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## Concurrent and Simultaneous Drug and Alcohol Use: Results of the 2000 National Alcohol Survey

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### Abstract

This study estimates the prevalence, assesses predictors and evaluates factors associated with concurrent and simultaneous use of drugs and alcohol in the United States population. Using data from the 2000 National Alcohol Survey ( $n = 7,612$ ), respondents were asked if they used specific drugs in the last 12 months. Current drinkers who reported using each type of drug were asked if they used alcohol and the drug at the same time. Approximately 10% reported using marijuana in the last 12 months (concurrent use); 7% reported drinking alcohol and using marijuana at the same time (simultaneous use). Approximately 5% of current drinkers reported using drugs other than marijuana in the last 12 months; 1.7% reported drinking alcohol and using drugs other than marijuana at the same time. Being younger, having a less than high school education, not having a regular partner and having heavier drinking patterns were associated with using alcohol and marijuana simultaneously. Simultaneous use of marijuana and alcohol as well as other drugs and alcohol were significantly related to social consequences, alcohol dependence, and depression. These results mirror clinical populations in which increasingly younger clients report use of alcohol *and* drugs and need treatment for both.

### Keywords

Alcohol; Drugs; Concurrent Use; Simultaneous Use; Alcohol-related Problems

### 1. Introduction

Polysubstance use by clients in alcohol and drug treatment systems has been recognized as an important treatment issue for many years (Weisner, 1992; Gossop et al., 2002; Miller et al., 1989). Among the many possible combinations of polydrug use, use of alcohol and other drugs are the most common patterns (Earleywine and Newcomb, 1997). Illegal drug use by alcohol abusers ranges from 30–60% for cocaine, 20–50% for marijuana, 12–20% for benzodiazepines and 7–10% for heroin (Petry, 2001). This clearly indicates the importance of treatment programs to assess as well as treat both illegal drug use and alcohol abuse.

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Much of the research on concurrent use of substances conducted in the U.S. is based on clinical samples of clients entering substance use treatment with recognition that “pure alcoholics” or “pure drugs abusers” as clients in these programs is increasingly not the norm within these facilities (Brown et al., 1994). Some studies did examine specific drugs and alcohol use in general populations (Kandel et al., 2001; Stinson et al., 2005). Using longitudinal data from 1981 and 1991 of a representative sample of U.S. women, Graham and Wilsnack (2000) found a significant relationship between alcohol problems and tranquilizer use that was unrelated to alcohol consumption. Yet, use of methamphetamine and frequent alcohol intoxication was found to be related in sample derived from the 1993 (NHSDA) National Household Survey on Drug Abuse (Furr et al., 2000). Respondents who self-reported daily occurrence of intoxication were five times more likely to have smoked methamphetamines as compared to drinkers who reported none or few episodes of intoxication and non-drinkers.

Other than patterns of polydrug use, concurrency of drug use also is a key issue in determining its effects on the drug user (Schensul et al., 2005). However, many studies of polydrug use do not differentiate concurrent (use of alcohol and other drugs in the same time period) and simultaneous use (use of alcohol and other drugs at the same time). A few studies have assessed simultaneous use as opposed to concurrent use of alcohol and drugs in general population samples (Barnwell and Earleywine, 2006; Collins et al., 1998; Barrett et al., 2006) as well as within clinical samples (Earleywine and Newcomb, 1997). Among a sample of clients admitted to alcohol detoxification centers, 54 percent had urine samples indicating alcohol and at least one other drug (Ogborne et al., 1992). Ogborne et al. (1992) also found that younger clients were more likely to use both alcohol and marijuana at the same time; whereas benzodiazepines and alcohol were most often found for those clients who were referred from hospitals and general practitioners and those with cuts and bruises. Clients admitted to a substance use treatment program who reported simultaneous use of both cocaine and alcohol were more likely to be alcohol dependent (Higgins et al., 1994). Using a sample of college freshman, Martin, Clifford & Clapper (1992) assessed patterns and predictors of concurrent and simultaneous use of alcohol, tobacco and marijuana. They found that 82–93 percent of polydrug users also used the drugs simultaneously. Approximately, 15 percent of the sample reported using alcohol and marijuana in combination. Higher use of alcohol and high sensation seeking were predictive of simultaneous drug use.

The lack of studies in general populations on the prevalence of simultaneous alcohol and drug use is surprising given its increased risk for overdose and suicide, higher sexual risk behaviors, worse outcomes from treatment programs (Petry, 2001), and in the case of cocaine and alcohol, enhanced psychological effects (McCance-Katz et al., 1998). One study focused on alcohol and cocaine use only from the 1985 NHSDA and found that 2.8 percent and 6.1 percent of the population reported concurrent use of alcohol and cocaine during the past month and past year respectively; while 2.4 percent and 4.7 percent reported simultaneous use during the past month and past year respectively (Grant and Harford, 1990a). In a second study of the same 1985 dataset, Grant & Harford (1990b) focused on concurrent and simultaneous use of alcohol with tranquilizers and sedatives. They estimated that the concurrent and simultaneous use of alcohol and sedatives were 2.5 percent and 1.6 percent respectively. The 1-year prevalence rate for alcohol and tranquilizers was the same for both concurrent and simultaneous use: 3.3 percent. More recent studies indicate that among younger adults, concurrent and simultaneous use of alcohol and marijuana is 31 percent and 28 percent respectively; and the corresponding percentages for alcohol and other illegal drugs are 28 and 16 (Earleywine and Newcomb, 1997). McCabe et al. (2006) found that simultaneous use of alcohol and prescription drugs was associated with higher rates of alcohol-related and drug-related problems among college students.

