Gender Roles and Substance Use Among Mexican American Adolescents: A Relationship Moderated by Acculturation?

Stephen Kulis, **Flavio Francisco Marsiglia**, and **Julie L. Nagoshi**
Southwest Interdisciplinary Research Center, Arizona State University, Phoenix, Arizona, USA

Abstract

This research assesses the effects of adaptive/maladaptive gender roles and acculturation in predicting substance use in a 2007 sample of 1466 Mexican American seventh-grade adolescents from Phoenix, Arizona, USA. Multiple regression analyses found significant effects for both adaptive and maladaptive gender roles, as well as several gender-specific interactions between gender roles and linguistic acculturation that predicted substance use. Limitations of the research are noted, as well as implications for understanding the impact of acculturation on how gender roles differentially affect substance use in Mexican American boys versus girls.

Keywords

gender roles; gender; acculturation; substance use; Mexican American adolescents

INTRODUCTION

In national US surveys, Latino adolescents have been shown to be at high risk for substance use and abuse.[1] Among eighth graders, Latino students have higher rates of use than non-Hispanic Whites and African Americans on nearly all legal and illegal substances, and higher rates in twelfth grade for use of crack, heroin, methamphetamine, and crystal methamphetamine (Johnston, O'Malley, Bachman, & Schulenberg, 2008). Acculturation is also an important factor in Latino substance use. Among Mexican-heritage youth responding in the National Survey on Drug Use and Health, 19% of the US-born and 13% of the Mexican-born immigrants reported use of alcohol, and this difference narrows with the immigrants' length of US residence (Gfroerer & Tan, 2003).

Prior studies have established that gender role socialization is a factor in substance use for Latinos of Mexican heritage, both those living in the US and those living in Mexico (Kulis, Marsiglia, Lingard, Nieri, & Nagoshi, 2008, Kulis, Marsiglia, & Nagoshi, 2010; Lara-Cantu, Medina-Mora, & Gutierrez, 1990). Several mechanisms have been proposed for how acculturation increases the risk for substance use in Mexican American adolescents, for example, by increasing associations with more acculturated peers, which exposes adolescents to risky behaviors, which include the use of drugs (Marsiglia, Kulis, Wagstaff, Elek, & Dran, 2005). Acculturation may also increase the risk for substance use by changing

[1]The journal's style utilizes the category *substance abuse* as a diagnostic category. Substances are used or misused; living organisms are and can be *abused*.

Mexican American youth's adherence to traditional gender roles of *machismo* and *marianismo*, which are predictive of the level of substance use (Gil, Wagner, & Vega, 2000; Strait, 1999). The research presented here assessed the effects of adaptive/desirable and maladaptive/undesirable gender roles in predicting substance use in a sample of Mexican American middle school youth. Analyses also tested the moderating effects of acculturation in an attempt to begin to elucidate the dynamic relationships between acculturation, gender roles, and substance use.

Biological Sex, Gender Roles, and Substance Use

Sex differences are an important factor in understanding substance use and have been studied extensively (Dakof, 2000; Ellis, O'Hara, & Sowers, 2000, Freshman & Leinwand, 2000; Kulis, Yabiku, Marsiglia, Nieri, & Crossman, 2007). While girls progress more slowly than boys to drug use initiation, once girls begin to use, they progress faster to addiction than boys when using the same amount of substances (Guthrie & Low, 2000; Kauffman, Silver, & Poulin, 1997; The National Center on Addiction and Substance Abuse [NCASA], 2003).

Although biological sex is an important predictor of substance use patterns, it is generally not malleable. In contrast, gender roles are the result of socialization and may be useful targets for intervention to prevent substance use and misuse. Gender roles are defined as the stereotypical emotions, cognitions, and behaviors associated with being male or female that are presumably acquired through socialization (social learning, modeling, etc.). For males, traditional gender roles typically promote being active, aggressive, and expressive of anger, but without displaying sadness (Block, 1983). These traditional male gender roles have been coined "masculine" or "instrumental" behaviors, i.e., focused on attainment of goals external to the social interaction process (Gill, Stockard, Johnson, & Williams, 1987). In turn, traditional gender roles promote women to be passive, compliant, and expressive of sadness without showing anger (Block, 1983). These traditional female gender roles have been coined "feminine" or "expressive" behaviors, i.e., giving primacy to facilitating the social interaction process (Gill, Stockard, Johnson, & William, 1987).

Spence's (1984) functional model suggests that gender role socialization influences an individual's vulnerability to both stress and distress, and consequently, the amount of distress experienced. Spence argues that personality attributes are adaptive through either instrumentality or expressivity, which is then inversely related to pathology. For example, highly instrumental individuals are less likely to see events as being threatening and are more likely to use problem-solving skills to cope with stressful situations that arise (Nezu & Nezu, 1987; Towbes, Cohen, & Glyshaw, 1989). Highly expressive individuals are also less likely to have pathological problems, due to their effective interpersonal skills and high levels of social support (Steenberger & Greenberg, 1990; Wells, 1980). On the other hand, gender roles may predict maladaptive psychological functioning among adolescents by externalizing (impulsivity, sensation seeking, antisociality) or internalizing (depression, anxiety, social withdrawal) problem behaviors (Oldehinkel, Hartman, Winter, Veenstra, & Ormel, 2004), which are linked to substance use.

To clarify the relationships between gender roles and problem behaviors, such as substance use, some researchers (Marsh & Myers, 1986; Ricciardelli & Williams, 1995; Russell & Antill, 1984) have proposed differentiating between the adaptive and the maladaptive aspects of masculinity and femininity by distinguishing between socially desirable and socially undesirable masculine and feminine traits. Aggressive (maladaptive) masculinity is characterized by controlling and dominance, while assertive (adaptive) masculinity is characterized by self-confidence, competence, and leadership. Submissive (maladaptive)

femininity is characterized by inadequacy and dependence, while affective (adaptive) femininity is characterized by emotional expressiveness, empathy, nurturance, and sense of communion. Another way of understanding this is that the maladaptive aspects of masculinity represent the extremes of instrumentality, where assertiveness becomes aggressiveness, and the maladaptive aspects of femininity represent the extremes of expressivity, where sensitivity to interpersonal relationships becomes emotional over-reactivity and social submissiveness or dependency. This may explain some of the seemingly contradictory findings discussed next, in which gender roles seem to predict both adaptive and maladaptive psychological functioning. Figure 1 depicts the functional pathways that theoretically link adaptive and maladaptive gender roles to greater or lesser risk for substance use.

Using this schema, Williams and Ricciardelli (1999) found in a sample of US college students that high maladaptive masculinity and low adaptive femininity were predictors of greater alcohol-related problems for adult men and women. Low adaptive masculinity and low adaptive femininity also predicted problem drinking in both men and women, possibly due to a need to use alcohol to heighten one's sense of masculinity or femininity.

Gender Roles and Drug Use in Mexican American Adolescents

Studies have examined the relationships between biological sex, gender roles, and drug use in Mexican and Mexican Americans adolescents (Kulis, Marsiglia, & Hecht, 2002; Kulis, Marsiglia, & Hurdle, 2003; Kulis et al, 2008; Kulis et al., 2010). Mexican culture traditionally is viewed as promoting two primary gender roles, *machismo* and *marianismo*. Adaptive aspects of *machismo* include honor, respect, bravery, and a deep sense of family commitment (Marsiglia & Waller, 2002). Maladaptive characteristics of *machismo* are invulnerability, patriarchal dominance, and aggressiveness (Goldwert, 1983), which may be associated with infidelity, abandonment of children, risk taking, and domestic violence (Gutmann, 1996; Kulis et al., 2003). *Marianismo* can be characterized by adaptive characteristics such as self-sacrifice, collectivism, family devotion, and the nurturing of others, but it also may promote undesirable characteristics such as dependency, passiveness, and submissiveness (Kulis et al., 2003; Stevens, 1973).

Traditional Mexican gender roles, *machismo and marianismo*, play an important role in substance use in Mexicans and Mexican Americans. These traditional, more polarized gender roles have been linked to strong gender differences in substance use among girls versus boys (Kulis et al., 2003). Men who ascribe to more traditional gender beliefs (emphasizing high instrumentality and low expressivity) may engage in antisocial behavior and substance use in order to prove their masculinity or appear "macho" (Unger et al., 2006). *Machismo* and celebratory fiesta drinking emphasize both binge drinking (Caetano & Medina-Mora, 1988) and the ability to manage high levels of alcohol consumption without losing self-control (Loury & Kulbok, 2007). Mexican cultural norms encourage men to drink when and where they like, while there is far less tolerance and acceptance of excessive drinking by women (Wycoff, 2000; Medina-Mora & Rojas Guiot, 2003). In support of traditional gender roles, women are encouraged to abstain from drinking out of concern for the maladaptive effects that substance use has on their family and friends (Perea & Slater, 1999).

