

Gendered Effects of Linguistic Acculturation on Drug Use
among Mexican-Origin Boys and Girls

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Abstract

Move1
step1 This study tested for gender differences in the impact of linguistic acculturation on pro-
drug norms, substance use intentions, and actual substance use among Mexican-heritage youth in
step2 a large metropolitan area in the Southwest U.S. Both theory and empirical research suggest that,
for Latino youth, use of the Spanish language is associated with cultural and familiar factors that
shelter them from drug offer opportunities, but these protective forces diminish as they begin
Move2
step1 using English regularly. This study examines whether the negative impact of acculturation on
youth substance use varies by gender. We analyzed baseline survey data provided by 2,487
step2 Mexican-heritage middle school students who were part of a larger, multiethnic randomized trial
of a culturally grounded drug abuse prevention program. Using multi-group structural equation
step3 modeling, we 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
recent alcohol use through pro-drug norms. All effects of linguistic acculturation were
significantly stronger for girls than for boys. Age had a direct effect on recent alcohol use for
step4 boys but not for girls. Among Mexican origin youth in this sample, acquisition and use of
English appeared to diminish the ability to resist drug offers effectively to a greater degree
among girls than among boys. These findings are interpreted in light of cultural and familiar
influences associated with Mexican immigrants.

Introduction

This study investigates possible gender differences in the substance use norms, intentions and behaviors of Mexican heritage youth as they become proficient in English (linguistic acculturation). There is some evidence that traditional gender norms of less acculturated Mexican females have a protective effect on their 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 the existing literature on the topic and aims at advancing knowledge by testing the hypothesis that 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 brings about ‘cultural change’ in individuals when they come into contact with different cultures on a continuous basis (Bean & Tienda, 1987; Laroche, et al. 1998). The outcomes of the change process are varied. Some groups may assimilate to or become integrated into society (Bean & Tienda, 1987; Keefe, 1980, Keefe & Padilla, 1987; Penaloza, 1994). Other groups may become marginalized or separated from society and/or their culture of origin (Berry, 1980, 1985, 1990, 1997)

Individuals are not always free to pursue the acculturation strategy they prefer. Even when newcomers achieve cultural competence -- “the learned ability to function in a culture in a manner that is congruent with the values, beliefs, customs, mannerisms, and language of the majority of members of the culture” (Padilla & Perez, 2003, p. 42) – treatment by members of the host culture may influence acculturation outcomes (Padilla & Perez, 2003; Berry, 1998; Tajfel & Turner, 1979). By failing to recognize their existing identities, the host culture may stigmatize newcomers, fostering a choice of acculturation strategy that is less integrative. For

example, immigrants who seek to retain their native language have often been met with negative attitudes in the host culture (Crawford, 1992; Gerber, 1991). In particular, they may be exposed to negative stereotypes about themselves (Blauner, 1969, 1972). 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. Communicative competence 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). Effective language use may possess either "*transient meaning*," emerging from a specific linguistic interaction, or "*durable meaning*," which extends beyond a specific interaction. Both may include the entire gamut of "meaning phenomena" -- i.e., cultural and individual ideas, orientations, and ways of-sense making (Alvesson & Karreman, 2000). Therefore, language is highly malleable and adaptable, especially for children, whose day-to-day interaction may not involve conscious enactment of historical and cultural symbols, but which nonetheless reveals their identity. Children are then able to consciously or unconsciously express dual identities by the linguistic choices they make. They may make different choices for different groups of people or for different settings, even different choices within a single sentence, as in the 'code-switching' described by Blom and Gumperz (1972).

Communication among individuals gives rise to self-referential or 'autopoietic' systems (Luhman, 1982). Language becomes an autopoietic system by reproducing itself in different forms and types, giving rise to new dialects such as *Spanglish*, which is used in areas along the U.S.-Mexico border. When immigrant youths come into contact with English, an 'interlanguage'

like *Spanglish* develops, enabling them to construct their culture in linguistic terms and form hybrid identities where language plays a vital role (Ardila, 2005). 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). Although language measures only one dimension of acculturation, it has been demonstrated to be comparable to multi-dimensional measures, accounting for up to 65% of the variance on acculturation status (Rogler et al., 1991; Samaniego & Gonzales, 1999). Following others who have called it *linguistic acculturation*, we focus on this key part of acculturation (Epstein, Botvin, & Díaz, 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 and acculturation stress have been widely implicated with an increase in substance use and dependence (Amaro et al., 1990; Burnam, Hough, Karno, Escobar, & Telles, 1987; Epstein, Botvin, & Díaz, 2000, 2001; Harrison & Kennedy, 1994; Vega, Gil, et al., 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 et al., 1998), while substance use among more acculturated Latinos' is more consistent with the native-born ethnic majority' use (Farabee,