Since 1981, per capita alcohol consumption has declined from 2.76 gallons per capita to a low of 2.14 gallons per capita in 1997 (Lakins et al., 2005). Beginning in 1998, U.S. per capita consumption has begun to increase; the latest figures indicate that per capita consumption is now at 2.22 gallons. While illegal drug use has remained relatively stable with an estimate of 19.5 million adults (8.2%) who reported illegal drug use in the past year, marijuana is the most used illegal drug comprising approximately 6.4 percent of the population (14.6 million) who used it in the last year (DHHS, 2005). Interestingly, very little research has focused on the combined or simultaneous use of marijuana and alcohol despite the high prevalence of use for both. Finally, with the exception of one study that focused exclusively on use of tranquilizers (Graham and Wilsnack, 2000), there has been no research on the effect of concurrent and simultaneous alcohol and drug use on negative outcomes such as alcohol-related social consequences, alcohol dependence, and depression.

The purpose of this paper is to address the following research questions: 1) What is the prevalence of concurrent and simultaneous use of alcohol and marijuana, cocaine/crack, uppers, downers, and heroin/opiates, hallucinogens and painkillers in the general population? 2) What demographic and drinking patterns are predictive of concurrent and simultaneous use of alcohol and drugs? and, 3) How do concurrent and simultaneous users of alcohol and drugs differ from drinkers who do not use drugs in terms of alcohol-related problems, alcohol dependence, and depression?

## 2. Methods

### 2.1. The National Alcohol Survey 2000 (NAS)

Data in this study were taken from the most recent NAS conducted by the Alcohol Research Group (ARG), Public Health Institute, from November 1999 through June 2001. The NAS is a national household computer assisted telephone interview (CATI) survey of the adult (18 or older) population in all 50 states of the US and Washington D.C. (N = 7612). Temple University's Institute of Survey Research (ISR) conducted the fieldwork. Random Digit Dialing (RDD) was used to develop the sample with list-assisted number generation, automatic detection of non-working numbers, and computer matching against yellow pages to increase the hit rate. A Spanish version (with translation and *back* translation) was administered to Spanish speakers. Hispanic respondents were given a choice of being interviewed in English or Spanish. A Spanish version of the survey and bilingual interviewers were assigned for 332 respondents. The Spanish version of the survey was constructed by a process of translation and independent back translation of the basic English questionnaire. This back-translated form was then compared with the original English version. Only minor adjustments in wording were necessary to bring the two versions to full agreement. These adjustments were discussed with the translators and with the research team before implementation as done in the 1995 National Alcohol Survey (Caetano and Clark, 1998). All interviews lasted 25–50 minutes.

Considerable pre-testing and extensive interviewer training was done, and efforts were made to minimize non-response with intensive callback and non-response conversion efforts. The response rate was 58 percent; this is common in US telephone surveys given telemarketing and call screening. Two types of evidence suggest that this response rate may not significantly effect use measures even though it is generally lower than in-person interviews. First, an extensive series of methodological studies comparing identical questions in telephone and in-person surveys has found comparable estimations of mean alcohol consumption (Greenfield et al., 2000; Midanik and Greenfield, 2003), with somewhat inconsistent but still modest interview mode effects for alcohol harms (Midanik et al., 2001). Second, a new analysis compared consumption estimates in the NAS sample replicates (each a random subsample, successively 'opened' during the conduct of the survey, and each with a specific response rate varying around the overall mean of 58%) finding no significant correlation between replicate

response rate and volume of consumption, again suggesting that telephone estimates of consumption are somewhat insensitive to response rate above and below the range typically obtained for telephone surveys (Greenfield et al., 2006).

The last birthday technique was used to identify respondents in households. Three primary samples are involved in the national survey. In addition to the main RDD sample covering all states plus DC, two ethnic group oversamples were selected from exchanges with at least a 10% African-American or Hispanic incidence rate. A second oversample involved augmenting 13 low-population states such as North Dakota, Hawaii, Wyoming, and Alaska (plus DC) to achieve at least 50 cases in each (designed to facilitate multi-level state modeling).

## 2.2. Measures

*Current drinker* was determined by an overall alcohol frequency question asked of all respondents and a more specific follow-up question that was asked of those respondents who drank infrequently, or who answered “don’t know” or “refused” to determine if they drank any alcohol in the last year. Based on these questions, 4,630 respondents were categorized as current drinkers who had at least a whole drink of any alcoholic beverage in the last year.

