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Gender identity and substance use among students in two high schools in Monterrey, Mexico

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Abstract

This study explored relationships between several hypothesized dimensions of gender identity and substance use outcomes within a non-probability sample of adolescents in Monterrey, Mexico. Based on Mexican concepts of *machismo* and *marianismo*, four gender identity constructs were measured: aggressive masculinity, assertive masculinity, affective femininity and submissive femininity. The study assessed how well these gender identity measures predicted substance use behaviors, substance use intentions, expectancies, and normative approval, and exposure and vulnerability to substance offers. Data were drawn from questionnaires completed by 327 students from 2 Monterrey secondary schools. Multivariate ordered logistic and linear regression analyses, adjusted for school level effects, indicated that aggressive masculinity was associated with higher risk of drug use on most outcomes, while affective femininity was associated with lower risk on selected outcomes. Assertive masculinity was associated with only one of the outcomes examined and submissive femininity with none of them. Most gender identity effects persisted after controlling for biological sex, academic performance, age, and other gender identity measures. For two of the outcomes, the gender identity measures had significantly stronger effects for males than for females. The findings are interpreted in light of males' higher risk for drug use and changes in gender roles and gendered behavior that are now occurring in Mexico as in the U.S.

Keywords

Gender identity; Substance use; Gender gap; Adolescents; Youth; Mexico

1. Introduction

Although gender differences in substance use have been explored extensively, there is much less research examining substance use and gender identity. Some studies have examined the relationship between sex-linked personality traits, such as aggression, and various risk behaviors, including substance use (Thomas, 1996; Huselid and Cooper, 1992). Other research has examined how gender roles shape attitudes and behaviors in ways that increase

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None of the co-authors has any actual or potential conflict of interest to disclose. They have no financial or personal connections to the people or organizations that were part of this study that could inappropriately influence, or be perceived to influence, their work.

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substance use risk, for example, how girls' emphasis on the preservation of relationships may make them vulnerable to male partners' pressure to use substances (Slater et al., 2001; Moon et al., 1999). However, further study is needed to understand specifically how gender identity may influence substance use. Research has examined how sex-linked traits combine to form gender identity (e.g., Bem, 1974), including in Mexico (Lara-Cantu, 1989). A few studies have examined the effects of different dimensions of gender identity on substance use among Mexican American youth (Kulis et al., 2002, 2003). As yet, the possible connection between gender identity and substance use has not been explored for youth populations residing in Mexico.

This study examined the relationships of positive and negative dimensions of masculinity and femininity with substance use behaviors, expectancies, norms, and exposure to drug offers, as well as whether gender identity was associated with these outcomes in different ways for males and females, using a sample of Mexican high school youth from Monterrey, Mexico.

1.1. Gender gaps in substance use in the U.S. and Mexico

Gender differences in substance use have been well documented over time. Typically these differences have been assessed based on a self-reported, dichotomous gender label, reflecting social conventions that individuals can be ascribed to mutually exclusive male and female categories. Even as a measure of biological sex, this binary conception of gender is inadequate when considering the appreciable percentage of the population that has ambiguous primary or secondary sex characteristics (Fausto-Sterling, 1993). Still, it is often used as a means of investigating the etiology of drug use.

Among youth in the U.S., some of the large differences between male and female substance use patterns, typical 30 years ago, have narrowed considerably in recent years. Persisting gender differences and their size vary by life stage and substance. Data from the U.S. Monitoring the Future national survey of youth show a continuing gender gap through 2004 in the annual prevalence of alcohol, marijuana and other illicit drug use among 12th graders, with males more likely to use than females, but virtually no gender differences at 8th and 10th grades (Johnston et al., 2005). In contrast, at all three grade levels there are virtually no gender differences in cigarette use. The literature on adolescent alcohol use now finds small or no gender differences in casual use, but persisting and significant differences in heavy use of alcohol (Randolph et al., 1998). Males are more frequent users of alcohol on a daily basis and in high volume during their high school, college and young adult years (Donovan, 1996; Kandel and Wu, 1995; Johnston et al., 2006). Similarly, gender differences in marijuana use, the most commonly used illicit substance among adolescents, appear to be changing. Specifically, for the casual user, gender differences are narrowing (Sarigiani et al., 1999), although males continue to have higher rates of heavy marijuana use than females do (Schinke et al., 2000).

Gender differences have been particularly salient in understanding substance use progression. Research has shown that girls typically lag behind boys in their initiation of drug use yet progress faster to addiction when using similar amounts of substances (Kauffman et al., 1997; National Center on Addiction and Substance Abuse, 2003). Additionally, female and male adolescents use different kinds of substances for different reasons. Tobacco plays a larger role in drug use for females than for males (Kandel et al., 1992; Yu and Williford, 1992). For example, adolescent females are more prone to cigarette use as a form of weight control, whereas adolescent males are more likely to use substances to improve their mood and creativity (Newcomb et al., 1988; Slater et al., 2001). Differences between boys and girls in social cognitive skill and brain development have been identified as explanations for gender differences in a range of antisocial behaviors (Bennett et al.,

2005). Peer pressure and peer modeling of drug use has been shown to be a strong influence on male adolescents' drug use (Howard et al., 1999).

