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A Trajectory Analysis of Alcohol and Marijuana Use Among Latino Adolescents in San Francisco, California

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Abstract

Purpose—We examined alcohol and marijuana use trajectories among Latino adolescents in the San Francisco Bay Area.

Methods—A total of 410 Latino adolescents aged 14–19 years were recruited from community venues from years 2001 to 2004 and followed up for 2 years. In separate models, we identified groups with similar temporal patterns of alcohol and marijuana use using semi-parametric latent group trajectory modeling. Multivariable multinomial logistic regression was used to identify factors associated with the probability of trajectory group membership.

Results—The use of alcohol (76%) and marijuana (55%) in the previous 6 months was common. Three alcohol-use trajectories were identified: low users (18%), moderate users (37%), and frequent users (45%). Low alcohol users (vs. moderate users) were found to be younger in age, preferred Spanish language, and had more parental monitoring. Frequent users were more likely to be male, sexually active, gang exposed, and have less parental monitoring than moderate users. Similarly, three marijuana-use trajectories were identified: low users (36%), moderate users (35%), and frequent users (28%), with similar correlates of group membership.

Conclusions—Urban Latino adolescents' substance use is shaped by complex cultural and environmental influences. Patterns of substance use emerge by early adolescence highlighting the need for timely intervention.

Keywords

Latinos; Adolescents; Substance use; Acculturation; Gangs; Marijuana; Alcohol

Reducing substance use among adolescents in the United States constitutes a major public health priority. Although national rates of cigarette, alcohol, and marijuana use among high school students have decreased since the late 1990s [1–3], they remain alarmingly high, with 45% and 20% of students reporting alcohol and marijuana use in the last month, respectively [1, 4]. Latino adolescents, the fastest growing minority group in the United States [5], report rates of alcohol and marijuana use similar to white teens in national school-based studies [4, 6], but they are more likely to have used cocaine, heroin, methamphetamine, and ecstasy as compared with both white and black students [4]. Because early substance use may be associated with a variety of adverse health and psychological outcomes, including future substance abuse and sexual risk-taking [7–10], understanding the patterns and predictors of adolescent substance use among Latinos is a prerequisite to the development of appropriate and effective interventions.

Latino adolescents must navigate a complex cultural environment which can affect their substance use choices. Acculturation, the multidirectional process by which immigrants and their families assimilate to the behaviors, beliefs, and values of a new culture while adapting those of their culture of origin, is a strong and consistent risk factor for substance use among Latino adolescents [6, 11, 12]. More acculturated youth are more likely to report use of alcohol and other substances than those less acculturated—thereby adopting the substance use behavior of non-Latino youth [6, 13, 14]. Furthermore, stress associated with the acculturation process can be experienced both by Latino immigrant adolescents as they cope with a new cultural environment, as well as by U.S.-born Latino adolescents as they negotiate a bicultural identity involving mainstream American values and those of their parent’s culture [11, 13]. Other research suggests that “acculturation gaps” between adolescents and their parents may be related to adolescent alcohol use through deterioration of the traditional Latino values of parental respect and familism, a cultural outlook emphasizing the importance of close family relationships [12, 13]. In addition to the cultural context, the social environment for youth may influence substance use choices, especially in urban areas where poverty, violence (often manifested as gang violence), crime, and substance use may be common [15].

Research on substance use by Latino adolescents has been conducted predominantly among school-based, nationally representative samples [4, 6, 16], which may underestimate patterns of substance use. The high school dropout rate for Latinos is at least double the dropout rate of whites and blacks (22% vs. 6% and 11%, respectively) [17], and substance use is typically higher among out-of-school youth [18]. To overcome these limitations, we examined alcohol and marijuana use among in- and out-of-school Latino adolescents living in the San Francisco Bay Area who participated in the Mission Teen Health Project [19–22]. The study was designed to measure the risk behavior of a community sample of youth in a major metropolitan area. The goals of the analysis were to describe frequencies, patterns, and heterogeneity of alcohol and marijuana use to form contextually and culturally relevant interventions that could prevent substance use and abuse among urban Latino adolescents.

Materials and Methods

Study population

The San Francisco Mission Teen Health Project was a 2-year prospective cohort study of 555 adolescents conducted from 2001 to 2004. The purpose of the study was to describe social and sexual networks among adolescents in the community [19]. The Mission District is the vibrant cultural center of San Francisco's Latino population and home to nearly one-third of San Francisco's approximately 109,000 Latino residents [23]. However, household incomes are less than those of San Francisco overall, and the youth are regularly exposed to alcohol and drug use, prostitution, domestic and street violence, and gang activity [20, 22, 23]. This analysis is limited to 410 self-identified Latino participants.

