

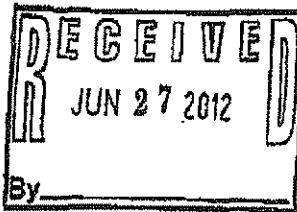
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ERNEST P. NOBLE, Ph.D., M.D.
DISTINGUISHED PROFESSOR OF PSYCHIATRY &
BIOBEHAVIORAL SCIENCES, EMERITUS
SEMEL INSTITUTE FOR NEUROSCIENCE & HUMAN BEHAVIOR, UCLA
760 WESTWOOD PLAZA, RM. 58-242
LOS ANGELES, CA 90095-1759
Ph. (310) 825-1891
FAX (310) 206-7309
e-mail: epnoble@ucla.edu

Richard Alarcón
Councilmember
Seventh District
City of Los Angeles

Date: 5-24-13 June 25, 2012
Submitted in PS Committee
Council File No: 11-1429
Item No.: 6
Deputy: [Signature]

Dear Mr. Alarcón,

Thank you for your letter on May 30, 2012. In that letter you asked for my specific input "in analyzing the potential benefit the legislation may have on reducing underage drinking, provide any studies or surveys on alcohol advertising that influences underage alcohol drinking, share reports and data on the financial burden and loss of productivity and life caused by underage drinking".

Alcohol advertising that influences underage alcohol drinking

A large number of studies have considered the impact of alcohol advertising on underage drinking. Out of these studies, information has been collected from seven rigorously selected cohort studies featuring information on 13,255 participants¹. This study evaluated a range of different alcohol advertisement and marketing exposure including print and broadcast media. Two studies measured the hours of TV and music video viewing. All measured drinking behavior using a variety of outcome measures. Two studies evaluated drinkers and non-drinkers separately. Baseline non-drinkers were significantly more likely to have become a drinker at follow-up with greater exposure to alcohol advertisements. In studies that included drinkers and non-drinkers, increased exposure at baseline led to significantly increased risk of drinking at follow-up.

This large systematic review concludes that exposure to ads and product placement, even those supposedly not directed at young people, leads to increased alcohol consumption. It is recommended that counter advertising, social marketing techniques and other prevention options such as parenting programs, price increases and limiting availability appears to be useful to limit alcohol problems in young people.

Financial burden and loss of productivity and life caused by underage drinking

Underage drinking costs the citizens of California \$6.8 billion in 2010. These costs include medical care, work loss, and pain and suffering associated with multiple problems resulting from the use of alcohol by youth². This translates to a cost of \$1,811 per year for each youth in the state or \$3.05 per drink consumed underage. Excluding pain and suffering from

these costs, the direct costs of underage drinking incurred through medical care and loss of work cost California \$2,918 million each year or \$1.31 per drink. In contrast, a drink in California retails for \$1.51.

Costs of Underage Drinking by Problem, California 2010 \$

Problem	Total Costs (in millions)
Youth Violence	\$3,754.5
Youth Traffic Crashes	\$1,136.0
High-Risk Sex, Ages 14-20	\$553.1
Youth Property Crime	\$806.8
Youth Injury	\$188.2
Poisonings and Psychoses	\$83.9
FAS Among Mothers 15-20	\$151.5
Youth Alcohol Treatment	\$305.3
Total	\$6,779.4

Youth violence (homicide, suicide, aggravated assault) and traffic crashes attributable to alcohol use by underage youth in California represent the largest costs for the state. However, a host of other problems contribute substantially to the overall cost. Among teen mothers, fetal alcohol syndrome (FAS) alone costs California \$152 million.

Young people who begin drinking before age 15 are four times more likely to develop alcohol dependence and are two and a half times more likely to become abusers of alcohol than those who begin drinking at age 21³. In 2009, 7,240 youth 12-20 years old were admitted for alcohol treatment in California, accounting for 17% of all treatment for alcohol abuse in the state⁴.

