Drug Resistance and Substance Use Among Male and Female Adolescents in Alternative Secondary Schools in Guanajuato, Mexico

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ABSTRACT. Objective: Research is limited on the strategies that Mexican adolescents use to resist use of alcohol, cigarettes, and other drugs. Cultural norms and gender socialization patterns concerning the acceptability of use of various substances by women and men influence Mexican youths in their responses to offers of substances. This study explored the drug-resistance strategies used by youth in the central Mexican state of Guanajuato, how their use predicted patterns of substance use, and how these associations differed by gender. **Method:** The analysis used cross-sectional survey data from 702 (60% male) students enrolled in eight alternative secondary education school sites in 2007. Participants reported the drug-resistance behaviors they used to deal with offers of alcohol, cigarettes, and marijuana. Past-12-month use of the four drug-resistance strategies employed most often by U.S. youth—refuse, explain, avoid, and leave (R.E.A.L.)—and any other strategies were measured. Composite measures of lifetime and recent use of alcohol, cigarettes, and marijuana were predicted in multivariate ordinary

least squares regression analyses. Models were tested with and without controls for the frequency that respondents were offered substances and introduced gender interaction effects. **Results:** Controlling for substance use offers, more frequent use of a wide repertoire of R.E.A.L. strategies predicted less consumption of alcohol and cigarettes, and using non-R.E.A.L. strategies predicted less marijuana consumption. All of these relationships were either stronger for males than for females or significant for males only. **Conclusions:** Gender differences exist in the impact of R.E.A.L. strategies on substance use among youth in Mexico. Despite a narrowing gender gap in substance use in Mexico, large exposure to and susceptibility of substance use remains. Developing effective prevention programs in Mexico based on teaching appropriate drug-resistance strategies and enhancing communication skills could aid in reducing substance use among Mexican adolescents. (*J. Stud. Alcohol Drugs*, 73, 111–119, 2012)

SUBSTANCE USE AMONG YOUTH IS A GROWING concern in Mexico, fueled by persisting high rates of adolescent alcohol and tobacco use and growing use of illicit drugs. In large national probability surveys over the last decade, more than one in three Mexican adolescents (ages 12–17) reported lifetime use of alcohol, and about one in six reported tobacco use (Instituto Nacional de Estadística, Geografía e Informática, 2004; Instituto Nacional de Salud Pública [INSP], 2008). Although illicit drug use remains relatively uncommon among adolescents in Mexico and primarily involves use of marijuana, it is increasing, especially in northern regions and large urban areas (Benjet et al., 2007b; Medina-Mora et al., 1993, 2003; INSP, 2008). Younger generations of Mexicans show signs of progressing to drug abuse and dependence at higher rates than those in older cohorts (INSP, 2008).

An emerging feature of youth substance use in Mexico is that, although longstanding gender differences in the prevalence of use remain, they are narrowing. Female adolescents in Mexico are increasingly exposed to substance use and appear especially vulnerable to substance abuse and dependence (Benjet et al., 2007b; Medina-Mora et al., 2006). In a 2008 national survey, the proportion of adolescents that met the criteria for alcohol abuse/dependence was similar for males and females, and 10-year trends in lifetime use of illicit drugs showed virtually no change for adolescent males, whereas rates for adolescent females more than doubled (INSP, 2008). Although Mexican men outnumber women as current users of illicit drugs in every age group, that ratio is much narrower among adolescents than older cohorts (INSP, 2008).

Despite increases in substance use rates among Mexican youth, a narrowing gender gap in use, and growing evidence

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that Mexican youth are increasingly exposed to offers of both licit and illicit substances (Benjet et al., 2007b), it is remarkable that most Mexican adolescents find ways to not use substances. This article explores the drug-resistance strategies used by youth in central Mexico, how their use of these strategies predicts patterns of substance use, and how these associations differ by gender.

Prevention and the use of drug-resistance strategies

A key component of several successful programs for substance use prevention in youth is the teaching of drug-resistance strategies (Botvin et al., 2001; Hecht et al., 2003). Strengthening adolescents' communication skills helps enable them to deal with increasing exposure to opportunities for substance use over the course of their development (Spitzberg and Cupach, 1984). Adolescents are more likely to resist drug offers when they are able to assess risk situations, choose the best technique given the circumstances, and effectively communicate their choice. Some adolescents may use substances not because they have a desire to use but because they lack the skills to resist the offer without socially isolating themselves. A wider repertoire of drug-resistance strategies promotes divergent thinking and a more flexible communication style and helps adolescents replace ineffective communication strategies with strategies that work (Wright et al., 2004). In the United States, youth possessing effective drug-resistance strategies are less likely to have future intentions to use alcohol, cigarettes, and marijuana, as well as less actual use of alcohol regardless of intention to use (Stephens et al., 2009).