Study design

The study has been described previously [19, 20, 22]. In brief, participants were recruited using three methods: venue-based recruitment throughout the Mission District, recruitment at community agencies, and friend referrals [22]. Eligible youth were aged 14–19 years, resided in the San Francisco Bay Area, and spoke English or Spanish. Participants were interviewed at baseline and reinterviewed every 6 months for 2 years (five visits). At each visit, a comprehensive social, reproductive health, and sexual network interview was conducted. Consent was obtained directly from adolescents aged 18 and 19 years. For adolescents aged 14–17 years, we obtained both parental consent and the participants' assent. The Committee for Human Research at the University of California, San Francisco, approved all study procedures and the Institutional Review Board at RTI International approved the secondary analysis.

Main outcome measures

Participants characterized alcohol and marijuana use at every visit ("About how often did you drink more than a few sips of beer, wine, a wine cooler, or hard liquor/use marijuana?") with a frequency scale ("a couple of times," "less than once a month," "not every week but at least once a month," "not every day, but at least once a week," and "every day"). These values were transformed to a scale of 0 to 5. Participants were also asked about getting drunk, parental and peer attitudes, and the sources for marijuana, its cost, and locations where it was being used.

Covariates

We examined several possible correlates of substance use. We assessed the role of school status (in- or out-of-school), sexual activity (vaginal or anal sex), participation in sports, and church attendance. Maternal education and living in crowded conditions (defined according to the U.S. Census [24]) served as proxies for socioeconomic status.

To assess the cultural status of participants, we measured country of birth, years in the United States, and immigrant generational status. First-generation participants were foreign-born; second-generation participants were born in the United States with foreign-born parents (one or both); and third-generation participants were born in the United States with U.S.-born parents. We assessed language use at home and also the language preference.

We assessed parental monitoring with the help of four questions: “How much of the time do your parents/guardians: 1) generally know where you are; 2) expect you to call if you are going to be late; 3) know who you are spending time with; and 4) know what you are doing when you are away from home?” The average response using a 4-point scale (none to all of the time) was classified into having no adult caretaker, having high levels of parental monitoring (monitoring most to all of the time), or less than high levels of parental monitoring. Finally, we assessed gang exposure, including current membership or affiliation, and having a sexual partner in a gang.

Statistical analysis

We first examined baseline descriptive statistics of alcohol and marijuana use. To group subjects by common temporal patterns of substance use, we used a data-adaptive, group-based trajectory modeling procedure. Group-based trajectory models identify distinctive groups of individuals with similar patterns of a behavior or outcome over time [25, 26]. The underlying model is a latent mixture polynomial model; the data-generating distribution consists of several unknown groups, each with a characteristic polynomial trend over time. Both the number of groups and the underlying degree of the polynomial are unknown, and thus model selection procedures are used to choose these parameter values. After the final model is determined, one can estimate the posterior probability of belonging to each group, which can also be made a function (through multinomial logistic regression) of baseline covariates [25, 27].

To determine the mixture model for both alcohol and marijuana use, we used the following methods. The optimal number of groups was determined by simultaneous considerations of fit (assessing change in the Bayesian Information Criterion [BIC] between models with successively more groups [27]), substantial knowledge about substance use patterns, and ease of interpretability. During this phase, all the group trajectories were set to a second order (quadratic) equation in time. After the appropriate number of groups was determined, individual group trajectories were adjusted to improve model fit by either adding or removing up to fourth order polynomial terms to the model or from the model, respectively, again choosing the model on the basis of change in BIC [25]. No covariates were added to the model at this time.

After the number of groups and model form were chosen, we then examined baseline factors associated with group membership using multinomial logistic regression [25]. The goal of the model was to predict an adolescent’s future pattern of substance use, given their current age and baseline covariates, rather than making causal inferences of the associations. After one fixes the order of the polynomial and the number of groups, the group assignment model and trajectory model are estimated simultaneously as part of a joint likelihood; the consequence is that the standard errors for the coefficients in the multinomial logistic regression model implicitly account for uncertainties in both group membership and the model for the trajectories. However, the “parameters” relating to prediction of the group are not parameters in the formal sense, which would assume that the classes are fixed and not estimated from the data. In reality, the definition of a class is a complex random function of the observed data, and thus the inference provided must be considered informal. Because

this analysis was exploratory in nature (and given the randomness of the definition of group), covariates with $p < .20$ in bivariable associations with trajectory groups by the Wald test were selected for inclusion in the final multivariable model, which also included age (years) at enrollment. We present odds ratios and 95% confidence intervals, which represent the odds of group membership in a particular trajectory group as compared with a referent trajectory group. We selected one measure of acculturation (personal language preference) for inclusion in the multivariable models on the basis of strength and precision of the association with the group trajectories in bivariable models. Because the results were similar for bivariable and multivariable models, we only present the multivariable models. All analyses were performed using SAS 9.2 statistical software (SAS Institute, Inc, Cary, NC); trajectory analyses were conducted using a customized procedure (PROC TRAJ) available at <http://www.andrew.cmu.edu/user/bjones/>.