Gender differences in substance use have been larger and more persistent in Mexico than in the U.S. Although consumption of alcohol and other drugs among Mexican women has increased over time, women overall continue to consume significantly less alcohol, tobacco and other drugs than Mexican men do, and they are much less likely than men to engage in binge drinking (Caraveo-Anduaga et al., 1999; Medina-Mora et al., 2003a,b; Medina-Mora and Rojas Guiot, 2003). The Mexican National Survey on Addictions reports that 9% of men and 2% of women in the general population have used drugs other than alcohol and tobacco (Ortiz et al., 2006). Among Mexican high school students, 10% of the male and 5% of the female students reported using marijuana in their life time. A similar gender gap has been reported in Mexican youth's exposure to drug use opportunities: adolescent males in Mexico are more than twice as likely to receive drug offers as adolescent females (Medina-Mora and Rojas Guiot, 2003). In some regions and age groups, however, the gender gap has narrowed markedly for certain substances. A large study of Mexico City students in middle and secondary schools found tobacco and alcohol use to be equally prevalent among males and females, although use of marijuana remained substantially more common among males (Villatoro et al., 2005).

Cultural norms, allowing men to drink alcohol to intoxication, are endorsed by both men and women in Mexico, but there is much less tolerance of excessive alcohol use by women (Caetano and Medina-Mora, 1988; Medina-Mora and Rojas Guiot, 2003; Villatoro et al., 1998). Gender differences in age of initiation for alcohol and tobacco also have been identified. The relatively early initiation of Mexican males into alcohol and tobacco use has been linked to their subsequent higher propensity to use other drugs (Wagner et al., 2005). Differences in the other direction have been found in initiation of illicit drug use among patients in drug abuse treatment (Ortiz et al., 2006). Mexican women in drug treatment report an earlier and narrower window of initiation into drug use (between ages 12 and 14) than their male counterparts do (age 15–19).

As the gender gap in substance use has narrowed substantially in the U.S. in recent years (Amaro et al., 2001; Dakof, 2000; National Center on Addiction and Substance Abuse, 2003), a similar trend is emerging in Mexico (Medina-Mora et al., 2006). One explanation is changing ideas about gender roles and gender identity. Gender identity develops over time and can change through an individual's life experiences (Guthrie and Low, 2000). Males and females may become more alike in their substance use patterns with age as they reject the influence of gender stereotypes on their own gender identities (Karinol et al., 1998; McCreary et al., 1998). This makes comparisons of substance use behavior based on biological sex difficult, as this binary approach greatly oversimplifies the actual role that gender may have in substance use outcomes.

1.2. Gender identity

The concept of gender identity moves beyond the male/female dichotomy such that masculinity and femininity are viewed as unique concepts rather than opposite polarities or fixed ends of a continuum. Thus, a male or female can possess both masculine and feminine gender identities simultaneously. Gender identity has been variously conceived to encompass one's subjective sense of maleness/femaleness, sex-linked personality traits, and culturally prescribed gender roles (Koestner and Aube, 1995). As originally conceived by Bem (1974), the scales developed to measure gender identity were based on North American and European idealizations of socially desirable male and female personality traits (Koestner and Aube, 1995). The masculinity subscale measured instrumental traits such as assertiveness and self-confidence (Koestner and Aube, 1995). The femininity subscale

measured one's degree of expressive or desirable "feminine" traits, namely nurturance and considerateness.

A subsequent advance in the conceptualization of gender identity was the delineation of positive and negative realms of masculinity and femininity. The resulting four dimensions of gender identity define both socially desirable and undesirable instrumental and expressive traits within masculine and feminine subscales (Antill et al., 1981; Marsh and Myers, 1986; Russell and Antill, 1984; Ricciardelli and Williams, 1995). Negative masculinity encompasses an inclination toward control and dominance in relationships, while negative femininity describes submissiveness and dependence. Using this schema, different components of one's gender identity can be isolated and their social utility evaluated.

For Mexican and other Latino populations, "*machismo*" and "*marianismo*" have been described as central gender role themes influencing the gender identity of males and females. *Machismo* often is equated solely with a Mexican male stereotype of hyper-masculinity, a masculine cultural trait that is thought to derive from the subjugation of Indians during the Spanish conquest of the Americas (Hardin, 2002). Stereotypically, it commonly is associated with male behaviors such as perpetration of and tolerance for domestic violence, infidelity, abandonment of children, intransigence in male-to-male relationships, alcoholism, and aggressive and risk-taking behavior (Gutmann, 1996; Kulis et al., 2003).

There is, however, a second meaning of machismo centered on traits such as honor, respect, bravery, dignity and family responsibility (Gutmann, 1996; Neff, 2001). The term *hombre* is sometimes used to capture the positive aspects of *machismo*. An *hombre* does not beat his wife, is helpful in the home, and sees to his family responsibilities with dedication and honor (Gutmann, 1996). Although the two conceptualizations of machismo coexist in the views of Mexican-origin youth about the nature of masculinity (Kulis et al., 2002; Marsiglia and Holleran, 1999), the two dimensions can be measured and analyzed separately (Neff, 2001).

Marianismo also can represent both positive and negative aspects of female behavior. *La mujer* is a strong and capable woman who takes a proactive role in her life, yet is still primarily concerned with the care and nurturance of her family (Rocha-Sanchez and Diaz-Loving, 2005). *La mujer abnegada* is passive and endures bad male partners with patience and understanding, sacrificing her needs and desires for the good of her family. She is submissive, selfless, and dependent, enacting women's expected role of taking care of the children, spouse and household.

These Mexican female gender models appear in the form of mythologized historical women and religious archetypes that embody desirable and undesirable female traits such as la Malinche, our Lady of Guadalupe and la Adelita (Hardin, 2002). The *marianista* is spiritually strong, benevolent, self-sacrificing on behalf of her children and family, and infinitely patient with men, who are viewed as inherently spiritually weaker than herself (Stevens, 1973). In Mexico, the Virgin of Guadalupe is the *marianista* model who exemplifies traditional, post-conquest female attributes that are highly valued; she is the *mestiza* version of the Virgin Mary. Meanwhile, *la Adelita* was a woman soldier or *soldadera* in the Mexican Revolution, fighting courageously alongside the men as well as caring for them and nursing the wounded.