Four drug-resistance strategies have been found to be the most commonly and effectively used by adolescents in the United States: refuse, explain, avoid, leave (R.E.A.L.; Moon et al., 1999). *Refuse* is simply saying "no." *Explain* is refusing while providing a reason for saying "no." *Avoid* is staying away from a situation or place where alcohol or drugs might be offered. *Leave* is an exit strategy used when the person is already in a situation where drugs are being offered. These strategies have been incorporated into the substance use prevention program *Keepin' it R.E.A.L.*, a model program on the National Registry of Evidence-based Programs and Practices that specifically incorporates Mexican American cultural values (Hecht et al., 2003). The R.E.A.L. strategies taught in *Keepin' it R.E.A.L.* have been shown to effectively reduce substance use in Mexican American youth (Kulis et al., 2005). There is also consistent evidence that these four drug-resistance strategies are also used by large majorities of youth in different regions of Mexico (Kulis et al., 2008a; Marsiglia et al., 2009). However, there is little empirical evidence to date that these four strategies serve to protect Mexican adolescents from substance use.

Evidence from the United States shows that cultural background plays a role in the types of resistance strategies

that are developed and used by adolescents (Hecht et al., 1992; Marsiglia and Hecht, 2005) as well as their attitudes toward substance use and decisions to use substances (Brook and Pahl, 2005; Marsiglia et al., 2001). Adolescents in the United States who were born in Mexico show better substance use resistance skills than Mexican-Americans born in the United States (Umaña-Taylor and Bámaca-Gómez, 2003). There is little research, however, into how culture may affect drug-resistance strategies and drug use among youth living in Mexico. Cultural norms (e.g., the importance of the family and a collectivistic orientation) that appear to protect Mexican American youth from risky behaviors like substance use (Chandler et al., 1999; Olson et al., 1983) may not be present in or may not have the same effects on youth living in Mexico. Drug-resistance strategies that have been found to be effective in preventing substance use among Latino youth in the United States may not be equally effective in Mexico. A prevention approach that teaches an adolescent to assertively refuse drug offers may not be successful within a culture that considers it improper to speak assertively to older persons (Dana, 1998).

Gender differences

Studies have found large disparities between male and female rates of substance use in Mexico, with males at much greater risk (Arillo-Santillan et al., 2005). Larger gender differences have been found in Mexican middle school students' reports of recent use of tobacco and alcohol than in their lifetime rates of substance use (Floyd et al., 2005), suggesting that although girls and boys may be experimenting with substances at a similar rate, there is a great disparity in their reports of regular use.

The disparity between rates of use among males and females could be the result of cultural norms surrounding gender roles. In Mexico, there is a traditional gender role of *Marianismo* that is based on the idealized role model of the Virgin Mary. Women and girls are expected to be warm, be concerned with the welfare of their family and others (Huselid and Cooper, 1992), consider others before themselves, accept a submissive role, and be "virgin like" (Alducin et al., 2004; Mendoza Flores et al., 2002; Stevens, 1973). These traditional ideas are communicated to younger women by older women and usually concern how women need to behave to please a husband (Mayo and Resnick, 1996). The cultural norm that encourages women to please others and to be submissive may lead women to have a hard time being assertive and saying "no" (Le et al., 2008). Although traditional gender roles are rapidly changing in Mexico, they remain influential in relationships and attitudes (Bergstrom and Heymann, 2005; Palermo et al., 2010), particularly those that concern a woman's domestic roles: having a home, taking care of children, and ensuring the well-being of her family (Bergstrom and Heymann, 2005; Palermo et al., 2010).

Males in Mexico are also influenced by traditional gender roles, especially the idea of machismo, which is often associated with negative traits like sexism, chauvinism, and hypermasculinity (Anders, 1993). Researchers increasingly recognize that the social construction of machismo embodies both positive and negative characteristics (Arciniega et al., 2004). Negatively, the social norm of machismo characterizes men as aggressive, exhibiting sexualized behaviors, participating in heavy drinking (Alaniz, 1996), and dominating women (Mayo and Resnick, 1996). More positively, machismo has been characterized as *caballerismo* (Arciniega et al., 2008), a trait emphasizing the protection of family and honor, dignity, hard work, and responsibility (Mirandé, 1997).

Gender roles and gender socialization can act as both a risk and a protective factor for substance use. For women, a sense of responsibility acts as a protective factor against substance use and is related to substance refusals (Kulis et al., 2003, 2008b). Females are much less likely to be offered such substances as marijuana (Caris et al., 2009); other substances, specifically tobacco, are less available to them, leading to lower substance use rates (Félix-Ortiz et al., 2001). This lack of availability and offers may be because of cultural norms in which families are more protective of daughters, resulting in fewer opportunities to use, and norms prescribing less acceptability for women using substances than men. However, once offered, females are equally likely to use substances (Caris et al., 2009). Social norms reinforcing passivity might make it difficult for girls to use some resistance strategies when they encounter drug offers.

Although traditional gender roles might inhibit a girl's ability to say "no" to drugs or alcohol, they may also be protective. Within traditional gender roles, it is generally believed that women should not drink (Mendoza and Medina-Mora, 2005). The dominating aspects of machismo coupled with the passive nature of traditional female roles may make some females more susceptible to pressure or lead them to rely on passive rather than assertive strategies when offered alcohol or drugs.