Results

Girls comprised 56% of the 410 participants and the average age at enrollment was 16.4 years (Table 1). Most (65%) of the participants were born in the United States. Spanish was spoken in 64% of the homes overall and exclusively spoken in 42% of homes. Current membership in or affiliation with a gang was reported by 14% of boys and 18% of girls. Leaving school before earning either a high school diploma or General Education Development test was reported by 43 (11%) of the total participants. High levels of parental monitoring were reported by 45% of participants; 14% had no adult caregiver.

Alcohol use

Peers were perceived to be mostly indifferent (55%) or approving (22%) of alcohol use, whereas parents were perceived to be disapproving (92%, Table 2). At enrollment, 76% of participants reported alcohol use in the previous 6 months and another 17% initiated alcohol use during the study follow-up period. Although boys and girls reported similar histories of alcohol use at baseline and initiation of use during the study, boys reported higher frequencies of use and of getting drunk. During the period of follow-up, 60% of boys reported drinking alcohol at least weekly in at least one 6-month interval as compared with 45% of girls ($p = .02$), and 42% reported getting drunk at least weekly as compared with 24% of girls ($p < .01$).

We selected a 3-group alcohol model with linear trajectories as satisfactory (Figure 1). Although the 5-group model provided the best statistical fit, the additional two groups in the 3- versus 5-group model described subtle variability in patterns of moderate use; therefore, the 3-group model was selected as the most interpretable and parsimonious. Given the number of groups, the linear model was chosen on the basis of change in BIC and statistical significance of higher order terms. A low-level group reported little use throughout follow-up (group 1: “low users”), representing 18% of the sample. A second group, group 2 (“moderate users”), represented 38% of the sample and was characterized by sporadic use at ages 14 and 15 years and then gradually increasing use over time, but this increase never went past the “less than once a month” level. Group 3 (i.e., “frequent users”), represented

45% of the sample, reported less than monthly use at the age of 14 years, but reported almost weekly use by their early 20s.

We examined baseline characteristics associated with group membership with group 2 (“moderate users”) as the referent group (Table 3). Characteristics associated with membership in the low use group as compared with the moderate use group included young age, Spanish as the language of preference, and having high levels of parental monitoring. Factors associated with membership in the frequent use group included being male, being sexually active at baseline, being exposed to a gang (membership, affiliation, or having a sexual partner in a gang), and having no adult caretaker or low levels of parental monitoring.

Marijuana use

Peers were perceived to be indifferent (50%) or approving (28%) of marijuana use, whereas parents were perceived to be disapproving (93%) of use (Table 2). Marijuana use in the previous 6 months at baseline was common (55%) and another 21% of participants first used or reinitiated marijuana use during the follow-up period. Sources of marijuana included friends (82%), regular suppliers (53% for boys and 45% for girls), boy- or girlfriends (21% for boys and 37% for girls), or relatives (22% of boys and 33% of girls). Among those reporting baseline use, the highest average amount spent at any one time on marijuana was \$12 for girls and \$36 for boys. Marijuana was used commonly on the street or in parking lots (78%), at friend’s homes (75%), or in a car (71%). During the follow-up period, 31% of participants reported daily marijuana use during at least one 6-month interval.

We selected a linear model with three marijuana groups as best representing the data (Figure 1) on the basis of change in BIC. Group 1 (“low users”) reported no marijuana use during the study and represented 36% of the sample. Group 2 (“moderate users,” 35%) consistently reported less than monthly marijuana use during follow-up, and group 3 (“frequent users,” 28%) reported high and increasing usage, starting at monthly use and subsequently reaching weekly use by the age of 20 years. Characteristics associated with membership in the low use group included preferring using either Spanish or Spanish and English equally, not being sexually active, not being exposed to a gang, having high levels of parental monitoring, and perceiving disapproving peer attitudes toward marijuana (Table 4). In contrast, characteristics associated with membership in the high frequency marijuana group included English being the language of preference, being sexually active, gang exposure, having either lower levels of parental monitoring or no adult caregiver, and perceiving permissive peer attitudes toward marijuana.

Joint trajectories of alcohol and marijuana use

Of the total participants, 28% were in both the alcohol and marijuana high use groups. The conditional probability of being in the high marijuana use group given membership in the high alcohol use group was 60%. Conversely, the probability of being in the high alcohol use group conditional on membership in the high marijuana use group was 94%. Few (16%) participants were in both the alcohol and marijuana low use groups.

Discussion

In this trajectory analysis of substance use among urban Latino adolescents, alcohol and marijuana use was common and increased steadily throughout adolescence and early adulthood. Patterns of usage were detectable early in adolescence: by the age of 14 and 15, groups of adolescents with the highest frequencies of alcohol and marijuana use were easily discernable and they remained the highest users during the course of the study. The public health implications are clear: substance use education and prevention programs must be implemented well before junior high and high school. The window of opportunity for prevention of high-frequency use seems to close by age 16, when many youth have already become regular users.

