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Gender Differences in Drug Resistance Skills of Youth in Guanajuato, Mexico

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Abstract

Research is limited or absent on Mexican adolescents' exposure to substance offers, ways of dealing with these offers, and possible gender differences in responses to offers. Extending U.S.-based research, this study examines how youth living in the Mexican state of Guanajuato employ the four drug resistance strategies—refuse, explain, avoid, and leave—that are part of the Keepin' It REAL evidence-based drug prevention intervention. The analysis uses cross-sectional survey data from 702 students enrolled in eight alternative secondary education sites in 2007. Participants reported the drug resistance behaviors they used to deal with offers of alcohol, cigarettes, and marijuana. Using multivariate regression, findings indicate most youth had developed repertoires of drug resistance strategies that involved multiple REAL strategies and some other strategy as well. For those receiving offers, the most common strategy was to refuse the offer with a simple “no.” However, males used all the strategies significantly more often than females for situations involving cigarettes and marijuana as well as when using refuse and non-REAL strategies for alcohol. Possible reasons for the gender difference in use of strategies are discussed. The findings can help inform effective prevention programs based on teaching culturally appropriate drug resistance and communication skills.

Keywords

Adolescents; Substance use; Substance use offers; Mexican youth; Drug resistance

Introduction

Trends in Youth Substance Use in Mexico and the US

Drug use has become a shared Mexican–U.S. public health concern as previously lower substance use rates among Mexican youth have become increasingly similar to those in the U.S. (Medina-Mora et al. 2003) and in some cases have surpassed the rates of U.S. adolescents. Alcohol, the most commonly used substance in Mexico (Felix-Ortiz et al. 2001), is consumed at higher rates among Mexican adolescents than among U.S. adolescents. Almost three-quarters (74%) of high school students in northern Mexico report using alcohol in the past 30 days (Medina-Mora et al. 1992) compared to 42% of 12th graders in U.S. national surveys (Johnston et al. 2009). In a more direct comparison, Mexican-heritage youth living in the U.S. state of California reported lower rates of alcohol use than Mexican-heritage youth living in Baja California, Mexico (Felix-Ortiz et al. 2001). There are also indications that initiation of alcohol use in Mexico may occur at an early age, with most adolescents in Mexico beginning to drink alcohol before reaching the legal drinking age of 18 (Herrera-Vasquez et al. 2004; Latimer et al. 2004). A study using a small, non-probability sample of elementary school students in Guanajuato, Mexico—the site of the current study—found that 30% of 7-year-olds had used alcohol (García Campos and Ferriani 2008).

Smoking rates among adolescents in Mexico have also increased, with 52.3% of female and 58.7% of male adolescents reporting any lifetime cigarette use (Santillan et al. 2002). In comparison, smoking rates among U.S. teenagers have trended downward, with 43.6% of 12th graders now reporting any lifetime cigarette use (Johnston et al. 2009). As with the onset of alcohol use, early initiation into cigarette use is endemic in Mexico. Of the estimated 13 million regular cigarette smokers throughout Mexico—approximately 20% of the adult population—more than 60% started smoking before the age of 18 (Tapia-Conyer et al. 2001). In their Guanajuato elementary school sample, García Campos and Ferriani (2008) reported 8.1% of the children had used cigarettes by age 7.

Although alcohol and cigarettes are the most common legal substances used by Mexican adolescents, marijuana, followed by stimulants/tranquilizers, are the illicit drugs used most often (Benjet et al. 2007b; Caraveo-Anduaga et al. 1999). Among adolescents aged 12–17 living in Mexico City, 5.2% reported lifetime use of illicit drugs, and 2.9% reported use in the last 12 months. For older age groups, aged 18–29, 25.0% of males and 5.5% of females reported using at least one illicit drug in their lifetime (Medina-Mora et al. 2006). When compared to U.S. rates of illicit drug use, Mexican adolescents are far less likely to use. Although rates have been declining for a decade, over a third (36.8%) of U.S. high school students (grades 9th–12th) still report having used marijuana (Centers for Disease Control and Prevention 2010).

Gendered Risk Factors for Substance Use in Mexico

Traditional gender roles, attitudes, and expectations appear to put young Mexican females and males at different levels of risk for drug use. The traditional expected gender roles for males can be summarized as being the provider for the family while maintaining his independence, strength, and success. These roles have been traditionally supported by the ascribed archetype of *machismo* that includes both undesirable and desirable traits. The negative aspect of *machismo* is usually described as a form of hypermasculinity: encouraging risk taking, aggression, and violence toward women (Goldwert 1983; Gutmann 1996; Harris et al. 2005); increased drug and alcohol use (Félix-Ortiz and Newcomb 1995; Kulis et al. 2003; Orozco and Lukas 2000); and higher levels of stress and depression (Fragoso and Kashubeck 2000). The more positive traits associated with *machismo* center

around honor, bravery, and a deep commitment to family wellbeing (Gutmann 2003). Expected gender roles for females are described by the traditional role of *marianismo*, which is concerned with taking care of the children, the household, and the spouse in a capable, strong, and interdependent way as well as being self-sacrificing, patient, and submissive (Rocha-Sanchez and Diaz-Loving 2005). The diverging gender socialization patterns for men and women in Mexico, and their connection to deep cultural values, have important implications for substance use.

Overall, gender differences in substance use have been larger and more persistent in Mexico than in the U.S. (Kulis et al. 2008b). Although male and female substance use patterns have begun to converge in Mexico (Medina-Mora et al. 2006), females continue to consume significantly less alcohol, tobacco, and other drugs than males (Caraveo-Anduaga et al. 1999; Medina-Mora et al. 2003; Medina-Mora and Rojas Guiot 2003). The absolute difference in drug consumption between males and females in Mexico may be driven, at least in part, by fewer opportunities for women to consume drugs. In a Mexico City survey of adolescents aged 12–17, males were more likely to have been exposed to drugs, but, interestingly, females were equally likely to use drugs if given the opportunity (Benjet et al. 2007a).

