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Alcohol-Branded Merchandise and Its Association With Drinking Attitudes and Outcomes in US Adolescents

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Abstract

Objective—To describe ownership of alcohol-branded merchandise (ABM) and its association with attitudinal susceptibility, initiation of alcohol use, and binge drinking.

Design—Three-wave longitudinal study.

Setting—Confidential telephone survey.

Participants—Representative US sample of 6522 adolescents aged 10 to 14 years at baseline survey (4309 of whom were never-drinkers at 8 months); subjects were resurveyed at 16 and/or 24 months.

Main Exposures—Ownership of ABM (first assessed at the 8-month survey) and attitudinal susceptibility to alcohol use.

Outcome Measures—Initiation of alcohol use that parents did not know about and binge drinking (≥ 5 drinks in a row).

Results—Prevalence of ABM ownership ranged from 11% of adolescents (at 8 months) to 20% (at 24 months), which extrapolates to 2.1 to 3.1 million US adolescents, respectively. Clothing and headwear comprised 88% of ABM. Beer brands accounted for 75% of items; 45% of items bore the Budweiser label. Merchandise was obtained primarily from friends and/or family (71%) but was also purchased by the adolescents themselves (24%) at stores. Among never-drinkers, ABM ownership and susceptibility were reciprocally related, each significantly predicting the other during an 8-month period. In turn, we found that ABM ownership and susceptibility predicted both initiation of alcohol use and binge drinking, while controlling for a broad range of covariates.

Conclusions—Alcohol-branded merchandise is widely distributed among US adolescents, who obtain the items one-quarter of the time through direct purchase at retail outlets. Among never-drinkers, ABM ownership is independently associated with susceptibility to as well as with initiation of drinking and binge drinking.

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There is growing evidence that a specialized type of marketing, alcohol-branded merchandise (ABM), effectively reaches teenagers and is associated with alcohol use. Alcohol-branded merchandise consists of clothing and other personal articles that bear an alcohol brand. These items are produced by alcohol companies and are widely distributed through retail and other outlets. Two studies of regional adolescent samples have described the type of ABM items teenagers own (predominantly clothing items like t-shirts and hats), the brand associated with the item (primarily Budweiser, Corona, and Miller), and where the child obtained the item (most commonly from parents, friends, or retail stores).^{1,2} A number of cross-sectional studies have demonstrated that ownership of ABM is prevalent among teenagers (14%-36%) and is associated with an increased likelihood of having initiated alcohol use.¹⁻³ Three longitudinal studies have examined ownership of these items among baseline never-drinkers and have shown that ownership predicts initiation of alcohol use.⁴⁻⁶

Although the longitudinal research offers strong evidence for an effect on behavior, questions remain regarding exactly how ABM ownership modifies behavior and whether it predicts other outcomes beyond onset of alcohol use, such as binge drinking. Furthermore, it is unclear whether ABM ownership in some way drives the behavior or instead serves only as a marker for an attitudinally susceptible adolescent. Although it seems plausible that acquisition of ABM could lead to more favorable attitudes toward alcohol, those with more favorable attitudes may also be more likely to purchase ABM. The theory of cognitive dissonance supports this notion of a reciprocal relationship between receptivity to alcohol-marketing messages, as indicated by ABM ownership, and more favorable attitudes toward alcohol. According to the theory, when cognitions are inconsistent with our behavior (cognitive dissonance), we seek to resolve this discrepancy by changing either the behavior or the cognition.⁷ Thus, a teenager who owns ABM may develop more favorable attitudes toward alcohol as a way to justify owning the item, or a teenager with favorable attitudes toward alcohol may acquire an ABM item to make his or her behavior more congruent with his or her attitudes.

This study adds to the growing body of evidence supporting a causal relationship between ABM and drinking. First, we report population-based prevalence estimates for ownership of ABM in a national sample of US adolescents. The study also describes type of ABM reported, brand, and how the item was obtained, including more detailed point-of-purchase information than previously reported. Finally, this is the first study to examine the longitudinal relationship between ABM ownership, attitudinal susceptibility, and measures of alcohol use in a multiple-wave study that includes binge drinking as an outcome. We used cross-lagged panel models to examine the reciprocal relationship between attitudinal susceptibility to alcohol use and ABM acquisition. The panel model was embedded within a survival model that examined the direct and indirect effects of ABM and susceptibility on initiation of drinking or binge drinking. All models include controls for a broad range of other potential influences, like media exposure (television exposure and depictions of alcohol in movies), personality characteristics (eg, sensation seeking and rebelliousness), peer and parental influence, extracurricular activities, academic performance, and demographics, to determine the independent effect of ABM ownership on behavior.

