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Receptivity to and Recall of Alcohol Brand Appearances in U.S. Popular Music and Alcohol-Related Behaviors

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Abstract

Background—The average U.S. adolescent is exposed to about 2.5 hours of popular music per day and 8 mentions of alcohol brands every day. Alcohol brand mentions may function as advertising whether or not they are sanctioned by the alcohol industry. Our study aimed to determine associations between adolescents' involvement with music containing alcohol brand mentions and alcohol-related behaviors.

Methods—In 2010–2011 we conducted a random-digit-dial survey using national U.S. land line and cell phone frames. Through screening interviews, we identified 6,466 eligible households with subjects between 15 to 23 years of age, of whom 3422 (52%) completed the telephone survey. Of these, 2541 opted to participate in a subsequent Web-based component. Independent variables included a composite score indicating owning and liking popular songs with alcohol brand mentions and correct recall of alcohol brands in songs. Outcome measures included ever having consumed a complete drink, ever bingeing, bingeing at least monthly, and having experienced problems from alcohol use.

Results—Among the 2541 participants, compared with those in the lowest tertile on the receptivity scale, those in the highest tertile had higher odds of having had a complete drink (OR=3.4; 95% CI=2.2, 5.2) after adjusting for age, sex, race/ethnicity, socioeconomic status, sensation seeking, friend alcohol use, and parent alcohol use. Compared with those who did not identify at least one alcohol brand correctly, those who did had over twice the odds of having had a complete drink (OR=2.1; 95% CI=1.2, 3.8) after adjusting for all covariates. Results were also

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significant for the outcome of ever bingeing but not for bingeing at least monthly or having had problems due to drinking.

Conclusions—In a national sample of U.S. adolescents and young adults, there were independent associations between involvement with popular music containing alcohol brand mentions and both having ever had a complete drink and having ever binged on alcohol.

Keywords

Alcohol; music; product placement; marketing; adolescent

INTRODUCTION

Alcohol consumption is considered the leading root cause of mortality in adolescence and young adulthood (U.S. Department of Health and Human Services, 2007; Centers for Disease Control and Prevention, 2012). Alcohol is also considered the leading cause of morbidity in this population, due to its established association with nonfatal injuries (Hingson, Heeren, Winter, & Wechsler, 2005; U.S. Department of Health and Human Services, 2007), other substance use (U.S. Department of Health and Human Services, 2007; Centers for Disease Control and Prevention, 2012), risky sexual behavior (Sales et al., 2012), academic failure (Bradley and Greene, 2013), physical and sexual assault (Rothman et al., 2012), and alcohol dependence (Dawson et al., 2007).

Despite our understanding of the impact of alcohol use on adolescents and young adults, consumption remains epidemic. For example, 39% of U.S. adolescents are current drinkers, defined as having a complete alcoholic drink during the past 30 days (Centers for Disease Control and Prevention, 2012), and over one-fifth (22%) of adolescents are current binge drinkers (Centers for Disease Control and Prevention, 2012). These early exposures are particularly concerning in light of the fact that the odds of future alcohol abuse or dependence increases for each year of age below 21 that alcohol consumption begins (Dawson et al., 2007). Alcohol use is associated with multiple socio-demographic (Nash et al., 2005; Schulte et al., 2009), environmental (Nash et al., 2005; Rothman et al., 2012), and personal factors (Nash et al., 2005; Sales et al., 2012). However, a growing body of literature suggests that exposure to certain mass media representations of alcohol—both narrative (e.g., movies) and persuasive (e.g., advertisements)—may be among the strongest risk factors for adolescent alcohol use (Sargent et al., 2006; Anderson et al., 2009; Dal Cin et al., 2009; Chung et al., 2010; McClure et al., 2009; Smith and Foxcroft, 2009; Wills et al., 2009; Hanewinkel et al., 2012). These media exposures are common; 83% of contemporary films (including 57% of G/PG films) depict alcohol use, exposing the average U.S. youth 10–14 years of age to 5.6 hours of movie alcohol use and 244 alcohol brand appearances annually (Dal Cin et al., 2008).