Although many individuals deviate from the expected traditional norms, these gender roles and expectations continue to be promoted in Mexican culture, and they are endorsed by large proportions of men and women (Ariza and Oliveira, 2001; Jelin, 2005; Reyes Luna et al., 2004; Rocha-Sanchez and Diaz-Loving, 2005). Globalization and migration are influencing traditional norms and behaviors of Mexican men and women, creating a new

type of gender role syncretism that challenges preconceived ideas about gender identity and its health implications.

1.3. Gender identity and substance use

Specific risk and protective factors for substance use have been associated with different sex-linked personality characteristics and gender identities (Amos et al., 1997; Kulis et al., 2002, 2003; Ricciardelli et al., 1998; Williams and Ricciardelli, 1999), including one study in Mexico (Lara-Cantu, 1990). Aggression-related variables and the negative realm of masculinity have been linked with heavier and more problematic alcohol use among males (Ricciardelli et al., 1998; Williams and Ricciardelli, 1999). Emotional warmth and concern for others have been linked with less alcohol use among females (Huselid and Cooper, 1992). Studies have also shown that interpersonal dominance typically associated with masculinity predicts more substance use for adolescents of both genders (Kulis et al., 2003), while nurturing qualities associated with femininity are related to drug refusals (Kulis et al., 2002).

1.4. Study aims and hypotheses

This study examines the gender identity of Mexican youth with specific emphasis on the protective and risk-prone components of gender identity. It tests for effects of gender identity on substance use and on an array of substance use related outcomes, using gender identity scales developed for Mexican-origin youth in the United States (Kulis et al., 2003). Based on theories of gender identity and prior empirical research on its link to substance use, we expect that the positive aspects of masculinity and of femininity generally will protect Mexican youth of both genders from substance use, and that the negative aspects of masculinity and of femininity will place Mexican youth of both genders at greater risk of substance use. However, we also expect that these gender identity influences on substance use will be stronger for the gender with which they are stereotypically associated. The hypotheses are that aggressive masculinity would predict less desirable outcomes, while assertive masculinity would predict more desirable outcomes, with stronger effects for males than for females. In turn, we expected that submissive femininity would predict less desirable outcomes, while affective femininity would predict more desirable outcomes, with this time stronger effects for females than for males.

2. Methods

2.1. Data

This study employs data from a non-probability sample of students enrolled in two public secondary schools, or *preparatorias*, in Monterrey, Mexico. These schools were selected for a field trial of a youth substance use prevention program that was originally developed in the U.S. (see Marsiglia and Hecht, 2005), and later adapted for use with Mexican youth (for details see Rodriguez and Villar Luis, 2004). One school was centrally located in Monterrey, while the other was in a suburb. Neither school was affiliated with any religious group or university system. Data for the current analysis came from 327 students who were either first- or second-year students within the schools. These students completed a self-administered Spanish language questionnaire in their classrooms in the Spring of 2003, before the prevention curriculum was implemented. The authors obtained IRB approval for the study from both Arizona State University and *La Universidad de Nuevo León*. During survey administration, teachers informed the students about the voluntary nature of the project and guaranteed confidentiality for those who chose to answer the questionnaires. All students present on the day the survey was administered chose to participate in the study.

2.2. Measures

2.2.1. Gender identity—The key predictors in the analyses were indicators of gender identity that were designed to measure four theorized constructs. An initial set of 19 items was based on extensions of those used by other researchers to map both positive and negative aspects of masculinity and femininity (Antill et al., 1981; Marsh and Myers, 1986; Russell and Antill, 1984; Ricciardelli and Williams, 1995); these items that had shown high reliability and criterion validity in Mexican-origin populations in the U.S. (Kulis et al., 2002, 2003). The items are also related thematically to those developed to measure gender identity orientations in a Mexican sample, an adaptation of the Bem Sex Role Inventory (1974) (Lara-Cantu, 1989; Lara-Cantu, 1990). To ensure linguistic and cultural equivalence, all items were translated and back-translated from Spanish to English using the method developed by Rogler (1989). The 19 items were factor analyzed to verify that they cohered around the theorized constructs in a consistent way for both female and male respondents.

The 13 items that formed the four dimensions of gender identity 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. There were three positive masculinity items measuring “assertive masculinity” that captured a sense of self-confidence, assertiveness, and personal valor: “When I’m with my friends, I am a good leader;” “I express my opinion even when others disagree;” and “When necessary, I act bravely.” Negative masculinity, or “aggressive masculinity,” indicated dominance and control over others: “I am rude to others;” “I am aggressive person;” and “I ignore rules that get in my way.” “Affective femininity” measured nurturing, empathetic, and expressive aspects of femininity: “I am a kind to others;” “I spend my time helping others;” and “I show my true feelings to others even if it makes me look weak.” In contrast, negative aspects of femininity, or “submissive femininity,” tapped a sense of dependence and inadequacy: “I feel timid around other people,” “I have trouble making decisions,” “I spend time worrying about things,” and “I feel afraid.”