*Drug Use* was measured by the following item: “How often have you used (**DRUG**) during the last twelve months? Was it once a week or more, once every two or three weeks, once every month or two, less often than that or never?” Two specific categories of drugs were asked (Marijuana, hash, THC, or grass; and, cocaine or crack cocaine). A third question determined if the respondent had taken any other drugs, including prescription and illegal drugs. If the answer was positive, respondents were then specifically asked the frequency of the following categories of drugs: Uppers such as speed or amphetamines; Downers such as tranquilizers, Quaaludes, Librium, Valium; Heroin or opium; painkillers and other opiates such as Codeine, Darvon, Percodan, Vicodin, Dilaudid; Hallucinogens such as LSD, mescaline, psilocybin, PCP, angels dust; and prescription drugs such as antidepressants like Prozac, or other drugs you take for your emotional health. Current drinkers were further asked if they had used alcohol and each specific drug at the same time using the response categories of usually, sometimes, or never. For those who reported using Uppers, Downers, or painkillers, an additional question was asked to identify if the use of each drug was always, sometimes, or never medically prescribed. For the purposes of this paper, prescription drug use was excluded from the analysis and only use of non-medically prescribed uppers, downers, or pain killers was included in the analyses. A dichotomous variable was created to indicate use of any other drug excluding marijuana. Separate analyses were conducted for marijuana and other drug use.

*Concurrent and Simultaneous drug and alcohol use* were measured by different coding of the following item that was asked of only those current drinkers who gave a positive response to any of the drug categories and reported drinking at least one drink in the last twelve months: “How often did you use alcohol and (“a specific”) **DRUG** at the same time? Was it usually, sometimes or never?” Individuals who reported using alcohol and one or more drugs in the past twelve months but never used alcohol and drug at the same time were classified as concurrent users. Those who responded using drug and alcohol at the same time sometimes or more often were classified as simultaneous users. Concurrent and simultaneous users were treated as *mutually exclusive groups* in our analyses. Because the prevalence of any drug use in the last twelve months was fairly low and somewhat dominated by marijuana use and the distinct use pattern of marijuana and alcohol compared to other drugs, two dichotomous variables were created to indicate concurrent drug and alcohol use 1) Marijuana and alcohol, and 2) Other drugs (cocaine/crack cocaine, hallucinogens, heroin, or non-medically use of uppers, downers, or painkillers) and alcohol. Similarly, two dichotomous variables were created to indicate simultaneous use of 1) Marijuana and alcohol, and 2) Other drugs (excluding marijuana) and alcohol in the last 12 months.

The following three variables were used as dependent variables: social consequences, DSM-IV alcohol dependence, and a short version of the Center for Epidemiologic Studies Depression Scale (CES-D). *Social Consequences* was based on 15 items in five problem areas: legal/accidents, health, work, fight and relationship problems (Midanik and Greenfield, 2000). We used a cutoff of 2 or more social consequences to indicate presence of the problem. The reliability of this scale is adequate ( $\alpha=0.70$ ). *DSM-IV Alcohol Dependence* was derived from criteria reported in the Fourth Edition of the DSM (American Psychiatric Association, 1994). Respondents who reported three or more of the seven criteria in the last 12 months were considered positive for DSM-IV (Caetano et al., 1997). *Depression* was measured by an abbreviated version of the CES-Depression Scale (Radloff, 1977). This reduced scale of 8 items from the original 20 were: 1) Bothered by unusual things, 2) felt depressed, 3) sleep was restless, 4) was happy (reversed), 5) felt hopeful about the future (reversed), 6) felt lonely, 7) enjoyed life (reversed), and 8) felt sad. Each item has a scoring range of 1 to 4 indicating rarely or none of the time, a little of the time, a moderate amount of the time, and most or all of the time. The briefer CES-D scale had strong reliability ( $\alpha = 0.81$ ) and was highly correlated with the original scale ( $r = 0.92$ ) (Rogers, 1998). A cutoff of 8 or more of the total score was used to measure depression in this study.

The following six demographic variables were used to describe current drinkers who do or do not concurrently or simultaneously use marijuana and alcohol or use other drugs and alcohol: 1) gender, 2) age (18–29, 30–49, 50 or older), 3) ethnicity (African-American, White, Hispanic, Other), 4) household income (less than \$30,000 or \$30,000 or more), 5) educational level (less than high school or high school or more) and, 6) relationship status (partnered defined as living with spouse, living as a couple, married not with spouse and not partnered defined as legally separated, divorced, widowed, and never married). These demographic variables were also used as control variables in the multivariate analyses along with *Number of days drank 5 or more drinks*, as a measure of heavier drinking patterns. This measure is based on a graduated frequency measure and is commonly used as a measure of heavier episodic drinking in alcohol surveys (Greenfield et al., 2000),

### 2.3. Analysis

All analyses are weighted with standard errors adjustment based on the sampling design (e.g., factors such as number of adults in household and number of independent telephone numbers) using Stata V.8 (Stata Corp., 2003). Stata's family of *svy*-commands incorporates the weights developed by ARG to calculate correct standard errors for statistical testing.

The chi-square test of independence was used to compare frequencies of categorical variables (e.g., gender, ethnicity, marital status) across current drinkers who never used drug, used drug but not with alcohol, and used alcohol and drug simultaneously. Analysis of variance (ANOVA) was used to examine mean differences in continuous variables (mean number of days drank 5 or more drinks) among the three groups of current drinkers.

Logistic regression was used to evaluate the associations between demographic characteristics, drinking patterns and combined alcohol and drug use. Separate analyses were conducted for (1) concurrent and simultaneous use of marijuana and alcohol and (2) concurrent and simultaneous use of other drugs (excluding marijuana) and alcohol.

