Published in final edited form as:

Alcohol Alcohol. 2007 ; 42(2): 143–149. doi:10.1093/alcalc/agl119.

THE RELATIONSHIP BETWEEN EXPOSURE TO ALCOHOL ADVERTISING IN STORES, OWNING ALCOHOL PROMOTIONAL ITEMS, AND ADOLESCENT ALCOHOL USE

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Abstract

Aim—This paper describes adolescents' exposure to alcohol advertising in stores and to alcohol-branded promotional items and their association with self-reported drinking.

Methods—A cross-sectional survey was administered in non-tracked required courses to sixth, seventh, and eighth graders ($n = 2125$) in three California middle schools. Logistic regressions compared the odds of ever (vs. never) drinking and current (vs. ever) drinking after controlling for psychosocial and other risk factors for adolescent alcohol use.

Results—Two-thirds of middle school students reported at least weekly visits to liquor, convenience, or small grocery stores where alcohol advertising is widespread. Such exposure was associated with higher odds of ever drinking, but was not associated with current drinking. One-fifth of students reported owning at least one alcohol promotional item. These students were three times more likely to have ever tried drinking and 1.5 times more likely to report current drinking than students without such items.

Conclusions—This study provides clear evidence of an association of adolescent drinking with weekly exposure to alcohol advertising in stores and with ownership of alcohol promotional items. Given their potential influence on adolescent drinking behaviour, retail ads, and promotional items for alcohol deserve further study.

The alcohol industry spends more than \$1 billion each year on measured media advertising, such as television, radio, print, and billboards. However, even for heavily advertised alcohol brands, measured media account for only one-third to one-half of total marketing expenditures (Federal Trade Commission, 1999). For example, a mid-sized marketing budget for one alcohol brand allocated 40% to merchandising, including packaging, direct mail, point-of-sale materials, and branded promotional items such as t-shirts, hats, and glassware (Federal Trade Commission, 1999). Although the alcohol industry's annual marketing expenditures may be three or more times its expenditures for measured media

advertising, surprisingly little is known about the impact of merchandising and other forms of alcohol promotion on young people.

The present study describes adolescents' exposure to retail advertising materials and to branded promotional items, and their association with alcohol consumption. Data were derived from the Survey of Teen Opinions about Retail Environments (STORE study), which combines a school-based survey about where adolescents shop with observations of advertising in those stores. The primary goal was to examine the association of retail tobacco marketing and smoking initiation, but the study also assessed alcohol advertising and use (Henriksen *et al.*, 2004b). In the census of stores that sell tobacco in the study community, observers counted an average of 28 ads ($SD = 27$) for three top-selling beer brands (Budweiser, Miller, Heineken), almost three times as many ads as were found for three top-selling cigarette brands. Given the preponderance of alcohol ads in stores, and the association of adolescents' exposure to retail tobacco marketing with smoking (Henriksen *et al.*, 2004b), we tested parallel analyses regarding adolescent drinking.

Alcohol advertising in stores

Widespread alcohol ads in stores constitute a significant public health concern, especially for youth. Nearly all (94%) of a US sample of 3961 stores that sold alcohol contained alcohol ads and 44% displayed such ads within 3.5 feet of the floor (in the sight line of children as opposed to adults; Terry-McElrath *et al.*, 2003a). Liquor stores, convenience stores, and small markets are the store types that contain the most alcohol advertising (Terry-McElrath *et al.*, 2003b), and are popular destinations for adolescents. Approximately 60% of 7th graders from San Jose, California, reported visiting such stores at least once a week (Schooler *et al.*, 1996). According to other surveys, three out of four teenagers shop at a convenience store at least once a week (Point-of-Purchasing Advertising Institute, 1992) and stay twice as long as adults (Chanil, 2002).

