R. Alternative definitions of Hispanics: Consequences in an alcohol survey. *Hispanic Journal of Behavioral Sciences* 1986;8:331–344.
- Caetano, R.; Clark, CL. Acculturation, alcohol consumption, smoking, and drug use among Hispanics. In: Chun, KM.; Balls Organista, P.; Marin, G.; Sue, S., editors. *Acculturation: Advances in theory, measurement, and applied research*. Washington, DC: American Psychological Association; 2003. p. 223-239.
- CASA. The formative years: Pathways to substance abuse among girls and young women ages. New York: National Center on Addiction and Substance Abuse at Columbia University; 2003. p. 8-22.
- Chandler CR, Tsai TM, Wharton R. Twenty years after: Replicating a study of Anglo and Mexican American cultural values. *Social Science Journal* 1999;36:353–367.
- Chilcoat HD, Breslau N, Anthony JC. Potential barriers to parent monitoring: Social disadvantage, marital status, and maternal psychiatric disorder. *Journal of the American Academy of Child and Adolescent Psychiatry* 1996;35:1673–1682. [PubMed: 8973075]
- Chin WW. Issues and opinion on structural equation modeling. *Management Information System Quarterly* 1998;22:7–16.
- Collins LR, McNair LD. Minority women in alcohol use. *Alcohol Research & Health* 2002;26:251–256. [PubMed: 12875034]
- Dakof GA. Understanding gender differences in adolescent drug abuse: Issues of comorbidity and family functioning. *Journal of Psychoactive Drugs* 2000;32:25–32. [PubMed: 10801065]
- Dalton MA, Sargent JD, Beach ML, Titus-Ernstoff L, Gibson JJ, Aherns M, et al. Effect of viewing smoking in movies on adolescent smoking initiation: A cohort study. *Lancet* 2003;362:281–285. [PubMed: 12892958]
- Denner J, Kirby D, Coyle K. The protective role of social capital and cultural norms in Latino communities: A study of adolescent births. *Hispanic Journal of Behavioral Sciences* 2001;23:3–21.
- Duncan SC, Duncan TE, Biglan A, Ary D. Contributions of the social context to the development of adolescent substance use: A multivariate latent growth modeling approach. *Drug and Alcohol Dependence* 1998;50:57–71. [PubMed: 9589273]
- DuRant RH, Rome ES, Rich M, Allred E, Emans SJ, Woods ER. Tobacco and alcohol use behaviors portrayed in music videos: A content analysis. *American Journal of Public Health* 1997;87:1131–1135. [PubMed: 9240102]
- Ellickson PL, Bell RM. Drug prevention in junior high: A multi-site longitudinal test. *Science* 1990;247:1299–1305. [PubMed: 2180065]