Although most research suggests that adolescent alcohol use is more common as compared with marijuana [11, 28, 29]; 77% of the participants reported marijuana use during the study period, suggesting that marijuana is highly normalized in this population. Given that youth were recruited in public venues, it is challenging to compare our findings with school-based studies and to appropriately put these data in context. Hispanic participants in the Youth Risk Behavioral Survey reported a decrease in 30-day marijuana use since 1997 (from 29% to 19%) [30]; however, data from the 2008 Monitoring the Future project indicated that marijuana use in the last 12 months may have stabilized or increased after a long period of decline (32% for 12th graders) [3]. Our community-based sample is clearly a much higher risk group of youth. The prevalence of daily marijuana use in at least one 6-month interval in the study (31%) is striking, underscoring the need for intensified public health efforts to prevent marijuana use.

An innovative feature of this analysis was the use of semi-parametric latent group trajectory modeling, a tool which identifies clusters of individuals with similar trajectories of a behavioral pattern over time [25]. Trajectories can be adjusted to improve fit, and time-stable and time-varying co-variables can be added to the model. Graphical displays of data are easy to interpret and succinctly summarize large quantities of data. However, an important shortcoming is the assumption that the differences in trajectories of subjects within a group due only to independent and identically distributed random normal errors around a mean trajectory. One such reason for not allowing more error structure (e.g., random effects models) is that it can be hard to identify the maximum likelihood estimator and the resulting estimated quantities regarding group membership cannot be considered true fixed parameters anyway; therefore, the model assumptions are strong and no matter what augmentations are added to the model, the inference will be informal.

Spanish language preference (or equal preference for English), our proxy measure for acculturation, was associated with lesser use of both alcohol and marijuana use, consistent with previous reports [12–14]. This finding demonstrates the importance of “selective acculturation” whereby youth assimilate to the U.S. culture while retaining protective elements of their familial heritage [6]. Similarly, cultural values of familism and parental respect may be evident in higher levels of parental monitoring; another factor strongly associated with substance use trajectories in this study and others [31–33]. Thus,

interventions designed to strengthen relationships between immigrant parents and their adolescent children may help to reduce substance abuse among Latino youth [34].

There appears to be a complex interplay of sexual activity, gang affiliation, and substance use in our sample. Baseline sexual activity and gang exposure were both associated with higher frequencies of alcohol and marijuana use. This relationship between sexual activity and substance use has been noted previously [7, 35, 36], suggesting that introduction to, use of, and/or the availability of alcohol and marijuana may be closely tied to having a sexual partner. The association between gang affiliation and substance use is not unexpected [37], yet is concerning given that 25% of participants had some form of gang exposure (directly or through a sexual partner). Furthermore, in the parent study, 27% of sexually active female participants became pregnant during the follow-up period, and pregnancy was strongly related to male partner gang membership [20]. The implication is that juvenile gangs, substance use, and sexual risk-taking comprise a dangerous synergy, and that substance use prevention should be integrated with reproductive health efforts and youth gang prevention.

This study has several limitations. First, trajectory analysis identifies clusters of individuals with similar temporal behavioral patterns; however, individual patterns may differ from the group trajectories and/or may exhibit patterns from multiple group trajectories. Furthermore, high levels of missing data from the lowest and highest age ranges limit the reliability of estimates in these ranges. An optimal dataset to evaluate substance use would enroll and follow-up participants of the same age; we have attempted to control some of the confounding induced by differential selection in the cohort by adjusting for age in the multivariable models. Second, self-reported drug use may be subject to social desirability bias which could result in under- or overreporting of substance use. Third, it is possible that missing data are non-ignorable such that participants with the highest levels of substance use were more likely to miss follow-up interviews. Our baseline data suggested that this was not the case because levels of baseline alcohol and marijuana use were similar between participants who were lost to follow-up after the first visit ($n = 27$) and those who attended at least one follow-up visit. However, we do not know the subsequent substance use patterns of participants who did not return for interviews so this remains an important limitation of the study. In addition, the street-based recruiting strategy resulted in a higher proportion of foreign-born males than females because of the inclusion of sites where men might congregate to find work as day laborers. Furthermore, we were unable to analyze the results separately by country of origin and have used the term “Latino” to describe a heterogeneous group of adolescents. Finally, we used proxy measures of acculturation such as language preference and generational status instead of the degree to which adolescents identified with the values and attitudes of the host culture and their culture of origin [11]. Despite these shortcomings, this analysis has improved our understanding of substance use among the population of urban Latino youth in San Francisco; findings which are probably generalizable to other urban Latino youth.