Wallisch, & Maxwell, 1995). Among those from immigrant families, language use is a better indicator of substance use risk than is national origin. In surveys across different groups of Latino youth—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 more frequently. Studies in different regions of the U.S. 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 somewhat greater risk of substance use than the Spanish monolingual (Epstein, Botvin, & Díaz, 2000, 2001; Marsiglia & Waller, 2002).

A number of explanations have been offered for the connection between *linguistic acculturation* and substance use. 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, among other reasons because adults learn English at a slower pace than children do (Rogler, Cortes, & Malgady, 1991; Marsiglia, Miles, Dustman, & Sills, 2002). Spanish language dominance appears to protect adolescents by sheltering them from a developmentally driven expansion of their social networks that puts them at greater risk for encountering pro-drug peers and opportunities to use substances (Escobar, 1998). English language acquisition enables them to access the broader community and enter new situations where substances are offered, while also distancing them from the protective effects of family and culture of origin (Chilcoat & 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 better English language skills has been associated with more consumption of pro-substance use images in mainstream English language media (Caetano, 1986; Dalton, Sargent, Beach, Titus-Ernstoff, Gibson, Ahrens, Tickle, & Heatherton, 2003). Second, English language acquisition may induce stress as the individual attempts to resolve conflicting cultural differences, leading to destructive attempts to reduce stress through drug use (Barnes, 1979; Beauvais, 1998; Bonnheim & Korman, 1985; Gil & Wagner, 2000). Third, as English language acquisition increases their familiarity with the host culture, ethnic minority youth may more readily perceive ethnic discrimination directed against them, begin to recognize their devalued minority group status and its social implications, 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 possible reason for the connection between English language 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, and Wharton 1999; Olson et al. 1983; Suarez-Orozco and Suarez-Orozco 1995). This family orientation is accompanied by greater parental monitoring and involvement with children (Chandler et al. 1999; Denner, Kirby, and Coyle 2001), which can protect against substance use (Duncan et al. 1998; Flannery, Williams, and Vazsonyi 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 and Rumbaut 2001).

Gender Socialization and Substance Use among Mexican Americans

The major goal of this study is to investigate the intersection of *linguistic acculturation* and gender, specifically how gender may moderate the impact of acculturation on substance use norms and behaviors. Why do we expect to see significant differences between girls and boys in the way that acculturation influences norms toward drug use, especially among Mexican Americans? The possible reasons include gender differences in the cultural expectations governing substance use, the nature of polarized gender roles in traditional Mexican culture, and gender differences in the way that acculturation changes substance use norms, behaviors, and opportunities. Cultural values within Mexican culture support different alcohol use norms by gender, such that men are allowed, even encouraged, to drink when and where they feel it is necessary while 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). Mexican women are socialized to adopt a collectivist approach that promotes abstinence by stressing the risks that their substance use would pose for family and friends while 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, 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).³ Another side of *machismo* emphasizes more positive masculine traits centered around honor, earned respect, bravery, dignity and a sense of family responsibility (Neff, 2001; Marsiglia, 2001). These two aspects of *machismo* appear to coexist in the cultural norms espoused by many Mexican American adolescents of the Southwest (Kulis, et al., 2002; Marsiglia & Holleran, 1999). *Marianismo*, the complement to *machismo*, is said to govern female gender roles in Mexican culture (Gil and Vazquez, 1996). It reflects cultural dynamics that view women as spiritually superior to men because of their supposed greater capacity for humility and selflessness, as well as their 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 position within the society, including gender roles that encourage women to concentrate their energies on the domestic sphere while discouraging their career aspirations and any interference

³ The existence, sources, scope and nature of Mexican *machismo* continues to be debated vigorously. Critics have argued that it is a social myth imposed by researchers (Mirandé, 1979), that it is a response to socioeconomic vulnerability rather than a cultural feature (Baca Zinn, 1982a), and that it over-emphasizes negative traits and obscures the more positive set of masculine traits that are also parts of *machismo* (Mirandé, 1985).