Little research, however, has focused on alcohol representations in popular music, which has emerged as an important source of alcohol-related media exposure (Primack et al., 2008; Siegel et al., 2013). Music is currently the fastest-growing media exposure among adolescents at 2.5 hours per day (Rideout et al., 2010). About a quarter of songs contain references to drinking and alcohol brand mentions, exposing the average adolescent to about

14 references to drinking per song-hour (Primack et al., 2008), and approximately 8 mentions of alcohol brands every day (Primack et al., 2012). These myriad references are commonly associated with consequences that adolescents find particularly compelling, such as sex, popularity, and partying (Primack et al., 2008; Primack et al., 2012). Brand mentions are important to assess because they may function as advertising, whether or not they are paid for or sanctioned by the alcohol industry. Developing brand recognition is a crucial step in the marketing of any product, and, for both cigarettes and alcohol, brand exposure and receptivity are considered important risk factors for the initiation and maintenance of the use of these substances among adolescents (Henriksen et al., 2008; McClure et al., 2013).

Prior research has not, however, examined independent associations between youth involvement in alcohol-containing music and alcohol-related behaviors. This is an important gap in the literature, especially in light of accelerating formal associations between the music and alcohol industries (Primack et al., 2012). Therefore, we aimed to determine independent associations between adolescents' receptivity to such music and alcohol-related behaviors among late adolescents and young adults.

MATERIALS AND METHODS

Participants and Procedures

Context—From Fall 2010 to Spring 2011, we assessed a nationally representative sample of 15–23 year olds using random digit dial survey methods. The survey was approved by the Human Subjects Protection Committee at Dartmouth Medical School and Westat (Rockville, MD), a national research organization with survey sites across the U.S.

Survey—We first conducted a random-digit-dial telephone survey, using land line and cell phone frames to recruit households with age-eligible youths. Telephone surveys were conducted by trained interviewers who used a computer-assisted telephone interview (CATI) system and administered the survey in English or Spanish. Verbal parental permission and adolescent assent were obtained prior to interviewing each respondent under age 18, and verbal consent was obtained from those 18 years and over. Participants under the age of 18 were given the option of answering sensitive questions using the telephone touch pad to provide confidentiality in the event that others were present or listening. Participants were then directed to a Web-based survey in which song titles were used to assess receptivity to popular songs with alcohol mentions. Participants without internet access were allowed to respond to the survey via regular mail.

Sample selection, response rate, and representativeness—Through screening interviews, we identified 6,466 eligible households with subjects between 15 to 23 years of age, of whom 3422 (52%) completed the telephone CATI. Of these, 2541 completed both the telephone and web-based portion of the survey. For households with more than one age-eligible subject, we randomly selected one for enrollment. Additional detail on recruitment and response rates is available on request from the senior author. Youths were drawn from every state in the continental United States, with the distribution approximating the U.S. population. The survey sample was somewhat more likely to be from the Midwest census

region of the US. Respondents also tended to be younger and were more likely to be White, but there was an even distribution with respect to household income.

Measures

Primary Independent Variables: Involvement with Music Containing Alcohol Brand Appearances—Our two measures included a composite score assessing receptivity (liking and ownership) to songs with alcohol brands, and correct recall of at least one alcohol brand contained in the song lyrics. For this assessment, ten songs were selected randomly from all 41 top songs from 2005–2007 containing alcohol brand mentions (Primack et al., 2012). For each song listed, participants were instructed to "please tell us if you like the song [yes/no], own the song [yes/no], and what brand of alcohol is mentioned in the song, if any [free text response]." For liking and owning a song, we generated a raw composite score from 0 to 20 for each participant based on the number of "yes" responses, and we collapsed the scale into tertiles, representing the participant's receptivity to music with alcohol branding as low, medium, or high. The alcohol brand recall item was coded as "yes" if the participant correctly identified at least one brand from the list of 10 songs and "no" if he or she did not. The variable was dichotomized because only 8% of respondents correctly identified one or more alcohol brand mentions from any of the 10 songs.

