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## Adolescent drinking risks associated with specific drinking contexts

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### Abstract

**Background**—In order to identify drinking contexts towards which prevention efforts should be directed, associations of context-specific alcohol use (past-year frequency of drinking and heavier drinking in the context) with a range of alcohol-related problems were examined in a population sample of adolescents.

**Methods**—A sample of youths (ages 15–18) residing in 50 medium-to-large California cities (n=473 drinkers) was obtained. Respondents provided information about seven past-year alcohol-related problems in three domains (physiological consequences, alcohol-related violence, and conflict/trouble) and the number of times in the past year they used six distinct drinking contexts (parties, restaurants/bars, parking lots/street corners, beaches/parks, respondent's home without parents, someone else's home without parents). Context-specific dose-response was estimated for each context using censored Tobit models with heteroskedasticity corrections

**Results**—Physiological problems were associated with more frequent drinking in five of six contexts. Heavier drinking in restaurants/bars/nightclubs (b=0.22, s.e.=0.10) and someone else's home without parents (b=0.14, s.e.=0.06) was associated with greater risk of violence. Conflict/trouble was associated with more frequent drinking in parking lots/street corners, declining at higher levels of drinking.

**Conclusions**—Certain drinking contexts are related to problems amongst youths, some because they are associated with frequent alcohol consumption and others because they are associated with heavier drinking. Identifying which drinking contexts are related to specific alcohol-related problems and why is an essential component of developing effective preventive interventions.

### Keywords

Context-specific; alcohol; dose-response; alcohol-related problems; youth drinking

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## Introduction

Associations between alcohol consumption and related problems vary by the context in which alcohol is consumed (Freisthler and Gruenewald, 2013, Mair et al., 2013). For example, in a study of 1,585 California couples, the context in which drinking occurred played a role in intimate partner violence, with male→female violence linked to drinking away from home and female→male violence linked to drinking at home (Mair et al., 2013). In another study, Freisthler and Gruenewald found that frequencies of using drinking venues, particularly bars and home or parties, were associated with greater use of abusive parenting practices (Freisthler and Gruenewald, 2013). Up to now, the associations between drinking contexts and problems have been studied primarily among adults and young adult college students. Much less is known about the contexts in which adolescents drink and the relationships of these drinking contexts to alcohol-related problems (Windle, 2003, Anderson and Brown, 2010, Harford and Grant, 1987, Foley et al., 2004, Jones-Webb et al., 1997). To begin to address this gap, the goal of this study is to examine the relationships between two aspects of drinking in various venues (past-year frequency of drinking and volume consumed per venue) and alcohol-related problems among adolescents using a context-specific dose-response model.

Despite a steady decline in use over the past three decades, alcohol remains the most commonly used substance amongst American adolescents (Patrick and Schulenberg, 2010). According to the Monitoring the Future (MTF) survey, 47% of 10<sup>th</sup> graders and 62% of 12<sup>th</sup> graders reported past-year alcohol use in 2013, and 20% of 12<sup>th</sup> graders reported binge drinking in the past two weeks (Johnston et al., 2014). Alcohol use by adolescents and young adults is associated with a wide range of alcohol-related problems (Foxcroft et al., 2003), including aggression (Wells et al., 2005, White et al., 1993, Bonomo et al., 2001), physiological problems such as hangovers and vomiting (Maney et al., 2002, Windle, 2003), and conflict/trouble with parents, police, and other authorities (Colder et al., 2002, White and Labouvie, 1989, Barnes, 1984). The harm caused to adolescents by alcohol misuse and its related problems may impair development, generate additional burdens such as academic failure, and create difficulties in the transition to adulthood (Ellickson et al., 2003). Whether these problems are differentially related to specific drinking contexts is unknown.

Preliminary evidence indicates that adolescents differentially select drinking contexts. In an earlier analysis of the same sample of California youth (Lippman-Kreda et al., 2015), older, more frequent drinkers were more likely to drink at parties and someone else's home without parents. Deviant youths, defined as those who are involved in behaviors that are illegal, socially disapproved, and/or age-inappropriate (Donovan et al., 1991; Jessor et al., 1991; Jessor and Jessor, 1977), were more likely to drink in almost all contexts, although the relationship of deviance to alcohol use in outdoor places (roughly 100% greater for every unit increase in deviance score) was much larger than for alcohol use in youths' homes (59%), at parties (22%), or someone else's home (19%). Furthermore, youth increased their use of drinking places outside their own homes over time. Whether this variation in use and distribution of drinking contexts contributes to specific risks for adolescents is a crucial question that remains largely unexplored.