Alcohol Consumption by Youth in California

Underage drinking is widespread in California. Approximately 1,372,000 underage customers in California drink each year. In 2007-2009, California students in grades 9-12 reported:⁵

- 56.6% had at least one drink of alcohol on one or more days during their life.
- 19.9% had their first drink of alcohol, other than a few sips before age 13.
- 34.0% had at least one drink of alcohol on one or more occasion in the past 30 days.
- 21.0% had five or more drinks of alcohol in a row (binge drinking) in the past 30 days.
- 7.5% had at least one drink of alcohol on school property in the past 30 days.

In 2009, underage customers consumed 17.5% of all alcohol sold in California, totaling \$3,352 million in sales (in 2010 dollars). These sales provided profits of \$1,641 million to the alcohol industry². Ranking states based on the percentage of alcohol consumed underage, with 1 the highest, California ranked number 33. This percentage is affected by both adult and youth drinking levels.

Annual sales of alcohol consumed by youth in California averaged \$2,443 per underage customer. Underage customers were heavier consumers than adults. They drank an average of 4.4 drinks per day; in contrast, legal customers consumed only 1.6.

Harm Associated with Underage Drinking in California

Underage drinking in California leads to substantial harm due to traffic crashes, violent crime, property crime, unintentional injury, and risky sex.

- During 2009, an estimated 141 traffic fatalities and 7,552 nonfatal traffic injuries were attributable to driving after underage drinking.
- In 2009, an estimated 239 homicides; 114,500 nonfatal violent crimes such as rape, robbery, and assault; and 179,000 property crimes including burglary, larceny, and car theft were attributable to underage drinking.
- In 2007, an estimated 28 alcohol involved fatal burns, drownings, and suicides were attributable to underage drinking.
- In 2009, an estimated 2,820 teen pregnancies and 115,282 teens having risky sex were attributable to underage drinking.

In closing, Assemblyman Alarcón, I strongly support your legislation to prohibit alcohol advertising on city owned and controlled property modeled after similar ordinances in the cities of San Francisco, CA and Philadelphia, PA.

Yours Sincerely,



Ernest P. Noble, Ph.D., M.D.
Director of the UCLA Alcohol Research Center
Former Director of National Institute on Alcohol Abuse and Alcoholism (NIAAA) in
Washington D.C.

¹ Smith LA, Foxcroft DR. The effect of alcohol advertising, marketing and portrayal on drinking behavior in young people: systematic review of prospective cohort studies. *BMC Public Health* 2009, 9:51.

² Levy, D.T., Miller, T.R. & Cox, K.C. (2003). Underage drinking: societal costs and seller profits. Working Paper. Calverton, MD: PIRE.

³ Grant, B.F., & Dawson, D.A. (1997). Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse* 9: 103-110.

⁴ Office of Applied Studies, Substance Abuse and Mental Health Services Administration. Treatment Episode Data Set. (2011). *Substance Abuse Treatment by Primary Substance of Abuse, According to Sex, Age, Race, and Ethnicity, 2009*. Available [On-line]: <http://www.icpsr.umich.edu/icpsrweb/SAMHDA/studies/30462>.

⁵ Center for disease Control (CDC). (2011). Youth Risk Behavior Surveillance System (YRBSS). Available [On-line]: <http://apps.nccd.cdc.gov/youthonline/App/Default.aspx>.

JOHNS HOPKINS
UNIVERSITY

Bloomberg School of Public Health

Department of Health, Behavior and Society
Center on Alcohol Marketing and Youth (CAMY)
624 N. Broadway, Room 288
Baltimore, MD 21205-1996
410-502-6579 / Fax 410-502-4333

Date: April 5, 2013

Re: Council File: 11-1429

Testimony of David H. Jernigan, PhD to the Los Angeles City Council

My name is David Jernigan, and I am the Director of the Center on Alcohol Marketing and Youth at the Johns Hopkins Bloomberg School of Public Health. My comments in this testimony are my own views and do not represent the official position of the Bloomberg School or Johns Hopkins University.