METHODS

RECRUITMENT

A detailed description of recruitment methods has been previously published.⁸ Briefly, from June to October of 2003, we conducted a random-digit dialing telephone survey, successfully recruiting 6522 US adolescents aged 10 to 14 years to participate in a survey of health behavior and media influences. Baseline and follow-up surveys were conducted by Westat (Rockville, Maryland), a national research organization, using computer-assisted telephone interviews. Surveys were conducted every 8 months for 4 waves, with 5503 subjects retained at 8 months,

5019 at 16 months, and 4575 at 24 months. Parental consent and adolescent assent were obtained before each adolescent interview. Participants were allowed to answer all sensitive questions (eg, tobacco and alcohol use) using the telephone touch pad to provide confidentiality in the event that others were present or listening. The Human Subjects Protection Committee at Dartmouth Medical School and Westat approved the survey. The cooperation rate (completed interviews divided by eligible households) was 66%. The unweighted baseline sample was almost identical to 2000 US census data, except for a slight underrepresentation of black adolescents and an overrepresentation of Hispanic individuals, which we corrected with weighting procedures. Adolescents lost to follow-up were more likely to be of a racial minority, were less likely to have excellent academic performance, and had parents with lower educational attainment.⁹ The sample was re-weighted at each wave to account for loss to follow-up, which allowed for national estimates for ABM ownership at each wave.

STUDY SAMPLE

The baseline and follow-up samples have been previously described.⁸ The baseline sample was equally distributed by age (mean age, 12 years; standard deviation [SD], 1.4 years) and sex. Sixty-two percent of subjects were white, 11% were black, 19% were Hispanic, and 8% were classified as mixed race/ other. Seventeen percent of responding parents had less than a high school degree, 23% had a high school degree only, 21% had some post-high school education but no degree, 9% had an associate's degree, 18% had a bachelor's degree, and 12% had education beyond a bachelor's degree. (For a description of survey items, response categories, and survey wave, see the eTable, <http://archpediatrics.com>.)

For this analysis, demographics, including age, sex, race, education, and household income, were assessed at baseline. Race categories comprising less than 10% of the sample were collapsed into an other/mixed race category.

OUTCOME MEASURES

The primary behavioral outcomes for the study were the transition from never-drinker to trying alcohol, and the transition from never-binge drinker to binge drinker. Questions on alcohol were preceded by the statement, "The next few questions are about alcohol. By alcohol we mean beer, wine, wine coolers or liquor, like vodka or gin." To assess whether adolescents had tried alcohol we asked, "Have you ever drunk alcohol that your parents did not know about? (yes, no)" To assess binge drinking we asked, "Have you ever had 5 or more drinks in a row, that is, within a couple of hours? (yes, no)" Change in drinking status was assessed longitudinally between 8 and 16 months and between 16 and 24 months.

EXPOSURE OF INTEREST

Ownership of ABM was not queried in the baseline survey but was in the surveys at 8, 16, and 24 months. At 8 months, those who responded yes to ownership were also asked the brand of the reported item. For this question, responses were postcoded for brand; for brands with multiple products (eg, Bud Lite and Budweiser), the products were collapsed into 1 category that represented the general brand. At 24 months, if a subject responded yes to ABM ownership, the type of item and how it was obtained was determined. As with brands, responses were postcoded into categories and tabulated.

ATTITUDINAL MEDIATOR

Attitudinal susceptibility to drinking was determined at the 8-, 16-, and 24-month surveys using 3 items that assessed response to peer offers, intentions, and positive expectancies. Following the methods of Pierce et al,¹⁰ we created a dichotomous measure: 0 if the adolescent answered "definitely no" or "strongly disagree" to the respective survey items, and 1 otherwise.

COVARIATES

To isolate the effect of ABM ownership and susceptibility to alcohol use on behavior, we controlled for a number of other factors, in addition to demographics, that could be related to alcohol attitudes or use. Social influence covariates included peer drinking, parental drinking (assessed first at 16 months), academic performance, and involvement in extracurricular activities. The perception of one's ability to obtain alcohol at home was assessed, as were personality factor covariates, including rebelliousness and sensation seeking. Aspects of responsive and/or demanding parenting style were queried to create a measure of parenting style. Composite scores were obtained for the measures of extracurricular activities, sensation seeking, rebelliousness, maternal responsiveness, and maternal demandingness⁹; reliabilities for each of the composite variables can be found in the eTable. Finally, because exposure to entertainment media might be relevant to ABM ownership, both television exposure and exposure to alcohol use in movies were assessed. Exposure to alcohol use in movies was determined as described previously¹¹ and extensively validated.¹² Subjects were asked whether they had seen movies selected from a random sample of popular box office films from the 5 years preceding the baseline survey. All movies had been assessed for alcohol content by trained content coders; based on movies viewed, a sum of movie alcohol exposure was determined. To avoid problems with outliers, continuous covariates were censored at the 5th and 95th percentiles of the distribution. After censoring, continuous covariates were linearly rescaled so that the 5th percentile was scored 0 and the 95th percentile was scored 1. Ordered categorical covariates were linearly rescaled to lie between 0 and 1 to provide a comparable metric for all predictors.