This article examines how the use of the R.E.A.L. drug-resistance strategies is associated with alcohol, cigarette, and marijuana use for adolescents living in the central state of Guanajuato, Mexico. Furthermore, given that in Mexico, substance use offers as well as substance use rates differ markedly by gender, we explored how gender moderates the relationship between using the four R.E.A.L. strategies and substance use.

Method

This study used questionnaire data from a probability sample of youth from the state of Guanajuato, Mexico. Participants were youth enrolled in an alternative secondary education program that uses 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 a 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 used cross-sectional survey data from 702 students enrolled in eight VIBA centers during the school cycle of January–June of 2007. The centers for the study were randomly selected from a list of the 137 centers located within a radius of 100 kilometers of León, the largest city in Guanajuato and a major transportation hub. The eight selected centers encompassed most of the larger population centers in the state. 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 ensured that 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 institutional review board 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. Dependent variables in the analyses were separate scales measuring alcohol, cigarette, and marijuana use, each of which was constructed from multiple items. There were five items for alcohol use and three items each for cigarette and marijuana use. For all three substances, the scale items included reports of the frequency of lifetime and recent (last-30-day) use of each substance and the amounts of the substance consumed recently. For the measure of alcohol use, the scale items also included the frequency of heavy episodic drinking (five or more drinks) in the last 30 days and the frequency of inebriation in the last 12 months. The original Likert-scale response categories for these items varied somewhat (including from five to nine categories); therefore, to combine them into multi-item scales, they were first standardized ($M = 0$, $SD = 1$). The resulting mean scales produced highly reliable measures, with Cronbach's α ranging from .92 to .94.

The key independent 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 States: 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). In addition, students reported how often they had used strategies other than the R.E.A.L. strategies to resist offers of substances. The frequency of use of R.E.A.L. and non-R.E.A.L. strategies was reported separately for alcohol, cigarette, and marijuana offers. Response options were Likert-scaled and were assigned numeric codes in analysis to estimate the actual number of times the strategies were used in the last 12 months: never (coded 0), once (coded 1), 2–3 times (coded 2.5), 4–5 times (coded 4.5), 6–10 times (coded 8), more than 10 times (coded 11). The total number of R.E.A.L. strategies used in the last 12 months was calculated by summing the individual items for use of the refuse, explain, avoid, and leave strategies. These measures were developed, validated, and tested in the original randomized trial of *Keepin’ it R.E.A.L.* (see Hecht et al., 2003).

In addition to the use of drug-resistance strategies, students reported how often they received substance offers: “In the last 12 months, how many times has someone offered you . . . alcohol? . . . cigarettes? . . . marijuana?” Response options were: *none* (coded 0), *1 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 measures were included in multivariate analyses to control for variation in how often the adolescents had occasion to use drug-resistance strategies.

Demographic variables in the analyses included gender, age, family type, parental education, financial strain, academic performance, and size of the locality. The participants identified their gender as female or male and reported their age in whole years. Family type was measured as a dummy variable indicating whether the student lived with both parents. 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. Financial strain was measured as a mean scale of four items in which students indicated how often there was enough money in their home to pay for (a) food, (b) utilities, (c) school fees, and (d) clothing. Coded to indicate lack of financial strain, the response options for these four items were always (coded 4), almost always (coded 3), sometimes (coded 2), and never (coded 1). The items formed a reliable scale (Cronbach’s $\alpha = .83$). 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 measured on a

1.0–4.0 scale. To control for possible variations across rural and urban sites in the availability of substances and networks of substance users (Medina-Mora et al., 2003), a measure of urbanism was included. Based on Mexican national census population estimates for the area where the VIBA center was located, this variable was coded 1 for a large urban center of at least 250,000 residents and coded 0 for less urban locales.

Analysis strategy

The purpose of the study was to assess associations between actual substance use and the use of R.E.A.L. and non-R.E.A.L. drug-resistance strategies and whether these associations vary for males and females enrolled in Guanajuato VIBES centers. After presenting descriptive statistics for variables used in the analyses, a series of multivariate ordinary least squares (OLS) regressions were used to investigate the extent to which the R.E.A.L. and non-R.E.A.L. drug-resistance strategies predicted use of alcohol, cigarettes, and marijuana, controlling for gender, age, academic performance, family type, parental education, household financial strain, and size of the locality. Three models are presented for each outcome. The first model includes the demographic controls plus use of R.E.A.L. strategies and other drug-resistance strategies. The second model adds controls for the frequency of substance use offers received by the respondent, and the third model includes mean-centered gender interaction terms. This last model tests whether the predictors of substance use varied in strength for males and females. In addition to the OLS regression models, we conducted a set of parallel multilevel analyses using SAS 9.2 Proc Mixed (SAS Institute Inc., Cary, NC) that adjusted for possible random effects at the school level. These analyses produced a pattern of findings identical to those we found using OLS regression. The findings were the same concerning the direction and threshold of statistical significance of the effects of the predictor variables. We thus present only the OLS results.