Studies about retail advertising and alcohol consumption have focused primarily on college students. Heavy drinking in the previous 2 weeks has been associated with the presence of a store that sells alcohol within a mile of campus (Wechsler *et al.*, 2002), the density of such stores within two miles of campus (Weitzman *et al.*, 2003), and the quantity of alcohol advertising in such stores for volume discounts, price specials, and coupons (Kuo *et al.*, 2003). Among South Dakota seventh graders who had never consumed alcohol, exposure to in-store beer displays increased the odds of drinking by ninth grade even when controlling for exposure to other forms of alcohol advertising (Ellickson *et al.*, 2005). Although underage youth are less likely to obtain alcohol from stores than other sources (Harrison *et al.*, 2000), there are several reasons why the preponderance of alcohol ads in stores may influence whether adolescents drink and which brands they choose.

Consider evidence for the role of retail tobacco advertising in the uptake of smoking. For example, eighth and ninth graders who saw pictures of a convenience store dominated by cigarette ads perceived significantly easier access to cigarettes, believed more of their peers smoked, and perceived greater approval for smoking than a control group who saw pictures of the same store devoid of cigarette ads (Henriksen *et al.*, 2002). Middle school students

who reported frequent exposure to retail tobacco ads were 38% more likely than their peers to have tried smoking (Schooler *et al.*, 1996), and high-school smokers preferred whichever brand (Marlboro or Camel) was advertised most heavily in the convenience store closest to their school (Wakefield *et al.*, 2002). Given the parallel processes that govern the influence of media on adolescent smoking and drinking (Austin and Knaus, 2000; Roberts *et al.*, 2004), it seems reasonable to expect that retail advertising could exert a similar influence on adolescent drinking.

Alcohol promotional items

Companies that produce beer or liquor distribute a variety of branded promotional items that appear designed to attract new drinkers (Center for Media Education, 1997; Jackson *et al.*, 2000; Casswell, 2004). Although the FTC requires the six largest tobacco companies to report annual expenditures on promotional items (\$333.4 million in 2001; Federal Trade Commission, 2003), no such accounting is required of the alcohol industry.

The expectation that APIs promote adolescent alcohol use is derived in part from substantial evidence about the role of cigarette promotional items in the uptake of smoking (Biener and Siegel, 2000; Sargent *et al.*, 2000a; Pierce *et al.*, 2002; Albers and Biener, 2003). Although the 1998 Master Settlement Agreement between tobacco companies and states' attorneys general banned the distribution of promotional items with cigarette brand names (NAAG, 1998), many adolescents still report owning them (Sargent *et al.*, 1997; Pierce *et al.*, 1998; Niederdeppe *et al.*, 2003). A correlation between owning or willingness to use a cigarette promotional item and smoking uptake has been demonstrated in cross-sectional (Schooler *et al.*, 1996; Sargent *et al.*, 1997; Feighery *et al.*, 1998) and longitudinal surveys (Biener and Siegel, 2000; Sargent *et al.*, 2000a; Pierce *et al.*, 2002; Albers and Biener, 2003). Additionally, the more items adolescents owned, the greater the chances of being a smoker (Sargent *et al.*, 2000b).

Comparatively less is known about the relationship between API ownership and alcohol use among adolescents. In a longitudinal survey of middle school students (grades 5–8), 14% of the students who were never drinkers at baseline owned an API by follow-up, and those students were 1.5 times more likely to have initiated drinking than students who did not acquire such items (McClure *et al.*, 2006). In other studies, Austin and colleagues measured the extent to which third, sixth, and ninth graders preferred toys and other promotional items with logos for either beer or soda pop (Austin and Johnson, 1997a, b; Austin and Knaus, 2000). Young people's preference for beer-branded items was correlated with their expectations about the positive consequences of drinking and a measure of risky behavior that combined use of alcohol, smokeless tobacco, and cigarettes (Austin and Knaus, 2000).