In a sample of Mexican adults, Lara-Cantu et al. (1990) found that, for men, assertive masculinity and affective femininity were associated with greater alcohol use, but submissive femininity and aggressive masculinity were associated with greater alcohol use problems. For women, aggressive masculinity predicted greater alcohol use, while affective femininity predicted less alcohol use and fewer alcohol use social problems, such as violence and difficulties with the partner. With regard to Mexican adolescents, a recent

study by Kulis et al. (2008) differentiated between adaptive and maladaptive gender roles in predicting substance use. In general, aggressive masculinity was correlated with greater substance use, while affective femininity was predictive of lower substance use for both boys and girls. Significant gender-specific effects were only found for affective femininity, which was correlated with less cigarette use among boys but not among girls, and aggressive masculinity, which was a stronger indicator of sharing or selling drugs for boys than for girls. Similar to the findings described next, femininity was found to be correlated with less externalizing behavior, while masculinity was predictive of more externalizing behavior in boys.

Acculturation as a Moderator of the Gender Role-Substance Use Relationship

Many Mexican Americans from immigrant families need to cope with a variety of stressors as they adjust to their new communities. During the acculturation process, there is typically socialization into the host dominant culture and a desire to become a part of the new culture. At the same time, there are pressures and desires to retain one's identity from one's culture of origin (Marsiglia et al., 2005). Adolescents' gender role expectations can change as youth transition to the gender role expectations of the new culture, which can affect their risk for substance use. Relative to more acculturated youth, less acculturated adolescents show greater gender differences in substance use (Kulis et al., 2003). Acculturation may affect Mexican American youth's ability to continue to conform to their traditional gender roles, *marianismo* and *machismo*, which are associated with their country of origin, and thus may increase the likelihood of substance use.

Immigrant women with initially low rates and levels of alcohol use are more likely than their male counterparts to adopt the drinking patterns of the majority culture during the acculturation process (National Institute on Alcohol Abuse and Alcoholism, 1997). Consistent with prior developmental research, women's rates of initiation and continued alcohol use increase at a faster pace than males through the acculturation process (Collins & McNair, 2002). For Mexican women, this increased substance use may be due to a greater acceptance and adoption of individualist values that weaken collectivist values and diminish concern about the impact that substance use will have on family and friends. The acculturation process also facilitates the access of Mexican women to larger social networks that are less constraining regarding women's substance use (Kulis et al., 2010). Traditional Mexican gender roles have been shown to have an impact on the acculturation process as women immigrants transition to Mexican American culture (Kranau, Green, & Valencia-Weber, 1982). For Mexican American girls, the transition from the restrictions on social experiences associated with *marianismo* to a wider, more diverse set of social contacts, and exposure to less conservative substance use norms that come with living in the US, is a much more profound change than is the case for Mexican American boys. The traditions of *machismo* for boys already allow for considerable freedom from parental restrictions and encouragement of peer relationships, making the transition to US culture and its permissive substance use norms less of a change (Kulis et al., 2010). Thus, it would be expected that acculturation would have more of an impact on the relationships between gender roles and substance use among Mexican American girls than among boys.

Hypotheses

The present secondary data analyses of a large sample of Mexican-heritage seventh-grade adolescents sought to replicate previous findings on the effects of adaptive and maladaptive gender roles (independent variable) on substance misuse (dependent variable), as well as test whether these relationships are conditional on acculturation (moderator variable). Hypotheses about the main effects of adaptive and maladaptive gender roles were formulated based on prior studies. Hypotheses regarding the moderating effects of

acculturation were based on evidence that acculturation has a larger undesirable impact on the use of substances by females than by males. Overall, we expected that gender role influences on substance use would be strongest for less acculturated boys and more acculturated girls.

- It was expected that maladaptive masculinity would predict greater substance use, while adaptive femininity would predict lesser substance use in similar ways for both boys and girls (Hypothesis 1).

- On the basis of previous findings in Mexican populations (Lara-Cantu et al., 1990), adaptive masculinity was expected to predict greater substance use for boys only, as a result of cultural expectations associating drug use with masculinity (Hypothesis 2).

- Among the least acculturated boys, the effects of *machismo* as manifested in strong expressions of adaptive and maladaptive masculinity were expected to predict greater substance use, while adaptive femininity was expected to predict less substance use (Hypothesis 3).

- In contrast, for the most acculturated girls, the effects of the loss of *marianismo* would be reflected in stronger expressions of adaptive and maladaptive masculinity, which would predict greater substance use (Hypothesis 4).

METHODS

Sample

This secondary data analysis study employed archival data from a randomized trial of a substance use prevention program in the Phoenix metropolitan area. The data come from the Drug Resistance Strategies study, which developed and tested an adapted and enhanced version of the *keepin' it REAL* school-based prevention intervention. The study involved seven school districts, 32 schools, 96 teachers, and more than 2000 students (see Hecht et al., 2008 for a detailed study description). At the start of the study, every fifth-grade student in the study schools was invited to participate in the study. Active parental consent/ permission and student assent to complete the survey were obtained from an estimated 82% of the enrolled students, following both university and school district policies protecting human research subjects.

Students completed self-administered questionnaires at several points in time, including a pre-test at the start of the fifth grade and five post-tests, with the last occurring in the Spring semester of the eighth grade. The majority of questionnaires were in English, with only 68 (less than 5%) of the participants utilizing the Spanish version of the questionnaire. University-trained survey proctors administered the questionnaires in classrooms. Students were informed that the survey was part of a university research project, their participation was voluntary, and their answers were confidential. Consented students who were absent on the initial survey date were able to complete the survey in class within a two-week follow-up period.

The current analyses are based on information collected at the fifth wave of data collection when students were in the Spring semester of the seventh grade, the only wave when questions regarding gender roles were included in the questionnaire. A total of 1466 participants (691 boys, 775 girls) of Mexican or Mexican American ancestry provided data in the fifth wave. The mean age of this sample was 12.70 (SD = .59) at the time the data for the current analysis was collected in the Spring semester of the seventh grade.

Measures

Substance use outcomes were measured by a series of questions where students self-reported the frequency and amount of their use of alcohol, cigarettes, marijuana, or inhalant within the past 30 days, with an additional question for frequency of binge drinking of alcohol ("5 or more drinks within a few hours"). These questions were modeled after those used previously by Flannery, Williams, and Vazsonyi (1999) and were chosen for their developmental appropriateness for the age group under study and their successful use in a Mexican-heritage middle school population (Kulis et al., 2005). For the questions assessing recent frequency of alcohol, cigarette, marijuana, and inhalant use, the responses were coded uniformly as the number of times these substances were used in the last 30 days: $1 = 0$ times, $2 = 1–2$ times, $3 = 3–5$ times, $4 = 6–9$ times, $5 = 10–19$ times, $6 = 20–39$ times, and $7 = 40$ or more times. Substance use amounts were reported in categories that varied by substance. For the amount of alcohol use in the last 30 days, responses were coded $1 = $ none, $2 = 1$ drink, $3 = 2$ or 3 drinks, $4 = 4–7$ drinks, $5 = 8–15$ drinks, $6 = 16–30$ drinks, and $7 = $ more than 30 drinks. For the last 30 days of binge drinking, responses were coded $1 = 0$ times, $2 = 1$ time, $3 = 2$ times, $4 = 3–5$ times, and $5 = 6$ or more times. For the amount of cigarettes smoked in the last 30 days, responses were coded $1 = $ none, $2 = $ one puff, $3 = $ part or all of one cigarette, $4 = 2$ or 3 cigarettes, $5 = 4–10$ cigarettes, $6 = 11–20$ cigarettes, and $7 = $ more than 20 cigarettes. For the amount of marijuana used in the last 30 days, responses were coded $1 = $ none, $2 = 1$ hit, $3 = 2$ or 3 hits, $4 = 4–10$ hits, $5 = 11–20$ hits, $6 = 21–40$ hits, and $7 = $ more than 40 hits. Due to the wide variety of types of inhalants that are used and lack of standard units of consumption, amounts of inhalant use were not assessed in the questionnaire.

Sex differences were measured by self-report in response to the question "Are you a boy or a girl?" and coded $0 = $ male, $1 = $ female.

Adaptive and *maladaptive gender roles* (Antill, Cunningham, Russell, & Thompson, 1981; Marsh & Myers, 1986; Ricciardelli & Williams, 1995; Russell & Antill, 1984) were measured by 12 items (Cronbach's alphas are based on the present sample). The 12 items that formed the four dimensions of gender roles asked students to describe how often they felt they fit gender-typed traits and behaviors, using a Likert scale from $0 = $ rarely to $4 = $ always. Three adaptive masculinity items measured "assertive masculinity," which captured a sense of self-confidence, assertiveness, and goal orientation ($\alpha = .70$): "When I'm with my friends, I am a good leader," "I express my opinion even when others disagree," and "I have clear goals for myself." Three items measured maladaptive masculinity, or "aggressive masculinity," indicating dominance and control over others ($\alpha = .67$): "I am rude to others," "I am an aggressive person," and "I ignore rules that get in my way." The adaptive facets of femininity, or "affective femininity," included three items that measured nurturing, empathetic, and expressive aspects of femininity ($\alpha = .75$): "I am a sweet person," "I really want to know how others are feeling," and "When someone feels bad, I try to make them feel better." In contrast, the three items measuring maladaptive aspects of femininity, or "submissive femininity," tapped a sense of dependence and inadequacy ($\alpha = .41$; the low alpha is due to the small number of items and the relatively low correlations among the items, but all inter-item correlations indicate direct relationships ranging from $r = .17$ to $r = .21$): "When someone pressures me to do something, I just give in," "I have trouble making decisions," and "I spend time worrying about things." The Spanish version of these items was successfully used to measure gender roles in a study of adolescents residing in Mexico (Kulis et al., 2008).