The difference in drug consumption between males and females in Mexico has been attributed to cultural norms that encourage or allow men to become intoxicated, which are endorsed by both men and women in Mexico. There is much less tolerance for excessive alcohol use by women, and women are less likely to engage in binge drinking, or *borracheras* (Caetano and Medina-Mora 1988; Caraveo-Anduaga et al. 1999; Medina-Mora et al. 2003; Medina-Mora and Rojas Guiot 2003; Villatoro et al. 1998). For example, 66% of male drinkers binge drink (e.g., consume five to six drinks of alcohol at a time) compared to only 16% of females. In addition, more than 20% of both men and women who drink alcohol agree that it is acceptable for a 30-year-old man to drink to inebriation, but only 6% say that such drinking is acceptable for a 30-year-old woman (Medina-Mora and Rojas Guiot 2003). These cultural norms are also associated with gender differences in age of alcohol and tobacco initiation. The early initiation of Mexican males, relative to females, into alcohol and tobacco use has been linked to their subsequent higher propensity to use other drugs (Wagner et al. 2003).

Consumption of alcohol and drugs in Mexico is also related to socioeconomic factors. Family wealth and income influence access to social networks where various substances are available, as well as the ability to purchase the substances. Educational attainment also places adolescents in Mexico at risk for substance use. Adolescents in Mexico who are not enrolled in school have much greater odds of being exposed to drugs and subsequently consuming them (Benjet et al. 2007a), although it is unclear whether dropping out of school is the cause or the result of exposure to more opportunities to use drugs or if a third factor is responsible for leaving school and becoming immersed in drug use. In the state where the current study took place, Guanajuato, only 35.8% of youth 16–19 were estimated to be in school (Instituto Nacional de Estadística Geografía e Informática 2005). Studies based on school surveys of adolescents thus provide a limited picture of substance use among Mexican adolescents because more than half of adolescents in Mexico drop out of school after the 6th grade (Medina-Mora and Rojas Guiot 2003). The current study is unusual in that it uses a probability sample of adolescents enrolled in an alternative school system designed for those who are typically unable to access or afford a secondary education.

Drug Offers and Drug Resistance Strategies

Research is limited on Mexican adolescents' exposure to substance offers and ways of dealing with these offers. In a national survey, over a third of Mexican adolescents (35%)

reported that it would be easy to obtain illicit drugs, and 21% of males and 10% of females said they had been offered drugs (Medina-Mora et al. 2003). Exposure to these offers markedly increases the risk of using substances. Estimates indicate that one in three adolescents in Mexico who have the opportunity to consume cocaine do so (Tapia-Conyer et al. 2003). Existing evidence on the social contexts of substance offers in Mexico suggests that youth are exposed to alcohol use most often in family settings, where nearly three-fourths of Mexican adolescents who drink say they first began to use alcohol (Mora-Ríos and Natera 2001). In contrast, large majorities of Mexican youth reporting offers of illegal substances say the offers came from friends, typically at parties or other gatherings of peers (Nuño-Gutierrez and Flores-Palacios 2004; Tapia-Conyer et al. 2003; Wagner et al. 2003), and rarely came from strangers or drug dealers (Medina-Mora et al. 2001).

There is some evidence of gender differences among Mexican adolescents in the degree of exposure to substance offers and the source of the offer. Males are more than twice as likely to receive drug offers than their female counterparts, and of those reporting easy access to drugs, males (67%) are more likely than females (57%) to receive offers from friends (Medina-Mora and Rojas Guiot 2003). Little is known, however, about the way in which each gender handles these offers except for small and regionally limited studies using convenience samples. A study of two secondary schools in Monterrey, Mexico, showed that, after controlling for the degree of exposure to substance offers, female adolescents were somewhat more likely than males to use passive strategies like avoiding or leaving situations where licit substances like alcohol and cigarettes would be offered to them, but no gender differences emerged in the strategies used to deal with offers of marijuana (Kulis et al. 2008a). Research on Mexican heritage samples in the U.S. provides some similar indications of these gender differences in exposure to drug offers and the types of strategies used to resist them (Kulis et al. 2005; Marsiglia et al. 2005; Moon et al. 1999). Further work to establish the prevalence of use of different drug resistance strategies in Mexico and how they vary by gender would help to clarify culturally related processes that protect individuals against drug use, an important step for designing effective prevention programs for Mexican youth.

Research on culturally specific resistance strategies used effectively by youth of Mexican descent living in the U.S. indicates that four strategies are most commonly used: Refuse, Explain, Avoid, and Leave (Marsiglia and Hecht 2005). Together these resistance strategies form the acronym *REAL*, which is part of the Keepin' It REAL evidence-based drug prevention intervention that is a model program on the National Registry of Evidence-Based Programs and Practices (Substance Abuse and Mental Health Services Administration 2010). *Refuse* is simply saying "no." *Explain* is a refusal that includes a reason why the person is declining the offer. *Avoid* is staying away from a situation or place where drugs might be offered. Lastly, *Leave* is an exit strategy used when the person is already in a situation where drugs are being offered. Considerable research indicates that drug resistance strategies are shaped by cultural and developmental factors that reflect preferences for certain communication styles and for the maintenance of important cultural values (Gosin et al. 2003; Hecht et al. 1989; Moon et al. 1999). The purpose of the present study is to enhance knowledge on the impact of culture and gender on drug resistance strategies by examining the drug resistance strategies used most often by adolescents in one central Mexican state.