To better understand the link between drinking in particular contexts and alcohol-related problems, it helps to distinguish between the *frequency* of drinking in a context and *heavier drinking* in a context. Characteristics of drinking contexts may promote alcohol-related problems (Gruenewald, 2007). For example, a social environment with more permissive norms towards violent behaviors may attract aggressive individuals and influence an individual to act aggressively in that specific context independent of the amount of alcohol consumed. Furthermore, it is possible that the amount of alcohol consumed in a particular context may be more important than other (e.g., social) characteristics of that context. Distinguishing between effects of frequency of drinking in the context vs. heavier drinking within the context requires an approach that separates the effects of these two types of context-specific risks. Using a context-specific dose-response model, the separate effects of frequency (i.e., how often someone drinks in each context) and continued volumes (i.e., how much alcohol they consume in each context beyond one drink) can be estimated. In this paper, we use quantitative dose-response models developed for this task (Gruenewald et al., 2010, Freisthler and Gruenewald, 2013) to assess how frequencies of drinking in different venues (e.g., bars or parties) and the amount of alcohol consumption in these venues may be related to different alcohol-related problems among youths. Using a sample of adolescents aged 15 to 18, we test the associations between past-year problems and frequency and amount of alcohol consumed in the past year in six specific drinking contexts.

## Materials and Methods

### Study sample and survey methods

Data were obtained from youths who participated in Wave 3 of a longitudinal study in mid-sized California cities. A geographic sampling method was used to select 50 non-contiguous California cities out of all 138 California cities with populations between 50,000 and 500,000 (Lipperman-Kreda et al., 2012). Specifically, a random city from the list of 138 was selected for inclusion and all contiguous cities and cities contiguous to those cities were excluded from the list. A second city was then randomly selected from those remaining on the list and the process was continued until 50 cities were sampled. The sampled cities tended, on average, to have slightly smaller populations (106,588 vs. 108,000), somewhat less ethnic diversity (e.g., 64% vs. 59% white), smaller household sizes (2.82 vs. 2.93 persons), and lower median household incomes (\$50,000 vs. \$52,000). Importantly, however, none of these differences were statistically significant.

Households within each selected city were sampled from a purchased list of households identified as likely to contain respondents in the target age range (i.e., 13–16 years old at Wave 1). If more than one eligible adolescent respondent resided in a household, one was randomly selected to receive the invitation to participate. Parental permission was first obtained to interview the adolescent. Respondents were informed that the study was voluntary, concerned smoking and drinking behaviors, and that they could refuse to participate, refuse to answer specific questions, or decide at any time to end their participation in the study. Respondents received \$25 at Waves 1 and 2 and \$35 at Wave 3 as compensation for their participation in the study. Data were collected through a computer-assisted telephone interview (CATI).

Of 3,062 sampled households with potential eligible respondents, 1,543 participated in the Wave 1 telephone interview in 2009 (response rate 50.4%). Of these participants, 1,121 of these completed the Wave 3 survey (72% follow-up). Wave 3 data were used for these analyses, as there were the greatest number of past-year drinkers (n=473 drinkers) at that measurement point. Analyses were limited to drinkers only, as we were primarily concerned with the differential impact of drinking contexts on alcohol-related problems.

## Measures

**Alcohol-related problems**—Adolescent respondents were asked about the past-year occurrence of seven alcohol-related problems corresponding to three domains (physiological, conflict/trouble, and violence-related). Physiological problems (three items) included throwing up or vomiting because of drinking; not being able to remember what happened while drinking; and having a hangover or feeling sick the day after drinking. Problems relating to conflict and trouble (two items) included getting into trouble with parents or guardians because of drinking and getting into trouble with the police because of drinking. Violence-related problems (two items) included starting a fight or shoving match because of your drinking and shouting/insulting/cursing at/threatening someone while drinking. Respondents were asked to report the number of times in the past year each problem occurred. Values for each problem were Winsorized to the 97<sup>th</sup> percentile in order to reduce the influence of a small number of extreme outliers in each problem measure. Correlations between individual items within domains ranged from 0.39 to 0.55.