Results

Descriptive statistics (Table 1) show that the sample included fewer males (40%) than females (60%). Reflecting the outreach and appeal of this alternative secondary school system, students ranged in age from early adolescence to early adulthood, but a large majority (78%) was in mid- or late adolescence, between 15 and 17 years of age; only 4% were older than 19. Most (83%) lived at home with both parents. Means for the measures of education attainment and financial strain indicated that the highest level of education of the typical student’s parents was some secondary school and that there was enough money at home “sometimes” or “almost always.” The typical student’s grades were between Cs and Bs. One quarter of the students attended a center in a large urban area.

TABLE 1. Descriptive statistics

Variable	<i>M</i>	<i>SD</i>	% Nonzero	Range
Male (1) vs. female (0)	0.40	0.49	39.7%	0–1
Age, in years	16.63	1.42		14–22
Two-parent home (1) vs. other (0)	0.83	0.38	82.6%	0–1
Parental education, ^a	3.81	1.89		1–8
Lack of financial strain: Money for basics	3.31	0.62		1–4
Grades in school, A = 4, D/F = 1	2.58	0.72		1–4
Large urban center (1) vs. other (0)	0.25	0.44	25.4%	0–1
R.E.A.L. strategies for alcohol ^b	8.90	10.02	82.6%	0–44
R.E.A.L. strategies for cigarettes ^b	6.87	9.64	62.3%	0–44
R.E.A.L. strategies for marijuana ^b	5.59	9.73	45.2%	0–44
Other strategies for alcohol ^b	1.76	3.15	44.4%	0–11
Other strategies for cigarettes ^b	1.76	3.37	37.7%	0–11
Other strategies for marijuana ^b	0.94	2.77	16.7%	0–11
Alcohol offers ^b	1.57	1.56	67.9%	0–5
Cigarette offers ^b	1.22	1.53	51.3%	0–5
Marijuana offers ^b	0.22	0.76	10.8%	0–5
Alcohol composite scale ^c	0.22	0.88		-0.6–4.2
Cigarettes composite scale ^c	0.01	0.96		-0.6–3.5
Marijuana composite scale ^c	0.04	0.91		-0.3–2.2
Ever used alcohol	78%	41%	78.3%	0%–100%
Ever used cigarettes	56%	49%	55.7%	0%–100%
Ever used marijuana	12%	33%	12.4%	0%–100%

^a1 = no education, 8 = more advanced education beyond the preparatoria; ^bnumber in the last 12 months;

^chigher scores within the range indicate greater use.

Means for the use of R.E.A.L. strategies in the last 12 months indicated that students used them to deal with alcohol use more often than for cigarettes and marijuana. A very large majority (83%) had used one of these strategies for alcohol, a plurality (62%) for cigarettes, and nearly half (45%) for marijuana. Use of strategies other than R.E.A.L. was much less frequent, and the proportions of students who used non-R.E.A.L. strategies were around half or less than the proportions using R.E.A.L. strategies. 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. More than two thirds of the students received offers of alcohol, more than half were offered cigarettes, but only 11% had been offered marijuana.

The composite scales measuring substance use were based on standardized indicators, and their means and distributions are not highly interpretable. Table 1 also reports the percentage of students who had ever used each of the substances, indicating that about three quarters had used alcohol, more than half had used cigarettes, and one in eight had used marijuana.

Table 2 presents the multivariate regression analyses, with three models for each substance. The first model includes as predictors the demographic controls plus use of R.E.A.L. strategies and other drug-resistance strategies. The second model adds controls for the frequency with which the specific substance was offered to the respondent. The third model includes a full set of gender interactions to test whether the effects of the predictors differed for females and

males. The models predicting alcohol use show that those using R.E.A.L. drug-resistance strategies and other strategies did not report significantly more or less alcohol use (Model 1) unless the number of alcohol offers they received was controlled (Model 2). Controlling for offers, those using the R.E.A.L. strategies more often consumed significantly less alcohol. The gender interaction term indicated that the latter relationship was significantly stronger for males and was, in fact, not significant for females (Model 3). A very similar pattern of findings emerged for cigarette use: Frequent use of the R.E.A.L. strategies predicted less cigarette use only when the number of offers was controlled (Model 5), but the relationship was significant only for males (Model 6). For marijuana use, frequent use of the R.E.A.L. strategies did not emerge as a significant predictor, but use of non-R.E.A.L. strategies did predict less marijuana use (at $p < .10$) once the frequency of marijuana offers was controlled (Model 8). Again, this relationship was significant only for males as shown in the interactions (Model 9).