Methods

This article reports on the drug resistance strategies used by a sample of youth from the state of Guanajuato, Mexico. Participants were youth enrolled in an alternative secondary education program that relies extensively on distance education to serve those not reached

by traditional public schools, especially rural and poorer population sectors. This alternative program, called Videobachillerato (VIBA), is a subsystem of the state-sponsored Sistema Avanzado de Bachillerato y Educación Superior (SABES; Advanced System of Baccalaureate and Higher Education). VIBA operates through an extensive network of 252 centers in the state. When data collection for this study took place, there were more than 25,000 enrolled students in VIBA centers.

The current analysis employs cross-sectional survey data from 702 students enrolled in eight VIBA centers during the school cycle of January–June of 2007. These VIBA centers were randomly selected from a list of the 137 centers located within a radius of 100 km of the largest city in Guanajuato, León, which is a major transportation hub. The eight selected centers encompassed most of the larger population centers in the state, including sites in the municipalities of León, Guanajuato, Irapuato, Pénjamo, San Felipe, Dolores Hidalgo, and San Diego de la Unión. Self-administered questionnaires were completed by students in each VIBA center under the direction of the university research team and with the assistance of regular teachers. Students were told the data they provided would be anonymous and would not affect their grades or school standing. The protocol for data collection was approved by the researchers' university IRB and by SABES representing the State of Guanajuato. SABES conducted the single wave of data collection and then sent the data to the researchers without any individual identifiers.

Measures

Except for an indicator of the size of the locality, all measures were self-reported by students. The key dependent variables, drug resistance behaviors, were assessed by asking how often within the last 12 months students had used different strategies to deal with offers of alcohol, cigarettes, and marijuana. They reported use of five different strategies for each of these three substances. Four of the strategies were those that have been found to be common among adolescents in the United State: Refuse (simply saying no), Explain (declining with an explanation), Avoid (staying away from people or situations where substances are offered), and Leave (exiting situations or places where substances are offered). Students also reported how often they had used some other (unspecified) strategy to resist offers of substances. Questions about the frequency of use of each resistance strategy were Likert-scaled items with the following response options: “never” (coded 0), “once” (code 1), “2–3 times” (coded 2.5), “4–5 times” (coded 4.5), “6–10 times” (coded 8), and “more than 10 times” (coded 11). These items were developed, validated, and tested in the original randomized trial of Keepin' It REAL that was conducted in Arizona (see Hecht et al. 2003).

In addition to the use of drug resistance strategies, students reported the number of substance offers they had received in the last 12 months for alcohol, cigarettes, and marijuana. Response options were “none” (coded 0), “one offer” (coded 1), “2–3 offers” (coded 2), “4–6 offers” (coded 3), “7–10 offers” (coded 4), and “more than 10 offers” (coded 5). These concrete response formats (as opposed to other commonly used Likert-type anchors such as “strongly disagree” to “strongly agree”) have been shown to work well with Mexican and Mexican American Spanish-speaking populations (Knight et al. 2009). These measures were included in multivariate analyses to control for differential exposure to substance use opportunities.

Demographic variables in the analyses included gender, age, family structure, parental education, family socioeconomic status, academic performance, and size of the locality. The participants identified their gender as female or male and reported their age in whole years. Family structure was measured as a set of dummy variables indicating whether the student lived with both parents (the reference category), with only one parent, or with neither parent.

Parental education was measured as the highest level of attainment of either the student's father or mother and was coded from 1 to 8: no education, some primary school, primary school completion, some secondary school, secondary completion, some pre-college (*preparatoria*), pre-college completion, and more advanced education beyond the *preparatoria*. Family socioeconomic status was measured as a mean scale of seven items where students indicated if there was enough money in their home to pay for (a) food, (b) transportation, (c) utilities, (d) school fees, (e) clothes one needs, (f) clothes one desires, and (g) entertainment. Response options for these seven items were "always" (coded 4), "almost always" (coded 3), "sometimes" (coded 2), and "never" (coded 1). Academic performance was measured by average grades in school, with these response options: "90–100%" (coded 4), "80–89%" (coded 3), "70–79%" (coded 2), "0–69%" (coded 1). This scale approximates a grade point average (GPA) measured on a 1.0–4.0 scale. Size of the locality, a measure of urbanism, was determined by the population of the area in which the VIBA center was located, based on population counts reported in the Mexican national census. This variable was coded 1 for larger urban centers of at least 150,000 residents and coded 0 for smaller locales.

Analysis Strategy

The chief aim of this explanatory study was to assess the extent to which the REAL drug resistance strategies—Refuse, Explain, Avoid, and Leave—and other strategies were utilized by a sample of youth in Guanajuato, Mexico, and how use of these strategies might differ by gender and other demographic characteristics. After presenting descriptive statistics on the use of the REAL strategies and other strategies for the total sample and for each gender, multivariate regression analyses were conducted to test whether the use of the drug resistance strategies varied by gender, age, family structure, socioeconomic status, academic performance, and size of the locality. Separate models were estimated for the frequency of use of each type of resistance strategy and in connection with offers of three different substances: alcohol, cigarettes, and marijuana. Two models are presented for each outcome, one without and another with controls for the number of offers of the substance that the respondent received in the last 12 months.

Results

Descriptive statistics in Table 1 indicated that the total sample included fewer males (40%) than females (60%). Students ranged in age from early adolescence to early adulthood, although a large majority (78%) was in mid-adolescence between 15 and 17 years of age. Most (83%) lived at home with both parents. Means for the socioeconomic measures indicated that a typical student lived with parents whose highest level of education was some secondary school and that there was enough money at home for various items "sometimes" or "almost always." The typical student's grades were between Cs and Bs. Fewer than half (44%) of the students lived in large urban centers (population 150,000 or more).