## Context-specific frequency of drinking and continued volumes

We used a model developed and used elsewhere (Gruenewald et al., 2010, Mair et al., 2013, Freisthler and Gruenewald, 2013) that relates overall drinking risks,  $R$ , to frequencies of drinking ( $F$ ) and continued drinking volumes (total number of drinks beyond one per drinking occasion,  $V-F$ ; interpretable as risks related to heavier drinking) of alcohol use. This model provides estimates of risks related to drinking,  $b$ , and risks related to heavier drinking,  $c$ :

$$R = a + bF + c(V - F) \quad (\text{Equation 1})$$

If we assume that  $F$  (overall frequency of drinking) is composed of context-specific drinking frequencies ( $F_i$ ), such that  $F = f_1 + f_2 + \dots + f_n$ , this approach can be extended to model context-specific risks:

$$R_i = a_i + b_i F_i + c_i F_i (V_i - F_i) \quad (\text{Equation 2})$$

Total risk related to drinking ( $R$ ) is a sum of context-specific risks ( $R_i$ ). The risks associated with frequency of being in each context and having one drink ( $b_i$ ) and context-specific continued volumes ( $c_i$ ) can be estimated using Equation 2. Estimates of  $b_i$  represent different risks related to frequency of attending each drinking context whereas estimates of  $c_i$  represent different risks related to heavier drinking between contexts.

Context-specific frequencies ( $F_i$ ) and continued volumes ( $V_i-F_i$ ) were derived for six distinct drinking contexts. Respondents were asked about a seventh context, school events, but this was too infrequent a drinking context for analyses to converge and was therefore dropped. The six contexts were parties, someone else's home, one's own home, parking lots or street corners, beaches or parks, and restaurants, bars or nightclubs. Respondents were asked how many days in the past year they drank in each context ( $F_i$ ).

Respondents were also asked how many drinks they typically had on the days they drank alcohol in the past year ( $Q$ ). To derive context-specific continued volumes, we first estimated person-specific drinking quantities for each context from all exogenous measures, then we used those person-level estimates to construct continued volume measures for the context-specific dose-response models. The first stage estimates of average drinking quantities within each context were, by definition, independent of correlated measurement error related to reciprocal effects of context-specific characteristics (e.g., number of other heavy drinkers) on respondents' average drinking levels. This procedure is based on the observation that average typical drinking quantities are a weighted (by frequency) average of (unobserved) typical drinking quantities ( $q_i$ ) consumed in each context:

$$Q=q_1F_1+q_2F_2+q_3F_3+\dots+q_6F_6 \quad (\text{Equation 3})$$

Thus, a regression of  $Q$  on values of  $F_i$  for each context provided an estimate of average drinking levels in each context (reported in Table 2). Subject specific variations in  $q_i$  related to person characteristics, like gender or deviance, were then identified by estimated difference in  $q_i$  related to these covariates.

**Deviance**—Based on Problem Behavior Theory, deviance is defined as involvement in illegal, socially disapproved, or age-inappropriate behaviors (Donovan et al., 1991; Jessor and Jessor, 1977; Jessor et al., 1991). Deviance was measured using a six-item scale adapted from these previous studies. Respondents were asked how many times in the past 12 months they had lied to cover up something they did, purposely damaged other people's property, taken things from a store or shop without paying for them, been in a fight where they hit or shoved someone, skipped school without permission, and used drugs to get high. There were four response options, from "never" to "often". A mean score was computed, with a higher score indicating greater deviance. The internal reliability (Cronbach's  $\alpha$ ) for the scale was 0.65.

**Other covariates**—Other measures included smoking status, weekly spending money, deviance, parental education, gender, age, and race. Past-year smoking status was measured by asking adolescents about their frequency of cigarette smoking in the past 12 months on a seven-point scale. A dichotomous variable was created, indicating past-year cigarette smoker versus non past-year cigarette smoker. Respondents were asked about how much spending money they received or earned in a typical week that could be spent on whatever they want. Weekly spending money was treated as a continuous variable, estimated by taking the midpoint of nine categories.