2.2.2. Substance use behaviors—The key substance use behaviors in this study were use of alcohol, cigarettes and marijuana within the last 30 days. All were self-reported and measured on Likert scales used by Flannery et al. (1994). They included: the number of alcohol drinks (glasses of wine, bottle/cans of beer, shots of liquor, or mixed drinks) (scored from 1 = “None” to 9 = “30 or more drinks”), the number of cigarettes (from 1 = “None,” 2 = “Only a puff,” to 9 = “More than 5 packs”), and the number of times marijuana was used (from 1 = “Never” to 9 = “More than 100 times”). Binge drinking was measured with a separate item asking how many times within the last 30 days respondents had consumed five or more alcoholic beverages over a few hours’ time (from 1 = “Never” to 6 = “10 or more times”). We utilized last-30-day substance use reports because they have higher demonstrated validity than do reports of lifetime use or use over lengthier intervals (Graham et al., 1984; Johnston, 1989).

2.2.3. Substance use intentions, norms, attitudes, and exposure—Additional outcomes included an array of social and psychological factors that have been demonstrated to be important precursors in the etiology of youth substance use. These included: (1) future intentions to use substances; (2) normative approval/disapproval of substance use; (3) positive expectancies about substance use; (4) substance use among friends and peers; (5) degree of exposure to offers of substances; (6) sharing, giving, or selling substances to peers and friends; (7) social pressure to use substances; (8) vulnerability for drug offers (self-efficacy to refuse). Multi-item scales or factor scores were created to measure each of these constructs. When the component items shared the same response categories, scales were constructed by calculating the mean. Principal component factor analysis scores were

created for two measures – normative approval of substance use and substance use among friends and peers – because, in both cases, the component items had dissimilar response categories.

Intentions to use substances were assessed by asking whether respondents would accept if someone offered them substances during the coming weekend. There were three separate questions for responses to offers of alcohol, cigarettes, and marijuana, all with the same four response categories: 1 = “Definitely no” to 4 = “Definitely yes”.

Four sets of items indicating normative approval of substance use by the respondent and his/her friends and parents (Cialdini et al., 1990) formed a strong single factor score, with loadings between .62 and .69. The questions were based on items used by Hansen and Graham (1991). One set asked whether the respondent thought it was “okay” for someone their age to drink alcohol, smoke cigarettes, and use marijuana (scored from 1 = “Definitely okay to 4 = “Definitely not okay”). A second set asked how angry the respondent’s parent(s) would be if they found out that the respondent had “got drunk” or “smoked marijuana” (both scored from 1 = “Not angry at all” to 4 = “Very angry”). The third set asked how their best friends would react if the respondent “drank alcohol,” “smoked cigarettes,” or “smoked marijuana” (scored from 1 = “Very friendly” to 4 = “Very unfriendly”). The fourth set asked respondents whether the majority of their friends approve of people (1) getting drunk, (2) using inhalants, and (3) using LSD, crack or cocaine (scored from 1 = “Definitely okay” to 4 = “Definitely not okay”).

Positive expectancies about substance use – its perceived benefits – were measured with four widely used items (Hansen and Graham, 1991). They included whether respondents thought that drinking alcohol make parties more fun, whether alcohol helps one have a good time with friends, whether smoking cigarettes calms nerves, and whether smoking makes it easier to concentrate. Each item was scored from 1 = “Almost always” to 5 = “Never”.

The extent of peer substance use was measured by asking respondents to estimate how many students in their school had tried alcohol, tobacco, or other drugs at least once, and how many students in their school use drugs regularly (both on scales of 1 = “None to 6 = “Almost all”. A third question asked the respondents how many of their friends use these same substances at least once a month, scored in whole numbers from 0 to 7 or more. These three items formed a strong factor score with loadings between .58 and .88.

Exposure to substance use offers was measured by asking respondents how often over the lifetime they had received offers to buy or be given substances, with separate items for offers of alcohol, cigarettes, and marijuana (scored from 1 = “Never” to 8 = “More than 100 times”).

Two indicators measured the extent to which the respondent had (1) sold or had (2) given or shared “alcohol, cigarettes, marijuana or other drugs with your friends or other youth.” Responses were 1 = “No, never,” 2 = “Yes, at times,” and 3 = “Yes, regularly.”

Pressure to use substances was measured as a count, from 0 to 4, of the number of different substances (alcohol, cigarettes, marijuana, and “other” drugs) that the respondent had felt pressured to use by someone else.

The measure of drug off vulnerability, or perceived inability to turn down drug offers, was based on the drug refusal self-efficacy scale of Kasen et al. (1992). There were three items, asking respondents how certain they felt they would turn down offers of alcohol from a family member, offers of cigarettes from a casual acquaintance, and offers of marijuana from a good friend. Responses ranged from 1 = “Not at all sure” to 5 = “Very sure.”

The scales for positive substance use expectancies and drug offer vulnerability were reversed in valence to parallel the scoring of all other measures of substance use behaviors, intentions, norms, and exposure, so that for all out comes examined, high values indicated undesirable, pro-drug orientations or behaviors.

All scales comprised of three or more component items had acceptable to very good reliability or internal consistency as indicated by Cronbach alpha coefficients. These included positive drug expectancies (α = .81), exposure to offers of substances (α = .79), refusal confidence (α = .67), and substance use intentions (α = .60). Reliability could be improved by dropping the marijuana item from substance use intentions scale (to α = .71), but we retained that item in the scale to ensure that all measures referred whenever possible to both licit and illicit substances.

2.2.4. Controls—Multivariate tests for the effects of gender identity controlled for the influence of gender, age, academic performance, and family socioeconomic status. The respondents' self-reported gender was measured with an item asking students to check whether they were female (*mujer*) or male (*varón*). Age was self-reported in years. Occupational prestige of the employed parent with the highest status served as a measure of socioeconomic status, using ordered occupational status categories from 0 (unemployed) to 7 (independent professional) as they are scored in the Mexican national census. Academic achievement was measured by the student's "usual grades" within ordinal categories reflecting a percentage scale. Responses ranged from 1 = "0–69," 2 = "70–79," 3 = "80–89," to 4 = "90–100," with higher values indicative of better grades on a scale roughly paralleling a 4-point GPA or whole letter grading system (D/E, C, B, A).