Control variables included age, school grades (coded $1 = $ "mostly F's" to $9 = $ "mostly A's"), whether the student came from a two-parent family (coded $0 = $ "other family type" versus $1 = $ "two-parent family"), and whether the student was receiving the federal school lunch

program (coded 1 = "free lunch," 2 = "reduced-price lunch," and 3 = "neither"). School lunch participation, based on family income, provided a more reliable proxy measure for socioeconomic status than students' imprecise knowledge of parental education or income levels. The sample was primarily composed of children from low-income homes: 71% received a free lunch, and another 16% received a reduced-price lunch. Two additional control variables were dummy-coded variables for whether the student's family was the first generation in the United States and whether the student's family was the second generation in the United States, with third-generation status as the reference group. These control variables were included to adjust for variations in the sample on demographic factors that are important predictors of substance use among Mexican American adolescents (Kulis et al., 2008; Kulis et al., 2010; Parsai, Voisine, Marsiglia, Kulis, & Nieri, 2009; Voisine, Parsai, Marsiglia, Kulis, & Nieri, 2008). Treatment group was another dummy-coded variable, with those not receiving the *keepin' it REAL* intervention coded 0 and those receiving the intervention coded 1.

Acculturation was measured in two ways. The assimilation scale of the Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA; Unger et al., 2002) assesses acculturation in terms of the number of US as opposed to Mexican cultural practices a person endorses. The linguistic acculturation scale (Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987) was adapted from The Short Acculturation Scale for Hispanics (SASH). The original scale included 12 items related to three factors: (a) language use, (b) media, and (c) ethnic social relations. This study utilized three of the items asking about the degree to which English or Spanish is used with family and friends, and in using media (α = .72 in the current study sample). The three items ask what language is usually used "when talking with family members," "when talking with friends," and "when you watch TV, listen to the radio, or listen to music." Response options are 1 = "Spanish only", 2 = "mostly Spanish," 3 = "both English and Spanish," 4 = "mostly English," and 5 = "English only."

The use of English by Latino immigrants in the United States has often been used as a measure of acculturation because English language fluency affects the ability to interact and communicate with the majority culture (Unger, Ritt-Olsen, Wagner, Soto, & Baezconde-Garbanati, 2007). Although language is a unidimensional indicator of acculturation, previous studies have found that English language use is comparable to multidimensional measures, accounting for approximately 65% of the variance in acculturation status (Epstein et al., 2001; Samaniego & Gonzales, 1999; Serrano & Anderson, 2003).

Analyses

Hierarchical multiple regression analyses were conducted to predict amount and frequency of alcohol, cigarette, marijuana, or inhalant use, with models being run separately by gender. In preliminary multiple regression analyses, the AHIMSA assimilation scale produced no significant main effects and no significant interactions with the four gender role scales in predicting substance use, so regression analyses are presented for linguistic acculturation alone.

The first block of the model included the control variables, the second block added linguistic acculturation, the third block entered the four gender roles, and the final block entered the interactions of linguistic acculturation by gender roles. The four interaction terms were computed by centering acculturation and each gender role and then multiplying the centered terms.

RESULTS

Table 1 presents the means and standard deviations for the control variables, acculturation measures, gender roles, and amount and frequency of alcohol, cigarette, marijuana, or inhalant use separately by gender, t-tests of mean differences by gender are indicated in the right-hand column. Boys were significantly older than girls by about one month, reported poorer school grades than girls did, and were more acculturated than girls, as measured by the AHIMSA assimilation scale. There were no significant sex differences in family structure, generation status, or linguistic acculturation. As expected, girls scored higher than boys on adaptive and maladaptive femininity, but surprisingly, girls also scored higher than boys on adaptive masculinity and did not differ for maladaptive masculinity.

There were sex differences in the use of only one substance. Boys scored significantly higher than girls only on marijuana amount and frequency. The pattern for the three alcohol measures and for inhalant use was the opposite, with girls reporting higher means than boys, although not significantly so. Means for the substance use outcomes generally indicated low levels of use of all substances. For the combined sample of boys and girls together (data not presented in tables), the mean for recent alcohol use amount (1.86) corresponded to about one drink in the last 30 days, while mean frequency of any recent alcohol use (1.55) and binge drinking (1.44) corresponded to between 0 and 1 time in the past 30 days. Means for the other substances were lower than for alcohol. Mean cigarette amount (1.26) and frequency (1.17) corresponded to the lower end of a range between none and one cigarette smoked and between no use and one occasion of use. Mean marijuana amount (1.43) and frequency (1.32) were in the same range as those for cigarette use but closer to the midpoint. Mean frequency of inhalant use (1.21) mirrored that for cigarette use. The overall prevalence of use, based on all the available questions regarding lifetime and recent use (data not presented in tables), showed that more of the sample had used alcohol (46.7%) than had ever used cigarettes (16.1%), marijuana (16.0%), and inhalants (10.3%).

Table 2 presents the intercorrelations among the acculturation and gender role measures, separately by gender (with girls above and boys below the diagonal). The AHIMSA assimilation scale was highly correlated with linguistic acculturation, but not with the gender role scales. Linguistic acculturation was correlated with higher adaptive masculinity scores among males, and with higher maladaptive masculinity scores among females, but was not associated with other gender role scales. There were strong direct correlations between adaptive masculinity and adaptive femininity for both boys and girls. All the other gender role scales were also directly correlated among the boys, although less strongly. Among the girls, however, adaptive femininity and maladaptive masculinity were inversely correlated and the adaptive and maladaptive masculinity scales were unrelated.

Table 3 presents correlations of the acculturation and gender role measures with the substance use measures, separately by gender. In general, higher levels of acculturation were not related to substance use, with the exception of greater marijuana use in girls. One of the gender role scales, maladaptive masculinity, was strongly associated with greater use of nearly all substances, both for boys and girls (Hypothesis 1). There were scattered relationships between adaptive femininity and lower levels of substance use for boys and girls (Hypothesis 1), with effects confined to alcohol amounts among the girls, but including alcohol, cigarette, and marijuana amounts among the boys. Maladaptive femininity was significantly correlated with greater use of alcohol and inhalants but only among the girls. Contrary to Hypothesis 2, adaptive masculinity was not correlated with substance use in boys, although as noted next, one positive correlation did emerge in the multiple regression analyses for alcohol frequency.

The hierarchical multiple regression results are presented separately by gender, first for males (Tables 4) and then for females (Table 5). The R^2 change reported for each block represents the effect of the variables in the block over and above the effects of variables in previous blocks. In general, the gender role main effects suggested in the bivariate correlations were not affected by the addition of the interaction terms, so the betas for the full model are presented after the addition of the fourth block of predictors.

For boys, (Table 4) greater maladaptive masculinity correlated with higher substance use across all outcomes. Greater adaptive femininity was a significant indicator of lower alcohol frequency, cigarette amounts and frequency, marijuana amounts, and inhalant frequency. Adaptive masculinity indicated only higher alcohol frequency, while maladaptive femininity indicated only lower alcohol amounts. Among the boys, there were several significant and near-significant interactions between linguistic acculturation and adaptive masculinity in the same direction. Generally, greater adaptive masculinity was correlated with greater substance use for less acculturated boys, but indicated lesser substance use for highly acculturated boys. This pattern can be seen using the interactions to calculate the estimated effects of adaptive masculinity for boys who scored low, medium, and high in linguistic acculturation. Subjects were split into roughly equal thirds based on their linguistic acculturation score in order to show the regression slopes, particularly for the low and high groups (data not presented in tables). The typical pattern of these interactions is shown in Figure 2 for binge drinking, with substance use levels being highest among boys who were the least acculturated but high in adaptive masculinity (Hypothesis 3). The standardized effects (betas) of adaptive masculinity for low, medium, and high acculturation groups, respectively (in parentheses), differed in the same pattern for: binge drinking (.115, −.017, −.050), cigarette amounts (.038, −.017, −.095), cigarette frequency (.112, .043, −.078), marijuana amounts (.174, .039, −.176), marijuana frequency (.184, .040, −.176), and inhalant frequency (.095, −.055, −.004).

There were also several significant and near-significant interactions between linguistic acculturation and adaptive femininity among the boys, but the typical pattern was the opposite of the interactions with adaptive masculinity, as shown in Figure 3 for binge drinking. Here, the less acculturated boys who were low in adaptive femininity reported the most substance use and those high in adaptive femininity reported the least substance use (Hypothesis 3). Using betas for low, medium, and high acculturation groups (in parentheses), this pattern appeared for: binge drinking (−.245, −.075, .076), alcohol amount (−.245, −.058, .009), alcohol frequency (−.256, −.013, .067), cigarette amount (−.228, −.058, −.050), marijuana frequency (−.230, .003, −.125), and inhalant frequency (−.178, −.028, .093).