A similar approach was taken to evaluate the association of concurrent and simultaneous use of alcohol and drugs for social consequences, alcohol dependence, and depression when controlling for demographic characteristics and drinking pattern. Separate analyses were conducted for concurrent and simultaneous marijuana and alcohol use and concurrent and simultaneous use of other drugs and alcohol with the three dependent variables.

### 3. Results

#### 3.1. Prevalence of Concurrent and Simultaneous Drug and Alcohol Use

Approximately 10% of the current drinkers reported using marijuana in the last 12 months; 7% of current drinkers reported drinking alcohol and using marijuana at the same time (simultaneous use) and 3.3% used marijuana and alcohol during the same period (concurrent use) (Table 1). Approximately 5% of current drinkers reported using non-prescription drugs other than marijuana; 1.7% of current drinkers reported drinking alcohol and using drugs other than marijuana simultaneously and 3.3% were concurrent users. Despite similar rates of concurrent use, prevalence rates of simultaneous use of marijuana and alcohol were much higher than those of other drugs and alcohol. Rates of simultaneous marijuana and alcohol use were 8.5% for men and 5.5% for women compared to 2.3% and 1.1% of simultaneous alcohol and other drug use for men and women respectively.

#### 3.2. Demographic and drinking pattern predictors

Table 2 shows the bivariate relationships comparing demographic characteristics and drinking pattern across groups of current drinkers who never used a drug, used drug and alcohol concurrently, and used drug and alcohol simultaneously. Being younger, male, lower household income, not having a regular partner, and having less than a high school education were significantly associated with simultaneous use of marijuana and alcohol as well as simultaneous use of other drugs and alcohol. In addition, being African-American or Other ethnicity was associated with simultaneous use of marijuana and alcohol. Frequency of consuming 5 or more drinks in a day was positively associated with simultaneous use of marijuana and alcohol as well as other drugs and alcohol.

Table 3 shows the odds ratios from logistic regressions of simultaneous and concurrent use of marijuana and alcohol use and other drugs and alcohol use on demographic characteristics and frequency of heavy drinking (drinking 5 or more drinks in a day). Younger age, not having a regular partner, and frequent heavy drinking were associated with concurrent marijuana and alcohol use. However, only monthly or more 5+ drinking was related to concurrent use of other drugs and alcohol. Frequent heavy drinking was strongly associated with simultaneous use of marijuana and alcohol as well as other drugs and alcohol. In addition to the drinking variable, demographic characteristics (younger age, ethnicity, education, and relationship status) remained strongly associated with simultaneous marijuana and alcohol use. Frequent heavy drinking was, however, the only significant factor associated with simultaneous use of other drugs and alcohol.

#### 3.3. Social consequences, alcohol dependence, and depression

Concurrent use of marijuana and alcohol as well as other drugs and alcohol were strongly associated with depression but not alcohol-related social consequences and alcohol dependence (Table 4). Separate analyses using the five problem areas of social consequences as dependent variables consistently showed that concurrent use of marijuana/other drugs with alcohol were not associated with problems reported in each area (data not shown). Those who were younger, had less than high school education, and frequent heavy drinkers were more likely to report alcohol-related social consequences. Being African-American or Hispanic, not partnered, and a frequent heavy drinker was associated with alcohol dependence. In addition to concurrent use of alcohol and drug, other demographic characteristics including lower educational level, lower household income, and not partnered was associated with depression.

Simultaneous use of marijuana and alcohol as well as other drugs and alcohol were significantly related to social consequences (and each of the five problem areas), alcohol dependence, and depression. The odds ratios ranged from 1.79 for depression to 6.35 for alcohol dependence

(Table 5). In addition, frequent heavy drinking (5+ drinking), younger age, and less than a high school education were associated with alcohol-related social consequences. Being African-American or Hispanic, those not having a regular partner, and frequent heavy drinking were additional significant factors associated with alcohol dependence beyond the effects of simultaneous use of alcohol and drug. Alcohol consumption pattern was not related to depression. However, those who had less than high school education, lower household income, and without a regular partner were more likely to report depression in the past 12 months when controlling for simultaneous use of drug and alcohol. Region of the country was not associated with concurrent or simultaneous use of alcohol and marijuana/other drugs with alcohol or any of the outcome variables (alcohol dependence, social consequences, and depression) considered in this paper (data not shown).

#### 4. Discussion

The prevalence of concurrent and simultaneous use of alcohol and drugs varies by the type of drug used and drinking patterns. Simultaneous use of marijuana and alcohol yielded a higher prevalence rate than simultaneous use of any other drug with alcohol for the total population and for men and women separately. Further, the prevalence rate of simultaneous use of marijuana and alcohol was considerably higher than concurrent use. With the exception of cocaine/crack use and alcohol for the total sample and for men, concurrent use was higher than simultaneous use for all other alcohol and drug combinations. Our one-year prevalence rates of concurrent and simultaneous cocaine/crack and alcohol use are considerably lower than those reported by Grant & Harford (1990a) (0.8% versus 6.1% for concurrent; 0.9% versus 4.7% for simultaneous). Differences in these rates may be due to different data collection methods, sample sizes and the way the questions were asked between the two surveys. However, the lower prevalence rates may also reflect actual changes in drug and alcohol use or drug use by moderate drinkers in the population now approximately 20 years following the beginning of the War on Drugs. It is difficult to compare rates of concurrent and simultaneous sedative and tranquilizer use with alcohol; however, if downers can roughly be considered to be "sedatives," the prevalence rates found in these data are fairly close to those obtained by Grant & Harford (1990b) in their study (3.2% and 2.5% concurrent use of downers and alcohol; 1.2% and 1.6% simultaneous use of downers and alcohol).