In summary, there is strong evidence to suggest that retail advertising and promotional items for cigarettes encourage adolescent smoking, but whether these forms of alcohol promotion encourage adolescent drinking is less clear. To address this important gap in the literature, the current study tested whether adolescents' exposure to alcohol advertising in stores or ownership of alcohol promotional items is associated with higher odds of alcohol use after controlling for other psychosocial and demographic risk factors.

METHODS

Participants

The STORE study was administered in all three middle schools in Tracy, California (population 62 500). Of the initial sample of sixth, seventh, and eighth graders ($N = 2731$), 396 students did not return parental consents, 96 were absent for the survey, and 115 parents refused permission, yielding a participation rate of 78%. All participants ($n = 2125$) completed the same survey with a subset of measures pertaining to alcohol described below.

Procedure

A paper-and-pencil survey was administered in required courses during March or April, 2003. Active parental consent and student assent was obtained from all participants following a protocol approved by the university's Administrative Panel on Human Subjects. A tear-off page with each participant's name and unique identification number, as well as a student consent form, was used to deliver surveys to all students whose parents approved their participation. Survey questions were read aloud while teachers remained at their desks to assure the confidentiality of students' responses. Students finished the survey in a single class period (45–55 min). In exchange for returning a parental consent form and completed survey, participants received small-value coupons to redeem at the student store or from a local vendor.

Measures

Alcohol use

Adolescent alcohol use: A single item assessed whether or not respondents had ever finished most or all of a can of beer, glass of wine, or other drink with alcohol. Response options included, 'no, never', and 'yes'. Two additional close-ended items asked how many days they had most or all of a drink with alcohol out of the past 30 and past 7 days. Students who indicated no alcohol use in response to all three items were coded as never drinkers. Students who indicated any alcohol use in either the past month or week were coded as current drinkers. Students who indicated ever trying alcohol, but not in the past month or week were defined as ever drinkers.

Parent alcohol use: Two items asked how often each parent drinks beer, wine, or another drink with alcohol. Students without a mother or father were instructed to answer the question for a step-parent or other person who has the most influence over their daily life. If students reported that one or both parents drank daily or weekly, this was coded as frequent exposure to a parental model of alcohol use. If it was reported that both parents drank once a month or less, this was coded as infrequent exposure to a parental model of alcohol use (Jackson *et al.*, 1997). Coefficient alpha was 0.57.

Peer alcohol use: Peer alcohol use was measured with one item asking participants how many of their four closest friends drink alcohol. The five response categories were scored dichotomously to compare students without any friends who drink to those with at least one friend who drinks.

Exposure to alcohol promotion

Retail advertising exposure: Three items assessed the frequency with which students visited convenience, liquor, and small grocery stores. These are types of retail outlets that typically have large amounts of alcohol marketing materials (Terry-McElrath *et al.*, 2003b). Additionally, 12 items assessed the frequency that students visited 12 stores that sell alcohol near their school. Adapting a procedure used to measure frequent exposure to retail tobacco marketing (Schooler *et al.*, 1996; Henriksen *et al.*, 2004a), frequent exposure to retail alcohol advertising was coded for students who reported at least weekly visits to convenience, liquor, or small grocery stores, either in response to questions about generic store types (e.g. ‘How often do you go to convenience stores?’) or about particular stores in the vicinity of the school ($\alpha = 0.77$).

Owning alcohol promotional items: Ownership of alcohol promotional items was assessed with the following question, ‘Have you ever owned an item—like a t-shirt, lighter, matches, hat, or sunglasses—with an alcohol brand name on it?’ No and ‘don’t know’ responses were coded as no ownership. This item parallels assessments of owning cigarette promotional items (Sargent *et al.*, 2000b; Albers and Biener, 2003).