Primary Dependent Variables: Alcohol-Related Outcomes—The outcomes assessment was based on items from the Alcohol Use Disorders Identification Test (Saunders et al., 1993). Our four outcome measures derived from these items were ever having had a complete drink of alcohol, ever having binged on alcohol, bingeing at least monthly, and a derived measure assessing problems due to alcohol use, such as injuries or memory loss. Before our item assessing ever having had a complete drink of alcohol, we used pictograms to illustrate the definition of a complete drink for each type of alcohol (e.g., 12 ounces for beer, 5 ounces for wine, and 1.5 ounces for hard liquor). We assessed binge drinking by asking how often the participant had 6 or more drinks on the same occasion (Saunders et al., 1993), with response choices of (a) never, (b) less than monthly, (c) monthly, (d) weekly, and (e) daily or almost daily. For outcome 2 (ever bingeing) we dichotomized between responses (a) and (b), and for outcome 3 (bingeing at least monthly), we dichotomized between responses (b) and (c). Finally, we asked participants if they had ever had a problem directly due to alcohol, including 7 separate items (α =0.73) listed in the notes of Table 3. If an individual endorsed any one of those items, he or she was defined as having had a problem due to alcohol.

Covariates—We collected data on a number of socio-demographic characteristics that have been related to alcohol use and/or alcohol brand receptivity in prior studies. These included age, sex, race/ethnicity, socioeconomic status, sensation seeking, friend alcohol use, and parent alcohol use. Socioeconomic status was assessed using a composite measure of household income and parental education (α=0.61) and collapsed into tertiles. Sensation seeking was measured with a 4-item scale (α=0.71) validated in a population similar to ours (Stephenson et al., 2003), also collapsed into tertiles. Based on distributions of the data, friend alcohol use was classified as "none or a few"; "more than a few"; or "most" and parental alcohol use was categorized as "none or occasionally"; "weekly"; or "daily."

Analysis

Descriptive analyses were used to summarize sample characteristics across alcohol use outcomes, and chi-square tests to determine whether differences were significant. We then used multivariable analyses to assess associations between our independent variables and alcohol outcomes. Because all outcome variables were dichotomous, we used logistic regression, and primary models controlled for all covariates. For the outcome of ever drinking, analyses involved all participants. However, only drinkers were asked about ever bingeing, bingeing at least monthly, and problems due to alcohol. For all analyses, we used a two-tailed α of 0.05 to define statistical significance.

All primary descriptive statistics and logistic regression models were carried out using sampling weights. The jackknife method was used to calculate the standard errors of the parameter estimators with the replicated weights that were developed by Westat. Potential confounders were also adjusted in the models. All the weighted analyses were conducted in SAS 9.3. To promote scientific transparency, we also present unweighted analyses, which apply to this specific sample of youths which, while national in scope, underrepresents minority youths.

RESULTS

Sample

While the majority of the 2541 individuals completed the survey using a Web-based interface (n=2221, 87%), some completed this component by regular mail (n=320, 13%). The final weighted sample was 52% female, 8% African-American, and 12% Hispanic. The average age was 18.3 years (standard deviation [SD] = 2.5).

Alcohol Outcomes

Of the 2541 participants, 1488 (59%) reported having had a complete alcoholic drink. Of the 1488 participants who had had a complete drink, 656 (44%) reported having ever binged, 261 (18%) reported bingeing at least monthly, and 547 (37%) reported problems such as injuries due to alcohol.

Alcohol Brand Exposure and Recall

The raw score on our initial measure of alcohol song receptivity ranged from 0 to 20, because 2 points were possible (liking and owning) for each of the 10 songs. Mean score was 3.7 with a standard deviation of 4.2. When scores were collapsed into tertiles, low was defined as raw score 0 (31%), medium as 1–4 (37%), and high as 5 or more (32%). One hundred eighty-nine (7.4%) participants correctly identified (recalled) at least one alcohol brand mention from the list of 10 songs.