Parental education was assessed by asking each youth to report the highest level of education their mother/female guardian and father/male guardian had completed. The nine response categories were recoded to the number of years of education, and the highest reported education for either parent used. Youth reported their gender, age, and race/ethnicity. Race/ethnicity was treated as a dichotomous variable (white non-Hispanic versus non-white).

## Analyses

Data were analyzed using censored Tobit models with heteroscedasticity corrections, with frequencies of alcohol-related problems measured as counts of the number of events in the past year. Models were run for each of the domains separately (Table 3). All models included controls for demographic characteristics (age, gender, race, parental education, weekly spending money), deviance, and smoking status. For each problem outcome, block tests were used to determine final models: Models were first run with only demographic and psychosocial characteristics (Model 1); next, context-specific frequencies of use were added (Model 2) and tested as a block for significance; as a final step, continued volumes for each context were added and tested. All contexts with a continued volumes p-value less than 0.05 were left in the model (all other contexts were removed) (Model 3), and a block test for continued volumes was calculated. If the block test for continued volumes was not significant at the  $p < 0.05$  level, no V-F variables were left in Model 3. The F and V-F coefficients are interpreted based on the underlying context-specific dose-response quantitative model presented above. Heteroskedasticity controls were included for F,  $F^2$ , and V-F, based on results of prior work (Gruenewald and Mair, In Press). We used White's test to check for heteroscedasticity, which was positive and significant for past-year F and negative and significant for past-year  $F^2$  in all models, such that the variance in the frequency of alcohol-related problems increased with greater drinking frequency. The heteroscedasticity was non-significant in most models for continued volumes of use. Results presented here are based on standard errors corrected for heteroscedasticity relative to overall drinking frequencies (F,  $F^2$ ) and continued volumes of use.

## Results

The respondents (all past-year drinkers) were 53.5% male, 60.5% white, and had a mean age of 17.1 at Wave 3. On average, parents had 16 years of education (equivalent to college graduation). Youth reported having \$39.85, on average, in spending money per week. 25.8% had smoked at least one cigarette in the past year. The mean deviance score was 1.56 (possible range 1–4). This sample of 473 past-year adolescent drinkers was similar to the overall survey respondents in Wave 3 ( $n=1,121$ ) in terms of demographic and other characteristics, although they had more weekly spending money (\$39.85 vs. \$30.19) and were more likely to be past-year smokers (25.8% vs. 13.6%).

On average, respondents reported 3.7 physiological problems, 0.5 conflict-related problems, and 0.5 violence-related problems per year. The most frequently reported problem was having a hangover or feeling sick the day after drinking (mean 2.0 times per year). On average, youth reported drinking on 16.1 days in the past year (Table 2). The mean quantity



of alcohol consumed in the past year was 68.6 drinks (standard deviation 140.13). Youth reported drinking most frequently at parties (8.2 times per year) and at someone else's home without parents (3.7 times per year), and least frequently in restaurants/bars/nightclubs (0.6 times per year). Similarly, the greatest estimated quantities of alcohol consumed were at parties (41.4 drinks/year) and someone else's home without parents (12.4 drinks/year), and the smallest in restaurants/bars/nightclubs (1.3 drinks/year).

Alcohol-related problems from each of the three domains demonstrated unique patterns (Table 3). More frequent drinking in five of the six contexts was associated with greater past-year physiological problems. The magnitude of this association was strongest for drinking in one's own home ( $b = 0.90$ ; *s.e.* 0.18). Associations were significantly reduced at higher levels of drinking at parties ( $b$ , continued volumes =  $-0.03$ ; *s.e.* 0.01) and at one's own home without parents ( $b = -0.17$ ; *s.e.* 0.05). Drinking more frequently in parking lots/on street corners was associated with greater past-year conflict-related problems, while this association declined at higher levels of drinking. Drinking more heavily at restaurants/bars/nightclubs and at someone else's home without parents were both associated with a greater number of past-year violence-related problems, while drinking more frequently at restaurants/bars/nightclubs was associated with fewer such problems ( $b = -0.61$ ; *s.e.* 0.25). A higher deviance score was associated with all three problem types. Additionally, current smoking, older age, and female gender were associated with greater physiological problems, while current smoking and greater parental education were associated with greater conflict/trouble.