Psychosocial risk factors for alcohol use: Maternal supervision was assessed using a four-point scale ranging from ‘not like her’ (1) to ‘just like her’ (4). Participants responded to four statements such as, ‘She asks me what I do with my friends’ (Jackson *et al.*, 1998; $\alpha = 0.64$). Risk taking was assessed using a five-point scale ranging from ‘not at all like me’ to ‘very much like me,’ with higher scores indicating more risk taking. Participants responded to three statements such as, ‘I think it’s worth getting in trouble to have fun’ (Flay *et al.*, 1998; $\alpha = 0.81$). A measure of after school supervision consisted of one item asking participants to indicate the number of hours they usually take care of themselves on a typical day after school without an adult being there. Self-reported grades were used as an indicator of academic performance (Jackson *et al.*, 1997).

Analyses: Odds ratios were computed to examine the association of adolescents’ exposure to retail alcohol advertising and API ownership with alcohol use, after controlling for social influences to drink, psychosocial risk factors (maternal supervision, risk taking, after school supervision, self-reported grades), and demographics (gender, grade level, and ethnicity). Ethnicity was dummy coded to compare non-Hispanic white with Hispanic/Latino (any ethnic identification that included Hispanic), and other/unknown. Because study participants were surveyed from three schools, we tested the potential effect of school clustering with multi-level modelling using GLIMMIX for SAS version 8.0 (SAS Institute, 2000, <http://v8doc.sas.com/sashtml/>). However, results of the multi-level model did not differ from the results of pooled multiple logistic regressions reported below.

RESULTS

Table 1 summarizes the alcohol use, psychosocial, and demographic characteristics of the 2125 participants. More than one-fourth of students (28%) reported trying alcohol, and nearly half of those who tried (13% of the total) reported drinking in the past 30 days.

Regarding exposure to alcohol promotion, two-thirds of students reported visiting a liquor, convenience or small market at least weekly, and one-fifth owned at least one API. Well over one-third of the sample was exposed to other social influences to drink: 42% reported daily or weekly exposure to parent alcohol use, and 37% reported having at least one friend who drinks alcohol.

Table 2 compares the prevalence of frequent exposure to alcohol ads in stores and API ownership across the various demographic and psychosocial variables measured in the study. Not surprisingly, adolescents' exposure to the two forms of alcohol promotion was positively correlated. Frequent exposure to alcohol ads in stores and API ownership were more common among males than females, and among students exposed to parents or peers who drink than among students without such exposure. All psychosocial risk factors measured in the study were correlated with adolescents' exposure to the two forms of alcohol promotion. Although API ownership increased with age, 6th, 7th, and 8th graders were equally likely to report at least weekly visits to liquor, convenience or small grocery stores. Such visits were more common among Latino youth than among non-Hispanic whites.

Among the bivariate odds ratios, peer alcohol use, risk taking, and API ownership had the strongest relationship with ever drinking, as shown in Table 3. After controlling for known risk factors, such as age, exposure to peers and parents who drink, propensity for risk-taking, and amount of unsupervised time after school, retail ad exposure was associated with a 50% increase in the odds of ever drinking; API ownership was associated with a 3-fold increase in the odds of ever drinking, as large as the association with exposure to friends who drink. At all three grade levels, students who reported API ownership were much more likely to have tried alcohol than those did not report API ownership, as shown in Figure 1.

A similar analysis was conducted on the subset of the sample who ever tried drinking ($n = 566$) to determine which factors distinguish students who reported drinking in the past 30 days from those who did not report current alcohol use. According to the bivariate analyses, current drinking was associated with API ownership ($OR = 1.8$, 95% $CI = 1.3, 2.5$), as well as having at least one friend who drinks alcohol ($OR = 2.7$, 95% $CI = 1.8, 3.9$), a propensity for risk-taking ($OR = 2.3$, 95% $CI = 1.4, 3.6$), and unsupervised time after school ($OR = 1.5$, 95% $CI = 1.1, 2.1$). Compared to non-Hispanic whites, students who identified an ethnic category other than Hispanic were less likely to report current alcohol use ($OR = 0.6$, 95% $CI = 0.4, 0.9$). According to the logistic regression analysis, current drinking was independently associated with owning an API ($OR = 1.5$, 95% $CI = 1.1, 2.2$, $P < 0.05$), having at least one friend who drinks alcohol ($OR = 2.4$, 95% $CI = 1.5, 3.6$, $P < 0.0001$) and a propensity for risk taking ($OR = 1.9$, 95% $CI = 1.2, 3.2$, $P < 0.05$). Contrary to our hypothesis, retail ad exposure was not independently associated with a significant increase in the odds of current drinking ($OR = 1.1$, 95% $CI = 0.7, 1.8$). Although Hispanics reported more frequent exposure to retail ads than non-Hispanic whites, the interaction between ethnicity (Hispanics vs. non-Hispanic white) and retail ad exposure on trying alcohol was not statistically significant.