2.3. Analysis strategy

The analyses assessed the extent to which the four gender identity measures predicted a range of substance use measures of behaviors, intentions, norms, expectancies, and exposure. These relationships were explored through bivariate correlations, *t*-tests, and one-way ANOVA and then in multivariate tests. Because individual respondents were enrolled within different schools, we employed statistical tests that adjusted for the deflated standard errors that this clustering can produce. For the four outcomes measuring actual substance use, all of which were measured on ordinal scales, we estimated ordered logistic models in SAS (Proc Glimmix). The remaining scale or factor score outcomes were analyzed with linear models through SAS Proc Mixed. Both types of analyses estimated both random and fixed effects. In addition to tests of whether the gender identity measures predicted these outcomes net of the effect of the other gender identity constructs and of the control variables, we tested for gender interaction effects. These tests determined whether the gender identity scales predicted the outcomes in significantly different ways for females and males. All the multivariate estimates were free of multicollinearity as indicated by low variance inflation factors, all under 1.26.

3. Results

3.1. Demographic profile

Descriptive statistics for the variables used in analysis are presented in Table 1. The respondents were just under 16 years of age on average. There were more males (56%) than females (44%). The students' usual grades corresponded, on average, to a grade of high C. Most students came from families that would be considered middle class in Mexico. In the ranked occupational categories that formed the socioeconomic status measure, the mean score corresponded to the occupational status of an office manager.

3.2. Substance use behaviors and risk factors

In addition to the means and standard deviations for outcome variables, Table 1 includes a report of the prevalence of use of substances for the four outcomes measured on ordinal scales. The distributions for these variables showed that a substantial minority of the respondents had used licit substances in the prior 30 days. About one-third had used alcohol (33%) and cigarettes (38%) recently. Recent bouts of binge drinking were reported by nearly one-quarter (24%) of the respondents. In contrast to use of licit substances, recent marijuana use was relatively uncommon (3%). The prevalence of three other behavioral outcomes also is reported in Table 1. A large plurality of the respondents reported having received offers of substances (81%). Substantial minorities had sold or given alcohol, tobacco, marijuana or other drugs to their friends or other youth (27%), and had felt pressured to use substances (31%).

Frequency distributions for the other outcomes (not represented in Table 1 except as mean scores) indicated that substantial portions of the youth were at risk for initiation or progression toward substance abuse. This higher risk group included those who said: that they would probably or definitely accept substances if offered them (23%—use intentions); that they are unsure they would be able to turn down offers of substances (18%—offer vulnerability); and that they agree that substance use often or always has beneficial consequences (13%—positive drug expectancies). In contrast to these risk factors describing a minority, most respondents perceived widespread use of substances among peers and friends. A large majority (70%) thought that more than half of their school peers had tried substances or used them regularly, and even more (75%) said they had one or more friends who used substances at least once a month.

3.3. Gender identity correlates

Respondents more often described their traits and behaviors as consistent with positive than with negative gender identity constructs. Mean scores were highest and about equal for affective femininity and assertive masculinity, and they were lowest for aggressive masculinity.

An analysis of bivariate relationships showed that the four gender identity scales were generally unrelated to the control variables, except for gender. In *t*-tests (not reported in tables), females reported significantly higher mean scores than males on affective femininity (0 = 3.5 vs. 0 = 3.2, $t = 4.38$) and submissive femininity (0 = 2.4 vs. 0 = 2.1, $t = 3.40$), but there were no significant gender differences on assertive masculinity (0 = 3.35 vs. 0 = 3.32, $t = 0.28$) or aggressive masculinity (0 = 1.99 vs. 0 = 2.07, $t = -0.80$). The only significant relationship with other control variables was an inverse correlation between school grades and aggressive masculinity ($r = -0.16$).

Bivariate relationships between the gender identity scales and outcome variables revealed two compelling patterns (not presented in tables). There were significant positive correlations (from $r = .12$ to .29) indicating that high scores on the aggressive masculinity scale were associated with less desirable outcomes for all substance use related variables except pressure to use substances. In contrast, affective femininity generally was associated with more desirable outcomes, including less recent use of alcohol ($r = -.21$) and marijuana ($r = -.16$), less binge drinking ($r = -.17$), less frequent selling or giving of substance to others ($r = -.18$), weaker intentions to use substances ($r = -.12$), less normative approval of substance use ($r = -.28$), and less positive drug use expectancies ($r = -.17$). High scores on the assertive masculinity scale were correlated only with perceptions of more widespread substance use by peers and friends ($r = .14$) and receipt of more substance offers ($r = .11$). Submissive femininity was not associated with any outcome in bivariate tests. In addition to

correlations, the relationships of gender identity scales with ordinal outcomes were confirmed through ANOVA.

3.4. Multivariate tests

Table 2 reports the results of ordered logistic regression analyses that assessed the gender identity scales as predictors of recent substance use, controlling for other gender identity measures and for possible differences by gender, age, academic grades and socioeconomic status. Table 3 reports estimated effects of the gender identity and control variables as predictors of the outcomes that were measured as scales or factor scores. Many of the bivariate relationships encountered earlier were reproduced. Aggressive masculinity was a significant predictor of heavier recent alcohol use and binge drinking, stronger intentions to use substances, more normative approval of use, more positive drug expectancies, more peer substance use, receipt of more substance offers, and more frequent selling, sharing or giving of substances to others. Affective femininity predicted less alcohol use and binge drinking, less normative approval of use, less positive drug expectancies, less frequent selling or giving of substances to others, yet more pressure to use substances. Assertive masculinity predicted only a single outcome, more peer substance use. Submissive femininity predicted none of the outcomes.