- Epstein JA, Botvin GJ, Diaz T. Linguistic acculturation and gender effects on smoking among Hispanic youth. *Preventive Medicine* 1998;27:583–589. [PubMed: 9672952]
- Epstein JA, Botvin GJ, Diaz T. Alcohol use among Hispanic adolescents: Role of linguistic acculturation and gender. *Journal of Alcohol and Drug Education* 2000;45(3):18–32.
- Epstein JA, Botvin GJ, Diaz T. Linguistic acculturation associated with higher marijuana and polydrug use among Hispanic adolescents. *Substance Use & Misuse* 2001;6:477–499. [PubMed: 11346278]
- Escobar JI. Immigration and mental health: Why are immigrants better off? *Archives of General Psychiatry* 1998;55:781–782. [PubMed: 9736003]
- Farabee D, Wallisch L, Maxwell JC. Substance use among Texas Hispanics and non-Hispanics: Who's using, who's not, and why. *Hispanic Journal of Behavioral Sciences* 1995;17:523–536.
- Feiring C, Lewis M. Do mothers know their teenagers' friends? Implications for individuation in early adolescence. *Journal of Youth and Adolescence* 1993;22:337–354.
- Flannery DJ, Vazsonyi AT, Torquati J, Fridrich A. Ethnic and gender differences in risk for early adolescent substance use. *Journal of Youth and Adolescence* 1994;23:195–213.
- Flannery DJ, Williams LL, Vazsonyi AT. Who are they with and what are they doing? Delinquent behavior, substance use, and early adolescents' after-school time. *American Journal of Orthopsychiatry* 1999;69:247–253. [PubMed: 10234390]
- Galvan FH, Caetano R. Alcohol use and related problems among ethnic minorities in the United States. *Alcohol Research and Health* 2003;27:87–94. [PubMed: 15301403]
- Gil, RM.; Vazquez, CI. *The Maria paradox*. New York: Putnam; 1996.
- Gil AG, Wagner EF. Acculturation, familism, and alcohol use among Latino adolescent males: Longitudinal relations. *Journal of Community Psychology* 2000;28:443–458.
- Gil AG, Wagner EF, Vega WA. Acculturation, familism, and alcohol use among Latino adolescent males: longitudinal relations. *Journal of Community Psychology* 2000;28:443–458.
- Gilbert MJ, Cervantes RC. Patterns and practices of alcohol use among Mexican Americans: A comprehensive review. *Hispanic Journal of Behavioral Sciences* 1986;8:1–60.
- Gilbert, MJ.; Collins, RL. Ethnic variation in women's and men's drinking. In: Wilsnack, RW.; Wilsnack, SC., editors. *Gender and alcohol*. New Brunswick, NJ: Rutgers Center of Alcohol Studies; 1997. p. 357–378.
- Goldwert, M. *Machismo and conquest: The case of Mexico*. Lanham, MD: University Press of America; 1983.
- Gonzalez A. Sex roles of the traditional Mexican family. *Journal of Cross-cultural Psychology* 1982;13:330–339.
- Graham JW, Flay BR, Johnson CA. Reliability of self-report measures of drug use in prevention research: evaluation of the Project SMART questionnaire via the test-retest reliability matrix. *Journal of Drug Education* 1984;14:175–193. [PubMed: 6536737]
- Harrison LD, Kennedy NK. Drug use in the United States Mexico border area: is there an epidemic waiting to happen? *Hispanic Journal of Behavioral Sciences* 1994;16:281–295.
- Heath, SB. *Ways with words: Language, life and work in communities and classrooms*. Cambridge: Cambridge University Press; 1983.
- Heath SB. Oral and literate traditions among Black Americans living in poverty. *American Psychologist* 1989;44:367–373.
- Hecht ML, Marsiglia FF, Elek E, Wagstaff DA, Kulis S, Dustman P, et al. Culturally grounded substance use prevention: An evaluation of the *keepin' it REAL* curriculum. *Prevention Science* 2003;4:233–248. [PubMed: 14598996]
- Hondagneu-Sotelo, P. *Gendered transitions: Mexican experiences of immigration*. Berkeley, CA: University of California Press; 1994.
- Hoyle, RH. *Structural equation modeling: Concepts, issues, and applications*. Thousand Oaks, CA: SAGE Publications; 1995.
- Johnston LD. The survey technique in drug abuse assessment. *Bulletin of Narcotics* 1989;41(1–2):29–40.
- Kauffman SE, Silver P, Poulin J. Gender differences in attitudes toward alcohol, tobacco, and other drugs. *Social Work* 1997;42:231–243. [PubMed: 9153092]