Although national trends of adolescent substance use are encouraging [1–3], our study has illuminated a complex picture of substance use among a community sample of Latino youth both in and out of school. Patterns of use were established early in adolescence, suggesting a need for early intervention. The retention of cultural values seemed to be protective against

substance use; however, the conflicting risks of youth gangs and sexual activity are also strong influences on adolescents' health behavior. Latino youth comprise a large and growing proportion of U.S. youth, and continued attention to reducing alcohol and marijuana use in urban Latino adolescent populations is clearly warranted.

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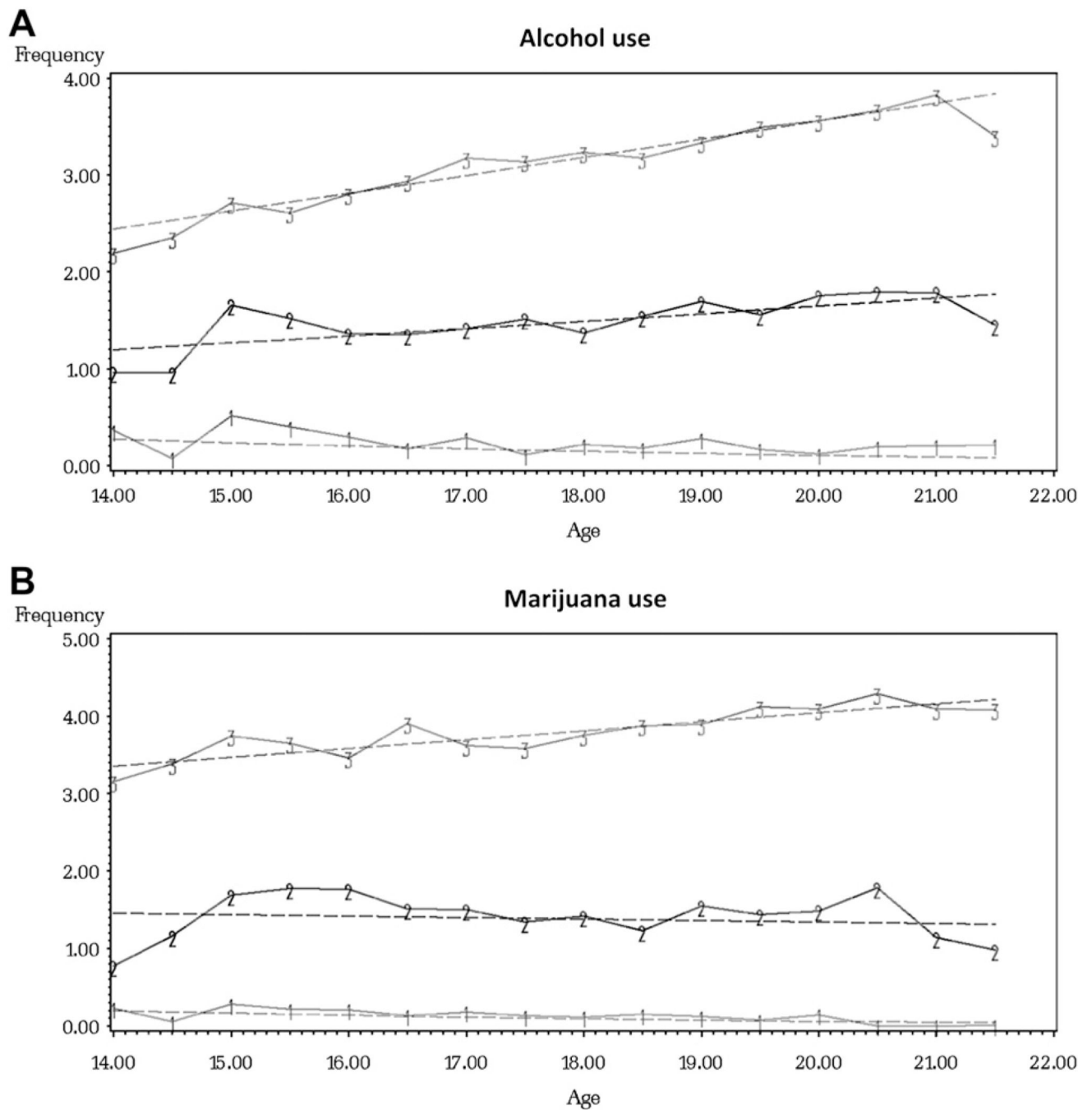


Figure 1. Trajectories of alcohol (panel A) and marijuana use (panel B) among a sample of Latino youth in San Francisco, California. Age-specific observed (—) and predicted (---) substance use frequencies in the previous 6 months were reported at each of the five study visits with the use of the following scale: 0 = no use, 1 = a couple of times, 2 = less than once a month, 3 = not every week but at least once a month, 4 = not every day but at least once a week, and

5 = every day. Groups were identified by a given number (1 = low frequency, 2 = moderate frequency, 3 = high frequency). Trajectories are from the final model without covariates.