Because those studies that have examined the use of alcohol and marijuana have focused on younger populations, we cannot determine if the prevalence rates for the entire adult population reflect any shifts over time given economic, personal or social changes. It is however possible that the high simultaneous prevalence rates of alcohol and marijuana may reflect the contexts in which marijuana is used. That is, marijuana may be more likely to be used at parties where alcohol is also widely available. Preliminary data from the 2000 NAS (unpublished) provide some evidence that respondents who simultaneously used alcohol and marijuana were more likely to attend parties once a week or more as compared to concurrent alcohol and marijuana users or drinkers who did not use marijuana in the last year (42%, 33% and 23% respectively). This pattern was also true for respondents who simultaneously used alcohol and other drugs (41%, 26% and 24%). Thus, the context of simultaneous use of alcohol and drugs is an important factor.

There are limitations to this study that need to be addressed. First, the sample size for drug use other than marijuana is small which can lead to unstable prevalence estimates. Second, data for this study were collected by telephone unlike other large national household probability samples, such as the National Household Survey on Drug Abuse (Office of Applied Studies, 2005) and the National Health Interview Survey (National Center for Health Statistics, 2003), which have used face-to-face data collection techniques. It should be noted that comparisons between telephone and face-to-face interviews on alcohol use yielded few differences by mode

of data collection (Midanik and Greenfield, 2003). Third, the study is cross-sectional. Thus, causal inferences cannot be made. Finally, all data used in this study are based on self-report. While validity measures such as collateral reports and biochemical measures were not used, some research has shown that such measures do not enhance self-report measurement accuracy (Babor et al., 2000). To enhance measurement quality in the data collection, the survey instrument was extensively pretested to ensure that the items were well written and easily understood. Moreover, respondents were assured of the confidentiality of their responses by the interviewer.

The relationship of heavier alcohol use and simultaneous and concurrent use of marijuana and alcohol is consistent with the clinical literature. Respondents who drank at least 5 or more drinks in one day were more likely to use marijuana and alcohol concurrently and simultaneous. It is striking that respondents who reported drinking five or more drinks on one day at least monthly were over 8 times more likely to be simultaneous users of alcohol and marijuana than those who never drank 5 or more drinks. Demographic correlates of simultaneous and concurrent marijuana and alcohol use such as younger age and not having a partner are also consistent with the clinical literature (Ogborne et al., 1992; Higgins et al., 1994).

With the exception of depression, concurrent use of alcohol and marijuana or alcohol and other drugs is not related to social consequences or alcohol dependence. However, simultaneous use of alcohol and drugs (marijuana and other drugs) is a significantly associated with social consequences, alcohol dependence and depression. The results of this study suggest the mediating effect of simultaneous use of alcohol and drugs (marijuana and other drugs) on the relationship between heavy drinking and the three outcome variables of interest. For example, heavy drinking, but none of the demographic variables, is related to simultaneous use. However, heavy drinking is not significantly related to depression, whereas simultaneous use is strongly associated with depression. It suggests that the relationship between heavy drinking and depression is fully mediated by simultaneous use. Results also suggest that the effects of heavy drinking on alcohol dependence and social consequences are only partially mediated by simultaneous use. The next step of analyses should consider path models to more clearly disentangle the direct and indirect effects of heavy drinking on alcohol outcome variables (Bollen, 1989; Loehlin, 1991).

From a treatment policy perspective, these findings support the need for programs to prevent and treat both alcohol and drug problems. It has been suggested that prevention programs targeted at simultaneous use of drugs and alcohol should focus on motivational and environmental factors (Collins et al., 1998). Thus particularly in adolescent populations, it would be important to focus both on beliefs about polydrug use as well as intentions to use multiple drugs in order to prevent significant negative impact of simultaneous use. Moreover, it is important to look beyond the use of alcohol and drugs to multiple drug combinations with and without alcohol in both adolescent and adult populations (Schensul et al., 2005; Earleywine and Newcomb, 1997). In these circumstances, the use of multiple drugs may include prescription drugs as well (McCabe et al., 2006). The results from this paper underscore the importance of including items in alcohol and drug surveys that address the effect of simultaneous use of alcohol and drugs particularly given the deleterious effects of simultaneous use on health and mental health.

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**Table 1**  
Prevalence of concurrent and simultaneous alcohol and drug use among current drinkers by gender

	Women (n=2310)		Men (n=2320)		Total (n=4630)	
	Concurrent Use <sup>1</sup>	Simultaneous Use	Concurrent Use	Simultaneous Use	Concurrent Use	Simultaneous Use
Marijuana	3.2	5.5	3.5	8.5	3.3	7.0
Cocaine/Crack	0.7	0.5	0.8	1.3	0.8	0.9
Uppers	0.9	0.4	0.7	0.6	0.8	0.5
Downers	0.3	0.4	0.4	0.5	0.4	0.5
Heroin/Opium	0.2	0.0	0.2	0.0	0.2	0.0
Hallucinogens	0.7	0.2	0.8	0.7	0.7	0.5
Painkillers	1.5	0.2	1.9	0.3	1.7	0.2
Any Drug <sup>2</sup>	3.1	1.1	3.5	2.3	3.3	1.7

<sup>1</sup> Notes: Concurrent and simultaneous users are mutually exclusive groups.