Descriptive statistics for the number of offers of substances in the last 12 months showed that offers of alcohol were the most common, and offers of marijuana were relatively rare. In addition to the mean for these variables there is a column presenting the percentage of respondents with scores above 0, indicating the proportion who had received at least one offer. Over two-thirds of the students received offers of alcohol, and over half were offered cigarettes; only 9% had been offered marijuana.

When examining the use of REAL strategies as well as some other strategy, in Table 1, over 50% of the total sample used each of the REAL strategies in response to alcohol offers, and around two-fifths used them for cigarette offers. Although less than 20% of the students used Refuse, Explain, and Leave in response to marijuana offers, nearly half reported that

they deliberately avoided situations where marijuana could be offered to them. Use of strategies other than REAL followed patterns for particular substances, with more use of these unspecified other strategies for alcohol and cigarettes than for marijuana. The statistics describing use of resistance strategies in Table 1 include both students who reported that they had received offers of the particular substance as well as those not receiving those offers. When considered in relation to the proportion of students who had been exposed to substance offers, the students' use of resistance strategies emerges more revealingly (data not presented in tables). Of the 68 percent of students who received alcohol offers, 75% used Refuse, 67% used Explain, 66% used Avoid, 65% used Leave, and 55% used a non-REAL strategy. Of the 51 percent of students who received cigarette offers, 70% used Refuse, 60% used Explain, 52% used Avoid, 58% used Leave, and 54% used a non-REAL strategy. Finally, of the small minority (9%) who received marijuana offers, 68% used Refuse, 61% used Explain, 64% used Avoid, 64% used Leave, and 68% used a non-REAL strategy. Thus, among the students exposed to offers of particular substances in the last year more than half reported using each of the REAL strategies as well as another strategy. For licit substances (i.e., alcohol and cigarettes), the most commonly used strategy was Refuse, but for marijuana, strategies other than REAL were used as commonly as Refuse.

The descriptive statistics presented separately for male students and for female students in Table 1 point to important gender differences in their use of resistance strategies, exposure to substance offers, and certain demographic characteristics. The last column of the table reports results of *t*-tests of mean differences by gender on all study variables. Compared to females, males were significantly older, came from higher socioeconomic status homes, received lower grades, and were more likely to live in larger population centers. Males also were significantly more likely than females to receive offers of all three substances. Males were five times more likely than females to receive offers of marijuana, nearly twice as likely to receive cigarette offers, and a quarter more of the males than of the females were offered alcohol. At least in part as a result of this gender difference in exposure to substance offers, males used all four REAL strategies as well as other strategies significantly more frequently than females and for all substances, with only one exception: There were no significant gender differences in the use of the Avoid strategy to deal with alcohol offers.

Beyond the preceding portrayal of the use of individual strategies to deal with substance offers, Fig. 1 depicts the prevalence of various drug resistance repertoires (i.e., use of combinations of strategies). As in Table 1, the figure includes both those who were offered the particular substance and those who did not receive offers. To produce the figure, the outcomes measuring frequency of use of each drug resistance strategy for each substance—the four REAL strategies and any other strategy—were first dichotomized into Non-use or Use, regardless of frequency. After examining the number of students reporting each of the possible combinations of these five dummy variables, some combinations were collapsed to highlight the most common repertoires, which were to use none of the strategies; Avoid only; only one of the remaining REAL strategies (Refuse, Explain, or Leave); only a strategy other than REAL; two or three REAL strategies in combination; two or three REAL plus another strategy; four REAL strategies; and the full repertoire of all four REAL plus another strategy.

In part due to differential exposure to offers of alcohol, cigarettes, and marijuana, the drug resistance repertoires varied by substance. For alcohol—the substance offered most frequently—the most common repertoire was to employ all four REAL strategies along with some other strategy (23%). Nearly as common was to use two or three REAL strategies, either with a non-REAL strategy (21%) or without one (21%). Students were much less likely to use single strategies than combinations of strategies for alcohol, but the most common single strategy was Avoid (11%). The pattern for cigarettes was similar to that for

alcohol, but with a higher proportion of students using no strategies at all (30%). A different pattern emerged for marijuana, which had not been offered to most of the students. A large proportion of students (39%) reported using no strategies at all for marijuana, and next most common was to use Avoid alone (23%) or two or three REAL strategies together (20%). For all three substances, students rarely (1% or less) relied solely on a single strategy other than REAL. On the other hand, there were few students (6% or less) who used all four REAL strategies without also using a non-REAL strategy as well.

Multivariate regression models (Tables 2, 3, 4) examined the frequency of use of the REAL strategies in the last 12 months using gender, age, family structure, socioeconomic status, academic grades, urban locality, and the frequency of offers of each substance (alcohol, cigarettes, and marijuana) as predictors. These models were also re-estimated without controls for the frequency of offers (not reported in tables); discrepant results are reported in the text below.

Table 2 reports on the use of various strategies to deal with alcohol. Gender predicted more frequent use of Refuse and Other (non-REAL) strategies, with males more likely than females to use them. When the frequency of alcohol offers was removed from the models, males used of all the strategies except Avoid significantly more often than females. This suggests that males used Explain and Leave relatively more often mainly because they received more alcohol offers, but males used Refuse and Other strategies more often than females who received an equivalent number of offers. Students with better grades used the Avoid strategy more often as well as Other strategies. Except for Avoid, students reporting more alcohol offers also reported more frequent use of each strategy. The models including offer frequency explained about 12% of the variance in use of Refuse and Explain but much less variance in the use of other strategies.

Regression results for cigarette strategies in Table 3 showed males more likely than females to use all the strategies, and the same pattern was found in models without controls for the number of cigarette offers received. Older students used Avoid and Other strategies more frequently. Students from higher SES families used Explain and Leave more often. Offer frequency contributed substantially to explained variance in the models predicting use of Refuse and Explain but less so for other substances.