Table 1

Baseline characteristics of 410 Latino youth participating in the Mission Teen Health Project, San Francisco, California, 2001–2004

Characteristic	<u>Overall (n = 410)^d</u>	<u>Males (n = 180)</u>	<u>Females (n = 230)</u>
	N (%)	N (%)	N (%)
Age ^b			
14–15	134 (32.8)	46 (25.6)	88 (38.4)
16–17	148 (36.2)	59 (32.8)	89 (38.9)
18–20	127 (31.1)	75 (41.7)	52 (22.7)
Country of birth			
United States	267 (65.1)	103 (57.2)	164 (71.3)
Mexico	78 (19.0)	42 (23.3)	36 (15.7)
El Salvador	23 (5.6)	9 (5.0)	14 (6.1)
Guatemala	14 (3.4)	10 (5.6)	4 (1.7)
Other	28 (6.8)	16 (8.9)	12 (5.2)
Years in the United States			
Less than 1 year	15 (3.7)	9 (5.0)	6 (2.6)
At least 1 year	126 (30.9)	67 (37.4)	59 (25.8)
Entire life (born in U.S.)	267 (65.4)	103 (57.5)	164 (71.6)
Generational status			
1st generation	143 (34.9)	77 (42.8)	66 (28.7)
2nd generation	211 (51.5)	79 (43.9)	132 (57.4)
3rd generation or higher	56 (13.7)	24 (13.3)	32 (13.9)
Language use at home			
English	146 (36.0)	53 (29.9)	93 (40.6)
Spanish	171 (42.1)	88 (49.7)	83 (36.2)
Both equally	89 (21.9)	36 (20.3)	53 (23.1)
Personal language preference			
English	213 (52.3)	84 (47.2)	129 (56.3)
Spanish	79 (19.4)	48 (27.0)	31 (13.5)
Both equally	115 (28.3)	46 (25.8)	69 (30.1)
Mother's education (highest completed)			
Less than primary school	36 (9.3)	18 (10.9)	18 (8.1)
Primary/elementary school	117 (30.3)	45 (27.3)	72 (32.6)
High school	146 (37.8)	63 (38.2)	83 (37.6)
Any college or technical school	87 (22.5)	39 (23.6)	48 (21.7)
Residence in crowded conditions ^c			
Yes	130 (31.9)	69 (38.8)	61 (26.6)
No	277 (68.1)	109 (61.2)	168 (73.4)
Participation in organized sports in the last 6 months			
Yes	162 (39.8)	89 (50.0)	73 (31.9)
No	245 (60.2)	89 (50.0)	156 (68.1)

Characteristic	Overall (n = 410) ^a	Males (n = 180)	Females (n = 230)
	N (%)	N (%)	N (%)
Sexually active ^d			
Yes	266 (64.9)	127 (70.6)	139 (60.4)
No	144 (35.1)	53 (29.4)	91 (39.6)
Current gang membership or affiliation			
Yes	65 (16.1)	24 (13.7)	41 (18.0)
No	338 (83.9)	151 (86.3)	187 (82.0)
Sexual partner in a gang			
Yes	54 (13.2)	18 (10.0)	36 (15.7)
No	183 (44.6)	93 (51.7)	90 (39.1)
No partners reported	173 (42.2)	69 (38.3)	104 (45.2)
Regular church attendance			
Yes	180 (44.1)	79 (44.4)	101 (43.9)
No	228 (55.8)	99 (55.6)	129 (56.1)
Current student status			
Yes, less than high school	291 (72.0)	109 (62.6)	182 (79.1)
Yes, college or technical school (completed HS or GED)	49 (12.1)	29 (16.7)	20 (8.7)
No, completed at least high school/GED	21 (5.2)	12 (6.9)	9 (3.9)
No, not completed high school/GED	43 (10.6)	24 (13.8)	19 (8.3)
Parental monitoring ^e			
No adult caretaker	55 (13.5)	29 (16.2)	26 (11.3)
High levels	183 (44.7)	62 (34.6)	121 (52.6)
Less than high levels	171 (41.8)	88 (49.2)	83 (36.1)

GED = General Education Development test.

^aNumbers may not add to 410 due to missing data.

^bExcludes one participant with no available data. Mean age = 16.4 years, 16.1 (females), 16.8 (males); $p < .01$.

^cAccording to the U.S. Census definition of more than one person per room in the household (including bedrooms, bathrooms, living rooms, etc.).

^dReporting vaginal and/or anal sex at baseline.

^eParental monitoring was computed as the average score on a 4-question scale. Participants with average monitoring corresponding to “most to all of the time” were considered to have high levels of parental monitoring.