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 Mexican culture 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 appears more complete for men than for women. Mexican American men seem to fit into traditional roles more readily than Mexican American females, especially with respect to career and family issues (Gonzalez, 1982). This difference is manifested most clearly when comparing Mexican-heritage men and women who are undergoing the acculturation process.

Studies of immigrant populations, including Latinos, suggest that acculturation to substance use norms in the U.S. has an especially strong impact on women. Immigrant women who either did not drink or drank small amounts of alcohol in their countries of origin show patterns of excessive drinking over time after adopting the drinking norms of native born U.S. women from the majority culture (NIAAA 1997). Among first generation Latinos in the U.S., drinking patterns seem to change more dramatically for females than males, 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 very high abstention rates, as they become more acculturated, they show a convergence in drinking status approximating the proportion of males drinkers (Alaniz et al,

1999). Upon 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 American report drinking patterns very similar to those found in the general population, including patterns of occasional or moderate social drinking as well as more problematic heavy drinking (Gilbert and 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, Treno, & Saltz, 1999; Randolph, et al., 1998; Marsiglia & Waller, 2002). 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; Trueba, 1997). As the acculturation process unfolds, however, behavioral norms that reflect the traditional values of *machismo* and *marianismo* do not necessarily change in the same way for boys and girls nor 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 is experienced by girls. Acculturation, then, 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 lead to a 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; Dakof, 2000; Kauffman, Silver, & Poulin, 1997; CASA, 2003).

Study Hypotheses

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

H1: Higher degrees of linguistic acculturation will be associated with stronger pro-drug norms for both Mexican American boys and girls.

H2: Pro-drug norms will mediate the relationship between linguistic acculturation and intentions to use substances and between linguistic acculturation and actual substance use.

H3: 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 and involved 7th grade students from 35 public middle schools in the city's central corridor (for details see Hecht, Marsiglia, Elek, Wagstaff, Kulis, Dustman, & Miller-Day, 2003). The current study uses only the baseline survey data collected in Fall 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 wave 1 survey. There were 1292 (52%) males and 1195 (48%) females.

Measures

Substance use: Two substance use outcomes, recent use and lifetime use, were measured separately for each substance: alcohol, cigarettes, and marijuana. 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 last 30 days (1=*None* to 9=*More than 30*) and in their lifetime (1=*None* to 10=*More than 100*). The mean for recent alcohol use was 1.97 (SD = 1.752), and for lifetime alcohol use was 3.27 (SD = 2.40). Approximately 70% of the respondents reported no alcohol use in the last 30 days, and 65% reported no lifetime use. Students also reported the number of cigarettes they smoked in the last 30 days (1=*None* to 8=*More than two packs*) and in their lifetime (1 = *None* to 10 = *More than 20 packs*). They reported the number of marijuana 'hits' they consumed in the last 30 days (1=*None* to 8=*More than 40*) and the number of time they consumed marijuana in their lifetime (1=*Never* to 7=*over 30 times*).

While self-reports of drug use are neither perfectly valid nor reliable, they are up to 95% in agreement with reports based on saliva samples (Ellickson and Bell, 1990). The validity of

self-reported data is especially strong when recall of activity does not extend beyond the last 30 days, as is the case in this study (O'Malley, Bachman, & Johnston, 1983; Graham, Flay & Johnson, 1984; Johnston, 1989).

Substance use intentions: Use intentions, which have been shown to predict actual substance use (Andrew, Tildesley, Hops, Hyman et al., 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*” (1 = *Definitely no* to 4 = *Definitely yes*). The means and standard deviations (alcohol: M = 1.82, S.D. = .862; cigarettes: M = 1.64, S.D. = .760; marijuana: M = 1.63, S.D. = .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 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*). The mean and standard deviation for each item was: alcohol M = 1.733, S.D. = 0.858; cigarettes M = 1.621, S.D. = 0.824; and marijuana M=1.643, S.D. = 0.917.