<sup>2</sup> Marijuana not included.

Percentages are weighted; counts are unweighted.

Table 2  
Demographics, drinking patterns and drug use among current drinkers by gender (percents and means)

Demographic Variables	Alcohol Only			Marijuana and Alcohol			Other Drugs <sup>2</sup> and Alcohol		
	Alcohol Only	Concurrent Use <sup>1</sup>	Simultaneous Use	Alcohol Only	Concurrent use	Simultaneous Use	Alcohol Only	Concurrent use	Simultaneous Use
Gender									
Men	88.1	3.5	8.5 <sup>†</sup>	94.2	3.5	2.3 <sup>*</sup>			
Women	91.3	3.2	5.5	95.8	3.1	1.1			
Age									
18-29	77.5	7.7	14.8 <sup>‡</sup>	90.6	5.4	4.0 <sup>‡</sup>			
30-49	90.7	2.5	6.8	96.3	2.4	1.3			
50+	97.9	1.1	1.0	96.6	3.0	0.4			
Ethnicity									
White	90.9	3.0	6.1 <sup>‡</sup>	95.1	3.3	1.6			
African-American	87.0	3.3	9.7	94.6	3.5	2.0			
Hispanic	85.4	6.1	8.5	95.6	2.8	1.6			
Other	83.0	2.1	14.9	92.4	4.2	3.4			
Education									
<High school	81.1	3.8	15.1 <sup>‡</sup>	91.6	5.7	2.8 <sup>*</sup>			
High school or more	90.5	3.3	6.2	95.3	3.1	1.6			
Income									
<\$30,000	84.5	4.8	10.7 <sup>‡</sup>	93.0	4.5	2.5 <sup>†</sup>			
>=\$30,000	91.7	2.6	5.7	95.8	2.7	1.5			
Relationship Status									
Partnered	93.2	2.1	4.7 <sup>‡</sup>	96.1	2.8	1.2 <sup>‡</sup>			
Not partnered	82.8	5.6	11.7	93.1	4.2	2.7			
Days drinking 5 or more drinks	15.6	26.7	76.0 <sup>‡</sup>	18.1	30.3	118.2 <sup>‡</sup>			
Mean (s.e.)	(1.0)	(8.3)	(7.1)	(1.1)	(5.9)	(18.3)			
Unweighted n	4106	156	338	3681	756	150			
Weighted %	90	3	7	80	17	3			

<sup>1</sup> Notes: Concurrent and simultaneous users are mutually exclusive groups.

<sup>2</sup> Marijuana not included.

\* p<.05.

<sup>†</sup> p<.01.

<sup>‡</sup> p<.001.

Percentages are weighted; counts are unweighted.

**Table 3**

Odds ratios of logistic regression for simultaneous and concurrent marijuana and other drug use with alcohol among current drinkers

	Concurrent Use		Simultaneous Use	
	Marijuana and Alcohol	Other Drugs <sup>I</sup> and Alcohol	Marijuana and Alcohol	Other Drugs <sup>I</sup> and Alcohol
Male	1.05 (0.70, 1.58)	0.91 (0.57, 1.45)	0.87 (0.64, 1.19)	1.00 (0.52, 1.89)
Age (vs 50+)				
18–29	<b>5.05 (2.38, 10.74)</b>	1.31 (0.75, 2.28)	<b>5.85 (2.72, 12.58)</b>	2.85 (0.84, 9.64)
30–49	2.04 (0.97, 4.29)	0.68 (0.39, 1.16)	<b>4.63 (2.19, 9.81)</b>	1.69 (0.46, 6.21)
Ethnicity (vs White)				
African-American	0.86 (0.50, 1.48)	1.09 (0.55, 2.12)	1.49 (0.97, 2.26)	1.14 (0.41, 3.16)
Hispanic	1.32 (0.80, 2.16)	0.62 (0.34, 1.12)	0.81 (0.51, 1.28)	0.64 (0.29, 1.41)
Other	0.56 (0.22, 1.45)	1.13 (0.50, 2.55)	<b>2.54 (1.44, 4.48)</b>	1.84 (0.61, 5.60)
Education (vs high school graduate)				
<High school	0.76 (0.39, 1.51)	1.81 (0.97, 3.37)	<b>2.32 (1.48, 3.64)</b>	1.27 (0.60, 2.69)
Income (vs >=\$30,000)				
<\$30,000	1.30 (0.83, 2.03)	1.39 (0.89, 2.16)	1.34 (0.96, 1.86)	1.25 (0.69, 2.27)
Relationship Status (vs Partnered)				
Not partnered	<b>1.74 (1.12, 2.71)</b>	1.23 (0.79, 1.91)	<b>1.75 (1.28, 2.38)</b>	1.32 (0.73, 2.38)
5 or more drinks in a day (vs never)				
Yearly	<b>1.78 (1.11, 2.86)</b>	1.36 (0.77, 2.40)	<b>3.99 (2.61, 6.08)</b>	<b>2.77 (1.09, 7.00)</b>
Monthly	1.10 (0.65, 1.86)	<b>1.85 (1.04, 3.28)</b>	<b>8.64 (5.83, 12.79)</b>	<b>14.17 (6.37, 31.51)</b>
F-statistics	6.67	2.92	24.07	13.80
DF	11, 4125	11, 4114	11, 4125	11, 4114
Prob > F	0.0000	0.0008	0.0000	0.0000

<sup>I</sup>Notes: Marijuana not included.