- Keefe, SE. Acculturation and the extended family among urban Mexican Americans. In: Padilla, AM., editor. *Acculturation theory, models and some new findings*. Boulder, CO: Westview Press; 1980. p. 85-110.
- Keefe, S.; Padilla, A. *Chicano ethnicity*. Albuquerque, NM: University of New Mexico Press; 1987.
- Kranau EJ, Green V, Valencia-Weber G. Acculturation and the Hispanic woman: Attitudes toward women, sex-role attribution, sex-role behavior, and demographics. *Hispanic Journal of Behavioral Science* 1982;4:21-40.
- Kulis S, Marsiglia FF, Hecht ML. Gender labels and gender identity as predictors of drug use among ethnically diverse middle school students. *Youth and Society* 2002;33:442-475.
- Kulis S, Marsiglia FF, Hurdle D. Gender identity, ethnicity, acculturation and drug use: Exploring differences among adolescents in the Southwest. *Journal of Community Psychology* 2003;31(2):1-22.
- Laroche M, Kim C, Tomiuk MA. Italian ethnic identity and its relative impact on the consumption of convenience and traditional foods. *Journal of Consumer Marketing* 1998;15:125-151.
- Li F, Harmer P, Duncan TE, Duncan SC, Acock A, Boles S. Approaches to testing interaction effects using structural equation modeling methodology. *Multibehavioral Research* 1998;33:1-39.
- Marsiglia FF, Holleran L. I've learned so much from my mother: An ethnography of a group of Chicana high school students. *Social Work in Education* 1999;21:220-237.
- Marsiglia FF, Miles BW, Dustman P, Sills S. Ties that protect: An ecological perspective on Latino/a urban pre-adolescent drug use. *Journal of Ethnic and Cultural Diversity in Social Work* 2003;11:191-220.
- Marsiglia FF, Waller M. Language preference and drug use among Southwestern Mexican American middle school students. *Children & Schools* 2002;25:145-158.
- Medina-Mora ME, Rojas Guiot E. Mujer, pobreza, y adicciones [Women, poverty, and addictions]. *Perinatología y Reproducción Humana* 2003;17:230-244.
- National Institute on Alcohol Abuse and Alcoholism. NIH Pub. No. 97-4017. Rockville, MD: National Institutes of Health; 1997. *Alcohol and health: Ninth Special Report to the U.S. Congress*.
- Neff JA. A confirmatory factor analysis of a measure of machismo among Anglo, African American, and Mexican male drinkers. *Hispanic Journal of Behavioral Sciences* 2001;23:171-188.
- Nielsen A, Ford JA. Drinking patterns among Hispanic adolescents: Results from a national household survey. *Journal of Studies on Alcohol* 2001;62:448-456. [PubMed: 11513223]
- Ochs, E. *Culture and language development*. New York: Cambridge University Press; 1988.
- Olson, DH.; McCubbin, H.; Barnes, HI.; Larsen, AS.; Muxen, MJ.; Wilson, MA. *Families*. Beverly Hills, CA: SAGE Publications; 1983.
- O'Malley PM, Bachman JG, Johnston LD. Reliability and consistency in self-reports of drug use. *The International Journal of the Addictions* 1983;18:806-824.
- Padilla AM, Perez W. Acculturation, social identity, and social cognition: A new perspective. *Hispanic Journal of Behavioral Sciences* 2003;25:35-55.
- Penaloza L. Atravesando fronteras/border crossings: A critical ethnographic exploration of the consumer acculturation of Mexican immigrants. *Journal of Consumer Research* 1994;21:32-54.
- Perea A, Slater MD. Power distance and collectivist/individualist strategies in alcohol warning: Effects by gender and ethnicity. *Journal of Health Communication* 1999;4:295-310. [PubMed: 10790786]
- Philips, SU. *The invisible culture: Communication in classroom and community on the warm springs indian reservation*. Prospect Heights, IL: Waveland Press; 1983.
- Phinney JS, Romero I, Nava M, Huang D. The role of language, parents, and peers in ethnic identity among adolescents in immigrant families. *Journal of Youth & Adolescence* 2001;30:135-153.
- Pineda D, Ardila A, Rosselli M, Arias BE, Henao GC, Gomez LF, et al. Prevalence of attention-deficit/hyperactivity disorder symptoms in 4-to 17-year-old children in the general population. *Journal of Abnormal Child Psychology* 1999;27:455-462. [PubMed: 10821627]
- Portes, A.; Rumbaut, RG. *Legacies: The story of the immigrant second generation*. Berkeley: University of California Press; 2001.