Linguistic acculturation: Students reported in two items the language(s) 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. About 20 percent of the sample spoke only Spanish with family and 8 percent only Spanish with friends. The mean

acculturation score was 3.1—close to the ‘bilingual’ scale mid-point—with a standard deviation of 1.1.

Control variables: Age was computed in years based on the student’s reported birthdate. There was little variation in age; the mean age was 12.89 years with a standard deviation of .61. Ages ranged from 9 to 16, but over 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’ reported of the usual grades they receive (*1 = Mostly A’s, 9 = Mostly F’s*). Socioeconomic status was measured with a dummy variable based on participation in the federal school lunch program for low income students. Nearly 85 percent 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* (FIML) procedures and Expected Maximization (EM) multiple imputation techniques for handling missing data. We used the EM 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.

We explored two primary questions in this paper: a) How is linguistic acculturation related to intentions to use substances and actual substance use?; b) 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). Thus, in this analysis we built

simultaneous models for boys and girls, testing them to determine if the paths in the models differed significantly across gender. Details of the modeling procedures appear below.

Figure 1 shows 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 substance use, and one predicting recent substance 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 use intentions were latent, endogenous constructs with multiple indicators. Substance use was also a latent, endogenous construct but with only a single indicator. We could not model a path between use intentions and substance use because the data are cross-sectional and we would have been predicting an earlier behavior with a later intention.

[Insert Figure 1 here]

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 to a lesser extent the chi-square statistic which is sensitive to sample size (Widaman & Thompson, 2003).

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 established by constraining to 1 the correlation between the latent constructs, comparing the resulting chi-square to the chi square of an unconstrained model, and finding a significant chi-square difference, indicating that the constraint worsened the model fit and that the latent factors were discriminant.

Second, we assessed whether the measurement models varied by gender. We were unable to establish measurement invariance in models predicting lifetime alcohol, cigarette, and marijuana use and recent cigarette and marijuana 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 groups by constraining the paths and covariances across 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 ($\chi^2_{\text{unconstrained}} = 86.02$, $df = 36$; $\chi^2_{\text{constrained}} = 90.42$, $df = 40$; $\chi^2_{\text{difference}} = 4.4$, $df = 4$, $p = 0.354$). Similarly, the chi-square difference was not significant for recent alcohol use ($\chi^2_{\text{unconstrained}} = 56.14$, $df = 18$; $\chi^2_{\text{constrained}} = 60.97$, $df = 20$; $\chi^2_{\text{difference}} = 4.83$, $df = 2$, $p = 0.089$). These results indicated that the model fit did not worsen with constraints and thus, we satisfied the measurement invariance criterion.

Third, we assessed the fit of the models. Both had good fit: use intentions ($\chi^2 = 86.02$, $df = 36$, $RMSEA = 0.033$, $NFI = 0.99$, $NNFI = 0.989$) and recent alcohol use ($\chi^2 = 56.14$, $df = 18$, $RMSEA = 0.041$, $NFI = 0.989$, $NNFI = 0.976$).

Structural Model of Substance Use Intentions

We then assessed the structural model of substance use intentions, reviewing modification indices and testing the hypothesized relationships for gender differences. Table 1 presents the total, direct, and indirect effects of the predictors on substance use intentions. The model had a good fit. We found significant positive effects of linguistic acculturation, age, and poor grades on pro-drug norms and of linguistic acculturation, pro-drug norms, age, poor grades, and socioeconomic status on substance use intentions.

To test for gender differences, we constrained the paths across groups for the hypothesized relationships and assessed chi-square differences with 1 degree of freedom tests. The gender difference in the effect of linguistic acculturation on pro-drug norms was marginally significant ($p < 0.10$) and suggested a stronger effect for girls than for boys. The gender difference in the effect of linguistic acculturation on use intentions was significant ($p < 0.05$) and indicated a stronger indirect effect for girls than for boys. These differences are highlighted in the table by the bold-type coefficients.

Structural Model of Recent Alcohol Use

The next step was to assess the structural model of recent alcohol use. Table 2 presents the total, direct, and indirect effects of the predictors on recent alcohol use. The goodness-of-fit measures indicated good fit for the model. We found significant positive effects of linguistic acculturation, age, and poor grades on pro-drug norms and of linguistic acculturation, pro-drug norms, age, poor grades, and socioeconomic status on recent alcohol use.