Bolded odds ratios statistically significant at p<.05.

**Table 4**  
Odds ratios of logistic regression of social consequences, alcohol dependence, and depression on concurrent use<sup>1</sup>

	Social Consequences			Alcohol Dependence			Depression		
<b>Concurrent Use</b>									
Marijuana and alcohol (vs not)	1.79 (0.89, 3.61)	---	1.48 (0.64, 3.40)	---	1.20 (0.51, 2.86)	---	2.17 (1.34, 3.53)	---	2.08 (1.29, 3.35)
Other drugs <sup>2</sup> and alcohol (vs not)	---	1.82 (0.83, 4.03)	---	---	---	---	---	---	---
<b>Demographic Variables</b>									
Male	1.29 (0.86, 1.92)	1.31 (0.89, 1.95)	1.02 (0.65, 1.59)	1.02 (0.65, 1.60)	1.02 (0.65, 1.60)	0.84 (0.67, 1.04)	0.84 (0.67, 1.04)	0.85 (0.68, 1.06)	0.85 (0.68, 1.06)
Age (vs 50+)									
18-29	<b>3.94 (1.96, 7.96)</b>	<b>4.11 (2.01, 8.41)</b>	1.54 (0.74, 3.21)	1.58 (0.76, 3.32)	1.58 (0.76, 3.32)	0.80 (0.58, 1.11)	0.80 (0.58, 1.11)	0.84 (0.60, 1.16)	0.84 (0.60, 1.16)
30-49	<b>2.12 (1.05, 4.29)</b>	<b>2.18 (1.06, 4.47)</b>	1.63 (0.81, 3.27)	1.65 (0.81, 3.34)	1.65 (0.81, 3.34)	1.21 (0.92, 1.56)	1.21 (0.92, 1.56)	1.25 (0.95, 1.64)	1.25 (0.95, 1.64)
Ethnicity (vs White)									
African-American	1.53 (0.91, 2.58)	1.47 (0.86, 2.51)	<b>2.22 (1.25, 3.95)</b>	<b>2.15 (1.21, 3.83)</b>	<b>2.15 (1.21, 3.83)</b>	1.23 (0.92, 1.64)	1.23 (0.92, 1.64)	1.20 (0.90, 1.60)	1.20 (0.90, 1.60)
Hispanic	0.94 (0.57, 1.55)	0.95 (0.57, 1.57)	<b>1.97 (1.19, 3.27)</b>	<b>1.99 (1.19, 3.29)</b>	<b>1.99 (1.19, 3.29)</b>	1.14 (0.84, 1.55)	1.14 (0.84, 1.55)	1.16 (0.86, 1.58)	1.16 (0.86, 1.58)
Other	1.50 (0.74, 3.04)	1.45 (0.71, 2.96)	1.96 (0.89, 4.33)	1.93 (0.87, 4.27)	1.93 (0.87, 4.27)	1.36 (0.85, 2.19)	1.36 (0.85, 2.19)	1.28 (0.79, 2.08)	1.28 (0.79, 2.08)
Education (vs high school graduate)									
<High school	<b>2.41 (1.41, 4.13)</b>	<b>2.34 (1.36, 4.00)</b>	1.58 (0.92, 2.69)	1.56 (0.91, 2.67)	1.56 (0.91, 2.67)	<b>1.81 (1.29, 2.52)</b>	<b>1.81 (1.29, 2.52)</b>	<b>1.72 (1.23, 2.41)</b>	<b>1.72 (1.23, 2.41)</b>
Income (vs >=\$30,000)									
<\$30,000	1.44 (0.99, 2.09)	1.42 (0.98, 2.06)	1.32 (0.89, 1.96)	1.30 (0.87, 1.95)	1.30 (0.87, 1.95)	<b>1.80 (1.44, 2.24)</b>	<b>1.80 (1.44, 2.24)</b>	<b>1.81 (1.45, 2.26)</b>	<b>1.81 (1.45, 2.26)</b>
Relationship Status (vs Partnered) Not partnered	1.27 (0.89, 1.82)	1.27 (0.88, 1.83)	<b>1.75 (1.18, 2.61)</b>	<b>1.76 (1.18, 2.62)</b>	<b>1.76 (1.18, 2.62)</b>	<b>1.88 (1.50, 2.34)</b>	<b>1.88 (1.50, 2.34)</b>	<b>1.92 (1.54, 2.40)</b>	<b>1.92 (1.54, 2.40)</b>
<b>Drinking Pattern</b>									
5 or more drinks in a day (vs never)									
Yearly	<b>3.94 (2.18, 7.11)</b>	<b>3.98 (2.22, 7.13)</b>	<b>5.17 (2.56, 10.44)</b>	<b>5.27 (2.60, 10.67)</b>	<b>5.27 (2.60, 10.67)</b>	1.05 (0.79, 1.39)	1.05 (0.79, 1.39)	1.09 (0.82, 1.44)	1.09 (0.82, 1.44)
Monthly	<b>22.41 (13.63, 36.84)</b>	<b>21.98 (13.31, 36.29)</b>	<b>31.82 (16.79, 60.32)</b>	<b>31.14 (16.72, 61.18)</b>	<b>31.14 (16.72, 61.18)</b>	1.28 (0.94, 1.75)	1.28 (0.94, 1.75)	1.24 (0.91, 1.70)	1.24 (0.91, 1.70)
F-statistics	27.03	27.30	24.71	25.40	25.40	11.77	11.77	11.34	11.34
DF	12,4124	12,4113	12,4124	12,4113	12,4113	12,4115	12,4115	12,4104	12,4104
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