Gender emerged again as a strong and consistent predictor of use of strategies to deal with opportunities to use marijuana (Table 4), with males more likely than females to use all of the strategies. As with cigarettes, older students used Avoid more often for marijuana as well. The small proportion of students not living with their parents (3%) were significantly more likely to use Refuse and Explain for marijuana offers, even controlling for age. Students with more educated parents reported more frequent use of all strategies except Avoid for marijuana. Students with better grades used Refuse more often for marijuana, and those from more urbanized locales used the Leave strategy less often. Except for Avoid, where the model explained a trivial proportion of variance, the models explained 11–16% of the variance in use of all other strategies to deal with marijuana.

Discussion

In this probability sample of Guanajuato youth, exposure to substance offers varied widely by substance, with over two-thirds of adolescents offered alcohol in the last year, about half offered cigarettes, and less than 10% offered marijuana. Among those offered these substances, sizable majorities reported using an array of strategies to resist using substances. For those receiving offers, the most common strategy was to Refuse the offer with a simple “no,” a strategy employed by 68–75%, depending on the substance. This finding is notable

both for the large proportion turning down offers in this way, and, from a cultural perspective, their selection of such a direct, even abrupt, way of resisting the offer. The other REAL strategies—Explain, Avoid, and Leave—were also employed by majorities of the youth exposed to substance offers: by 52–58% of those offered cigarettes and by 61–64% of those offered marijuana. Majorities of those offered substances also used other non-REAL strategies as well: 55% of those offered alcohol, 54% of those offered cigarettes, and 68% of those offered marijuana.

Most youth had developed repertoires of drug resistance strategies that involved both multiple REAL strategies and some other strategy. Only one strategy, Avoid, was used alone by an appreciable proportion of students, and many of those students had never received substance offers. For example, while only 9% of the students were offered marijuana in the last year, almost half (47%) the students who were not offered said that they had deliberately avoided situations where marijuana might be offered. This suggests that, by avoiding marijuana offers, a large proportion of these students eschewed or limited their use of marijuana.

Thus, a picture emerges of Guanajuato youth relying both on the REAL strategies used most often by youth in the United States (Moon et al. 1999), including Mexican American youth (Kulis et al. 2005), as well as use of strategies other than REAL. Moreover, the pattern and prevalence of use of these strategies is quite similar to reports of drug resistance strategies used by a convenience sample of adolescents in public secondary schools in Monterrey, a major urban center in northern Mexico (Marsiglia et al. 2009). The cross-national similarities in the prevalence of REAL strategies may be, at least in part, a reflection of cultural diffusion. Both Guanajuato and Monterrey are areas of Mexico that have experienced high rates of migration to the United States and a strong penetration of elements of “American” culture, including permissive attitudes toward drug use. For over a century, Guanajuato has been a major sending area for U.S. migration, and the long migration histories of many of its families create extensive cross-border social networks (Massey et al. 2002). Through return migration and visits, these networks may expose youth in Guanajuato to the more relaxed drug norms in the U.S., while remittances from U.S. relatives help raise household living standards and increase the affordability of substance purchases (Borges et al. 2007). Acculturation to U.S. norms is also encouraged by strong approval of, and expectations for, youth to migrate as a means of achieving long-term economic mobility (Cornelius 1981; Kandel and Massey 2002)

The REAL strategies were a salient way for these youth in Guanajuato to deal with drug offers, but usually they were used in combination with Other strategies which may reflect the particular social and cultural context of their central Mexico locale. Additional research is needed on the nature of these other strategies and how they may reflect cultural norms and communication styles. Qualitative research on drug resistance of various ethnic minority youth populations in the United States, including urban American Indians and Hawaiian natives, has found that many of the non-REAL strategies in their repertoire are culturally influenced variations on the approaches represented in the REAL strategies (Kulis et al. in press; Okamoto et al. 2010). For example, although both these groups of native youth report that half or more of their likely responses to drug offers fall clearly into the REAL categories, the remaining strategies often reflect ways to blend the REAL strategies (e.g., Refuse and then Explain) or achieve their objective in a different way (e.g., instead of avoiding drug use opportunities, evading use by pretending to use the substance or surreptitiously discarding it). These alternatives emerge because of pressure on youth to remain in certain family and peer environments that cannot be avoided or exited easily and where strong refusals may not be culturally appropriate. A similar research approach undertaken with Mexican youth could illuminate the extent to which the REAL strategies

are utilized in somewhat distinct cultural variations and whether socially competent alternatives to the REAL strategies are part of their repertoire. This research could inform prevention programs designed specifically for this population. Given the strong differences between males and females in the current study in their use of drug resistance strategies, it would be advisable to analyze these qualitative data by gender groups.

Gender differences in substance offers and in the use of REAL strategies and other strategies were pronounced. Compared to females, males received more frequent offers of all three substances examined, and this accounted partially for their more frequent use of most strategies. A similar pattern has been reported among high school students in the United States, with males reporting relatively higher and more wide-ranging exposure to substance offers than is reported by females (Alberts et al. 1992; Moon et al. 1999). However, the results from the current study of Mexican youth show that, even after controlling for offer frequency, males used all the strategies significantly more often than females for situations involving cigarettes and marijuana as well as when using Refuse and non-REAL strategies for alcohol. Traditional gender roles of *marianismo* and *machismo* are likely to help insulate female adolescents from exposure to alcohol and drug offers while simultaneously promoting the exposure of males to substance use opportunities, but gender roles do not provide a simple explanation for the gender differences in the use of resistance strategies that emerged even among those reporting the same level of exposure to substance offers.