## Discussion

Frequency of drinking and heavier drinking are important predictors of specific types of alcohol-related problems in some, but not all, drinking contexts. Physiological problems were associated with drinking more frequently in five of the six contexts, while drinking more heavily was not associated with greater physiological problems in any context; in fact, the associations between frequency and physiological problems were reduced at higher drinking levels at parties and at respondents' homes without parents. Frequent drinking at restaurants/bars/nightclubs was associated with fewer conflict-related problems. Drinking more frequently in parking lots/street corners was associated with more conflict/trouble, with this association disappearing at higher levels of drinking. In contrast, the volumes, not frequencies, of alcohol consumed at someone else's home without parents and at restaurants/bars/nightclubs were associated with greater violence. By using a context-specific model, a more nuanced picture of the links between alcohol consumed in a context and problems emerges. These results indicate a need to consider what occurs within drinking contexts (besides alcohol consumption) that might trigger alcohol-related problems in youth. Specifically, in-depth analyses of drinking contexts are needed to identify what situational and ecological factors, such as party size, presence of adults, and parties in secluded areas, contribute to risk.

The story that emerges from these results is one in which the social-ecological facets of drinking in different places appear to influence a range alcohol-related problems. Different patterns emerge when we examine these relationships by problem type. Frequency of

drinking, rather than volume consumed, drives context-specific associations for physiological problems. It may be that youth who rarely drink experience hangovers at low levels of drinking, with heavy drinking not additionally contributing to these problems. By comparison, drinking more frequently in restaurants/bars/nightclubs was associated with fewer past-year violent events, while greater volume of alcohol consumed in that setting, and at someone else's home without parents, were associated with greater violence. This may be because there is more social control over violence in these settings compared with other locations, which is only overcome with heavy drinking. Conflict and trouble with parents and police was associated with the frequency of drinking in parking lots/street corners. This may be a location that the police monitor for adolescent drinking, where youth drinking is more visible and likely to attract attention of authorities, or may be a drinking context largely used by youths who are likely to have contentious relationships with their parents.

In a complementary analysis, Lipperman-Kreda et al. examined the associations between drinking patterns, demographic and other individual-level characteristics with use of specific drinking contexts (Lipperman-Kreda et al., 2015). They found that some characteristics, such as youth deviance, were associated with drinking in most contexts. Age and gender were also important predictors of where these youth drank in the past year. Combining information on selection risks with context-specific problem risks is potentially very useful for understanding the social mechanisms by which drinking contexts affect drinking-related problems and the development of preventive interventions. For example, females were more likely to drink in parking lots/street corners; from this analysis, we see that frequency of drinking in this context is associated with increased physiological problems and conflict/trouble. Creating context-specific restrictions (e.g., prohibiting loitering on street corners during evening hours) and/or increasing enforcement in specific contexts may help reduce risk in this population. As another example, deviant drinkers were more likely to drink in their own homes without parents. In this paper we show that physiological problems are greater for adolescents who drink more frequently in this context. This is one potential mechanism through which we see deviance associated with alcohol-related problems: the choice of drinking location for more deviant youth.

A number of study limitations should be noted. First, the analyses are limited to past-year drinkers, most of whom have had few problems, limiting potential generalizability of results. Second, our data are drawn from mid-to-large-sized California cities, so the study results are not necessarily representative of rural or urban areas. Third, these analyses consider drinking in only six contexts, representing a small sample of possible drinking contexts. Planned work will allow us to better capture the full range of drinking contexts in the same cities with a different sample of adolescents. Fourth, our data do not allow us to definitively determine the direction of causality or link specific drinking occasions to problems, which were measured as past-year and without regard to the context in which the problems occurred. Methods such as ecological momentary assessment will permit us to look at the temporal ordering of drinking in specific contexts and same- or next-day problems. Finally, while our analyses indicate that elements of certain drinking contexts, aside from the amount of alcohol consumed, are related to alcohol-related problems among adolescents, these data



do not enable us to discern which characteristics of riskier contexts might contribute to these associations. More work is needed to understand these social-ecological mechanisms.

This study adds to the literature by using a dose-response model to distinguish between youth's frequency of drinking in certain venues and the amount consumed in each context in relation to a range of alcohol-related problems. A better understanding of the social interactions that occur in certain environments, and subsequent behaviors, will contribute to understanding what aspects of environments might be amenable to change and subsequent decreases in problem behaviors such as violence. The findings, therefore, have critical implications for the prevention of alcohol-related problems. They can help identify effective prevention contexts and target specific locations and types of drinkers.