Finally, there were significant or near-significant interactions of linguistic acculturation by maladaptive masculinity for several outcomes: alcohol frequency (.405, .234, .199), binge drinking (.460, .192, .173), and inhalant frequency (.356, .106, .082), with greater maladaptive masculinity being predictive of greater substance use, particularly for low acculturated boys (Hypothesis 3). In contrast, there was no evidence of appreciable interactions between linguistic acculturation and maladaptive femininity.

Table 5 presents the hierarchical multiple regression results for girls. Here, two of the gender role main effects were affected by the addition of all the terms in the model. The significant bivariate correlations of maladaptive femininity with substance use shown in Table 3 were no longer significant in the full-model multiple regressions. In addition, there were main effects of adaptive masculinity on alcohol frequency and marijuana amounts and frequency in the full regression models that did not emerge as significant bivariate correlations in Table 3. For boys, across all variables, greater maladaptive masculinity

predicted greater substance use. Greater adaptive femininity significantly or near-significantly predicted lower alcohol frequency, while adaptive masculinity predicted higher alcohol frequency and marijuana amount and frequency. For girls, there were significant or near-significant interactions of linguistic acculturation by maladaptive masculinity. In contrast to boys, however, greater maladaptive masculinity predicted greater drug use for highly acculturated girls (Hypothesis 4). Figure 4 shows this interaction for marijuana amount, with highly acculturated girls who scored high in maladaptive masculinity reporting the most marijuana use. The betas representing the effect of maladaptive masculinity for low, medium, and high acculturation groups (in parentheses) were in a similar pattern for marijuana amount (.072, .143, .252) and marijuana frequency (.101, .109, .292). None of the other three gender role scales in interaction with acculturation had significant effects on any outcome for girls, including the pattern of effects predicted for adaptive masculinity in Hypothesis 4.

DISCUSSION

Consistent with the study of Mexican high school students by Kulis et al. (2008), in the present sample of Mexican American seventh-graders, maladaptive, aggressive masculinity was correlated with greater substance use, while adaptive, affective femininity was correlated with lesser substance use, for both boys and girls. From Spence's (1984) functional model of gender roles, it can be argued that higher maladaptive masculinity is indicative of poor instrumental coping strategies, while lower adaptive femininity is indicative of poor expressive coping strategies. Poor instrumental coping strategies may lead to internalizing (depression, anxiety, social withdrawal) symptoms, due to negative emotions from social failure, or externalizing (impulsivity, sensation seeking, antisociality) problem behaviors, due to an inability to engage in adaptive problem-solving behaviors (Oldehinkel et al., 2004). Internalizing increases the risk for substance use, possibly through the use of drugs to self-medicate negative effects, while externalizing increases the risk for substance use by encouraging impulsive and thrill-seeking behaviors. In contrast, highly expressive individuals may be less likely to have pathological problems leading to drug use due to their effective interpersonal skills and high levels of social support (Steenberger & Greenberg, 1990; Wells, 1980). Such individuals may also be less likely to hang out with socially deviant peers.

The sex differences that emerged from this study in the significant interactions of acculturation by gender roles provide additional insights into the gender role–substance use relationship. Consistent with our hypotheses, for Mexican American boys, adaptive masculinity and maladaptive masculinity were particularly predictive of greater substance use, while adaptive femininity predicted less substance use for those who were *low* in acculturation. It is also interesting that while there were many significant interactions of acculturation and adaptive masculinity for boys, there was only one significant main effect of adaptive masculinity in multivariate models and no significant correlations in the bivariate results. Moreover, the significant interaction effects of adaptive masculinity by acculturation appeared only for binge drinking of alcohol, not general alcohol use frequency and amounts in the last 30 days. Taken together, these findings are consistent with the idea that socialization of *machismo* in boys raised under traditional Mexican values fosters high levels of excessive alcohol to the point of inebriation. Postcolonial *machismo* (Hardin, 2002) encourages a view of masculinity and instrumental competence that includes the ability to consume large amounts of alcohol and perhaps other drugs (Caetano & Medina-Mora, 1988; Unger et al., 2006). For less acculturated Mexican-heritage boys, both facets of masculinity measured in this study—assertive, self-confident, problem-solving adaptive masculinity and aggressive, controlling maladaptive masculinity—may promote excessive substance use in the form of fiesta drinking and use of other substances. Possibly through acculturation,

Mexican American boys may be socialized into more flexible definitions of masculinity that decouple such masculinity from substance use. On the other hand, less acculturated boys are subject to the strongest influence of traditional Mexican cultural values that associate masculinity or *machismo* with increased substance use and femininity or *marianismo* with less substance use.

In contrast, but also consistent with our hypotheses, for Mexican American girls, maladaptive masculinity was particularly indicative of greater substance use for those who were high in linguistic acculturation. The more acculturated girls who adopt mainstream American gender roles may begin to manifest masculinity traits that are associated with greater substance use. In terms of maladaptive, submissive femininity, greater *marianismo* in the least acculturated girls might be expected to predict lower levels of substance use, while maladaptive femininity in *highly* acculturated girls might be expected to increase vulnerability to substance use. What was unanticipated in the hypotheses was that this effect would only predict marijuana use, not use of other substances, and that no interactions between adaptive masculinity and acculturation would emerge for girls. One interpretation of this finding is that the protective effects of *marianismo*—socialization into gender roles that discourage substance use and limit social interactions outside controlled family settings —may diminish rapidly through acculturation, leading to the adoption of pro-drug use norms and more opportunities to use substances. Another possible interpretation is that more acculturated Mexican American girls may be particularly vulnerable to converting psychological distress into heavier substance use. Evidence for both interpretations came from a small sample study of Mexican American adolescents that found that while for girls aggressive masculinity and submissive femininity significantly predicted greater alcohol use, these effects were almost completely mediated by internalizing problem behaviors, externalizing problem behaviors, and peer substance use (Kulis et al., 2007; Kulis et al., 2010). It should be noted that in this study, internalizing and externalizing problem behaviors did not at all mediate the significant relationships between adaptive and maladaptive gender roles and alcohol use in Mexican American boys.

For Mexican American adolescent girls, substance use may be a response to psychological distress. This psychological distress can be exacerbated by different societal gender role expectations within their country of origin (Mexico) and with the new transition to the US culture. While the gender role expectations for girls in Mexico may differ significantly from those for boys, this difference may erode as girls become more acculturated to the US culture. These differences in gender role expectations may also differ from one area of Mexico to another.

Sex differences in pubertal change may also be important. Benjet and Hernandez-Guzman's (2002) research with early adolescents in Mexico found that pubertal change was associated with greater depression in adolescent females but no change in psychological adjustment in adolescent males. The greater physical adjustment required of adolescent girls reaching the age of menarche and adolescent girls' socialization into a subordinate social role may contribute to greater emotional distress and internalizing, as well as maladaptive aggressive externalizing problem behaviors. In particular, the developmental onset and changes occurring during puberty can lead to an increased likelihood of substance use for girls (Kulis et al., 2009). In ways that can be more severe than for boys, puberty can affect girls' physical and emotional well-being, pose challenges to body image, and increase depression (NCASA, 2003) and conflict with peers (LeCroy & Daley, 2001).

STUDY LIMITATIONS

In terms of study limitations, this sample was a large sample for a randomized trial that included an array of public schools in a large southwestern city, schools located mostly in lower-income and predominantly Latino neighborhoods. The sample may not be representative of all Mexican American students of this age, especially those of higher socioeconomic backgrounds, those in more ethnically mixed schools, and those in regions of the country with a different immigration history and proximity to Mexico. Similar to the positive aspects of *marianismo* in Mexico, as Montoya (2007) points out, in parts of Latin America, women's roles in society are highly valued. Therefore, cross-cultural differences should be taken into consideration for future research. As noted earlier, poverty may moderate the effects of the variables studied here in several ways. For example, poor neighborhood characteristics appear to weaken parenting effectiveness in preventing problem behaviors in Hispanic youth (Ceballo & Hurd, 2008; Gayles, Coatsworth, Pantin, & Szapocznik, 2009).

The study's cross-sectional design limits causal inferences. The gender role measures had only a few items for each subscale, and the internal consistency (α) of these subscales was marginal. Because gender roles are a social construction, there could be a high social desirability bias when asking questions about them. While girls may report low instrumentality, they may actually feel quite instrumental in their lives, especially due to a higher value on caretaking in a Latin American context. Future research should address this possible discrepancy through a mixed-methods design. A longitudinal design would also be of use to trace the effect of early gender role socialization on later adolescent and young adult substance use, as well as would permit the examination of important mediating variables, such as internalizing and externalizing problem behaviors.

CONCLUSIONS

The present findings confirm the importance of gender roles in predicting substance use among Mexican American adolescents. That acculturation moderates the effects of these gender roles on substance use suggests that gender roles and gender role socialization may indeed be promising targets for interventions to prevent the development of adolescent substance use and problems. The present findings also confirm the importance of understanding the different pathways of risk for the development of substance use and problems for adolescent boys versus adolescent girls.