It is important to note that males used all the types of strategies more often than females, both passive strategies like Avoid or Leave (for cigarettes and marijuana) as well as the simple, direct Refuse strategy (for all substances). The relative disinclination of females to report use of resistance strategies, even after controlling for their relative lack of exposure to substance offers, raises questions for future research. Are males and females in Mexico socialized in ways that leaves females relatively more uncertain or unprepared to deal with substance offers, less knowledgeable about the range of possible drug resistance strategies, or less empowered than males to resist in social environments where substances are offered? In the United States, research on gender differences in resistance strategies has shown that youth who employ the Refuse strategy often face increased pressure to accept the substance offer, and that this subsequent pressure is greater for females than for males who initially refuse (Hecht et al. 1992). Other U.S. studies document how males and females tend to receive substance offers from different offerors: Males are offered by other males who are relatives, strangers, or acquaintances, usually in public settings; females are offered by female acquaintances or peer family members and by boyfriends, usually in private settings (Moon et al. 1999). Although the current research did not include information on the person offering substances or the setting of the offer, these factors may play a role in the gender differences observed among this Mexican sample. If so, these contextual factors are likely to be connected in complex ways to the persistence of traditional gender roles in Mexico.

Central Mexico has been identified as a socially conservative region of the country (Cortés-Guardado and Shibya-Soto 1999) where traditional, conservative gender roles are still in place (Nuño-Gutierrez and Álvarez-Nemegyei 2006). Drug sellers and those offering drugs may observe traditional ethical codes of respecting the purity of women as mothers and sisters by avoiding offering drugs to females or perhaps offering the drugs in a different way (Nuño-Gutierrez and Álvarez-Nemegyei 2006). Substance offers to women may be made in a less direct or assertive way than they are made to men, perhaps in a manner that can be ignored politely or without expecting a reply. More research, perhaps through an ethnographic approach, is needed into possible differences in the ways that drug offers are made to Mexican men and women. Also, as Mexican women continue to advance socially and enter the labor market and other social spheres previously restricted to men, they may be exposed to more drug offers and adopt new ways of resisting these offers.

The strongest predictor of use of the REAL strategies was a measure of opportunity—the number of substance offers—which accounted for much of the explanatory power of the models predicting frequency of use of the resistance strategies. However, use of different strategies may be both a consequence of and an influence on such opportunities. Though those receiving more offers used virtually all strategies more frequently, more frequent use of the Avoid strategy was inversely related to the number of alcohol and marijuana offers.

Unlike the pattern of gender differences, there were no general trends in the use of resistance strategies according to age, family structure, socioeconomic status, academic performance, or size of locale. A few substance-specific findings emerged. Older students used Avoid more frequently than younger students for cigarettes and marijuana (but not for alcohol), even after controlling for offer frequency. As they mature, students may develop more nuanced avoidance skills in response to changes in their social networks and social situations where various substances may be offered to them (Clark et al. 1986; Hecht and Driscoll 1994). Because alcohol use is widely accepted and perhaps pervasive in social situations routinely encountered by older adolescents and young adults, avoiding alcohol offers may not be a viable option.

Family background was related to use of selected strategies and substances. Students who were not living with their parents, many of whom were living independently with a partner, used Refuse and Explain more often for marijuana. Students with better educated parents used all the strategies except Avoid more often for marijuana. Students from relatively wealthier homes (those with less of a shortage of money) used Refuse, Explain, and Leave more often for cigarettes. These findings may reflect a variety of factors. Youth from higher SES backgrounds (i.e., youth with better educated parents and/or from relatively wealthier homes) may rely on REAL strategies other than Avoid because their social environment may make it harder to avoid social situations in which substances are available, relative to youth from lower SES backgrounds. That is, youth living independently and those from higher SES backgrounds may develop and rely on a repertoire of more active and assertive resistance skills because their social environments and opportunities to use substances are different. Mexican youth with better educated parents have been found at higher risk of substance use because they are more likely to be able to purchase those substances or find them available at home (Felix-Ortiz et al. 2001). In national surveys, Mexican youth who perform better academically have been found to use substances much less frequently (Medina-Mora et al. 2003), but in the Guanajuato sample, school grades were not clearly related to different patterns of drug resistance strategies. Better grades in school were associated with two scattered findings: more frequent use of Refuse for marijuana and Avoid for alcohol. Although population size would seem a likely determinant of opportunities for using substances, size of locale emerged as a factor in drug resistance strategies for only one outcome: students from larger population centers used Leave less often for marijuana.

Limitations

Although this study utilized a probability sample, it was limited to one central state of Mexico and included only youth enrolled in an alternate secondary school system that is designed to serve poor and remote located families who typically cannot access public education beyond primary school. Results showed many parallels with a similar study in the northern Mexican city of Monterrey (Marsiglia et al. 2009). However, the findings do not necessarily describe youth in other regions of Mexico or students drawn from other socioeconomic sectors—especially those who have dropped out of school in early or mid-adolescence, a group at very high risk of drug abuse—or even students attending a more typical *preparatoria* or high school in Mexico. Paradoxically, attendance at regular *preparatorias* has been identified as a risk factor for certain kinds of drug use (Nuño-

Gutierrez and Álvarez-Nemegyei 2006). Perhaps the students in the current study are different because it takes more effort for them to access their alternative secondary education program and because they are aware that this opportunity would otherwise not be open to them. Thus, they may place a different value on the educational experience and do not want to jeopardize their chances of succeeding at school by using drugs, enabling them to refuse drug offers in a direct way. This hypothesis needs to be confirmed in future qualitative research exploring the reasons that students used different refusal strategies. Future studies can also expand the scope of the sample to include north, south, and central Mexico as well as adolescents no longer enrolled in school. These efforts would provide greater clarity about the types of strategies used with success by youth in Mexico to resist using substances, creating a more solid basis for designing effective drug use prevention programs.