Bivariable Analyses

Associations between covariates and outcomes are shown in Table 1. In weighted analyses, sex, sensation seeking, friend alcohol use, and parental alcohol use were significantly associated with all outcomes. However, age, race/ethnicity, and socioeconomic status were associated with some alcohol outcomes but not others.

Multivariable Analyses

Weighted multivariable analyses demonstrating associations between independent and dependent variables are shown in Table 2 (for liking and owning music with alcohol branding) and Table 3 (for correctly identifying alcohol brands).

Compared with those in the lowest tertile on the alcohol song receptivity scale, those in the highest tertile had three times the odds of having had a complete drink (OR=3.4; 95% CI=2.2, 5.2) after adjusting for age, sex, race/ethnicity, socioeconomic status, sensation seeking, friend alcohol use, and parent alcohol use. As is indicated in Table 2, the only variables with stronger associations with having had a complete drink were age=21–23 (vs. age=15–16) and “most” friends being alcohol users (vs. “none or a few” friends). Compared with those who did not identify at least one alcohol brand correctly, those who did had nearly twice the odds of having had a complete drink (OR=2.1; 95% CI=1.2, 3.8) after adjusting for all covariates.

Compared with those in the lowest tertile on the alcohol song receptivity scale, those in the highest tertile had nearly twice the odds of ever bingeing (OR=1.9; 95% CI=1.2, 3.2) after adjusting for all covariates. Compared with those who did not identify at least one alcohol brand correctly, those who did also had twice the odds of ever binge drinking (OR=2.0; 95% CI=1.2, 3.3) after adjusting for all covariates. Results for the outcomes of bingeing at least monthly and having had problems from alcohol had odds ratio point estimates greater than 1 (between 1.3 and 2.2). However, for both independent variables, none of these associations reached statistical significance (Table 3).

Unweighted Analyses

In unweighted analyses, results were parallel but generally had stronger levels of significance (Appendix 1). In some cases, nonsignificant results in weighted analyses were significant in unweighted analyses. For example, compared with those in the lowest tertile on the alcohol song receptivity scale, those in the highest tertile had nearly twice the odds of having had problems from drinking (OR=1.9; 95% CI=1.4, 2.7) after adjusting for all covariates. Also, compared with those in the lowest tertile on the alcohol song receptivity scale, those in the highest tertile had more than twice the odds of bingeing at least monthly (OR=2.2; 95% CI=1.4, 3.3) after adjusting for all covariates (Appendix 1).

DISCUSSION

The study finds an association between liking and owning music containing drinking references and two outcomes, having had a complete alcoholic drink and binge drinking. Furthermore, the few adolescents who correctly recalled the alcohol brand mentioned in these songs had increased odds for each of these outcomes. These findings suggest that music be considered along with other entertainment venues that shape how adolescents think about alcohol (Stoolmiller et al., 2012). Longitudinal studies demonstrate that exposure to movie alcohol depictions predicts alcohol onset and subsequent binge drinking (McClure et al., 2009). Taken together, the evidence supports the notion that having movie and music

industry stars endorse drinking on screen and in their songs promotes it among adolescents familiar with such entertainment.

It should be noted, however, that the cross-sectional design of this study limits our ability to make causal inferences regarding these associations. Therefore, while it may be that alcohol mentions in songs prompt adolescents to form more favorable attitudes about alcohol, it is also highly plausible that music-oriented adolescents who develop favorable attitudes about drinking for other reasons could be drawn to genres that promote drinking and often mention brands (McClure et al., 2009). In particular, longitudinal studies may enable us to disentangle directionality regarding this relationship.