- Randolph VM, Stroup-Benam C, Black SA, Markides KS. Alcohol use among Cuban-Americans, Mexican Americans, and Puerto Ricans. *Alcohol Health & Research World* 1998;22:265–269. [PubMed: 15706753]
- Robinson TN, Chen HL, Killen JD. Television and music video exposure, and risk of adolescent alcohol use. *Pediatrics* 1998;102(5):1–6. [PubMed: 9651405]
- Rogler LH, Cortes DE, Malgady RG. Acculturation and mental health status among Hispanics: Convergence and new directions for research. *American Psychologist* 1991;46:585–597. [PubMed: 1952420]
- Samaniego R, Gonzalez N. Multiple mediators of the effects of acculturation status on delinquency for Mexican American adolescents. *American Journal of Community Psychology* 1999;27:189–210. [PubMed: 10425699]
- Schieffelin, B. The give and take of everyday life: Language socialization of Kaluli children. Cambridge: Cambridge University Press; 1990.
- Serrano E, Anderson J. Assessment of a refined short acculturation scale for Latino preteens in rural Colorado. *Hispanic Journal of Behavioral Sciences* 2003;25:240–253.
- Stephens GK, Greer CR. Doing business in Mexico: Understanding cultural differences. *Organizational Dynamics* 1995;24:39–55.
- Stevens EP. The prospects for a women's liberation movement in Latin America. *Journal of Marriage and the Family* 1973;35:313–321.
- Suarez-Orozco, C.; Suarez-Orozco, M. Transformations: Immigration, family life, and achievement motivation among Latino adolescents. Stanford, CA: Stanford University Press; 1995.
- Taylor, C. Hermeneutics and politics. In: Connerton, P., editor. *Critical sociology, selected readings*. Harmondsworth: Penguin Books Ltd.; 1976. p. 153–193.
- Unger JB, Ritt-Olson A, Wagner K, Soto D, Baezconde-Garbanati L. A comparison of acculturation measures among Hispanic/Latino adolescents. *Journal of Youth and Adolescence* 2007;36:555–565.
- Valentine S, Mosley G. Aversion to women who work and perceived discrimination among Euro-Americans and Mexican-Americans. *Perceptual and Motor Skills* 1998;86:1027–1033.
- Valentine S, Mosley G. Acculturation and sex-role attitudes among Mexican Americans: A longitudinal analysis. *Hispanic Journal of Behavioral Sciences* 2000;22:104–113.
- Vega, WA.; Gil, AG. Drug use and ethnicity in early adolescence. New York: Plenum Press; 1998.
- Vega WA, Gil AG, Warheit GJ, Zimmerman RS, Apospori E. Acculturation and delinquent behavior among Cuban American adolescents: Toward an empirical model. *The American Journal of Community Psychology* 1993;21:113–125.
- Vega WA, Zimmerman RS, Warheit GJ, Apospori E, Gil AG. Acculturation strain theory: Its application in explaining drug use behavior among Cuban and other Hispanic youth. *Substance Use & Misuse* 1997;32:1943–1948.
- Wagner-Echeagaray FA, Schütz CG, Chilcoat HD, Anthony JC. Degree of acculturation and the risk of crack cocaine smoking among Hispanic Americans. *American Journal of Public Health* 1994;84:1825–1827. [PubMed: 7977926]
- Wallack L, Grube JW, Madden PA, Breed W. Portrayals of alcohol on prime-time television. *Journal of Studies on Alcohol* 1990;51:428–437. [PubMed: 2232796]
- Widaman KF, Thompson JS. On specifying the null model for incremental fit indices in structural equation modeling. *Psychological Methods* 2003;8:16–37. [PubMed: 12741671]
- Witkin HA, Berry JW. Psychological differentiation in cross-cultural perspective. *Journal of Cross-Cultural Psychology* 1975;6:4–87.
- Wycoff CS. The García family: Using a structural systems approach with an alcohol-dependent family. *Family Journal* 2000;8:47–57.
- Zapata JT, Katims DS. Antecedents of substance use among Mexican-American school-age children. *Journal of Drug Education* 1994;24:233–251. [PubMed: 7844696]
- Zayas L, Rojas M, Malgady RG. Alcohol and drug use, and depression among Hispanic men in early adulthood. *The American Journal of Community Psychology* 1998;26:425–438.