Table 2

Attitudes and use of alcohol and marijuana at baseline and during follow-up among 410 Latino Youth, San Francisco, California, 2001–2004

Characteristic	Overall (n = 410) ^d	Males (n = 180)	Females (n = 230)
	N (%)	N (%)	N (%)
Attitudes ^b			
Perceived peer attitudes toward alcohol use			
Disapprove	95 (23.2)	44 (24.4)	51 (22.2)
Don't care	225 (54.9)	107 (59.4)	118 (51.3)
Approve	90 (22.0)	29 (16.1)	61 (26.5)
Perceived parental attitudes toward alcohol use			
Disapprove	377 (92.0)	164 (91.1)	213 (92.6)
Don't care	22 (5.4)	9 (5.0)	13 (5.7)
Approve	11 (2.7)	7 (3.9)	4 (1.7)
Perceived peer attitudes toward marijuana use			
Disapprove	91 (22.3)	46 (25.8)	45 (19.6)
Don't care	203 (49.8)	92 (51.7)	111 (48.3)
Approve	114 (27.9)	40 (22.5)	74 (32.2)
Perceived parental attitudes toward marijuana use			
Disapprove	383 (93.4)	164 (91.1)	219 (95.2)
Don't care	18 (4.4)	10 (5.6)	8 (3.5)
Approve	9 (2.2)	6 (3.3)	3 (1.3)
Alcohol use			
Alcohol use in last 6 months (enrollment)			
Yes	310 (76.2)	137 (77.0)	173 (75.6)
No	97 (23.8)	41 (23.0)	56 (24.4)
Alcohol use during study			
Reported any use at baseline	310 (76.7)	137 (77.0)	173 (76.6)
First reported use during follow-up	67 (16.6)	31 (17.4)	36 (15.9)
None reported	27 (6.7)	10 (5.6)	17 (7.5)
Highest use frequency reported ^c			
Daily	31 (8.2)	20 (11.9)	11 (5.3)
At least once a week	164 (43.6)	81 (48.2)	83 (39.9)
At least once a month	75 (19.9)	32 (19.1)	43 (20.7)
Less than once a month	61 (16.2)	19 (11.3)	42 (20.2)
A couple of times	45 (12.0)	16 (9.5)	29 (13.9)
Highest frequency of getting drunk in last 6 months ^c			
Daily or weekly	119 (31.6)	70 (41.7)	49 (23.6)
At least once a month	77 (20.5)	31 (18.5)	46 (22.1)
Less than once a month	45 (12.0)	14 (8.3)	31 (14.9)
A couple of times	77 (20.5)	29 (17.3)	48 (23.1)

Characteristic	Overall (n = 410) ^d	Males (n = 180)	Females (n = 230)
	N (%)	N (%)	N (%)
Never	58 (15.4)	24 (14.3)	34 (16.4)
Marijuana use			
Where marijuana could be obtained ^d			
From boy/girl friend	122 (29.8)	37 (20.6)	85 (37.0)
From friends	334 (81.5)	146 (81.1)	188 (81.7)
From regular supplier (not a friend)	199 (48.5)	96 (53.3)	103 (44.8)
From a relative	102 (29.0)	34 (21.8)	68 (33.0)
Grow it	71 (17.3)	38 (21.1)	33 (14.3)
Highest amount of money spent on marijuana ^e			
Nothing	51 (25.1)	14 (17.9)	37 (29.6)
\$1–20	118 (58.1)	43 (55.1)	75 (60.0)
\$21–100	26 (12.8)	15 (19.2)	11 (8.8)
>\$100	8 (3.9)	6 (7.7)	2 (1.6)
Marijuana use in previous 6 months (baseline)			
Yes	227 (55.4)	94 (52.2)	133 (57.8)
No	183 (44.6)	86 (47.8)	97 (42.2)
Marijuana use during study			
Reported any use in last 6 months, baseline	227 (56.9)	94 (54.0)	133 (59.1)
Re-/Initiated marijuana use in follow-up	83 (20.8)	42 (24.1)	41 (18.2)
None reported	89 (22.3)	38 (21.8)	51 (22.7)
Where marijuana is regularly used ^f			
At home	61 (30.7)	27 (32.5)	34 (29.3)
At a friend's home	149 (74.5)	57 (67.9)	92 (79.3)
On the street or in parking lots	155 (77.5)	65 (77.4)	90 (77.6)
At school	45 (22.5)	22 (26.2)	23 (19.8)
At a park	125 (62.5)	54 (64.3)	71 (61.2)
At a movie theater or mall	41 (20.5)	24 (28.6)	17 (14.7)
In a car	100 (71.4)	44 (73.3)	56 (70.0)
Highest use frequency reported ^g			
Daily	95 (30.9)	44 (32.4)	51 (29.8)
Weekly	80 (26.1)	43 (31.6)	37 (21.6)
At least once a month	44 (14.3)	16 (11.8)	28 (16.4)
Less than once a month	27 (8.8)	9 (6.6)	18 (10.5)
A couple of times	61 (19.9)	24 (17.7)	37 (21.6)

^aNumbers may not add to 410 due to missing follow-up data on some participants. Percents may not add to 100 due to rounding.