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**Table 1**

Number of past-year alcohol-related problems (n=473 drinkers)

<b>Problem</b>	<b>Mean (SD)</b>	<b>Range</b>
Physiological (all)	3.7 (6.5)	0–41
Thrown up or vomited because of drinking?	1.0 (2.0)	0–10
Not been able to remember what happened while you were drinking?	0.7 (1.4)	0–7
Had a hangover or felt sick the day after you had been drinking?	2.0 (4.4)	0–24
Conflict/trouble (all)	0.5 (1.0)	0–6
Gotten into trouble with your parents (or guardians) for drinking?	0.4 (0.9)	0–5
Gotten into trouble with the police because of your drinking?	0.1 (0.2)	0–1
Violence (all)	0.5 (1.7)	0–11
Started a fight or shoving match because of your drinking?	0.1 (0.5)	0–3
Shouted at/insulted/cursed at/threatened someone when you were drinking?	0.4 (1.3)	0–8

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**Table 2**

Past-year frequency (mean number of times) and estimated quantities of alcohol consumed (mean number of drinks) by drinking context (n=473 drinkers)

	Mean (SD)	Range
Past-year frequency	16.1 (28.3)	1–283
Past-year quantity (drinks/year)	68.6 (140.1)	0–1,248
<u>Past-year frequency</u>		
Parties	8.2 (17.0)	0–150
Restaurants/Bars/Nightclubs	0.6 (3.0)	0–50
Parking lots/street corners	1.1 (6.3)	0–100
Beaches/parks	1.1 (5.2)	0–90
Respondent's home without parents	1.2 (3.8)	0–60
Someone else's home without parents	3.7 (8.2)	0–70
<u>Past-year estimated quantities</u>		
Parties	41.4 (110.3)	0–1,575
Restaurants/Bars/Nightclubs	1.3 (6.6)	0–90
Parking lots/street corners	4.9 (41.8)	0–876
Beaches/parks	4.1 (19.7)	0–290
Respondent's home without parents	5.1 (22.9)	0–420
Someone else's home without parents	12.4 (28.8)	0–263

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**Table 3**

Associations between number of past-year physiological problems, conflict/trouble, and violence and context-specific frequency and volume of alcohol consumed (n=473 drinkers)

	Model 1: Demographics		Model 2: + Frequency		Model 3: + V-F	
	Beta	s.e.	Beta	s.e.	Beta	s.e.
<b>Physiological Problems</b>						
Past-year frequency						
Parties			0.048	0.032	0.141**	0.045
Restaurants/Bars/Nightclubs			0.221	0.234	0.484*	0.223
Parking lots/street corners			0.460**	0.149	0.530**	0.145
Beaches/parks			0.193	0.103	0.100	0.093
Respondent's home without parents			0.293**	0.095	0.899**	0.181
Someone else's home without parents			0.145**	0.047	0.179**	0.048
<b>Past-year continued volumes</b>						
Parties					-0.028**	0.010
Restaurants/Bars/Nightclubs						
Parking lots/street corners						
Beaches/parks						
Respondent's home without parents					-0.169**	0.054
Someone else's home without parents						
Male	-1.336**	0.515	-0.945*	0.376	-1.027**	0.394
Age (years)	0.541*	0.272	0.370	0.206	0.578*	0.227
White	0.132	0.524	0.479	0.393	0.482	0.411
Parental education (years)	-0.079	0.128	0.017	0.106	-0.002	0.108
Current smoker	1.809**	0.656	1.051*	0.502	1.507**	0.536
Deviance	4.763**	0.521	1.972**	0.483	2.405**	0.561
Weekly disposable income (dollars)	0.018**	0.006	0.010*	0.004	0.004	0.005