Gender was a significant main effect in the initial models predicting use of all three substances, with males using substances more than females, but these effects were more than halved in size after controlling for offers. There was a similar but less pronounced pattern for age and the urban setting as predictors; older students and those in highly urban centers reported significantly more alcohol and cigarette use but with the relationship attenuated somewhat after controlling for frequency of offers. Students with more highly educated parents reported more alcohol and marijuana use, and those from households with less financial strain reported more

TABLE 2. Ordinary least squares regression analyses predicting substance use composite scores (standardized coefficients)

Variable	Alcohol use			Cigarette use			Marijuana use		
	1 β	2 β	3 β	4 β	5 β	6 β	7 β	8 β	9 β
Intercept	.000**	.000	.000	.000***	.000	.000*	.000**	.000**	.000†
Male vs. female	.250***	.110**	.052	.288***	.118***	.238**	.165***	.063†	-.008
Age	.173***	.120***	.028	.119**	.085**	.063†	.072†	.018	.003
Two-parent home	-.033	-.036	-.051	-.005	-.023	.015	.062	.063†	.025
Parental education	.109**	.073*	.013	.055	.029	.019	.118**	.081*	.034
Lack of financial strain	-.001	.018	.018	.101**	.034	.029	-.039	-.010	-.002
School grades	-.072*	-.042	-.021	-.084*	-.051†	.012	-.072†	-.072*	-.031
Urban	.264***	.174***	.138**	.200***	.061†	.112*	.048	-.003	.005
R.E.A.L. strategies	-.021	-.115**	-.047	-.027	-.157***	-.042	-.036	-.027	.007
Other strategies	-.005	.021	-.002	-.028	-.017	-.014	.034	-.082†	.036
Offers		.453***	.490***		.635***	.519***		.539***	.143
Age × Male			.149***			.039			.007
Two Parent × Male			.047			-.111			.091
Parental education × Male			.076			.032			.082†
Financial Strain × Male			.007			-.007			.009
School Grades × Male			-.030			-.104**			-.083†
Urban × Male			.041			-.078			.000
R.E.A.L. Strategies × Male			-.102†			-.152**			-.002
Other Strategies × Male			.035			.008			-.174*
Offers × Male			-.060			.141**			.431***
Adjusted R ²	.267	.415	.431	.212	.503	.519	.062	.309	.340
N	634	627	627	642	636	636	623	612	612

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

cigarette use—relationships that once again were attenuated after controlling for offers. Students with better school grades used all three substances significantly less; after controlling for offers, this relationship became nonsignificant for alcohol and was attenuated for cigarettes, yet it retained its strength in predicting less marijuana use. For cigarettes and marijuana, good school grades predicted less use of the substances more strongly for males than for females.

The most powerful predictor in any model was frequency of substance offers, which accounted for 15% of the variance in alcohol use, 29% for cigarette use, and 25% for marijuana use. Gender interactions with offer frequency showed that males and females differed in their vulnerability to substance use through the receipt of substance offers. Frequency of offers predicted alcohol use for females alone, it predicted cigarette use both for females and males but more powerfully for males, and it predicted marijuana use for males alone.

Discussion

The Mexican youth in this sample from the state of Guanajuato reported extensive use of the R.E.A.L. strategies—refuse, explain, avoid, leave. Frequent use of a wide repertoire of R.E.A.L. strategies appeared to be a successful means of resisting substance use. Controlling for how often they were exposed to substance use offers, Guanajuato youth who used the R.E.A.L. strategies more often also reported less consumption of alcohol and cigarettes. Although use of the R.E.A.L. strategies did not predict marijuana use, fre-

quent use of other, non-R.E.A.L. drug-resistance strategies was associated with less consumption of marijuana. All of these relationships were either stronger for males than for females, or they were significant for males only.

The reliance of Guanajuato youth on R.E.A.L. strategies indicates that they use the same drug-resistance strategies commonly used in other areas of Mexico (Marsiglia et al., 2009) and by youth in the United States (Moon et al., 1999). The salience of the R.E.A.L. strategies to Guanajuato youth, and their connection to reduced alcohol and cigarette use, suggests that they constitute a promising foundation on which to build substance prevention programs in Mexico. Alcohol and cigarettes are the most widespread substances used by youth in Mexico, and for many, their use is initiated at a young age. That these two substances are legal and not highly stigmatized (at least for use by males) may account for their high prevalence among youth in Mexico. It is notable, however, that the proportion of youth resisting their use approaches or exceeds the proportion that has used the substance. In the Guanajuato sample, 78% had initiated alcohol use and 83% had used a R.E.A.L. strategy to resist alcohol use in the last year; for cigarettes, 56% had initiated use and 62% used R.E.A.L. strategies to resist use.

In contrast to alcohol and cigarettes, initiation into marijuana use is relatively uncommon in Guanajuato and in most of Mexico, reported by only 12% of the Guanajuato sample. Nevertheless, 45% reported using a R.E.A.L. strategy to resist marijuana use. Further research is needed to ascertain why those who used the R.E.A.L. strategies did

not report appreciably less use of marijuana, whereas those using non-R.E.A.L. strategies did use marijuana less. What are the alternate strategies to R.E.A.L., and why are they a more successful means of resisting marijuana? The answers to these questions will require more in-depth qualitative research.