Another possible limitation in assessing the findings is the reliance on self-reported measures of drug resistance strategies and exposure to substance offers. Unlike reports of actual use of substances, resisting drug offers is not a highly stigmatized behavior that might be expected to lead to serious underreporting. Nevertheless, respondents may feel that reports of frequent exposure to substance offers and subsequent drug resistance efforts carry an implication of guilt by association, i.e., that the respondent associates with drug using peers or that family members are substance users. Although the study had no means of assessing this bias, it is possible that it might apply more to females than to males, given the nature of traditional gender roles in Mexico that discourage substance use among females more strongly than among males.

Conclusion

This study traced the patterns of drug resistance strategies used by youth from population segments that are rarely assessed through population surveys in Mexico—those who cannot afford or do not have access to secondary education, a group who account for as much as half of Mexico's youth. This probability sample of youth in alternative secondary schools in a central Mexican state reported widespread use of the same drug resistance strategies as adolescents in the United States as well as those used by youth from more typical secondary schools in a large city of northern Mexico. This knowledge, paired with the knowledge of Mexican cultural norms and values, expands the existing foundation for evidence-based drug prevention and treatment programs in Mexico. Effective prevention programs based on teaching culturally appropriate drug resistance and communication skills can build on these findings that Mexican youth employ a range of drug resistance skills.

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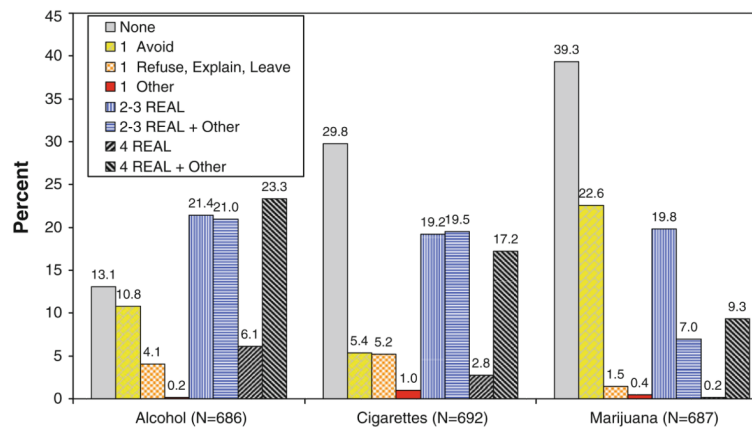


Fig. 1. Combinations of Drug Resistance Strategies Used in Last 12 months, by Substance

Table 1

Descriptive statistics for study variables, for total sample, and by gender

Variable	Total			Males			Female			Gender differences <i>t</i> test	
	N	Range	Mean SD	% Non-zero	Mean SD	% Non-zero	Mean SD	% Non-zero	Mean SD	% Non-zero	
Gender (female = 0, male = 1)	693	0-1	0.40 0.49		1 0		0 0				-
Age	693	14-24	16.63 1.42		16.79 1.42		16.52 1.41				2.42*
Two parent home	685	0-1	0.83 0.38		0.81 0.39		0.83 0.37				-0.67
Single parent home	685	0-1	0.14 0.35		0.16 0.37		0.13 0.34				1.24
No parent home	685	0-1	0.03 0.17		0.02 0.15		0.04 0.19				-1.11
Parental education	700	1-8	3.81 1.89		4.08 2.00		3.66 1.80				2.77**
Family SES	698	1-4	2.89 0.58		3.04 0.56		2.80 0.58				5.42***
Grades	697	1-4	2.58 0.72		2.46 0.72		2.67 0.72				-3.77***
Urban (pop. ≥ 150,000)	702	0-1	0.44 0.50		0.52 0.50		0.39 0.49				3.38***
Alcohol—# of offers	694	0-5	1.57 1.57	67.9%	2.31 1.70	83.3%	1.11 1.29				9.85***
Cigarettes—# of offers	692	0-5	1.22 1.53	51.3%	1.94 1.70	72.4%	0.76 1.22				9.87***
Marijuana—# of offers	685	0-5	0.22 0.76	8.8%	0.47 1.10	21.4%	0.06 0.35				5.77***
Alcohol—refuse	699	0-11	2.11 3.10	57.9%	2.98 3.55	72.9%	1.57 2.65				5.63***
Alcohol—explain	696	0-11	1.89 3.05	52.0%	2.51 3.39	63.1%	1.49 2.76				4.11***
Alcohol—avoid	663	0-11	3.14 4.04	52.7%	3.02 3.81	65.4%	3.24 4.20				-0.68
Alcohol—leave	692	0-11	1.96 3.11	64.7%	2.39 3.23	64.6%	1.67 3.02				2.92**
Alcohol—other	686	0-11	1.76 3.15	44.5%	2.50 3.54	61.4%	1.24 2.73				4.96***
Cigarettes—refuse	697	0-11	1.84 3.28	44.3%	2.82 3.80	63.8%	1.22 2.75				5.97***
Cigarettes—explain	694	0-11	1.59 3.09	39.0%	2.50 3.68	56.5%	1.00 2.47				5.87***
Cigarettes—avoid	643	0-11	1.75 2.99	42.4%	2.30 3.36	49.3%	1.36 2.64				3.81***
Cigarettes—leave	687	0-11	1.86 3.28	42.0%	2.47 3.56	55.8%	1.48 3.05				3.76***
Cigarettes—other	692	0-11	1.76 3.37	37.7%	2.68 3.85	54.6%	1.18 2.90				5.47***
Marijuana—refuse	694	0-11	0.67 2.32	13.8%	1.31 3.14	26.6%	0.26 1.46				5.17***
Marijuana—explain	692	0-11	0.75 2.51	13.9%	1.49 3.44	26.5%	0.26 1.48				5.53***