STATISTICAL ANALYSIS

The number of US adolescents that owned ABM 8 to 24 months after baseline was determined by back-weighting the sample using survey weights that corrected for response bias at baseline and attrition bias for each of the follow-up surveys using the svy commands in Stata, version 7 (Stata Corp, College Station, Texas). The relationship between ABM ownership at the 8-month survey and other covariates was examined using logistic regression. To study the potential reciprocal relationship between ABM and susceptibility and their direct and indirect effects on drinking behavior, a cross-lagged panel model was combined with a discrete time hazard regression. The structure of the models for alcohol initiation and binge drinking is diagrammed in Figure 1 and Figure 2, respectively. All relationships in the panel hazard models were estimated using logistic regression to model the log odds of initiation of drinking or binge drinking occurring in a specific time interval, given that it had not happened by the beginning of the interval. Hazard odds pertain to the odds of alcohol initiation occurring in a specific time interval, given that it has not happened yet.¹³ In these models, ABM ownership, susceptibility to alcohol use, and covariates could prospectively affect the hazard of alcohol use in the time from 8 to 16 months and from 16 to 24 months. Cross-lagged paths between ABM ownership at 8 months and susceptibility were used to determine the reciprocal relationship between the 2 predictors from 8 months to 16 months.

ATTRITION

Approximately 13% of the sample at risk for initiating drinking was lost to follow-up for each observation period: 547 participants (13%) from 8 to 16 months, and 445 participants (13%) from 16 to 24 months. Thus, subject retention at 24 months was still 77% of the original 8-month sample at risk for initiating drinking. For the hazard model predicting the initiation of alcohol use, the risk set, described previously, included subjects who had not initiated alcohol use at 8 months (n=4342) and those with complete 8-month data (n=4309). Subjects who dropped out before initiating alcohol use or who were still nondrinkers when the follow-up period ended (at 24 months) were censored at their last wave of observation.

MISSING DATA

Missing data at the 8-month survey were minimal for all variables (33 missing values for 4342 nondrinkers), except for household income (n=275 [6%]) and parental drinking (n=549 [13%]). Data were missing for household income because of nonresponse at the baseline survey, while data were missing for parental drinking at the 16-month survey because of attrition from 8 to 16 months. To minimize potential nonresponse bias for household income and attrition bias for parental drinking, subjects with missing data on these covariates were still included in the model. Estimation for all multivariate models was carried out using full-information maximum likelihood, assuming noninformative censoring for drinking and ignorable missingness for household income and parental drinking. All 95% confidence intervals (CIs) are based on a 2-tailed assessment.

RESULTS

In adolescents aged 10 to 14 years in this national representative sample, the prevalence of ABM ownership ranged from 11% (at 8 months) to 20% (at 24 months), which extrapolates to 2.1 to 3.1 million US adolescents, respectively.

ABM PREVALENCE AND OBTAINMENT

Clothing items like t-shirts and jackets were the most commonly reported items (64%), followed by headwear, such as hats and headbands (24%). The remaining items included a wide array of alcohol-branded paraphernalia, such as jewelry, key chains, shot glasses, posters, and pens. Adolescents could recall a specific alcohol brand for 548 of the 597 ABM items (92%) reported at 8 months. Eighty-two percent of reported brands were beer brands, 18% were for distilled alcohol, and less than 1% were wine brands. Of all alcohol brands reported, Budweiser accounted for 45%, followed by Corona at 16% and Miller at 5%. The most commonly reported distilled alcohol brands were Jack Daniels (5%) and Bacardi (2%), which accounted for about 5% of all reported brands.

Table 1 details where adolescents obtained their ABM. Of the 916 adolescents who reported owning ABM at 24 months, 71% reported that the item was a gift from family or a friend, 24.1% said it was purchased, and 4.1% found the item, won it, or got it free as a giveaway at an event. Of the 221 purchased items, most (66%) were purchased in a store. Specific stores, such as Wal-Mart, Spencer's, Target, Kohl's, JC Penney, Macy's, and Hot Topic, were identified by one-third of the youth who had purchased the item; the remainder did not specify a store, or they described the site of purchase more generally, eg, "at the mall," "at the beach," or "on vacation."