Acknowledgments

Biographies

Stephen Kulis (Ph.D., Columbia University, 1984) is Cowden Distinguished Professor of Sociology in the School of Social and Family Dynamics at Arizona State University (ASU), and an affiliated faculty member in the School of Social Work, the Justice and Social Inquiry Program, and the Women and Gender Studies Program. He is the Director of

Research at the Southwest Interdisciplinary Research Center (SIRC) at ASU, which is an NIH/NIMHD (National Institutes of Health/National Institute on Minority Health and Health Disparities)-funded Center of Excellence for health disparities research. His research has focused on cultural processes in health disparities, such as the role of gender and ethnic identity in youth drug use and prevention interventions; cultural adaptation of prevention programs for ethnic minority youth; contextual neighborhood and school level influences on individual level risk and protective behaviors; gender and racial inequities in professional careers; and the organizational sources of ethnic and gender discrimination.

Flavio F. Marsiglia, Ph.D., is the Distinguished Foundation Professor of Cultural Diversity and Health at ASU's School of Social Work and the Director of the SIRC. SIRC is an exploratory Center of Excellence on health disparities research and training is funded by the NIMHD of the NIH. Dr. Marsiglia is the principal investigator on other externally funded research projects, studying risk and protective factors associated with health and mental health outcomes among Mexican/Mexican American and American Indian youth and their families. He also leads a global health initiative with projects in Mexico, Spain, and Tanzania.

Julie Nagoshi is a Ph.D. student in the School of Social Work at ASU and is a graduate associate with the SIRC. Julie has received a predoctoral fellowship from the National Institute on Drug Abuse (NIDA). Julie's research interests include gender identity, gender roles, acculturation, and substance use.

GLOSSARY

Acculturation	The ongoing process through which people from one culture adjust and adapt to another culture.
Adaptive and maladaptive gender roles: Aggressive masculinity	Characterized by controlling and dominance.
Assertive masculinity	Characterized by self-confidence, competence, and leadership.
Affective femininity	Characterized by emotional expressiveness, empathy, nurturance, and sense of communion.
Submissive femininity	Characterized by inadequacy and dependence.

Expressive behaviors	Giving primacy to facilitating the social interaction process.
Gender roles	The stereotypical emotions, cognitions, and behaviors associated with being male or female that are presumably acquired through socialization (social learning, modeling, etc.).
Instrumental behaviors	Focused on attainment of goals external to the social interaction process.
Machismo	Traditional Mexican beliefs about gender roles for men. Adaptive aspects include honor, respect, bravery, and a deep sense of family commitment. Maladaptive characteristics of machismo are invulnerability, patriarchal dominance, and aggressiveness.
Marianismo	Traditional Mexican beliefs about gender roles for women. Adaptive characteristics include self-sacrifice, collectivism, family devotion, and the nurturing of others, but it also may promote maladaptive characteristics such as dependency, passiveness, and submissiveness.

REFERENCES

Antill JK, Cunningham JD, Russell G, Thompson NL. An Australian sex-role scale. Australian Journal of Psychology. 1981; 33:169–183.

Benjet C, Hernandez-Guzman L. A short-term longitudinal study of pubertal change, gender, and psychological well-being of Mexican early adolescents. Journal of Youth and Adolescence. 2002; 31:429–442.

Block JH. Differential premises arising from differential socialization for the sexes. Child Development. 1983; 54:1335–1354. [PubMed: 6661940]

Caetano R, Medina-Mora ME. Acculturation and drinking among people of Mexican descent in Mexico and in the United States. Journal of Studies on Alcohol. 1988; 49:462–471. [PubMed: 3216651]

Ceballo R, Hurd N. Neighborhood context SES, parenting: Including a focus on acculturation among Latina mothers. Applied Development Science. 2008; 12:176–180.

Collins RL, McNair LD. Minority women and alcohol use. Alcohol Research & Health. 2002; 26:251–256. [PubMed: 12875034]

Dakof GA. Understanding gender differences in adolescent drug abuse: Issues of comobordity and family functioning. Journal of Psychoactive Drugs. 2000; 32:25–32. [PubMed: 10801065]

Ellis RA, O'Hara M, Sowers KM. Profile-based intervention: Developing gender-sensitive treatment for adolescent substance abusers. Research on Social Work Practice. 2000; 10:327–347.

Epstein JA, Botvin GJ, Diaz T. Linguistic acculturation associated with higher marijuana and polydrug use among Hispanic adolescents. Substance Use & Misuse. 2001; 36:477–499. [PubMed: 11346278]

Flannery DJ, Williams LL, Vazsonyi AT. Who are they with and what are they doing? Delinquent behavior, substance use, early adolescents' after-school time. American Journal of Orthopsychiatry. 1999; 69:247–253. [PubMed: 10234390]

Freshman, A.; Leinwand, C. The implications of female risk factors for substance abuse prevention in adolescent girls. In: Atwood, JD., editor. Family systems/Family therapy: Applications for clinical practice. New York, NY: Hawthorn Press; 2000. p. 29-51.

Gayles JG, Coatsworth JD, Pantin H, Szapocznik J. Parenting and neighborhood predictors of youth problem behaviors within Hispanic families: The moderating role of family structure. Hispanic Journal of Behavioral Sciences. 2009; 31:277–296.

Gfroerer JC, Tan LL. Substance use among foreign-born youths in the United States: Does the length of residence matter? American Journal of Public Health. 2003; 93:1892–1896. [PubMed: 14600061]

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.

Gill S, Stockard J, Johnson M, Williams S. Measuring gender differences: The expressive dimension and critique of androgyny scales. Sex Roles. 1987; 17:375–400.

Goldwert, M. Machismo and conquest: The case of Mexico. Lanham, MD: University Press of America; 1983.

Guthrie BJ, Low LK. A substance use prevention framework: Considering the social context for African American girls. Public Health Nursing. 2000; 17:363–373. [PubMed: 11012999]

Gutmann, MC. The meanings of macho: Being a man in Mexico City. Berkeley, CA: University of California Press; 1996.

Hardin M. Altering masculinities: The Spanish Conquest and the evolution of the Latin American machismo. International Journal of Sexuality and Gender Studies. 2002; 7:1–22.

Hecht ML, Elek E, Wagstaff DA, Kam JA, Marsiglia F, Dustman P, et al. Immediate and short-term effects of the 5th grade version of the keepin' it REAL substance use prevention intervention. Journal of Drug Education. 2008; 38:225–251. [PubMed: 19157042]

Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the future national results on adolescent drug use: Overview of key findings. Vol. 2007. Bethesda, MD: National Institute on Drug Abuse; 2008. (NIH Publication No. 08–6418)

Kauffman S, Silver P, Poulin J. Gender differences in attitudes toward alcohol, tobacco, and other drugs. Social Work. 1997; 42:231–241. [PubMed: 9153092]

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 Sciences. 1982; 4:21–40.

Kulis, S.; Marsiglia, FF.; Crossman, A.; Nieri, TA. Gender, gender identity, and risk behaviors of youth from Mexican immigrant families. Paper presentation at the Society for Social Work and Research annual meeting; San Francisco, CA. 2007.

Kulis S, Marsiglia FF, Elek E, Dustman P, Wagstaff DA, Hecht ML. Mexican/Mexican American adolescents and keepin' it REAL: An evidence based substance abuse prevention program. Children Schools. 2005; 27:133–145. [PubMed: 21359122]

Kulis S, Marsiglia FF, Hecht ML. Gender labels and gender identity as predictors of drug use among ethically diverse middle school students. Youth 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; 31:167–188. [PubMed: 21359134]

Kulis S, Marsiglia FF, Lingard EC, Nieri T, Nagoshi J. Gender identity and substance use among students in two high schools in Monterrey, Mexico. Drug and Alcohol Dependence. 2008; 95:258–268. [PubMed: 18329826]

Kulis S, Marsiglia FF, Nagoshi JL. Gender roles, externalizing behaviors, and substance use among Mexican American adolescents. Journal of Social Work Practice Addiction. 2010; 10:1–25.

Kulis S, Yabiku S, Marsiglia FF, Nieri T, Crossman A. Differences by gender, ethnicity, and acculturation in the keepin it REAL model prevention program. Journal of Drug Education. 2007; 37:123–144. [PubMed: 17977237]

Lara-Cantu MA, Medina-Mora ME, Gutierrez CE. Relationship between masculinity and femininity in drinking in alcohol-related behavior in a general population sample. Drug and Alcohol Dependence. 1990; 26:45–54. [PubMed: 2209415]

LeCroy, CW.; Daley, J. Empowering adolescent girls: Examining the present and building skills for future with the Go Grrrls Program. New York, NY: W. W. Norton; 2001.

Loury S, Kulbok P. Correlates of alcohol and tobacco use among Mexican immigrants in rural North Carolina. Family Community Health. 2007; 30:247–256. [PubMed: 17563486]

Marin G, Sabogal R, Marin BV, Otero-Sabogal R, Perez-Stable EJ. Development of a short acculturation scale for Hispanics. Hispanic Journal of Behavioral Sciences. 1987; 9:183–305.