Variable	Total			Males			Females			Gender differences <i>t</i> test		
	<i>N</i>	Range	Mean	<i>SD</i>	% Non-zero	Mean	<i>SD</i>	% Non-zero	Mean		<i>SD</i>	% Non-zero
Marijuana—avoid	586	0–11	3.65	4.81	48.6%	4.20	4.87	55.2%	3.27	4.76	43.6%	2.30*
Marijuana—leave	689	0–11	1.10	3.01	18.1%	2.02	3.86	32.2%	0.50	2.12	8.5%	5.91***
Marijuana—other	687	0–11	0.94	2.77	16.7%	1.77	3.61	30.5%	0.38	1.80	7.1%	5.85***

SES socioeconomic status

* $p < .05$;

** $p < .01$;

*** $p < .001$

Table 2

OLS regression of frequency of use of strategies for alcohol

Independent Variable	Refuse		Explain		Avoid		Leave		Other	
	b	SE	b	SE	b	SE	b	SE	b	SE
Gender (male = 1)	0.701**	0.257	0.270	0.251	0.135	0.354	0.431	0.273	1.016***	0.273
Age	0.019	0.087	0.076	0.085	0.128	0.120	-0.017	0.092	0.097	0.092
One parent	0.166	0.330	-0.069	0.322	-0.470	0.465	-0.174	0.352	-0.317	0.350
No parent home	-0.284	0.677	-0.463	0.661	0.019	0.921	0.138	0.719	0.325	0.716
Parent education	0.042	0.065	0.068	0.064	-0.043	0.090	0.071	0.070	0.025	0.070
Family SES	0.139	0.210	-0.003	0.204	0.499<	0.291	0.108	0.223	0.279	0.222
Grades	0.198	0.163	0.212	0.159	1.001***	0.227	0.038	0.173	0.287<	0.173
Urban	0.035	0.250	0.118	0.244	-0.128	0.347	0.080	0.266	0.047	0.266
Number of offers	0.596***	0.082	0.625***	0.081	-0.115	0.113	0.266***	0.088	0.215*	0.087
Intercept	-0.533	1.680	-1.289	1.635	-2.590	2.326	0.964	1.783	-2.239	1.784
Adjusted R ²	0.122		0.118		0.028		0.023		0.048	
N	653		651		624		647		642	

SES socioeconomic status

* $p < .05$;

** $p < .01$;

*** $p < .001$;

† $p < .10$

Table 3

OLS regression of frequency of use of strategies for cigarettes

Independent Variable	Refuse		Explain		Avoid		Leave		Other	
	b	SE	b	SE	b	SE	b	SE	b	SE
Gender (male = 1)	0.966***	0.273	0.912***	0.258	0.650*	0.263	0.666*	0.287	0.971**	0.288
Age	0.053	0.091	0.077	0.086	0.297***	0.089	0.004	0.097	0.211*	0.097
One parent	0.409	0.267	0.136	0.253	-0.275	0.262	0.171	0.283	0.247	0.283
No parent home	-0.230	0.352	0.010	0.332	-0.050	0.344	0.540	0.370	-0.133	0.373
Parent education	-0.049	0.720	0.220	0.679	-0.157	0.697	0.411	0.753	0.089	0.758
Family SES	0.101	0.069	0.162*	0.066	0.038	0.067	0.178*	0.073	0.076	0.073
Grades	-0.338	0.224	-0.001	0.212	-0.185	0.218	-0.265	0.236	-0.303	0.237
Urban	0.156	0.173	0.057	0.163	0.211	0.169	-0.048	0.182	-0.185	0.182
Number of offers	0.569***	0.090	0.456***	0.085	0.291***	0.086	0.237*	0.094	0.316**	0.094
Intercept	-0.049	1.779	-1.408	1.683	-3.837*	1.745	1.320	1.887	-1.530	1.884
Adjusted R ²	0.125		0.115		0.055		0.039		0.072	
N	651		649		605		642		647	

SES socioeconomic status

* $p < .05$;

** $p < .01$;

*** $p < .001$

Table 4

OLS regression of frequency of use of strategies for marijuana

Independent Variable	Refuse		Explain		Avoid		Leave		Other	
	b	SE	b	SE	b	SE	b	SE	b	SE
Gender (male = 1)	0.684***	0.189	0.873***	0.205	1.037*	0.444	1.212***	0.249	0.999***	0.222
Age	0.020	0.065	-0.039	0.071	0.323*	0.158	-0.093	0.086	0.093	0.076
One parent	0.306	0.188	0.206	0.204	-0.026	0.453	0.383	0.248	0.139	0.221
No parent home	0.496*	0.251	0.793**	0.272	-0.105	0.594	0.481	0.330	0.093	0.295
Parent education	2.529***	0.509	2.057***	0.550	0.694	1.126	1.427*	0.666	1.381*	0.595
Family SES	-0.039	0.049	-0.018	0.053	-0.092	0.115	-0.081	0.065	-0.049	0.058
Grades	0.414**	0.159	0.246	0.172	-0.271	0.377	0.121	0.209	0.278	0.186
Urban	-0.115	0.122	-0.190	0.133	-0.184	0.291	-0.316*	0.160	-0.247<	0.144
Number of offers	0.748***	0.118	0.638***	0.132	-0.147	0.264	0.704***	0.155	0.822***	0.139
Intercept	-1.084	1.266	0.507	1.376	-0.427	3.076	2.535	1.670	-1.272	1.485
Adjusted R ²	0.163		0.125		0.008		0.107		0.131	
N	642		640		546		637		635	

SES socioeconomic status

* $p < .05$;** $p < .01$;*** $p < .001$;† $p < .10$