All of the control variables predicted at least some of the outcomes in multivariate tests. There were significant gender differences for recent cigarette use, normative approval of substance use, and receipt of substance offers, all in the direction of less desirable outcomes for males than for females. Older students were at relatively increased risk of recent alcohol and marijuana use, binge drinking, normative approval of substance use, and of receiving more offers of substances. Students with better grades reported more desirable outcomes on recent cigarette use, binge drinking, substance use intentions, receipt of offers of substances, and vulnerability to offers. Controlling for other variables, higher socioeconomic status predicted more cigarette use and stronger intentions to use substances.

3.5. Gender-by-gender identity interactions

To investigate whether gender identity scales predicted outcomes in different directions or degrees for females and males, tests of interaction effects were conducted. Interaction terms were created by mean centering each of the gender identity scales and multiplying by the gender (biological sex) dummy variable. The interaction terms were added along with their component main effects to all the models reported in Tables 2 and 3. There were no significant gender interactions at probability (p) < .05 except for two outcomes, recent cigarette use and selling or giving substances to others (results not reported in tables). To clarify the nature of these interactions, gender identity effects on these two outcomes were estimated separately for males and females. Although affective femininity was not a predictor of recent cigarette use for the sample as a whole, there was a significant difference between males and females in its effects on cigarette use. Unexpectedly, it predicted less cigarette use among males (estimate =−0.386, S.E. = 0.195, $p < .05$), but was non-significant in predicting female's cigarette use in the opposite direction (estimate = 0.289, S.E. = 0.301, $p < .17$). The second significant gender interaction involved the direct relationship shown in Table 3 between aggressive masculinity and selling or giving substance to others. This relationship was significant for the sample as a whole, but was a significantly stronger predictor for males (estimate = 0.647, S.E. = 0.184, $p < .01$) than for females (estimate = 0.311, S.E. = 0.167, $p < .07$).

4. Discussion

This study examined the relationship between substance use related outcomes and positive/negative dimensions of masculine and feminine gender identity in a non-probability sample of Mexican adolescents. Limitations of the study included the limited generalizability of the sample, the exclusively self-report nature of the measures, some weaknesses of the measures (such as the failure to account for gender differences in the threshold criteria for defining binge drinking), the cross-sectional design that precludes conclusively demonstrating causal directions, and a limited sample size for investigating gender differences in the influence of gender identity. Nevertheless, the findings suggest that gender identity is a salient factor in substance use among youth in Mexico as it is in the U.S. and elsewhere. Many gender identity effects emerged independent of the effects of gender alone. We found that certain dimensions of gender identity consistently predicted the outcomes, while other dimensions did not. For most outcomes, the predictive power of gender identity did not differ significantly for males and females, and in the two instances where it did differ, the effects were not always in the hypothesized direction.

Consistent with prior research on negative and positive gender identity dimensions, we found that aggressive masculinity was associated with a wide range of less desirable substance use outcomes, from actual use to pro-drug norms, expectancies, intentions, exposure to substances, and substance using peers. Several interpretations of this finding are possible. Youths with aggressive masculine identities may view substance use as an acceptable behavior, consonant with a toughness they consider desirable or important. They may view their bodies as an appropriate target of their aggressiveness, just as other people are, and substance use as a means for demonstrating aggression to others or themselves. Another explanation is that the items measuring aggressive masculinity tap into aspects of antisocial or deviant personality, or with risk-taking attitudes that often are associated with substance use (Brook et al., 2003). In this case, the effect on substance use may not be one of gender identity primarily but rather one of personality. Because the data do not include an established antisocial or deviant personality scale, we could not assess the extent to which our negative masculinity items overlap with personality. A related explanation is that the negative masculinity items are proxies for bad behavior, i.e., the bad behavior may be the outcome of substance use, rather than its cause. Other studies have established the negative effects that substance use has on behavior. For example, people under the influence of substances commit more aggressive acts (Hoaken and Pihl, 2000). Our negative masculinity items capture aggressive behavior. Since our analyses were cross-sectional, however, we cannot draw conclusions about the direction of causality in the identified relationship between negative masculinity and substance use.

In contrast to aggressive masculinity, affective femininity was associated with several desirable outcomes, including less alcohol use, less normative approval and positive expectancies regarding substance use, and less giving or selling of substances. Youths with high affective femininity scores may view substance use as undesirable because it could interfere with their ability to show attention to others. Similarly, they may view it as “rough” behavior that is incompatible with their gentleness. Unexpectedly, youth with high affective femininity scores also reported experiencing more social pressure to use substances. This finding requires more study. Do these youths report less substance use because their caring orientation enables them to avoid confrontation while resisting the enhanced pressure to use drugs? As in the case of aggressive masculinity, the direction of causality is uncertain. It is possible that use of substances (especially heavier and more frequent usage) may alter brain function associated with affective states, thus reducing the capacity for interpersonal connection and some of the other interpersonal dimensions captured in the affective femininity measure.