We used the same procedures as noted above to test for gender differences in effects. The path between linguistic acculturation and pro-drug norms was significantly different by gender ($p < 0.05$). The effect was stronger for girls than for boys. Similarly, we found significant differences by gender in the effect of linguistic acculturation on recent alcohol use, again with the indirect effect stronger for girls than for boys. There was also a significant difference in the effect of age on recent alcohol use. Age had a direct effect on recent alcohol use among boys but no effect among girls. The indirect of age was similar for boys and girls.

DISCUSSION

All the hypothesized associations were found to be significant and in the expected direction. Differences in the effects of linguistic acculturation indicate that as individuals convert from use of their native language to English, they develop pro-drug norms. Age, grades and socioeconomic status, the hypothesized control variables, were found to be significant predictors of intentions to use and actual use, mediated through pro-drug norms. Total effects for boys and girls varied, and girls particularly had stronger effects of acculturation in comparison to boys.

Although the path from acculturation to intention to use 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.

The findings are consonant 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. But 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 are encouraged to be out in the “world” and to be risk takers. Their different pre-acculturation socialization provides 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 not only become more vulnerable to drug offers and actual use than less acculturated girls but even more at risk than Mexican boys at the same level of linguistic acculturation.

Several studies have been inconclusive about the effects of SES and acculturation; however, there are many studies that examine the effects of SES and substance use. In the present study SES and acculturation variables were ‘covaried’ and there was no path from SES to acculturation. So, when we find SES and acculturation influencing intentions to use and actual substance use, several interpretations are possible. One explanation, as Phinney (2001:150) observes, is that in higher SES Mexican American parents may devote “less effort ... to maintain their culture,” resulting in less proficiency in Spanish among their offspring. Secondly, in our results the effect of SES on intentions to use substances and recent alcohol use were not mediated by the acquisition of pro-drug norms, so 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 U.S., it appears to be a very 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 music, videos, advertisements, and popular movies (Robinson, Chen, & Killen, 1997; DuRant, Rome, Rich, Allred, Emans, & Woods, 1997; 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 U.S. is English. Acquisition of this language especially from an autopoietic and communicative competence perspective creates opportunity structures for both males and females. It exposes triggers and/or helps sustain assimilation imageries among new immigrant children irrespective of parental monitoring and/or strong social networks and enables reconstruction of identity through use of language (English) and behaviors associated with it. Adolescents therefore, in order to ‘fit in’ or to be ‘cool’ 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.

Although based on a large sample, the sample was drawn from one region of the country, a U.S.-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 substance use.

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Figure 1
Conceptual model

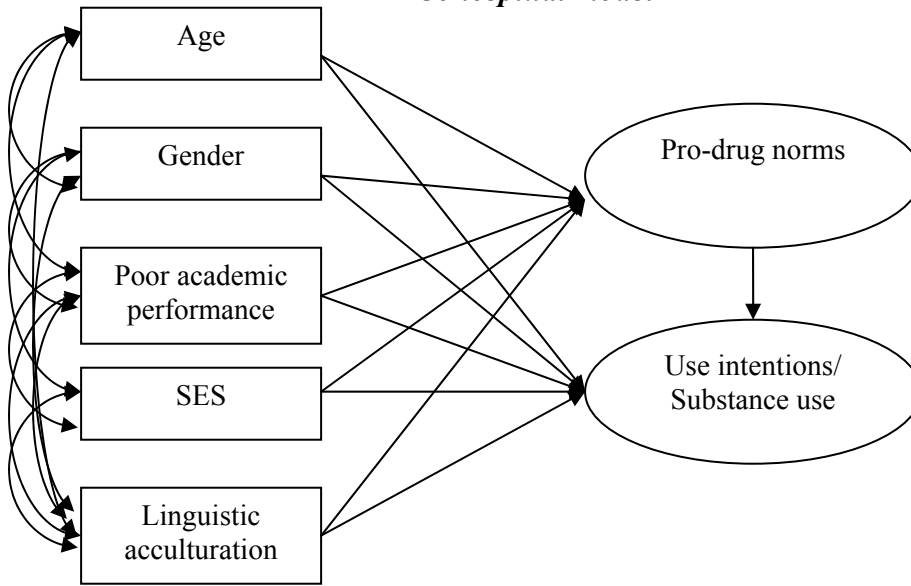


Table 1
Structural Model of Use Intentions, Unstandardized Coefficients (Standard Errors)