The large gender differences in use of all three substances is consistent with much prior research showing a large gender gap in the prevalence and intensity of substance use in Mexico. This gap is often attributed to cultural norms that permit and even encourage males to use substances like alcohol to the point of inebriation while negatively sanctioning substance use by females as a behavior that is inconsistent with traditional gender roles (Caetano and Medina-Mora, 1988; Lounsbury and Kulbok, 2007; Medina-Mora and Rojas Guiot, 2003; Wyckoff, 2000). The current study contributes to this line of research by showing that more than half of the gender gap in use of both legal and illegal substances occurs because males are more likely to receive substance offers than are females, as has been suggested in other research in Mexico (Benjet et al., 2007a). Guanajuato is located in a socially conservative region of central Mexico where traditional gender roles, including respect for the "purity" of women, continue to govern daily life (Cortés and Shibya, 1999). Those offering or selling alcohol, cigarettes, and marijuana may avoid approaching women or demonstrate reluctance to do so (Nuño-Gutiérrez et al., 2006).

Frequent receipt of offers was the single largest predictor of substance use, but depending on the substance, its impact on use differed for males and females. Although females received fewer alcohol offers than males, the number of these offers predicted use of alcohol for females but not males. For cigarettes, both males and females used more of the substance the more they were offered it, but the susceptibility to offer frequency was stronger for females than for males. In the case of marijuana use, males, but not females, who received more offers were at greater risk. These results may reflect the widespread availability and acceptability of alcohol use by males in Mexico, such that use by males is common regardless of offers of the substance. For females, the number of alcohol offers may reflect the level of opportunity and social pressure to use alcohol, use which might not occur absent an offer. Although offers of cigarettes place both males and females at greater risk of use, males may obtain the substance more readily than females without an offer, for example by buying cigarettes. Marijuana appears to be quite different, with males alone being vulnerable to offers of the substance. A possible reason, suggested by research in the United States (Warner et al., 1999), is that networks of marijuana users may be restricted to males, limiting females' access to the substance. However, the more acute vulnerability of women to alcohol and cigarette offers, and perhaps to offers of other drugs, may increase as Mexican women continue to advance socially and educationally, enter the

labor market, and begin to occupy social spheres previously restricted to men. They may be exposed to more drug offers and will need to adopt new ways of resisting these offers.

Limitations

Although this study used a probability sample, it was limited to one state in central Mexico and included only youth enrolled in an alternate secondary school system that is designed to serve poor and remotely 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 (Kulis et al., 2008a; 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 use problems; the findings may also not generalize to 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-Gutiérrez et al., 2006). Perhaps the students in the current study are different because it takes greater 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.

Despite rapid social and cultural changes, this study shows that gender differences remain a key factor to be considered when designing, implementing, and evaluating prevention interventions in Mexico. More research is needed to better identify gendered protective and risk factors associated with substance use and misuse in Mexico. Qualitative and mixed-methods designs will provide a better understanding of the experiences of these young men and women, their full repertoire of resistance strategies, and their application in different contexts and in relationship to the different actors in their social networks.

Conclusion

This study examined substance use and ways of resisting it among a population that is often missed in surveys

of youth drug use in Mexico—those unable to afford or to access secondary education, who account for as much as half of Mexico's youth in late adolescence. This probability sample of alternative secondary school students from a central Mexico 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. Those who used the strategies reported significantly less use of alcohol and cigarettes. This knowledge expands the 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, which show that Mexican youth have a range of drug-resistance skills to draw on when navigating offers to use substances.