Marsh HW, Myers M. Masculinity, femininity, and androgyny: A methodological and theoretical critique. Sex Roles. 1986; 14:397–430.

Marsiglia FF, Kulis S, Wagstaff DA, Elek E, Dran D. Acculturation status and substance use prevention with Mexican and Mexican American youth. Journal of Social Work Practice Addiction. 2005; 5:191–220.

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, probeza, y adicciones. Perinatolgia y Reproduccion Humana. 2003; 17:230–244.

Montoya R. Socialist scenarios, power, and state formation in Sandinista Nicaragua. American Ethnologist. 2007; 34:71–90.

National Institute on Alcohol Abuse and Alcoholism. Alcohol and health: Ninth special report to the U.S. Congress. Rockville, MD: National Institutes of Health; 1997. (NIH Publication No. 97–4017)

Nezu AM, Nezu CM. Psychological distress, problem solving, and coping reactions: Sex role differences. Sex Roles. 1987; 16:205–214.

Oldehinkel AJ, Hartman CA, Winter AF, Veenstra R, Ormel J. Temperament profiles associated with internalizing and externalizing problems in preadolescence. Development and Psychopathology. 2004; 16:421–440. [PubMed: 15487604]

Parsai M, Voisine S, Marsiglia FF, Kulis S, Nieri T. The protective and risk effects of parents and peers on substance use, attitudes and behaviors of Mexican heritage female and male adolescents. Youth & Society. 2009; 40:353–376. [PubMed: 19478992]

Perea A, Slater M. Power distance and collectivist/individualist strategies in alcohol warnings: Effects of gender and ethnicity. Journal of Health Communication. 1999; 4:295–310. [PubMed: 10790786]

Ricciardelli LA, Williams RJ. Desirable and undesirable gender traits in three behavioral domains. Sex Roles. 1995; 33:637–655.

Russell G, Antill JK. An Australian sex-role scale: Additional psychometric data and correlations with self-esteem. Australian Psychologist. 1984; 19:13–18.

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]

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.

Spence JT. Gender identity and its implications for the concepts of masculinity and femininity. Nebraska Symposium Motivation. 1984; 32:59–95.

Steenberger BN, Greenberg RP. Sex roles, stress, and distress: A study of person by situation contingency. Sex Roles. 1990; 22:59–68.

Stevens E. Machismo and marianismo. Transition Society. 1973; 10:57–63.

Strait SC. Drug use among Hispanic youth: Examining common and unique contributing factors. Hispanic Journal of Behavioral Sciences. 1999; 21:89–103.

The National Center on Addiction and Substance Abuse (NCASA). The formative years: Pathways to substance abuse among girls and young women ages 8–22. New York, NY: Author; 2003.

Towbes LC, Cohen LH, Glyshaw K. Instrumentality as a life-stress moderator for early versus middle adolescents. Journal of Personality and Social Psychology. 1989; 57:109–119. [PubMed: 2754599]

Unger JB, Gallaher P, Shakib S, Ritt-Olson A, Palmer PH, Johnson CA. The AHIMSA acculturation scale: A new measure of acculturation for adolescents in a multicultural society. Journal of Early Adolescence. 2002; 22:225–251.

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.

Unger JB, Shakib S, Gallaher P, Ritt-Olson A, Mouttapa M, Palmer PH, et al. Cultural/interpersonal values and smoking in an ethnically diverse sample of southern California adolescents. Journal of Cultural Diversity. 2006; 13:55–63. [PubMed: 16696546]

Voisine S, Parsai M, Marsiglia FF, Kulis S, Nieri T. Parental monitoring and adolescent substance use among Mexican/Mexican American students in the southwest of the United States. Families in Society. 2008; 89:264–273. [PubMed: 20668660]

Wells K. Gender-role identity and psychological adjustment in adolescence. Journal of Youth and Adolescence. 1980; 9:59–73.

Williams RJ, Ricciardelli LA. Gender congruence in confirmatory and compensatory drinking. Journal of Psychology: Interdisciplinary and Applied. 1999; 133:323–331. [PubMed: 10319451]

Wycoff CS. The Garcia family: Using a structural systems approach with an alcohol-dependent family. Family Journal. 2000; 8:59–73.

Masculinity/Instrumentality

+Assertiveness, problem solving ⟶ Individual coping

- Aggression, dominance, impulsivity ⟶ Sensation seeking, impulsivity ⟶ More drug use

Femininity/Expressivity

+ Emot. expression, relationship maintenance ⟶ Social coping

- Emotional reactivity, submission ⟶ Negative affectivity ⟶ Less drug use
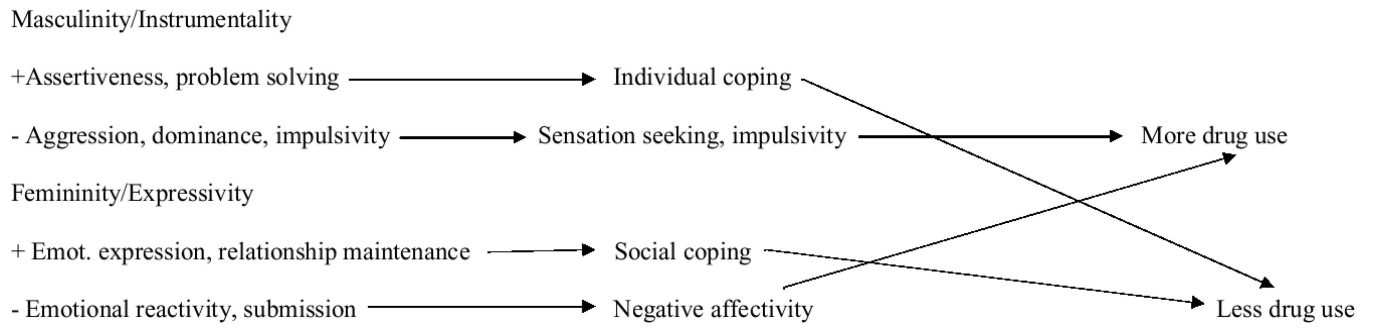
FIGURE 1.
Functional pathways between adaptive and maladaptive gender roles and drug use.
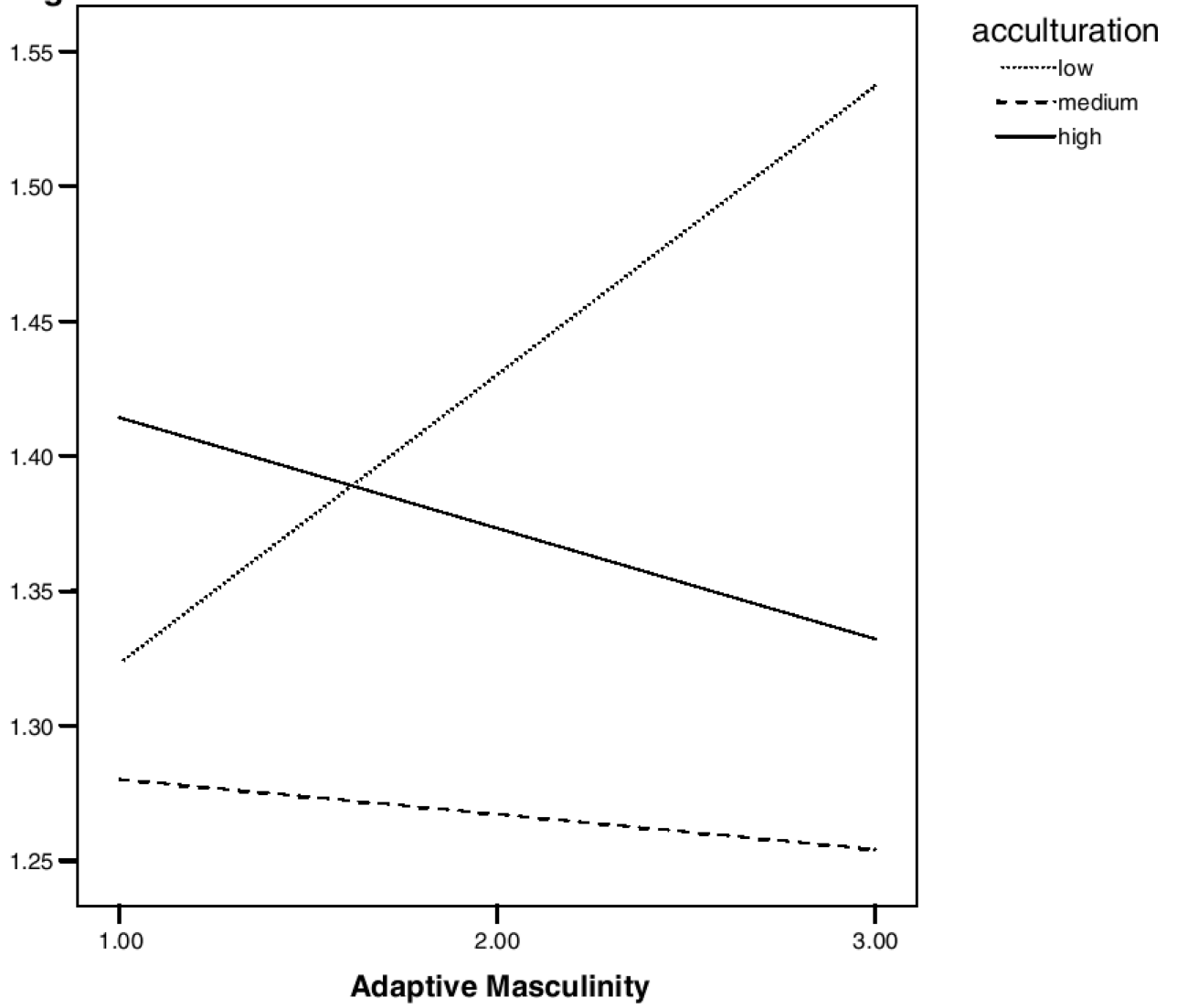
FIGURE 2.
Linguistic acculturation by adaptive masculinity interaction for binge drinking in boys.