In contrast to the aggressive masculinity and affective femininity gender identity measures, assertive masculinity and submissive femininity failed to predict nearly all of the substance use outcomes in multivariate models. Both were unrelated to a key measure—drug offer vulnerability, or the sense of efficacy to refuse substance offers. Youth scoring high in assertive masculinity – which was measured through items that tapped a sense of self-confidence and ability to resist peer pressure – might be expected to have an enhanced ability to refuse substance offers. Moreover, assertive masculinity predicted significantly higher estimates of the level of substance use among peers and friends. Submissive femininity might be expected to make a youth more susceptible to peer or partner pressure to use substances, or increase the likelihood of using substances to self-medicate to compensate for feelings of inadequacy.

These two dimensions of gender identity may not have produced the hypothesized associations due to cultural differences between Mexico and the U.S. For example, the U.S. has a strongly individualistic culture that may not measure well the gendered expressions of assertiveness in Mexico which as a society tends to be more collectivistic. Submissive femininity may be culturally prescribed and accepted in Mexico, affording a certain level of respect to boys and girls who conform to those norms and, thus, not necessarily put them at risk for drug offers. Ethnographic research may be needed to better capture Mexican expressions of gendered assertiveness as well as the peer reactions to submissive femininity.

Our analysis of interaction effects showed that gender identity was a more salient predictor for boys than for girls, but in only two instances. Interestingly, this included both masculine and feminine gender identity measures. One finding was consistent with expectations that masculine gender identities would be more predictive for boys than for girls, as was the case for the undesirable effects of aggressive masculinity on selling or giving substances to other. However, boys also appeared to benefit more than girls from affective femininity as a protective factor against cigarette use, which ran counter to our hypotheses. Due to higher levels of gender segregation in friendships and socializing in Mexico, it is possible that boys scoring higher in affective femininity are not part of higher risk peer groups.

In addition, the greater salience of the gender identity measures for males than for females in predicting some outcomes may be a reflection of the outcome itself being gendered. Males, for example, are generally more prone to externalizing disorders, including substance abuse, whereas females are considered to be more prone to internalizing disorders, such as depression (Horwitz and Scheid, 1999). Had we examined outcomes including internalizing disorders, we might have found greater or equal salience of the feminine gender identities for females than for males. However, it is important to note that there was no evidence that submissive femininity placed females at relatively greater risk of being pressured into using substances or of using substances to self-medicate against feelings of gender oppression. It should also be noted that the present use of the labels assertive vs. aggressive masculinity and affective vs. submissive femininity in some ways reinforces gender stereotypes. Such stereotypes are also reflected in some definitions of *machismo* and *marianismo,* although this study took care to recognize multiple meanings of these constructs, including the relatively more and less desirable aspects of each.

Given that the data were cross-sectional, it is difficult to interpret the findings that several effects of gender identity dimensions were mediated by various demographic variables or by another gender identity dimension. For example, although gender mediated affective femininity's effects, it is unclear how gender may influence both the development of affective femininity and intentions to use drugs. However, there was evidence from correlations that the feminine gender identity dimensions – both positive and negative – were gendered, with females reporting higher scores than males did, while scores on the

masculinity gender identity measures did not differ markedly by gender. This may suggest that gender roles in Mexico, as in the U.S. and many other westernized societies, are becoming less polarized and stereotyped. To understand better how gender identity influences on substance use are mediated or conditioned by other variables, longitudinal data will be needed to determine the direction of the relationship between gender identity and the variables found here to be mediators.

As in the U.S. and many other societies, gender roles and gendered behaviors are undergoing significant change in Mexico, and at different rates in certain subgroups depending on educational level, social class background, region and urbanization (Gutmann, 2003). Globalization, consumerism, migration, and economic hardships are transforming traditional Mexican notions of family responsibilities and the influence of traditional conceptions of *machismo* and *marianismo* on Mexican gender roles. Mexico has experienced key changes that include a doubling of the proportion of single mother households in the last quarter of the 20th century, dramatic increases in women's entry into the workforce and pursuit of higher education, their increasing representation within business, government, and the professions, and a rise in women's emigration (Hondagneu-Sotelo, 1994). These educational and occupational advances for women have helped to de-polarize gender role expectations, especially among younger cohorts and those with higher education.

At the same time, sharp increases in the prevalence of substance use and abuse among Mexican youth have been noted, most dramatically in northern regions and border cities (Sanchez-Huesca et al., 2006). Thus it is important to note that the data for this study came from a northern, highly industrialized, and relatively wealthy city that is closely tied to the United States economically, migratorially, and culturally. Gender identities among youth attending secondary schools in Monterrey may develop in ways that are not yet highly prevalent in rural Mexican settings, in areas where indigenous populations are more prevalent, or among the population from lower socioeconomic strata. Much more research is required to capture the changing nature and full variability of gender identity among Mexico's distinct social groups. Results from the current study suggest, however, that these changing gender identity dynamics can be helpful in understanding the process and the trajectory through which youth initiate and progress toward substance use and abuse.

The present findings suggest that historical changes in gender role socialization in Mexico may already be affecting gender differences in substance use. This may be important for understanding changing regional and gender-based trends in substance use in Mexico. For example, increased substance use among Mexican women may be due to their taking on more masculine gender roles over time. Gender role socialization, in turn, may be an appropriate target for interventions to prevent the development of antisocial behaviors and substance use in Mexican youth. While Kulis et al. (2007) found no overall gender differences in the effects of a substance use prevention program for 7th grade mostly Mexican Americans, there was a suggestion that program effects were stronger for boys than girls among less acculturated Mexican Americans, an effect that might be due to differences in traditional gender roles between the less vs. more acculturated adolescents.