Classic theories of communication suggest that receptivity to a message involves not only exposure to a message, but also an understanding of and agreement with the message (Petty & Cacciopo, 1981). It should be noted that it is a challenge to accurately assess constructs such as these as they relate to music and/or alcohol brands. We attempted to capture these constructs as fully as possible by assessing them in various ways. For example, we asked not only about ownership of music but also about “liking” of music, which may indicate a level of affinity for and/or agreement with the music beyond simple familiarity. Despite this, our primary composite independent variable may simply be a surrogate for overall media exposure, which is why we also used the dichotomous recognition measure; being able to recall the correct brand would be a higher level of receptivity, beyond owning or liking the song. Thus, it is noteworthy that the results were consistent regardless of the independent variable used. However, it remains an important task of future work to explore improved ways of assessing complex constructs such as exposure to, recall of, and receptivity to media messages.

Although odds ratio point estimates were elevated for both independent variables and each of the other dependent variables—bingeing at least monthly and having had problems from bingeing—these associations did not achieve statistical significance. One possible explanation is that exposure to alcohol brand appearances in music is more strongly related to the earlier alcohol-related transitions (e.g., experimentation) than the later transitions (e.g., consolidation), for which factors such as age, sensation seeking, and friend alcohol use are more potent. However, because the odds ratios were elevated and close to significance in many cases, it is also possible that we did not have sufficient power to determine these differences. Considering the widespread popularity of music among adolescents and young adults, the findings of this study raise concerns about the practice of alcohol companies that sign promotional deals with singer/songwriters. Most of the brands mentioned in these songs involved premium distilled spirits, such as vodka, tequila, rum, and cognac. While advertising for these brands is regulated by guidelines promulgated by the Distilled Industries Council of the United States (DISCUS, 2011), the DISCUS rule that “Beverage alcohol advertising and marketing materials should portray beverage alcohol products and drinkers in a responsible manner” may be in violation in some of these cases. Additional study involving the lyrics of these songs, other related marketing materials, and the DISCUS legal text may help determine whether there are violations.

If it is ultimately determined that media messages such as these are prospectively associated with problematic alcohol-related outcomes, it ultimately may be valuable to develop intervention strategies which aim to reduce the susceptibility of individuals to the alcohol-related messages to which they will inevitably be exposed. For example, “Media literacy,” an innovative approach that teaches young people to understand, analyze, and criticize media messages, may be a promising complement to exposure reduction (Bergsma and Carney, 2008; Chen, 2013; Primack et al., 2014). Yet while media literacy has been commonly utilized to address tobacco use (Pinkleton et al., 2007; Bergsma and Carney, 2008; Primack et al., 2009a; Primack, 2014), it has been less frequently applied to alcohol (Kupersmidt et al., 2010; Chen, 2013). This may be an important gap, because media literacy aims to leverage developmentally normative adolescent tendencies such as rebelliousness and sensation seeking against industry messaging (Primack et al., 2006; Bergsma & Carney, 2008; Primack et al., 2009b).

Limitations

It is a limitation that our response rate was only about 39% (2541/6466), and Westat was not able to collect demographic data on non-responders. However, it should also be noted that we present here results of analyses which were weighted to approximate the US population, which may in part improve generalizability of findings. It should also be noted that we assessed alcohol outcomes using self-report rather than using any type of biochemical validation. These types of measures, however, tend to be highly accurate, especially when they are anonymous (Brodey et al., 2007). Finally, we defined an alcohol “binge” as 6 or more drinks, because this is the AUDIT standard, and because we involved youth up to age 23 in the sample. However, this outcome may not have been highly sensitive for younger participants, for whom a 3–5 drink binge may still be clinically significant. However, it was for this reason that we utilized many different outcome variables, and it is notable that the results were quite consistent regardless of the specific outcome variable.

Conclusion

Despite these limitations, the results of this study show that there are strong, independent associations between liking, owning and correctly identifying music containing alcohol brand appearances and two early problematic outcomes related to alcohol: having had a complete alcoholic drink and having ever binged on alcohol. These results, especially in light of accelerating formal associations between the music and alcohol industries (Primack et al., 2012), suggest that it would be valuable to continue surveillance of alcohol brand references in popular music and to consider policy and/or educational interventions designed to reduce the impact of these exposures on alcohol outcomes.