DISCUSSION

This study examined whether adolescents' exposure to retail alcohol advertising and API ownership are associated with levels of alcohol use, when taking into account other psychosocial and demographic risk factors. Two-thirds of middle school students reported at least weekly visits to liquor, convenience, or small grocery stores where alcohol advertising is widespread. Consistent with prior research (Ellickson *et al.*, 2005), such exposure was associated with increased odds of ever drinking, but was not associated with drinking alcohol in the past 30 days. One-fifth of students reported owning at least one API. These students were three times more likely to have tried alcohol and 50% more likely to report current alcohol use than students without such items.

These findings extend the literature in several important ways. This study is one of the first to demonstrate an association between adolescents' exposure to alcohol advertising in stores and ever drinking. Although previous research demonstrated a relationship between college students' exposure to such messages and their binge drinking (Kuo *et al.*, 2003), results of this study suggest the preponderance of alcohol ads in stores may also have an impact on younger audiences. Future research should consider whether exposure to such advertising alters adolescents' normative perceptions about the availability and popularity of alcohol, thereby contributing to an environment that encourages its use. Future research should also explore how these variables are related to the quantity of alcohol consumed by those who report current drinking.

Two previous studies found that alcohol use was more common among students who owned APIs than among peers who did not own them (Workman, 2003; McClure *et al.*, 2006). Results of the current study demonstrate that the association of owning APIs and alcohol use persists even after controlling for social influences, such as exposure to peers who drink, and individual differences, such as propensity for risk taking, as well as parent characteristics including parent alcohol use and maternal supervision. Future research should provide more detailed evidence about the number and nature of APIs that adolescents own, as well as test whether self-reported alcohol consumption increases with the number of items owned (a dose-response relationship).

The main limitation of this study is its cross-sectional design. The findings are consistent with research demonstrating that adolescents' exposure to other forms of alcohol advertising, such as television and magazine ads, promotes alcohol use (Martin *et al.*, 2002; National Research Council and Institute of Medicine, 2003). However, it could be the case that adolescents who drink are selectively exposed to alcohol ads in stores and to APIs. For example, adolescents may own APIs because they choose to identify themselves with the brand imagery of products they have already sampled (Feighery *et al.*, 1998; Workman, 2003). In addition, it is possible that some other, unmeasured, variable may underlie the observed relationships in this study. Longitudinal research is needed to address the possibilities of reverse and reciprocal causation, and to rule out possible spurious relationships.

Other limitations of the study concern the measurement of alcohol use and advertising exposure. The quantity of alcohol consumed by those who reported current drinking was not assessed. Given that students could drink alcohol the same number of days but consume different quantities, it is important for future studies to assess the relationship of advertising to both frequency and quantity of alcohol consumption. The measure of exposure to alcohol advertising does not capture how much attention adolescents paid to in-store advertising. We cannot assume that all adolescents who are exposed paid equal attention to such ads. However, lack of attention would reduce the relationship between exposure and drinking. Future research should be conducted to determine the best measure of exposure to alcohol marketing in stores. A measure of attention to advertising, such as recognition or recall memory, might be able to demonstrate a greater impact overall or moderate the relationship between exposure and drinking. Future research should also examine differences in marketing between store types and the impact that these potential differences may have on youth.