Variables	Pro-drug Norms	Use intentions
Linguistic acculturation (Boys)		
<i>Total effects</i>	0.067** (0.021)	0.107*** (0.030)
<i>Direct effects</i>	0.067** (0.021)	0.070** (0.012)
<i>Indirect effects</i>		0.036** (0.012)
Linguistic acculturation (Girls)		
<i>Total effects</i>	0.118*** (0.021)	0.135*** (0.030)
<i>Direct effects</i>	0.118*** (0.021)	0.070** (0.012)
<i>Indirect effects</i>		0.064*** (0.012)
Personal Injunctive Norms		
<i>Total effects</i>		0.534*** (0.024)
<i>Direct effects</i>		0.534*** (0.024)
<i>Indirect effects</i>		
Age		
<i>Total effects</i>	0.189*** (0.026)	0.183*** (0.025)
<i>Direct effects</i>	0.189*** (0.026)	0.0813** (0.021)
<i>Indirect effects</i>		0.102*** (0.013)
Poor Grades		
<i>Total effects</i>	0.042*** (0.009)	0.069*** (0.008)
<i>Direct effects</i>	0.042*** (0.009)	0.0466*** (0.007)
<i>Indirect effects</i>		0.023*** (0.004)
SES		
<i>Total effects</i>	0.046 (0.045)	0.107** (0.016)
<i>Direct effects</i>	0.046 (0.045)	0.080* (0.037)
<i>Indirect effects</i>		0.036 (0.012)
Fit statistics		
	$\chi^2 = 114.50$, $df = 54$, $RMSEA = 0.030$, $NFI = 0.99$, $NNFI = 0.991$	

*** $p < .0001$ ** $p < .01$ * $p < .05$

Table 2
Structural Model of Recent Alcohol Use, Unstandardized Coefficients (Standard Errors)

Variables	Pro-drug Norms	Recent alcohol use
Linguistic acculturation (boys)		
<i>Total effects</i>	0.059** (0.019)	0.128** (0.036)
<i>Direct effects</i>	0.059** (0.019)	0.062** (0.030)
<i>Indirect effects</i>		0.066** (0.021)
Linguistic acculturation (girls)		
<i>Total effects</i>	0.111*** (0.019)	0.185*** (0.036)
<i>Direct effects</i>	0.111*** (0.019)	0.062*** (0.040)
<i>Indirect effects</i>		0.122*** (0.022)
Personal Injunctive Norms		
<i>Total effects</i>		<i>1.104***</i> (0.056)
<i>Direct effects</i>		<i>1.104***</i> (0.056)
<i>Indirect effects</i>		
Age (boys)		
<i>Total effects</i>	<i>0.183***</i> (0.024)	0.468*** (0.083)
<i>Direct effects</i>	<i>0.183***</i> (0.024)	0.266** (0.080)
<i>Indirect effects</i>		0.202*** (0.028)
Age (girls)		
<i>Total effects</i>	<i>0.183***</i> (0.024)	0.204** (0.083)
<i>Direct effects</i>	<i>0.183***</i> (0.024)	0.002 (0.072)
<i>Indirect effects</i>		0.202*** (0.028)
Poor Grades		
<i>Total effects</i>	<i>0.041***</i> (0.007)	<i>0.127***</i> (0.019)
<i>Direct effects</i>	<i>0.041***</i> (0.007)	<i>0.081***</i> (0.017)
<i>Indirect effects</i>		<i>0.046***</i> (0.009)
SES		
<i>Total effects</i>	<i>0.036</i> (0.041)	<i>0.382**</i> (0.102)
<i>Direct effects</i>	<i>0.036</i> (0.041)	<i>0.341**</i> (0.094)
<i>Indirect effects</i>		<i>0.040</i> (0.046)
Fit statistics	$\chi^2 = 114.14$, $df = 37$, $RMSEA = 0.041$, $NFI = 0.97$, $NNFI = 0.97$	

Note: *** $p < .0001$ ** $p < .01$ * $p < .05$

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