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Table 1

Weighted Sample Characteristics by Alcohol Use Outcomes for a National U.S. Sample.

	Whole Sample	Has Had Complete Drink*			Has Ever Had Binge†			Binges† at Least Monthly			Had Problems from Drinking‡		
		N = 2541			n = 1488			n = 1488			n = 1488		
		No	Yes	*P*	No	Yes	*P*	No	Yes	*P*	No	Yes	*P*
	N = 2541	n = 1053	n = 1488		n = 832	n = 656		n = 1227	n = 261		n = 941	n = 547	
	%	%	%		%	%		%	%		%	%	
Age													
15–16	23	43	13	<.0001	17	8	<.0001	15	4	.0002	15	10	.19
17–18	22	28	20		22	17		21	15		19	20	
19–20	21	19	22		20	25		22	25		21	24	
21–23	34	11	45		40	51		43	55		45	46	
Sex													
Male	51	47	53	0.02	43	65	<.0001	48	75	<.0001	50	59	.01
Female	49	53	47		57	35		52	25		50	41	
Race/Ethnicity													
White	58	55	60	<.0001	53	68	0.001	57	73	.003	60	60	.80
Black	15	20	11		15	8		14	3		12	10	
Hispanic	19	15	21		24	17		21	19		20	22	
Other	8	10	8		8	7		8	5		8	7	
Socioeconomic Status													
Low	33	31	34	.001	34	33	.96	33	37	.58	33	35	.42
Medium	34	29	36		36	37		36	36		38	33	
High	34	40	30		31	30		31	27		29	32	
Sensation Seeking													
Low	35	49	27	<.0001	34	20	<.0001	31	11	<.0001	35	16	<.0001
Medium	34	34	34		36	32		36	28		34	35	
High	31	17	38		29	48		32	61		31	49	
Friend Alcohol Use													

	Whole Sample	Has Had Complete Drink*			Has Ever Had Binge†			Binges† at Least Monthly			Had Problems from Drinking‡		
		N = 2541			n = 1488			n = 1488			n = 1488		
		No	Yes	*P*	No	Yes	*P*	No	Yes	*P*	No	Yes	*P*
	N = 2541	n = 1053	n = 1488		n = 832	n = 656		n = 1227	n = 261		n = 941	n = 547	
	%	%	%		%	%		%	%		%	%	
None or a few	45	77	29	<.0001	42	14	<.0001	35	6	<.0001	39	15	<.0001
More than a few	14	12	16		17	14		17	9		17	13	
Most	40	12	55		40	72		48	85		44	72	
Parental Alcohol Use													
None or occasionally	72	83	65	<.0001	70	61	.03	69	52	.001	71	58	.001
Weekly	16	10	19		16	23		17	27		17	23	
Daily	12	7	15		14	16		14	21		12	20	

*A drink was defined as 12 ounces of beer, 5 ounces of wine, or 2 ounces of hard liquor.

†A binge was defined as 6 or more drinks in a single sitting (AUDIT criteria).

‡Specific problems asked about included (1) inability to stop drinking; (2) failure to do something important that they had to do; (3) needing a drink of alcohol the next morning; (4) feeling guilty after drinking; (5) forgetting what happened while they were drinking; (6) injuring themselves or someone else because of drinking; or (7) being told by someone that they had a drinking problem.

Table 2

Weighted Multivariable Associations between Liking and Ownership of Music with Alcohol Branding and Alcohol Outcomes in a National U.S. Sample.