Additionally, this study followed a model of research in tobacco use and advertising. Linking tobacco use to store advertising is less problematic because tobacco advertising is banned from television. However, in the United States, the alcohol advertising expenditures are concentrated in broadcast media, primarily television. Without taking into account the influence from other sources, e.g. broadcast media, it is difficult to determine the unique impact store advertising has on youth alcohol use. Lastly, this study was conducted in a single California community, thus additional research is needed to determine whether these findings generalize to other communities. Although our sample is typical for California, the large Hispanic population is likely to be different in other states.

The appearance of liquor ads on television has increased since the distilled spirits industry abandoned its self-imposed, 48-year ban on such advertising, but the impact this will have on other forms of alcohol promotion is unknown. Increasing investments in measured media may decrease the type of advertising and promotional items assessed in this study. Alternatively, an increase in liquor ads on television may serve to make APIs more attractive to adolescents and stimulate demand for such items. However, it may be inadequate to simply impose bans on specific forms of alcohol advertising (Casswell, 2004). It has been suggested by Casswell (2004) that all types of advertising be monitored based on the amount of exposure, as well as the *reaction* by youth to the advertisements themselves. Results of this study also suggest that all forms of alcohol advertising and promotion warrant careful monitoring.

Acknowledgments

We are grateful to Amanda Dauphinee for managing the data collection and project administration, to Harry Haladjian for managing the store observations, to Matthew Barton, Christopher Doyle, Allyson Fish, Dominique Johnson, Lani Ream and Diana Wu for collecting the data, and to the principals and teachers who supported the study. This research was supported by Public Health Service grant CA67850 from the National Cancer Institute. Dr Hurtz was supported by Public Health Service NRSA No. 5 T32- HL07034 from the National Heart, Lung, and Blood Institute.

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Fig. 1.
Percent of adolescents who reported ever drinking alcohol, by grade and alcohol promotional item (API) ownership.

Table 1Characteristics of study participants: $N = 2125$ middle school students, Tracy, CA, 2003

Variable	Percent of full sample
Grade level	
6th Grade	33.2
7th Grade	29.8
8th Grade	37.0
Gender	
Female	53.1
Male	46.9
Ethnicity	
African American/black	5.4
Asian/Filipino	10.5
Hispanic/Latino ^a	41.8
Non-Hispanic, white	26.9
Multiple ethnicities	11.8
Other	3.6
Self-reported grades	
Mostly As	23.4
As and Bs	29.0
Mostly Bs	8.7
Bs and Cs	19.7
Mostly Cs and below	19.2
Exposure to parent alcohol use	
Once/month or less	58.4
Weekly or daily	41.6
At least one friend drinks alcohol	
No	62.7
Yes	37.3
Retail ad exposure (at least once/week)	
No	33.6
Yes	66.4
Owens alcohol promotional item (API)	
No	80.0
Yes	20.0
Alcohol use	
Never used	72.2
Has used, but not in past month	15.1
Used in past month	12.7
	Mdn IQR
Maternal supervision (maximum = 4)	3.3 1.0
Risk taking (maximum = 5)	2.3 1.3

	Mdn	IQR
After school supervision (hours/day)	1.0	3.0

Note. Mdn = median; IQR = interquartile range.

^a All who reported that they were at least part Hispanic/Latino were categorized as Hispanic/Latino.