Figure 1. Conceptual model. Two other outcomes were examined—recent and lifetime use of alcohol—and both were measured as observed rather than latent variables.

TABLE 1

Structural Model of Use Intentions, Unstandardized Coefficients (Standard Errors)^a

Variables	Pro-drug norms	Recent alcohol use
Linguistic acculturation (boys)		
Total effects	0.058** (0.019)	0.095*** (0.016)
Direct effects	0.058** (0.019)	0.061** (0.012)
Indirect effects		0.034** (0.011)
Linguistic acculturation (girls)		
Total effects	0.113*** (0.019)	0.135*** (0.030)
Direct effects	0.113*** (0.019)	0.070** (0.012)
Indirect effects		0.065*** (0.012)
Pro-drug norms		
Total effects		0.579*** (0.025)
Direct effects		0.579*** (0.025)
Indirect effects		
Age		
Total effects	0.183*** (0.024)	0.172*** (0.025)
Direct effects	0.183*** (0.024)	0.066** (0.022)
Indirect effects		0.106*** (0.014)
Poor grades		
Total effects	0.041*** (0.008)	0.071*** (0.008)
Direct effects	0.041*** (0.008)	0.0467*** (0.022)
Indirect effects		0.024*** (0.005)
SES		
Total effects	0.037 (0.042)	0.116** (0.043)
Direct effects	0.037 (0.042)	0.095* (0.037)
Indirect effects		0.021 (0.024)

 $p < .0001$;**
 $p < .01$;*
 $p < .05$.Fit Statistics: $\chi^2 = 454.63$, $df = 65$, RMSEA = 0.069, NFI = 0.957, NNFI = 0.948.^aPaths that differed significantly by gender are indicated through either bold ($p < .05$) or italicized ($p < .10$) coefficients.

TABLE 2

Structural Model of Recent Alcohol Use, Unstandardized Coefficients (Standard Errors)^a

Variables	Pro-drug norms	Recent alcohol use
Linguistic acculturation (boys)		
Total effects	0.070 ^{**} (0.021)	0.128 ^{**} (0.036)
Direct effects	0.070 ^{**} (0.021)	0.053 ^{**} (0.030)
Indirect effects		0.076 ^{**} (0.023)
Linguistic acculturation (girls)		
Total effects	0.122 ^{***} (0.02)	0.185 ^{***} (0.036)
Direct effects	0.122 ^{***} (0.02)	0.053 ^{***} (0.040)
Indirect effects		0.132 ^{***} (0.024)
Pro-drug norms		
Total effects		1.077 ^{***} (0.054)
Direct effects		1.077 ^{***} (0.054)
Indirect effects		
Age (boys)		
Total effects	0.188 ^{***} (0.026)	0.469^{***} (0.083)
Direct effects	0.188 ^{***} (0.026)	0.267^{**} (0.080)
Indirect effects		0.203 ^{***} (0.030)
Age (girls)		
Total effects	0.188 ^{***} (0.026)	0.203^{**} (0.083)
Direct effects	0.188 ^{***} (0.026)	0.0003 (0.072)
Indirect effects		0.203 ^{***} (0.030)
Poor grades		
Total effects	0.041 ^{***} (0.008)	0.127 ^{***} (0.019)
Direct effects	0.041 ^{***} (0.008)	0.081 ^{***} (0.017)
Indirect effects		0.046 ^{***} (0.009)
SES		
Total effects	0.050 (0.046)	0.382 ^{**} (0.102)
Direct effects	0.050 (0.046)	0.341 ^{**} (0.094)
Indirect effects		0.040 (0.046)

p<.0001;

**
p<.01.

Fit Statistics: $\chi^2 = 81.67$, df = 35, RMSEA = 0.033, NFI = 0.98, NNFI = 0.98.

^aPaths that differed significantly by gender are indicated through either bold ($p<.05$) or italicized ($p<.10$) coefficients.