CHARACTERISTICS OF ADOLESCENTS WHO OWN ABM

Table 2 lists variables associated with ownership of ABM at 8 months. A number of social influences were significant multivariate predictors of ABM ownership, including attitudinal susceptibility to alcohol use (odds ratio [OR], 1.94; 95% CI, 1.52-2.49), exposure to alcohol in movies (OR, 2.91; 95% CI, 2.09-4.06), peer drinking (OR, 1.50; 95% CI, 1.19-1.89), and ability to obtain alcohol at home (OR, 2.10; 95% CI, 1.56-2.85). Personal characteristics, like sensation seeking and rebelliousness, contributed to risk of ownership, but parenting style (responsiveness and demandingness) and parental alcohol use did not. Older adolescents and those involved in extracurricular activities were more likely to report ABM ownership. Black and Hispanic adolescents were significantly less likely to own ABM than white adolescents. Academic performance and television viewing were not significantly associated with owning ABM in the multivariate analysis. Measures of socioeconomic status (parental education and household income) were not significantly associated with owning ABM even in the bivariate analysis.

SUSCEPTIBILITY TO ALCOHOL USE, ABM OWNERSHIP, AND DRINKING OUTCOMES

Table 3 details prevalence and incidence of ABM ownership and drinking outcomes across survey waves. The prevalence of ABM ownership and all drinking outcomes increased throughout the course of the study. Eight percent of adolescents acquired ABM during each observation period, whereas about 20% became susceptible to alcohol use. About 10% of adolescents tried drinking for the first time and 5% tried binge drinking for the first time during each observation period.

ABM OWNERSHIP AS A PREDICTOR OF INITIATION OF ALCOHOL USE

Figure 1 and Table 4 illustrate the results of the panel hazard model for alcohol drinking initiation. Results for the panel part of the model are discussed first, as they have implications for indirect effects in the hazard part of the model.

In the panel part of the model, cross-lagged (prospective) effects between ABM ownership and susceptibility were significant, suggesting that the relationship between them is reciprocal. All else being equal, nonsusceptible adolescents who owned ABM at 8 months were 1.66 times more likely to become susceptible to alcohol use by 16 months. Conversely, non-ABM owners who were susceptible to alcohol use at 8 months were 1.41 times more likely to own ABM by 16 months. Concurrent effects of ABM ownership at 8 and 16 months on susceptibility were also significant. The concurrent effect of ABM at 16 months on susceptibility remained, over and above the cross-lagged effect of ABM at 8 months and the stability effect, suggesting that change in ABM ownership directly affects changes in susceptibility. For example, a nonsusceptible, non-ABM-owning adolescent who acquired ABM by 16 months was 2.34 times more likely to become susceptible compared with a nonsusceptible adolescent who did not acquire ABM.

In the hazard part of the model, all effects of ABM and susceptibility on drinking initiation were significant, at $P < .05$, with the exception of a direct effect of ABM ownership at 8 months on drinking initiation by 16 months. These results indicate that ABM ownership had direct and indirect effects on drinking initiation, both immediately in the following 8 months (indirectly through susceptibility at 8 months) and through lagged effects on the period from 16 to 24 months. The longer-term effects of ABM ownership at 8 months were direct and indirect through 4 different routes: (1) ABM ownership at 8 months, to ownership at 16 months, to initiation; (2) ownership at 8 months, to ownership at 16 months, to susceptibility at 16 months, to initiation; (3) ownership at 8 months, to susceptibility at 16 months, to initiation; and (4) ownership at 8 months, to susceptibility at 8 months, to initiation from 16 to 24 months.

The results also indicate that susceptibility had direct and indirect effects on drinking initiation, both immediately in the next 8 months (OR, 2.43; 95% CI, 1.84-3.20) and 16 months later (OR, 3.54; 95% CI, 2.56-4.89). The longer-term effects of susceptibility at 8 months were direct (OR, 3.58; 95% CI, 3.54-5.05) and indirect through 3 different routes: (1) susceptibility at 8 months, to susceptibility at 16 months, to initiation; (2) susceptibility at 8 months, to ABM ownership at 16 months, to susceptibility at 16 months, to initiation; and (3) susceptibility at 8 months, to ownership at 16 months, to initiation. The results underline the importance of attitudinal susceptibility as a predictor of trying alcohol. Although not shown in Figure 1 and Table 4, susceptibility effects were greater for predicting initiation between 8 and 16 months than all other covariates except age and movie alcohol exposure. For predicting initiation between 16 and 24 months, susceptibility effects were second only to movie alcohol exposure.