	Model 1: Demographics		Model 2: + Frequency		Model 3: + V-F	
	Beta	s.e.	Beta	s.e.	Beta	s.e.
Constant	-14.284**	4.806	-9.719**	3.746	-13.215**	3.940
Sigma	3.489**	0.247	2.635**	0.213	2.747**	0.205
Heteroskedasticity: Frequency	0.035**	0.005	0.043**	0.005	0.037**	0.005
Heteroskedasticity: Frequency <sup>2</sup>	-0.0002**	0.00003	-0.0003**	0.00004	-0.0003**	0.00003
Heteroskedasticity: V-F	0.002**	0.001	0.002*	0.001	0.002**	0.0005
Block test, likelihood ratio	106.32**		107.57**		19.17**	
<b>Conflict/Trouble</b>						
Past-year frequency						
Parties			0.012	0.014	0.018	0.010
Restaurants/Bars/Nightclubs			-0.045	0.082	-0.133*	0.064
Parking lots/street corners			0.099	0.070	0.176**	0.058
Beaches/parks			0.032	0.029	0.023	0.031
Respondent's home without parents			0.036	0.059	0.002	0.057
Someone else's home without parents			0.003	0.023	-0.002	0.021
Past-year continued volumes						
Parties						
Restaurants/Bars/Nightclubs						
Parking lots/street corners						
Beaches/parks						
Respondent's home without parents						
Someone else's home without parents						
Male	-0.115	0.315	-0.103	0.307	-0.050	0.309
Age (years)	-0.294	0.164	-0.329*	0.163	-0.299	0.165
White	0.019	0.320	0.127	0.311	0.044	0.317
Parental education (years)	-0.208**	0.079	-0.212**	0.077	-0.188*	0.078



	Model 1: Demographics		Model 2: + Frequency		Model 3: + V-F	
	Beta	s.e.	Beta	s.e.	Beta	s.e.
Current smoker	0.802*	0.373	0.744*	0.364	0.742*	0.367
Deviance	1.137**	0.405	0.743	0.400	0.890*	0.381
Weekly disposable income (dollars)	0.003	0.003	0.003	0.004	0.002	0.004
Constant	3.847	2.772	6.392	4.892	3.929	2.750
Sigma	2.038**	0.215	2.015**	0.227	1.991**	0.221
Heteroskedasticity: Frequency	0.015*	0.007	0.010	0.007	0.021**	0.007
Heteroskedasticity: Frequency <sup>2</sup>	-0.0001*	0.00005	-0.0001	0.00005	-0.0001**	0.00005
Heteroskedasticity: V-F	0.001	0.001	0.001	0.001	-0.001	0.001
Block test, likelihood ratio	37.56**		16.70*		5.86*	
<b>Violence</b>						
Past-year frequency						
Parties			-0.027	0.041	-0.022	0.042
Restaurants/Bars/Nightclubs			-0.378	0.227	-0.609*	0.252
Parking lots/street corners			0.258	0.141	0.146	0.093
Beaches/parks			-0.002	0.085	-0.078	0.108
Respondent's home without parents			0.026	0.141	0.092	0.140
Someone else's home without parents			0.087	0.050	-0.259	0.155
<i>Past-year continued volumes</i>						
Parties						
Restaurants/Bars/Nightclubs					0.219*	0.096
Parking lots/street corners						
Beaches/parks						
Respondent's home without parents						
Someone else's home without parents					0.139*	0.059
Male	0.473	0.793	0.306	0.782	0.494	0.779

	Model 1: Demographics		Model 2: + Frequency		Model 3: + V-F	
	Beta	s.e.	Beta	s.e.	Beta	s.e.
Age (years)	-0.247	0.395	-0.140	0.395	0.004	0.388
White	0.157	0.790	0.040	0.768	-0.069	0.747
Parental education (years)	-0.106	0.211	-0.023	0.210	0.013	0.208
Current smoker	-0.821	0.925	-0.703	0.910	0.272	0.930
Deviance	5.700**	1.026	5.177**	0.997	4.848**	0.952
Weekly disposable income (dollars)	0.009	0.009	0.007	0.009	-0.001	0.009
Constant	-9.821	6.936	-11.717	7.018	-13.657*	6.911
Sigma	4.077**	0.553	4.029**	0.570	3.833**	0.560
Heteroskedasticity: Frequency	0.012	0.006	0.009	0.007	0.012	0.007
Heteroskedasticity: Frequency <sup>2</sup>	-0.0001	0.00004	-0.00005	0.00004	-0.0001	0.00004
Heteroskedasticity: V-F	0.001	0.001	0.001	0.001	0.0002	0.001
Block test, likelihood ratio	51.63**		10.02		10.92**	

\* p&lt;0.05;

\*\* p&lt;0.01