References

- Alaniz, M. L. (1996). Husband's level of drinking and egalitarianism in Mexican-American families. *Substance Use & Misuse*, 31, 647–661.
- Alducin, A. E., Blancarte, R. J., Castrejón, D. J., Cossío, J. R., Díaz-Guerrero, R., Flores, J. I., et al. (2004). *Los valores de los Mexicanos: Cambio y permanencia*. México City, México: Tomo V Grupo Financiero Banamex.
- Anders, G. (1993). Machismo: Dead or alive. *Hispanic*, 6, 14–17.
- Arciniega, G. M., Anderson, T. C., Tovar-Blank, Z. G., & Tracey, T. J. G. (2008). Toward a fuller conception of machismo: Development of a traditional machismo and caballerismo scale. *Journal of Counseling Psychology*, 55, 19–33.
- Arciniega, G., Tovar-Gamero, Z., & Sand, J. (2004). *Machismo and marianismo: Definitions, instrumentation, and clinical relevance*. Workshop presented at the Relevance of Assessment and Culture in Evaluation Conference, Tempe, AZ.
- Arillo-Santillan, E., Lazcano-Ponce, E., Hernandez-Avila, M., Fernández, E., Allen, B., Valdes, R., & Samet, J. (2005). Associations between individual and contextual factors and smoking in 13,293 Mexican students. *American Journal of Preventive Medicine*, 28, 41–51.
- Benjet, C., Borges, G., Medina-Mora, M. E., Blanco, J., Zambrano, J., Orozco, R., . . . Rojas, E. (2007a). Drug use opportunities and the transition to drug use among adolescents from the Mexico City Metropolitan Area. *Drug and Alcohol Dependence*, 90, 128–134.
- Benjet, C., Borges, G., Medina-Mora, M. E., Fleiz, C., Blanco, J., Zambrano, J., . . . Ramirez, M. (2007b). Prevalence and socio-demographic correlates of drug use among adolescents: Results from the Mexican Adolescent Mental Health Survey. *Addiction*, 102, 1261–1268.
- Bergstrom, C. A., & Heymann, S. J. (2005). Impact of gender disparities in family carework on women's life chances in Chiapas, Mexico. *Journal of Comparative Family Studies*, 36, 267–288.
- Botvin, G. J., Griffin, K. W., Diaz, T., & Ifill-Williams, M. (2001). Drug abuse prevention among minority adolescents: Posttest and one-year follow-up of a school-based preventive intervention. *Prevention Science*, 2, 1–13.
- Brook, J. S., & Pahl, K. (2005). The protective role of ethnic and racial identity and aspects of an Africentric orientation against drug use among African American young adults. *Journal of Genetic Psychology*, 166, 329–345.
- Caetano, R., & Mora, M. E. M. (1988). Acculturation and drinking among people of Mexican descent in Mexico and the United States. *Journal of Studies on Alcohol*, 49, 462–471.
- Caris, L., Wagner, F. A., Ríos-Bedoya, C. F., & Anthony, J. C. (2009). Opportunities to use drugs and stages of drug involvement outside the United States: Evidence from the Republic of Chile. *Drug and Alcohol Dependence*, 102, 30–34.
- Chandler, C. R., Tsai, Y.-M., & Wharton, R. (1999). Twenty years after: Replicating a study of Anglo-and Mexican-American cultural values. *The Social Science Journal*, 36, 353–367.
- Cortés, M., & Shibya, C. (1999). *Los valores de los jaliscienses*. Guadalajara, Mexico: Universidad de Guadalajara.
- Dana, R. H. (1998). *Understanding cultural identity in intervention: An assessment*. Thousand Oaks, CA: Sage.
- Félix-Ortiz, M., Villatoro Velázquez, J. A., Medina-Mora, M. E., & Newcomb, M. D. (2001). Adolescent drug use in Mexico and among Mexican American adolescents in the United States: Environmental influences and individual characteristics. *Cultural Diversity & Ethnic Minority Psychology*, 7, 27–46.
- Floyd, L. J., Latimer, W. W., Vasquez, M., & O'Brien, M. (2005). Substance use among school-based youths in northern Mexico. *The American Journal on Addictions*, 14, 464–470.
- Hecht, M. L., Alberts, J., & Miller-Rassulo, M. (1992). Resistance to drug offers among college students. *Substance Use & Misuse*, 27, 995–1017.
- Hecht, M. L., Marsiglia, F. F., Elek, E., Wagstaff, D. A., Kulis, S., Dustman, P., & Miller-Day, M. (2003). Culturally grounded substance use prevention: An evaluation of the Keepin' it R.E.A.L. curriculum. *Prevention Science*, 4, 233–248.
- Huselid, R. F., & Cooper, M. L. (1992). Gender roles as mediators of sex differences in adolescent alcohol use and abuse. *Journal of Health and Social Behavior*, 33, 348–362.
- Instituto Nacional de Estadística. Geografía e Informática. (2004). *Encuesta Nacional de Adicciones 2002 [National Survey of Addictions, 2002]*. Aguascalientes, Mexico.
- Instituto Nacional de Salud Pública. (2008). *Encuesta Nacional de Adicciones 2008 [National Survey of Addictions, 2008]*. Cuernavaca, Mexico: Author.
- Kulis, S., Marsiglia, F. F., Castillo, J., Becerra, D., & Nieri, T. A. (2008a). Drug resistance strategies and substance use among adolescents in Monterrey, Mexico. *The Journal of Primary Prevention*, 29, 167–192.
- Kulis, S., Marsiglia, F. F., Elek, E., Dustman, P. A., Wagstaff, D. A., & Hecht, M. L. (2005). Mexican/Mexican American adolescents and Keepin' It R.E.A.L.: An evidence-based substance use prevention program. *Children & Schools*, 27, 133–145.
- Kulis, S., Marsiglia, F. F., & Hurdle, D. (2003). Gender identity, ethnicity, acculturation, and drug use: Exploring differences among adolescents in the Southwest. *Journal of Community Psychology*, 31, 167–188.
- Kulis, S., Marsiglia, F. F., Lingard, E. C., Nieri, T., & Nagoshi, J. (2008b). Gender identity and substance use among students in two high schools in Monterrey, Mexico. *Drug and Alcohol Dependence*, 95, 258–268.
- Le, H.-N., Lara, M. A., & Perry, D. F. (2008). Recruiting Latino women in the U.S. and women in Mexico in postpartum depression prevention research. *Archives of Women's Mental Health*, 11, 159–169.
- Loury, S., & Kulbok, P. (2007). Correlates of alcohol and tobacco use among Mexican immigrants in rural North Carolina. *Family & Community Health*, 30, 247–256.
- Marsiglia, F. F., & Hecht, M. L. (2005). *Keepin' it R.E.A.L.: An evidence-based program*. Santa Cruz, CA: ETR Associates.
- Marsiglia, F. F., Kulis, S., & Hecht, M. L. (2001). Ethnic labels and ethnic identity as predictors of drug use among middle school students in the Southwest. *Journal of Research on Adolescence*, 11, 21–48.
- Marsiglia, F. F., Kulis, S., Rodriguez, G. M., Becerra, D., & Castillo, J. (2009). Culturally specific youth substance abuse resistance skills: Applicability across the U.S.–Mexico border. *Research on Social Work Practice*, 19, 152–164.
- Mayo, Y. Q., & Resnick, R. P. (1996). The impact of machismo on Hispanic women. *Affilia*, 11, 257–277.