^bAs measured at study enrollment.

^cLimited to the 377 participants who reported any alcohol use during the study. Frequency was assessed for each 6 month period. Numbers may not add to 377 due to missing data.

^dOptions are not mutually exclusive; number indicates the number of participants who indicated source.

^eHighest amount spent at a single time. Limited to the 227 participants who reported any marijuana use in the previous 6 months. Missing for 11% of the 227. Mean amount reported = \$21.60.

^fOptions are not mutually exclusive; number indicates the number of participants who indicated venue. Measured at the 12-month follow-up visit among participants who reported use in the previous 6 months. Marijuana use in a car was measured at the final (30 month) follow-up visit.

^gLimited to the 310 participants who reported any marijuana use during the study.

Table 3

Baseline predictors of alcohol trajectory group affiliation with multivariable multinomial logistic regression among Latino youth in San Francisco, California, 2001–2004^a

Characteristic	Group 1 Low users		Group 3 Frequent users	
	OR	95% CI	OR	95% CI
Gender *				
Male	1.27	(.58, 2.76)	4.41	(2.12, 9.19)
Female	Referent	–	Referent	–
Age (years) *	.60	(.45, .82)	.92	(.72, 1.22)
Personal language preference *				
English	Referent	–	Referent	–
Spanish	6.23	(2.08, 18.68)	.46	(.16, 1.31)
Both equally	1.14	(.46, 2.82)	.51	(.23, 1.14)
Sexually active *				
Yes	1.29	(.60, 2.76)	4.26	(1.97, 9.23)
No	Referent	–	Referent	–
Any gang exposure ^{*,b}				
Yes	.72	(.24, 2.14)	2.46	(1.08, 5.60)
No	Referent	–	Referent	–
Regular church attendance				
Yes	.45	(.21, .98)	.55	(.28, 1.10)
No	Referent	–	Referent	–
Parental monitoring *				
No adult caretaker	.34	(.07, 1.69)	3.36	(1.18, 9.55)
High levels	Referent	–	Referent	–
Less than high levels	.34	(.14, .78)	2.17	(1.05, 4.46)
Perceived peer attitudes toward alcohol use				
Disapprove	Referent	–	Referent	–
Don't care	.89	(.39, 2.02)	2.63	(.96, 7.17)
Approve	.26	(.05, 1.28)	2.78	(.91, 8.45)

OR = Odds ratio; CI = confidence interval.

* $p < .05$ for Wald Test of all $\beta = 0$.

^aReference group is Group 2 (i.e., moderate users).

^bParticipant reports of current gang membership or affiliation, or having a partner in a gang.

Table 4

Baseline predictors of marijuana trajectory group affiliation with multivariable multinomial logistic regression among Latino youth in San Francisco, California, 2001–2004^a

Characteristic	Group 1 Low users		Group 3 Frequent users	
	OR	95% CI	OR	95% CI
Gender				
Male	.75	(.38, 1.45)	1.57	(.77, 3.17)
Female	Referent	–	Referent	–
Age (years)	.90	(.73, 1.12)	1.00	(.79, 1.27)
Personal language preference *				
English	Referent	–	Referent	–
Spanish	3.53	(1.48, 8.45)	.08	(.01, .51)
Both equally	1.97	(.96, 4.04)	.41	(.19, .88)
Sexually active *				
Yes	.47	(.24, .95)	2.13	(.93, 4.89)
No	Referent	–	Referent	–
Any gang exposure ^{*,b}				
Yes	.30	(.13, .71)	1.50	(.73, 3.09)
No	Referent	–	Referent	–
Regular church attendance				
Yes	1.02	(.55, 1.90)	.95	(.48, 1.88)
No	Referent	–	Referent	–
Participation in organized sports in last 6 months				
Yes	.86	(.46, 1.60)	.52	(.26, 1.06)
No	Referent	–	Referent	–
Parental monitoring *				
No adult caretaker	.89	(.30, 2.62)	1.57	(.55, 4.49)
High levels	Referent	–	Referent	–
Less than high levels	.49	(.25, .97)	1.74	(.83, 3.61)
Perceived peer attitudes toward marijuana use *				
Disapprove	Referent	–	Referent	–
Don't care	.40	(.19, .87)	1.63	(.46, 5.73)
Approve	.68	(.25, 1.88)	3.28	(.84, 12.80)

OR = Odds ratio; CI = confidence interval.

* $p < .05$ for Wald Test of all $\beta = 0$.

^a Reference group is Group 2 (i.e., moderate users).

^b Participant reports of current gang membership or affiliation, or having a partner in a gang.