Table 2

Prevalence of retail ad exposure and alcohol promotional item ownership: 2125 middle school students, Tracy, CA, 2003

Variable	Retail ad exposure %	Unadjusted odds ratio (95% CI)	API ownership%	Unadjusted odds ratio (95% CI)
Grade level				
6th Grade	68.0		13.0	
7th Grade	66.1	0.9 (0.7,1.2)	20.2	1.7 (1.3,2.3)
8th Grade	65.2	0.9 (0.7,1.1)	26.2	2.4 (1.8,3.1)
Gender				
Female	63.9		15.6	
Male	69.1	1.3 (1.1,1.5)	25.2	1.8 (1.5,2.3)
Ethnicity				
Non-Hispanic, white	58.7		21.2	
Latino/Hispanic	76.0	2.2 (1.8,2.8)	23.7	1.2 (0.9,1.5)
Other/unknown	60.2	1.1 (0.8,1.3)	14.1	0.6 (0.5,0.8)
Self-reported grades				
Above median	60.2		15.3	
Below median	73.1	1.8 (1.5,2.2)	25.1	1.8 (1.5,2.3)
Exposure to parent alcohol use				
Infrequent	62.7		15.1	
Frequent	71.5	1.5 (1.2,1.8)	26.9	2.1(1.7,2.6)
At least one friend drinks alcohol				
No	59.7		11.6	
Yes	77.6	2.3 (1.9,2.8)	34.3	4.0 (3.2,5.0)
Maternal supervision				
Above median	61.8		15.2	
Below median	68.9	1.4 (1.1,1.6)	22.6	1.6 (1.3,2.1)
Risk taking				
Below median	56.6		8.2	
Above median	74.9	2.3 (1.9,2.7)	30.3	4.9 (3.8,6.3)
After school supervision				
Above median	61.1		13.7	
Below median	72.6	1.7 (1.4,2.0)	27.1	2.3 (1.9,2.9)
Retail ad exposure (at least once/week)				
No	—		10.7	
Yes	—	—	24.7	2.7 (2.1,3.6)
API ownership				
No	62.5		—	
Yes	82.1	2.8 (2.1,3.6)	—	—

Note. The first category of each variable is the referent category. CI = confidence interval; API = alcohol promotional item.

Table 3

Unadjusted and adjusted odds ratios for ever drinking alcohol: 2050 middle school students, Tracy, CA, 2003

	Unadjusted OR ^a (95% CI)	Adjusted OR ^b (95% CI)	% ever used alcohol
Grade level			
6th Grade			14.6
7th Grade	2.1 (1.6,2.7)	1.5 (1.1,2.1)	26.1
8th Grade	4.1 (3.2,5.2)	2.4 (1.7,3.2)	41.0
Gender			
Female			26.5
Male	1.1 (0.9,1.4)	0.9 (0.7,1.1)	29.1
Ethnicity			
Non-Hispanic, white			25.0
Latino/Hispanic	1.4 (1.1,1.7)	1.4 (1.0,1.9)	31.3
Other/unknown	1.0 (0.8,1.3)	1.3 (0.9,1.8)	25.5
Self-reported grades			
Above median			21.2
Below median	2.0 (1.6,2.4)	1.1 (0.9,1.4)	34.8
Exposure to parent alcohol use			
No			20.6
Yes	2.3 (1.9,2.8)	1.8 (1.4,2.3)	37.8
At least one friend drinks alcohol			
No			13.2
Yes	7.2 (5.9,8.9)	3.3 (2.6,4.3)	52.3
Maternal supervision			
Above median			21.3
Below median	1.7 (1.4,2.1)	1.2 (0.9,1.6)	31.3
Risk-taking			
Below median			10.0
Above median	6.8 (5.4,8.7)	3.3 (2.5,4.4)	43.2
After school supervision			
Above median			19.4
Below median	2.5 (2.0,3.0)	1.4 (1.1,1.7)	37.5
Retail ad exposure (at least once/week)			
No			16.1
Yes	2.6 (2.1,3.3)	1.5 (1.1,2.0)	33.6
Owens alcohol promotional item			
No			19.3
Yes	6.7 (5.3,8.4)	3.3 (2.5,4.3)	61.5

Note. The first category of each variable is the referent category. CI = confidence interval; OR = odds ratio.

^aUnadjusted odds ratio is the bivariate relationship between each study variable and the outcome variable.

^bAdjusted odds ratio from logistic regression.