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Table 1

Descriptive statistics for study variables

Variable	*N*	Percent reporting behavior	Range	Mean	Standard deviation
Outcomes					
Recent alcohol use	323	33.4%	1–9	2.58	2.47
Alcohol binge drinking	323	23.8%	1–6	1.52	1.14
Recent cigarette use	323	37.8%	1–9	2.76	2.67
Recent marijuana use	321	3.1%	1–9	1.06	0.63
Substance use intentions	323		1–4	1.63	0.69
Normative approval of use[a]	316		−2.7 to 2.2	0.00	1.00
Positive drug expectancies	323		1–5	2.09	0.99
Peer substance use[a]	316		−3.4 to 2.8	0.00	1.00
Substance offers received	323	80.7%	1–7.7	2.60	1.63
Sells or gives substances	323	26.7%	1–3	1.21	0.39
Pressured to use substances	323	31%	0–3	0.37	0.62
Substance offer vulnerability	323		1–5	2.12	1.12
Predictors: gender identity					
Affective femininity	320		1–5	3.42	0.76
Assertive masculinity	320		1–5	3.46	0.82
Submissive femininity	319		1–4.8	2.37	0.81
Aggressive masculinity	319		1–4.7	2.17	0.76
Controls					
Female (1) vs. male (0)	323		0–1	0.44	0.49
Age in years	319		13–22	15.73	0.94
Usual grades	323		1–4	2.11	0.73
Socioeconomic status	319		0–7	4.15	2.13

[a] Factor scores.

Table 2

Ordered logistic estimates predicting last 30-day substance use

	Recent alcohol use	Recent cigarette use	Recent marijuana use	Recent binge drinking
Affective femininity	−0.581*** (0.174)	−0.122 (0.164)	−0.049 (0.482)	−0.344† (0.191)
Assertive masculinity	−0.001 (0.164)	−0.055 (0.154)	0.008 (0.441)	−0.004 (0.182)
Submissive femininity	0.012 (0.163)	0.009 (0.157)	−0.265 (0.480)	−0.222 (0.189)
Aggressive masculinity	0.571** (0.176)	0.139 (0.169)	0.397 (0.434)	0.507** (0.194)
Female vs. male	−0.174 (0.271)	−0.545* (0.262)	−1.798 (1.135)	−0.222 (0.308)
Age in years	0.368* (0.120)	0.149 (0.119)	0.061** (0.218)	0.409** (0.127)
Usual grades	−0.317 (0.179)	−0.672*** (0.174)	−0.306 (0.462)	−0.238 (0.199)
Socioeconomic status	0.046 (0.061)	0.109† (0.058)	0.107 (0.185)	0.031 (0.069)
−2 log likelihood (d.f.)	772.6 (8)	867.8 (8)	97.8 (8)	523.0 (8)
Nagelkerke pseudo R^2	0.049	0.044	0.133	0.056
N	311	311	309	311

Estimates and standard errors (in parentheses) from models with random (school level) and fixed effects.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

† $p < .10$.

Table 3

Mixed model estimates predicting substance use intentions, norms, expectancies, peer use and substance offer variables

	Substance use intentions	Normative approval of substance use	Positive drug expectancies	Peer substance use	Substance offers received	Sells or gives substances	Pressured to use substances	Substance offer vulnerability
Affective femininity	−0.079 (0.053)	−0.249*** (0.073)	−0.166* (0.076)	−0.060 (0.080)	−0.091 (0.123)	−0.064* (0.030)	0.106* (0.051)	−0.072 (0.089)
Assertive masculinity	−0.002 (0.049)	−0.103 (0.069)	−0.076 (0.071)	0.154* (0.075)	0.100 (0.114)	0.008 (0.028)	−0.028 (0.047)	−0.028 (0.083)
Submissive femininity	−0.010 (0.049)	0.016 (0.068)	−0.020 (0.071)	−0.010 (0.074)	−0.042 (0.114)	−0.026 (0.028)	−0.004 (0.047)	0.005 (0.082)
Aggressive masculinity	0.197*** (0.054)	0.262*** (0.075)	0.218** (0.078)	0.171* (0.082)	0.499*** (0.127)	0.095** (0.031)	0.044 (0.053)	0.147 (0.092)
Female vs. male	−0.021 (0.081)	−0.387*** (0.113)	−0.117 (0.117)	0.097 (0.124)	−0.395* (0.189)	−0.075 (0.046)	−0.116 (0.078)	−0.192 (0.137)
Age in years	0.068† (0.040)	0.217*** (0.055)	0.076 (0.058)	0.001 (0.060)	0.238* (0.093)	0.011 (0.023)	−0.014 (0.039)	0.056 (0.068)
Usual grades	−0.169** (0.056)	−0.038 (0.075)	−0.010 (0.083)	−0.089 (0.086)	−0.325* (0.127)	−0.051 (0.0321)	−0.007 (0.052)	−0.173† (0.095)
Socioeconomic status	0.009 (0.018)	0.056* (0.025)	0.017 (0.026)	0.019 (0.028)	0.065 (0.042)	0.007 (0.010)	0.011 (0.017)	−0.006 (0.030)
Intercept	0.876 (0.318)	0.031 (0.444)	2.262 (0.495)	−1.103 (0.509)	0.309 (0.735)	1.175 (0.185)	0.183 (0.304)	1.843 (0.540)
−2 log likelihood (d.f.)	640.5 (8)	819.6 (8)	867.0 (8)	871.9 (8)	1155 (8)	304.4 (8)	621.9 (8)	961.1 (8)
Nagelkerke pseudo R^2	0.009	0.055	0.006	0.013	0.029	0.037	0.048	0.012
N	311	305	311	311	311	311	311	311

Estimates and standard errors (in parentheses) are from mixed models with random (school level) and fixed effects.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

† $p < .10$.