ABM OWNERSHIP AS A PREDICTOR OF INITIATION OF BINGE DRINKING

Figure 2 illustrates the results for the panel hazard model predicting binge drinking, and Table 5 lists the estimate for each path with its 95% confidence intervals. The results are much the

same as those for initiation of drinking, showing a reciprocal relationship between ABM ownership and susceptibility to alcohol use and multiple direct and indirect paths from ABM ownership to binge drinking.

COMMENT

This study demonstrates that ABM is owned by millions of adolescents throughout the United States. These items bear the labels of alcohol products produced predominantly by large beer companies, like Anheuser-Busch, Corona, and Miller, and are reasonably considered to be part of the promotional campaigns behind these products. Adolescents acquire these items through family members and friends and through direct purchase at large retail chains like Wal-Mart, Spencer's, Target, and Kohl's. Ownership of ABM is predicted by a number of important social influences, including peer drinking, involvement in extracurricular activities, and exposure to drinking in movies, which includes numerous brand placements by the same companies that distribute these items¹⁴ and suggests that exposure to alcohol advertising may lead to ABM acquisition. Susceptibility to alcohol use is a strong predictor of ownership as are personality factors, like sensation seeking and rebelliousness, that predict higher exposure to media and higher risk for substance-use experimentation. Minority adolescents and girls seem to be less likely to own ABM. Surprisingly, ownership of ABM is not predicted by measures of parenting style or parental drinking but is influenced by the perceived ability to obtain alcohol at home; this suggests that alcohol-specific parenting practices may influence ABM ownership and ultimately drinking behavior.

The results also demonstrate a prospective relationship between ABM ownership and initiation of both alcohol use and binge drinking. This is the first study to link ABM ownership to more problematic youth alcohol outcomes that predict morbidity and mortality. Notably, the relationship is independent of a number of known social, personality, and environmental risk factors for alcohol use. Moreover, the mediational model shows that the effect of ABM ownership on behavior is both direct and indirect, demonstrating that some of the effect on behavior occurs as a result of this ownership prompting more favorable attitudes. The results underline the importance of owning ABM as a predictor of drinking and the complexity of the linkages, both short-term and long-term, through attitudinal susceptibility. Finally, the models show the reciprocal relationship between ABM ownership and attitudinal susceptibility to alcohol use, with ABM predicting more favorable attitudes and vice-versa. Importantly, the results very clearly demonstrate that ABM ownership is more than a simple marker of an adolescent with favorable attitudes toward alcohol use, strengthening the case for ABM ownership as a causal factor in initiation of alcohol use and binge drinking.

This study has several limitations. Although all alcohol questions were asked with touch-tone responses to assure confidentiality, information regarding alcohol and ABM ownership relied on self-report and is subject to response errors. In addition, there was differential attrition in the sample such that higher-risk adolescents were more likely to have been lost to follow-up; thus, we are describing the ABM ownership of adolescents who remained in our study over time. We used weights to adjust for this but recognize that the follow-up sample may not be as representative of all adolescents in the United States as the baseline sample. We also did not assess for other sources of alcohol advertising or product placement within television programming, so it is likely that we underestimated the full alcohol marketing influence on adolescent alcohol use. Finally, although multiple confounding variables were assessed, the possibility of a third unmeasured confounder cannot be ruled out in an observational study. Despite these limitations, this study, in concert with the literature to date, provides strong evidence that ABM distribution among adolescents plays a role in their drinking behavior and provides a basis for policies to restrict the scope of such alcohol-marketing practices.