		Has Had Complete Drink*	Has Ever Had Binge†	Binges† at Least Monthly	Had Problems from Drinking‡
	%	N = 2541	n = 1488	n = 1488	n = 1488
		Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §
Liking and Ownership of Music with Alcohol Branding					
Low	29	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Medium	35	1.8 (1.3,2.6)	1.7 (1.0,2.7)	1.4 (0.8,2.5)	1.3 (0.7, 2.3)
High	36	3.4 (2.2,5.2)	1.9 (1.2,3.2)	1.7 (0.9, 3.0)	1.5 (0.8, 2.7)
Age					
15–16	23	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
17–18	22	1.9 (1.3,2.6)	1.6 (0.9, 2.8)	1.9 (1.0,3.9)	1.4 (0.8, 2.4)
19–20	21	3.2 (2.0, 5.0)	2.4 (1.4,4.2)	2.4 (1.2,4.9)	1.4 (0.8,2.5)
21–23	34	12.8 (7.9, 20.7)	2.9 (1.7,4.9)	3.5 (1.8,6.7)	1.3 (0.8, 2.2)
Sex					
Male	51	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Female	49	0.7 (0.5, 1.0)	0.3 (0.2,0.5)	0.2 (0.1, 0.4)	0.7 (0.5,1.0)
Race/Ethnicity					
White	58	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Black	15	0.4 (0.2, 0.8)	0.4 (0.2,0.9)	0.1 (0.0,0.6)	0.9 (0.4, 2.1)
Hispanic	19	1.3 (0.8, 2.2)	0.7 (0.4, 1.1)	0.9 (0.4, 1.9)	1.5 (0.9, 2.5)
Other	8	0.7 (0.4, 1.2)	0.6 (0.3,1.2)	0.4 (0.2, 0.9)	0.8 (0.4, 1.4)
Socioeconomic Status					
Low	33	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Medium	34	1.3 (0.9, 2.0)	1.2 (0.8, 1.9)	0.8 (0.5, 1.4)	0.8 (0.5,1.2)
High	34	1.0 (0.7,1.5)	1.0 (0.7,1.7)	0.7 (0.4, 1.3)	0.9 (0.6, 1.5)
Sensation Seeking					
Low	35	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Medium	34	1.9 (1.4, 2.7)	1.8 (1.1,2.9)	2.5 (1.2,5.2)	2.5 (1.5,4.2)

		Has Had Complete Drink*	Has Ever Had Binge†	Binges† at Least Monthly	Had Problems from Drinking‡
	%	N = 2541	n = 1488	n = 1488	n = 1488
		Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §
High	31	3.1 (2.1,4.6)	2.4 (1.6,3.7)	4.3 (2.3, 8.3)	3.0 (1.8,5.0)
Friend Alcohol Use					
None or a few	45	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
More than a few	14	2.7 (1.9,4.0)	2.2 (1.3,3.7)	2.5 (1.0, 6.3)	1.6 (0.9, 2.9)
Most	40	6.0 (4.0, 9.0)	4.9 (3.3, 7.4)	9.1 (4.5,18.5)	3.8 (2.3,6.2)
Parental Alcohol Use					
None or occasionally	72	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Weekly	16	2.2 (1.6, 3.1)	1.4 (0.9, 2.0)	1.8 (1.0, 3.1)	1.3 (0.8, 2.0)
Daily	12	2.6 (1.7, 4.0)	1.2 (0.7, 1.9)	1.9 (1.1, 3.3)	1.7 (1.0, 2.9)

*A drink was defined as 12 ounces of beer, 5 ounces of wine, or 2 ounces of hard liquor.

†A binge was defined as 6 or more drinks in a single sitting (AUDIT criteria).

‡Specific problems asked about included (1) inability to stop drinking; (2) failure to do something important that they had to do; (3) needing a drink of alcohol the next morning; (4) feeling guilty after drinking; (5) forgetting what happened while they were drinking; (6) injuring themselves or someone else because of drinking; or (7) being told by someone that they had a drinking problem.

§Adjusted for age, sex, race/ethnicity, socioeconomic status, sensation seeking, friend alcohol use, and parent alcohol use.

Table 3

Weighted Multivariable Associations between Correctly Identified at Least One Alcohol Brand and Alcohol Outcomes in a National U.S. Sample.