- Medina-Mora, M. E., Borges, G., Fleiz, C., Benjet, C., Rojas, E., Zambrano, J., . . . Aguilar-Gaxiola, S. (2006). Prevalence and correlates of drug use disorders in Mexico. *Revista Panamericana de Salud Pública, 19*, 265–276.
- Medina-Mora, M. E., Cravioto, P., Villatoro, J., Fleiz, C., Galván-Castillo, F., & Tapia-Conyer, R. (2003). Consumo de drogas entre adolescentes: Resultados de la Encuesta Nacional de Adicciones, 1998. *Salud Pública de México, 45*, S16–S25.
- Medina-Mora, M. E., & Rojas Guiot, E. (2003). Mujer, prueba, y adicciones. *Perinatología y Reproducción Humana, 17*, 230–244.
- Medina-Mora, M. E., Rojas, E., Galván, J., Juárez, F., Berenzon, S., Carreño, S., . . . Olmedo, R. (1993). Drug use among Mexican student youth. In Johnson, Bassin, & Shaw (Eds.), *Epidemiologic trends in drug abuse: Proceedings of the community epidemiology work group* (pp. 483–494). Rockville, MD: National Institute on Drug Abuse.
- Mendoza, M. R., & Medina-Mora, M. E. (2005). Alcohol consumption among Mexican women: Implications in a syncretic culture. In I. S. Obot & R. Room (Eds.), *Alcohol, gender and drinking problems* (pp. 125–142). Geneva, Switzerland: World Health Organization, Department of Mental Health and Substance Abuse.
- Mendoza Flores, M. E., Sánchez-Jiménez, B., García-Cardona, M., & Avila-Rosas, H. (2002). Morbilidad percibida y control prenatal. Estudio de campo. *Perinatología y Reproducción Humana, 16*, 26–34.
- Mirandé, A. (1997). *Hombres y machos: Masculinity and Latino culture*. Boulder, CO: Westview Press.
- Moon, D. G., Hecht, M. L., Jackson, K. M., & Spellers, R. E. (1999). Ethnic and gender differences and similarities in adolescent drug use and refusals of drug offers. *Substance Use & Misuse, 34*, 1059–1083.
- Nuño-Gutiérrez, B. L., Alvarez-Nemegyei, J., González-Forteza, C., & Madrigal-de León, E. A. (2006). La adicción ¿vicio o enfermedad? Imágenes y uso de servicios de salud en adolescentes usuarios y sus padres. *Salud Mental, 29*, 47–54.
- Olson, D. H., McCubbin, H., Barnes, H., Larsen, A. S., Muxen, M. J., & Wilson, M. A. (1983). *Families: What makes them work?* Beverly Hills, CA: Sage.
- Palermo, T. M., Wilson, K. S., García, S. G., & Díaz-Olavarrieta, C. (2010). Abortion and women's roles in society: Opinions from Tlaxcala, Mexico. *Salud Pública de México, 52*, 52–60.
- Spitzberg, B. H., & Cupach, W. R. (1984). *Interpersonal communication competence*. Beverly Hills, CA: Sage.
- Stephens, P. C., Sloboda, Z., Stephens, R. C., Teasdale, B., Grey, S. F., Hawthorne, R. D., & Williams, J. (2009). Universal school-based substance abuse prevention programs: Modeling targeted mediators and outcomes for adolescent cigarette, alcohol and marijuana use. *Drug and Alcohol Dependence, 102*, 19–29.
- Stevens, E. P. (1973). Machismo and marianismo. *Society, 10*, 57–63.
- Umaña-Taylor, A. J., & Bámaca-Gómez, M. Y. (2003). Generational differences in resistance to peer pressure among Mexican-origin adolescents. *Youth & Society, 35*, 183–203.
- Warner, J., Weber, T. R., & Albanes, R. (1999). “Girls are retarded when they're stoned.” Marijuana and the construction of gender roles among adolescent females. *Sex Roles, 40*, 25–43.
- Wright, A. J., Nichols, T. R., Graber, J. A., Brooks-Gunn, J., & Botvin, G. J. (2004). It's not what you say, it's how many different ways you can say it: Links between divergent peer resistance skills and delinquency a year later. *Journal of Adolescent Health, 35*, 380–391.
- Wycoff, S., & Cameron, S. C. (2000). The Garcia family: Using a structural systems approach with an alcohol-dependent family. *The Family Journal, 8*, 47–57.