Acknowledgments

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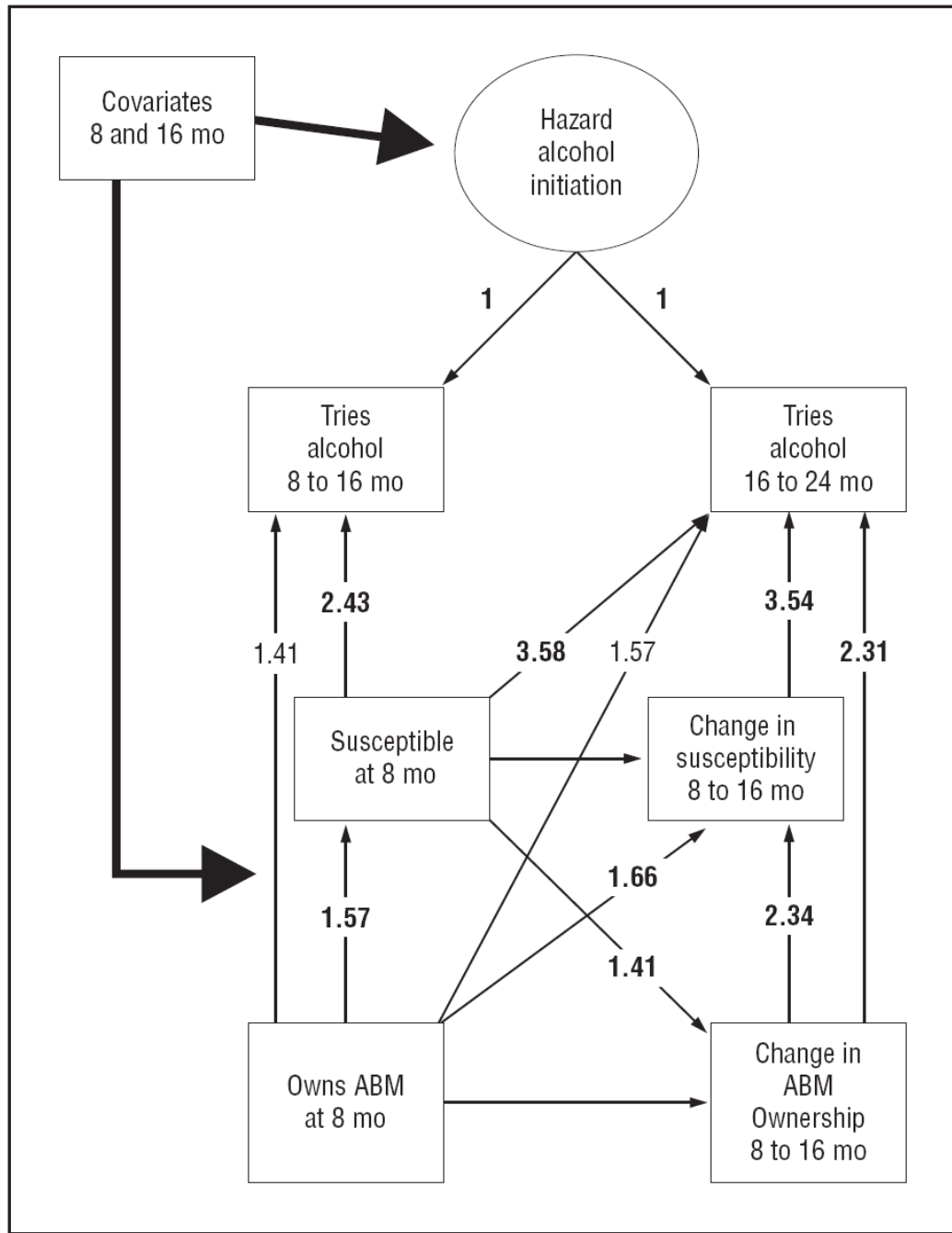


Figure 1. Panel hazard model for initiation of alcohol use. Each arrow is associated with a number that represents the hazard ratio for the association. Hazard ratios in bold are statistically significant at $P < .05$. All analyses included the covariates described previously and in the eTable; a table of results for the other covariates are available on request from the first author. The horizontal lines (from alcohol-branded merchandise [ABM] ownership at 8 months to ABM ownership at 16 months and from susceptibility at 8 months to susceptibility at 16 months) represent stability paths, implying that other arrows to these 16-month measures can be interpreted as effects on change from 8 to 16 months. Thus, the cross-lagged path model shows how ABM ownership at 8 months affects change from 8 to 16 months in susceptibility and how alcohol

susceptibility at 8 months affects a change from 8 to 16 months in ABM ownership. See Table 4 for hazard ratios and 95% confidence intervals.