		Has Had Complete Drink*	Has Ever Had Binge†	Binges† at Least Monthly	Had Problems from Drinking‡
	%	N = 2541	n = 1488	n = 1488	n = 1488
		Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §
Correctly Identified at Least One Alcohol Brand					
No	91	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Yes	9	2.1 (1.2,3.8)	2.0 (1.2,3.3)	2.2 (0.9, 5.3)	1.5 (0.9, 2.6)
Age					
15–16	23	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
17–18	22	1.9 (1.3,2.6)	1.6 (0.9, 2.8)	2.0 (1.0,4.1)	1.4 (0.9, 2.4)
19–20	21	3.1 (2.0,4.9)	2.3 (1.3,4.0)	2.5 (1.2,5.2)	1.4 (0.8,2.7)
21–23	34	12.9 (7.6, 21.7)	2.8 (1.7,4.7)	3.2 (1.6,6.2)	1.4 (0.9,2.3)
Sex					
Male	51	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Female	49	0.8 (0.6,1.1)	0.4 (0.3,0.5)	0.2 (0.1, 0.4)	0.8 (0.5,1.1)
Race/Ethnicity					
White	58	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Black	15	0.7 (0.4, 1.3)	0.4 (0.2,1.1)	0.1 (0.0,0.6)	1.0 (0.4, 2.3)
Hispanic	19	1.5 (0.9, 2.5)	0.7 (0.4, 1.2)	1.0 (0.4, 2.2)	1.6 (0.9,2.7)
Other	8	0.8 (0.5,1.3)	0.7 (0.4, 1.2)	0.4 (0.2, 0.9)	0.8 (0.4, 1.5)
Socioeconomic Status					
Low	33	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Medium	34	1.4 (0.9,2.2)	1.2 (0.8, 1.9)	0.8 (0.5, 1.4)	0.8 (0.5,1.2)
High	34	1.1 (0.7,1.6)	1.0 (0.6, 1.6)	0.7 (0.4, 1.3)	1.0 (0.6,1.5)
Sensation Seeking					
Low	35	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Medium	34	2.0 (1.4,2.9)	1.8 (1.1,3.0)	2.7 (1.3,5.7)	2.6 (1.6,4.2)
High	31	3.3 (2.2,4.9)	2.7 (1.8,4.2)	4.6 (2.5, 8.8)	3.3 (2.0, 5.4)

		Has Had Complete Drink*	Has Ever Had Binge†	Binges† at Least Monthly	Had Problems from Drinking‡
	%	N = 2541	n = 1488	n = 1488	n = 1488
		Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §	Adjusted OR (95% CI) §
Friend Alcohol Use					
None or a few	45	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
More than a few	14	2.9 (2.0,4.1)	2.0 (1.2,3.4)	2.3 (0.9, 6.0)	1.6 (0.8, 2.9)
Most	40	6.2 (4.1,9.3)	4.7 (3.1,7.0)	8.6 (4.1, 17.9)	3.7 (2.3,6.2)
Parental Alcohol Use					
None or occasionally	72	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]	1.0 [Reference]
Weekly	16	2.3 (1.7,3.2)	1.4 (1.0,2.1)	1.8 (1.0,3.0)	1.3 (0.8, 2.0)
Daily	12	2.7 (1.7,4.2)	1.2 (0.7, 2.0)	1.9 (1.1,3.5)	1.7 (1.0,2.9)

*A drink was defined as 12 ounces of beer, 5 ounces of wine, or 2 ounces of hard liquor.

†A binge was defined as 6 or more drinks in a single sitting (AUDIT criteria).

‡Specific problems asked about included (1) inability to stop drinking; (2) failure to do something important that they had to do; (3) needing a drink of alcohol the next morning; (4) feeling guilty after drinking; (5) forgetting what happened while they were drinking; (6) injuring themselves or someone else because of drinking; or (7) being told by someone that they had a drinking problem.

§Adjusted for age, sex, race/ethnicity, socioeconomic status, sensation seeking, friend alcohol use, and parent alcohol use.