Binge Drinking
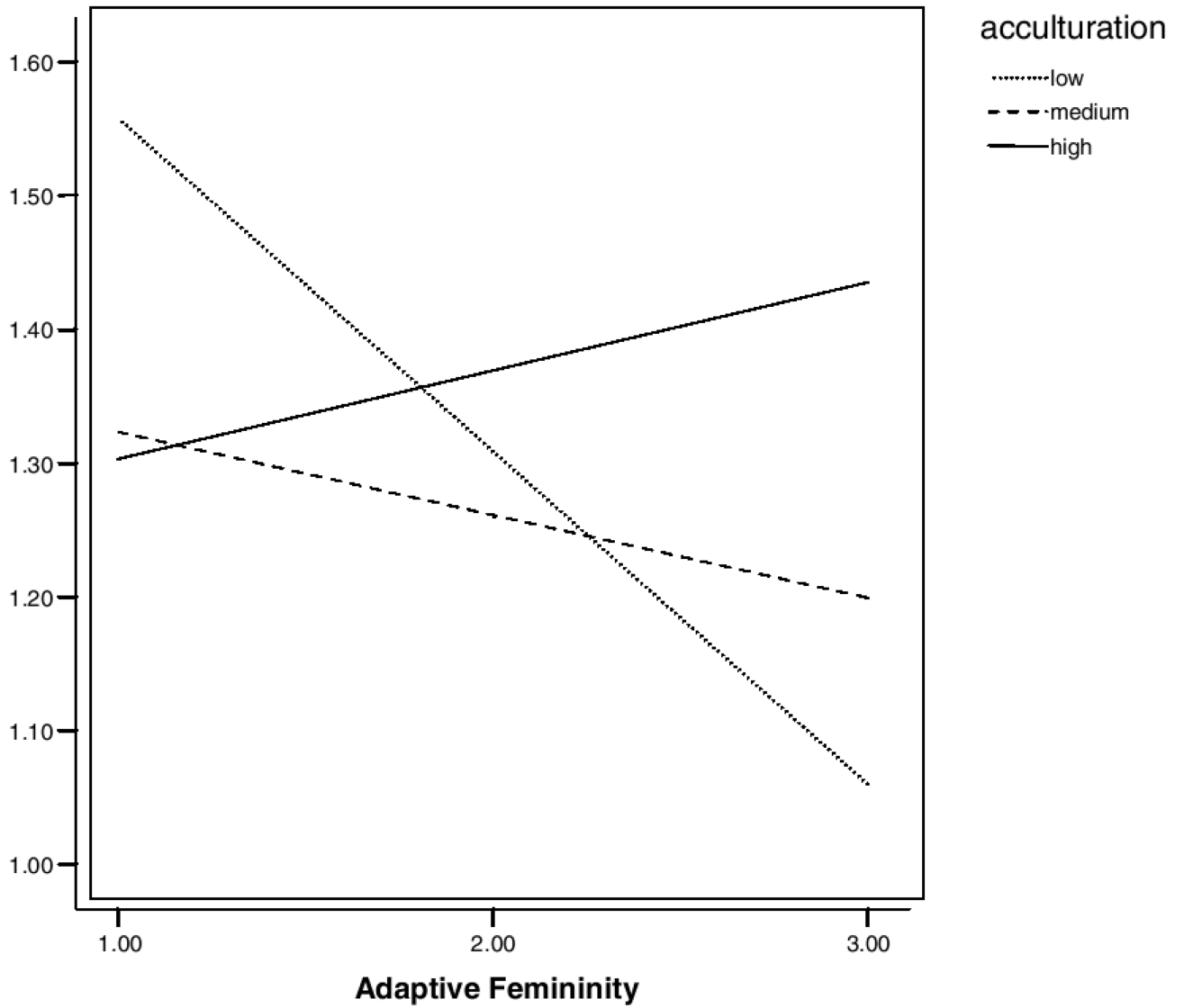
FIGURE 3.
Linguistic acculturation by adaptive femininity interaction for binge drinking in boys.

Marijuana Amount
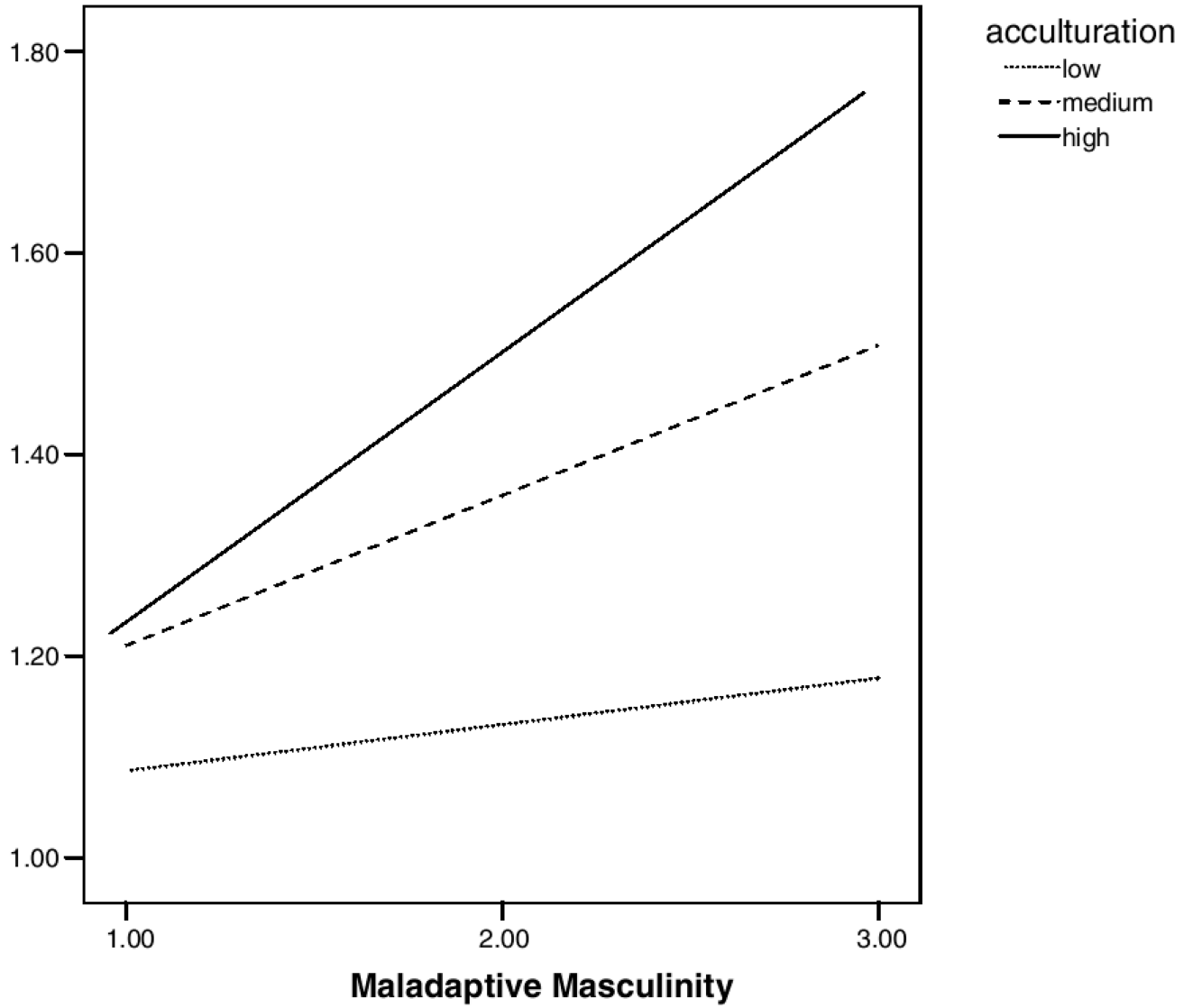
FIGURE 4.
Linguistic acculturation by maladaptive masculinity interaction for marijuana amount in girls.