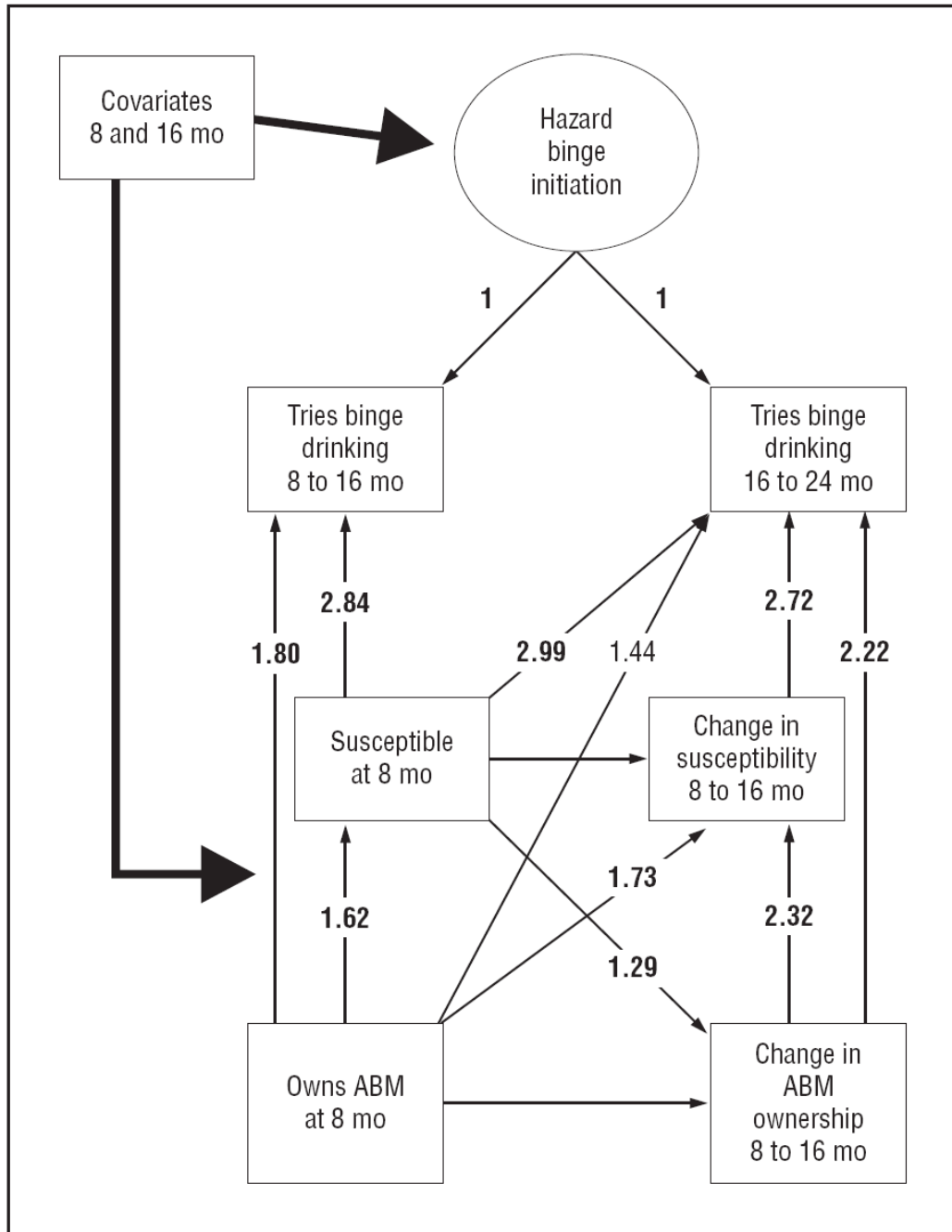


Figure 2. Panel hazard model for initiation of binge drinking. Each arrow is associated with a number that represents the hazard ratio for the association. Hazard ratios in bold are statistically significant at $P < .05$. All analyses included the covariates described previously and in the eTable; a table of results for the other covariates are available on request from the first author. See Table 5 for hazard ratios and 95% confidence intervals.

Table 1

Detailed Survey Responses for How Adolescents Obtained Alcohol-Branded Merchandise

How Item Was Obtained	No. (%) ^a (n=916)
Gift from friend/family member	650 (71.0)
Purchased	221 (24.1)
In a store	146 (66)
At the mall	33 (21)
Wal-Mart	10 (7)
Spencer's	7 (5)
Target	5 (3)
Convenience store/gas station	5 (2)
Kohl's	3 (2)
Corona shop	2 (1)
Hot Topic	2 (1)
JC Penney	2 (1)
Anchor Blue	2 (1)
Department store	2 (1)
Sears	1 (1)
K-Mart	1 (1)
Drugstore	1 (1)
Liquor store	1 (1)
Disney store	1 (1)
Macy's	1 (1)
No store identified	67 (46)
At an event	12 (5)
At a flea market/vendor	8 (4)
Via the Internet or a catalog	4 (2)
Not specified	51 (23)
Free/found/won	38 (4.1)
Not specified	7 (0.8)

^aPercentages are of their category subgroup.