<sup>1</sup> Notes: Concurrent and simultaneous users are mutually exclusive groups.

<sup>2</sup> Marijuana not included.

--- Not included in model. Bolded odds ratios statistically significant at p<.05.

**Table 5**  
Odds ratios of logistic regression of social consequences, alcohol dependence, and depression on simultaneous use

	Social Consequences			Alcohol Dependence			Depression		
<b>Simultaneous Use</b>									
Marijuana and alcohol (vs not)	<b>3.21 (2.12, 4.87)</b>	---	---	<b>3.55 (2.32, 5.42)</b>	---	---	<b>1.79 (1.28, 2.52)</b>	---	---
Other drugs <sup>1</sup> and alcohol (vs not)	---	<b>4.43 (2.37, 8.29)</b>	---	---	<b>6.35 (3.46, 11.67)</b>	---	---	<b>2.56 (1.40, 4.70)</b>	---
<b>Demographic Variables</b>									
Male	1.33 (0.88, 2.01)	1.29 (0.86, 1.94)		1.02 (0.65, 1.63)	1.01 (0.64, 1.59)		0.84 (0.68, 1.05)	0.84 (0.68, 1.05)	
Age (vs 50+)									
18-29	<b>3.53 (1.78, 6.98)</b>	<b>3.86 (1.88, 7.94)</b>		1.27 (0.62, 2.60)	1.39 (0.65, 2.97)		0.80 (0.58, 1.11)	0.83 (0.60, 1.15)	
30-49	1.88 (0.95, 3.72)	<b>2.06 (1.01, 4.22)</b>		1.39 (0.71, 2.75)	1.53 (0.75, 3.14)		1.18 (0.91, 1.54)	1.23 (0.94, 1.61)	
Ethnicity (vs White)									
African-American	1.43 (0.84, 2.45)	1.60 (0.96, 2.68)		<b>2.14 (1.19, 3.84)</b>	<b>2.49 (1.41, 4.41)</b>		1.21 (0.91, 1.61)	1.21 (0.90, 1.62)	
Hispanic	0.99 (0.60, 1.66)	1.00 (0.60, 1.68)		<b>2.15 (1.27, 3.64)</b>	<b>2.24 (1.33, 3.79)</b>		1.17 (0.87, 1.59)	1.16 (0.86, 1.58)	
Other	1.17 (0.59, 2.32)	1.33 (0.66, 2.67)		1.56 (0.74, 3.32)	1.74 (0.82, 3.68)		1.26 (0.78, 2.05)	1.28 (0.79, 2.08)	
Education (vs high school graduate)									
<High school	<b>2.12 (1.25, 3.59)</b>	<b>2.45 (1.42, 4.23)</b>		1.36 (0.79, 2.34)	1.59 (0.92, 2.77)		<b>1.71 (1.23, 2.37)</b>	<b>1.76 (1.26, 2.46)</b>	
Income (vs >=\$30,000)									
<\$30,000	1.37 (0.94, 2.02)	1.39 (0.95, 2.03)		1.25 (0.83, 1.86)	1.25 (0.84, 1.87)		<b>1.79 (1.44, 2.23)</b>	<b>1.82 (1.46, 2.27)</b>	
Relationship Status (vs Partnered) Not partnered	1.17 (0.81, 1.69)	1.26 (0.88, 1.81)		<b>1.59 (1.06, 2.40)</b>	<b>1.73 (1.15, 2.60)</b>		<b>1.86 (1.49, 2.32)</b>	<b>1.91 (1.53, 2.39)</b>	
<b>Drinking Pattern</b>									
5 or more drinks in a day (vs never)									
Yearly	<b>3.53 (1.97, 6.31)</b>	<b>4.08 (2.26, 7.36)</b>		<b>4.58 (2.27, 9.23)</b>	<b>5.48 (2.73, 11.03)</b>		1.03 (0.77, 1.36)	1.10 (0.83, 1.46)	
Monthly	<b>17.57 (10.52, 29.34)</b>	<b>20.3 (12.33, 33.54)</b>		<b>24.43 (12.62, 47.28)</b>	<b>28.72 (14.99, 55.01)</b>		1.12 (0.81, 1.55)	1.04 (0.86, 1.62)	
F-statistics	32.83	27.79	25.90	25.90	25.56	11.32	11.50	11.50	
DF	12,4124	12,4113	12,4124	12,4113	12,4113	12,4115	12,4104	12,4104	
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

<sup>1</sup> Notes: Marijuana not included.

--- Not included in model. Bolded odds ratios statistically significant at p<.05.