TABLE 1

Means and standard deviations by gender

Scale	Males		Females		
	Mean	SD	Mean	SD	t
Age	10.38	0.56	10.28	0.51	3.76***
Grades in school	6.45	1.57	6.94	1.32	−6.55***
School lunch	1.36	0.64	1.32	0.61	1.01
Two-parent family	0.71	0.46	0.72	0.45	−0.36
First generation	0.28	0.45	0.26	0.44	0.67
Second generation	0.53	0.50	0.53	0.50	0.07
AHIMSA assimilation	2.82	3.35	2.19	2.98	3.76***
Linguistic acculturation	3.38	0.86	3.32	0.71	1.34
Adaptive masculinity	2.20	1.04	2.52	0.92	−6.01***
Adaptive femininity	1.89	0.96	2.53	0.88	−12.45***
Maladaptive masculinity	1.15	0.88	1.12	0.82	0.59
Maladaptive femininity	1.37	0.83	1.62	0.71	−5.93***
Alcohol amount	1.56	1.19	1.63	1.19	−1.01
Alcohol frequency	1.33	0.90	1.41	0.90	−1.57
Binge drinking	1.28	0.80	1.31	0.79	−0.69
Cigarette amount	1.21	0.81	1.14	0.55	1.87
Cigarette frequency	1.14	0.63	1.09	0.41	1.67
Marijuana amount	1.37	1.17	1.22	0.81	2.82**
Marijuana frequency	1.27	0.99	1.17	0.72	2.37*
Inhalant frequency	1.11	0.62	1.17	0.67	−1.85

*
p < .05,

**
p < .01,

***
p < .001.

TABLE 2

Intercorrelations of acculturation and gender roles

Assimilation	Linguistic acculturation	Positive masculinity	Positive femininity	Negative masculinity	Negative femininity
AHIMSA assimilation	.62 ***	.03	−.01	.04	−.01
Linguistic acculturation	.56 ***	.05	−.01	.12 **	.05
Adaptive masculinity	−.05	.11 **	.62 ***	−.05	.15 ***
Adaptive femininity	−.08	.02	.66 ***	−.16 ***	.26 ***
Maladaptive masculinity	−.01	.01	.28 ***	.14 ***	.41 ***
Maladaptive femininity	.05	.03	.39 ***	.46 ***	.46 ***

Females above the diagonal. Males below the diagonal.

*
$p < .05$,

**
$p < .01$,

***
$p < .001$.

TABLE 3

Correlations of acculturation and gender roles with substance use

| | Alcohol | | | Cigarettes | | Marijuana | | Inhalant Frequency |
	Amount	Frequency	Binge drinking	Amount	Frequency	Amount	Frequency	
Males								
AHIMSA assimilation	−.04	−.04	.03	−.01	.00	.01	.06	−.01
Linguistic acculturation	−.01	−.01	−.01	−.04	−.04	.05	.04	−.05
Adaptive masculinity	−.01	.08	−.01	−.03	.03	.01	.01	−.03
Adaptive femininity	−.08*	−.05	−.07	−.09*	−.06	−.08*	−.07	−.06
Maladaptive masculinity	.24***	.25***	.23***	.20***	.21***	.16***	.17***	.15***
Maladaptive femininity	−.03	.03	−.01	.03	.06	.00	.01	.05
Females								
AHIMSA assimilation	−.02	.00	.00	.00	.03	.09*	.09*	.01
Linguistic acculturation	.00	.02	−.02	.01	−.01	.08*	.03	.00
Adaptive masculinity	−.01	.02	.01	.00	.02	.03	.06	−.01
Adaptive femininity	−.08*	−.08*	−.05	−.01	.01	−.04	−.02	−.05
Maladaptive masculinity	.26***	.23***	.21***	.09*	.07	.17***	.14***	.19***
Maladaptive femininity	.08*	.11**	.13***	.04	.01	.05	.05	.12***

*
$p < .05$,

**
$p < .01$,

***
$p < .001$.

TABLE 4

Hierarchical multiple regressions of alcohol, cigarette, marijuana, and inhalant frequency and amount: Males

| | Alcohol | | | | | | Cigarettes | | | | Marijuana | | | | Inhalants Frequency | |
| | Amount | | Frequency | | Binge drinking | | Amount | | Frequency | | Amount | | Frequency | | | |
	Beta[a]	ΔR²	Beta	ΔR²	Beta	ΔR²	Beta	ΔR²	Beta	ΔR²	Beta	ΔR²	Beta	ΔR²	Beta	ΔR²
Block 1																
Treatment	.08+		.03		.06		.01		.01		.04		.04		.03	
Age	.07+		.02		.03		−.03		−.05		.07		.05		−.07	
Grades in school	−.03		−.06		−.05		−.01		−.03		−.08+		−.08+		.00	
School lunch	.09		.04		.06		.04		.06		.01		.01		−.02	
Two-parent family	.02		.02		.04		.01		.00		.01		−.02		−.05	
First generation	−.11+		−.15*		−.17*		−.15*		−.16*		−.28***		−.23***		−.07	
Second generation	−.13+	.04*	−.13+	.03+	−.12+	.03*	−.10	.01	−.11	.02	−.22***	.05***	−.17*	.04**	−.03	.01
Block 2																
Linguistic acculturation	−.03	.01	−.05	.01+	−.02	.00	−.08	.01	−.11+	.01*	−.07	.00	−.08	.01+	−.08	.01*
Block 3																
Adaptive masculinity	.00		.13*		−.02		.00		.06		.07		.07		.05	
Adaptive femininity	−.06		−.13*		−.06		−.11+		−.13*		−.13*		−.10+		−.14*	
Maladaptive masculinity	.31***		.26***		.24***		.21***		.18***		.14**		.17***		.16**	
Maladaptive femininity	−.15**	.07***	−.09	.06***	−.07	.04***	.00	.04***	.03	.04***	−.06	.03**	−.04	.03**	.02	.03**
Block 4																
Linguistic acculturation by adaptive masculinity	−.09		−.09		−.15*		−.12+		−.13*		−.16*		−.19**		−.13*	
Linguistic acculturation by adaptive femininity	.13+		.13+		.19*		.12+		.11		.11		.13+		.19**	
Linguistic acculturation by maladaptive masculinity	−.07		−.09+		−.09+		−.05		−.05		−.05		−.08		−.13*	
Linguistic acculturation by maladaptive femininity	.05	.01	.07	.02+	.05	.02*	.02	.01	.03	.01	.03	.01+	.07	.02*	.03	.03**

Note. R^2 values have been italicized to distinguish them from beta values.

[a]Beta for full model.

+
$p < .10,$

*
$p < .05,$

**
$p < .01,$

***
$p < .001.$

TABLE 5

Hierarchical multiple regressions of alcohol, cigarette, marijuana, and inhalant frequency and amount: females

| | Alcohol | | | | Binge drinking | | Cigarettes | | | | Marijuana | | | | Inhalants Frequency | |
| | Amount | | Frequency | | | | Amount | | Frequency | | Amount | | Frequency | | | |
	Beta[a]	ΔR^2	Beta	ΔR^2	Beta	ΔR^2	Beta	ΔR^2	Beta	ΔR^2	Beta	ΔR^2	Beta	ΔR^2	Beta	ΔR^2
Block 1																
Treatment	.03		.03		−.01		−.01		.01		.00		−.02		.08*	
Age	.04		.02		−.01		.01		−.03		.04		.05		−.01	
Grades in school	−.01		−.02		−.03		−.02		−.01		.00		.02		.00	
School lunch	−.04		−.04		−.04		−.02		−.01		−.04		−.04		.00	
Two-parent family	−.04		−.02		−.01		−.04		−.05		.05		.03		.02	
First generation	−.10		−.07		−.06		.00		−.06		−.15*		−.17**		.04	
Second generation	−.03	.02	.02	.02	.02	.01	.06	.01	.02	.01	−.08	.02+	−.10+	.02+	.09	.02
Block 2																
Linguistic acculturation	−.07	.00	−.03	.00	−.04	.00	.00	.00	−.05	.00	.01	.00	−.05	.00	.02	.00
Block 3																
Adaptive masculinity	.05		.11*		.06		.03		.04		.09+		.11*		.02	
Adaptive femininity	−.08		−.12*		−.07		−.01		.00		−.08		−.09		−.06	
Maladaptive masculinity	.25***		.18***		.18***		.09+		.08+		.12**		.11*		.17***	
Maladaptive femininity	−.01	.07***	.03	.06***	.06	.05***	−.02	.01	−.03	.01	−.02	.03**	−.01	.02**	.08	.04***
Block 4																
Linguistic acculturation by adaptive masculinity	.03		.04		.03		−.08		−.07		−.04		−.01		−.06	
Linguistic acculturation by adaptive femininity	.01		.00		−.03		.04		.02		.01		−.01		.01	
Linguistic acculturation by maladaptive masculinity	.01		.06		.01		−.01		−.04		.12**		.08+		−.06	
Linguistic acculturation by maladaptive femininity	−.06	.00	−.02	.00	−.02	.00	−.04	.01	−.01	.01	−.08	.01+	−.05	.01	−.04	.01

Note. R^2 values have been italicized to distinguish them from beta values.

[a]Beta for full model.

[+] $p < .10,$

[*] $p < .05,$

[**] $p < .01,$

[***] $p < .001.$