Table 2
Alcohol-Branded Merchandise by Adolescent and Familial Characteristics

Characteristic ^a	Unadjusted OR	Adjusted OR (95% CI)
Age, y	4.36	1.41 (1.01-1.98)
Sex		
M	1 [Reference]	1 [Reference]
F	0.49	0.53 (0.44-0.65)
Race/ethnicity		
White	1 [Reference]	1 [Reference]
Black	0.30	0.24 (0.15-0.39)
Hispanic	0.66	0.58 (0.44-0.77)
Susceptibility to alcohol use	5.07	1.94 (1.52-2.49)
Exposure to movie alcohol	7.41	2.91 (2.09-4.06)
Television exposure, h/d	1.60	1.22 (0.87-1.70)
Peer drinking	3.95	1.50 (1.19-1.89)
Parental drinking	2.98	1.27 (0.90-1.79)
Could get alcohol from home	5.96	2.10 (1.56-2.85)
Sensation seeking	12.08	2.80 (1.90-4.13)
Rebelliousness	6.85	1.63 (1.15-2.31)
Parenting style	0.15	0.71 (0.49-1.03)
Extracurricular activities	0.60	1.45 (1.01-2.09)
Academic performance	3.37	1.28 (0.89-1.84)

Abbreviations: CI, confidence interval; OR, odds ratio.

^aIncludes variables that were significant in the bivariate analysis. Controls also for other covariates that were not significantly related to alcohol-branded merchandise ownership: other race, parental education, and household income.

Prevalence and Incidence of Key Outcomes

Table 3

Characteristic	Prevalence			Incidence ^a	
	At 8 mo	At 16 mo	At 24 mo	From 8 to 16 mo	From 16 to 24 mo
	%				
Owens ABM	11	16	20	8	8
Susceptible to alcohol use	46	51	57	21	26
Tried alcohol	21	27	34	9	10
Ever binge drank	9	14	19	5	5

Abbreviation: ABM, alcohol-branded merchandise.

^a Non-ABM-owners who acquired ABM, nonsusceptible never-drinkers who became susceptible, never-drinkers who tried drinking, and never-binge drinkers who became binge drinkers.

Table 4

Hazard Odds for Initiation of Alcohol Use

Outcome by Predictors	Adjusted HR (95% CI) ^a
Trying alcohol from 8 to 16 mo	
Susceptible to alcohol use at 8 mo	2.43 (1.84-3.20)
Owns ABM at 8 mo	1.41 (0.98-2.01)
Trying alcohol from 16 to 24 mo	
Change in susceptibility to alcohol use from 8 to 16 mo	3.54 (2.56-4.89)
Change in ABM ownership from 8 to 16 mo	2.31 (1.60-3.35)
Susceptible to alcohol use at 8 mo	3.58 (2.54-5.05)
Owns ABM at 8 mo	1.57 (0.99-2.50)
Susceptible to alcohol use at 8 mo	
ABM ownership at 8 mo	1.57 (1.18-2.10)
Change in susceptibility to alcohol use from 8 to 16 mo	
Change in ABM ownership from 8 to 16 mo	2.34 (1.76-3.11)
Owns ABM at 8 mo	1.66 (1.15-2.40)
Change in ABM ownership from 8 to 16 mo	
Susceptible to alcohol use at 8 mo	1.41 (1.09-1.83)

Abbreviations: ABM, alcohol-branded merchandise; CI, confidence interval; HR, hazard ratio.

^aThis analysis controls for the effects of age, sex, race, parental education, household income, exposure to alcohol in movies, exposure to television, peer drinking, parental drinking, perceived availability of alcohol at home, sensation seeking, rebelliousness, parenting style, extracurricular activities, and academic performance.

Table 5

Hazard Odds for Initiation of Binge Drinking

Outcome by Predictors	Adjusted HR (95% CI) ^a
Trying binge drinking from 8 to 16 mo	
Susceptible to alcohol use at 8 mo	2.84 (1.90-4.27)
Owns ABM at 8 mo	1.80 (1.28-2.54)
Trying binge drinking from 16 to 24 mo	
Change in susceptibility to alcohol use from 8 to 16 mo	2.72 (1.70-4.35)
Change in ABM ownership from 8 to 16 mo	2.22 (1.49-3.32)
Susceptible to alcohol use at 8 mo	2.99 (1.84-4.85)
Owns ABM at 8 mo	1.44 (0.90-2.31)
Susceptible to alcohol use at 8 mo	
ABM ownership at 8 mo	1.62 (1.24-2.11)
Change in susceptibility to alcohol use from 8 to 16 mo	
Change in ABM ownership from 8 to 16 mo	2.32 (1.77-3.04)
Owns ABM at 8 mo	1.73 (1.23-2.43)
Change in ABM ownership from 8 to 16 mo	
Susceptible to alcohol use at 8 mo	1.29 (1.01-1.64)

Abbreviations: ABM, alcohol-branded merchandise; CI, confidence interval; HR, hazard ratio.

^aThis analysis controls for the effects of age, sex, race, parental education, household income, exposure to alcohol in movies, exposure to television, peer drinking, parental drinking, perceived availability of alcohol at home, sensation seeking, rebelliousness, parenting style, extracurricular activities, and academic performance.