File #11-1429 will help the City of Los Angeles play a positive role in reducing youth exposure to alcohol advertisements by prohibiting commercial advertising on or in publically owned or controlled facilities. This proposal has the potential to reduce youth alcohol consumption and help make area neighborhoods safer places for young people to live, grow, and flourish.

Alcohol use is widespread among our youth, and the consequences of youth alcohol use are real and tragic. Young people who begin drinking prior to the age of 15 are five times more likely to develop alcohol problems later in life than those who wait until they are 21 to drink, according to the U.S. Surgeon General.[1] They are four times more likely to develop alcohol dependence,[2] six times more likely to be in a physical fight after drinking, more than six times more likely to be in a motor vehicle crash because of drinking, and almost five times more likely to suffer from other unintentional injuries after drinking.[3] Every year approximately 4,700 people under age 21 die from injuries resulting from excessive alcohol use.[4] In California, approximately 545 deaths of young persons under 21 per year are attributable to alcohol use.[4]

Alcohol is the most popular drug of intoxication among our youth. The average age of first drink for 12- to 17- year-olds is 14, and this has changed little in recent years.[5] People aged 12 to 20

drink between 11 and 20% of all alcohol consumed in the US, and they drink substantially more per occasion than adults.[6, 7]

A 2010 survey found that 41.2% of U.S. high school seniors reported drinking in the past month, and 21.6% reported binge drinking in the past two weeks.[8] In Los Angeles, 25.5% of high school students reported drinking alcohol for the first time before 13 years of age, 33% drank alcohol in the past month, and 18 reported binge¹ drinking.[9]

In 2011, the U.S. Surgeon General issued the first National Prevention Strategy, which explicitly recognized the importance and need for the federal government to conduct ongoing, independent, and brand-specific monitoring of youth exposure to alcohol marketing in order to ensure compliance with advertising standards and subsequent protection of youth from these marketing influences.[10]

At least 14 longitudinal studies have followed groups of young people over time, measured their exposure to alcohol marketing and their drinking behavior, and found that the more youth are exposed to alcohol marketing, the more likely they are to drink or, if already drinking, to drink more.[11, 12] One study specifically examining outdoor signage around schools found that exposure to that signage in sixth grade predicted young people's intentions to drink two years later.[13] Another found a dose-response relationship with advertising exposure: for each additional advertisement a young person saw above the monthly average, he or she drank one percent more, and for each additional dollar per capita spent on alcohol advertising in a local media market, young people drank three percent more.[14] Further, a new analysis of survey data from 5,472 underage college students found that exposure to alcohol marketing was the most formidable risk factor for underage drinking, more powerful than perceived drinking norms or law alcohol policy enforcement. The same study found that exposure to alcohol education programs had little effect on underage student drinking. This study and others suggest that restrictions on alcohol marketing will more effectively reduce underage consumption than alcohol education programs.[15]

While quantifying the precise benefit of the City of Los Angeles' proposal to ban alcohol advertising on City-owned and controlled property is not possible without more detailed information on current youth exposure to that advertising, one could extrapolate from existing studies. In addition to the findings detailed above about monthly average advertising exposure and per capita alcohol advertising spending in a media market, another study estimated that a 28 percent reduction in alcohol advertising would decrease adolescent monthly drinking from 25 percent to between 21 and 24 percent, and binge drinking from 12 percent to between 8 and 11

¹ This survey defines binge drinking as, "had five or more drinks of alcohol in a row within a couple of hours on at least 1 day during the 30 days before the survey."

percent.[16] Yet another estimated that a complete ban on advertising would reduce years of life by 16.4 percent, and a partial ban by 4 percent.

These declines are important since a recently released longitudinal study of young people in Los Angeles found that exposure to alcohol advertising at baseline was associated with increased alcohol use over time as well as greater likelihood of alcohol problems three years later.[17]

A new ecological study from San Jose found that the presence of alcohol advertising sexualizing Latina females in a block group predicted sexual violence against Latina and non-Latina females more powerfully than measures such as outlet density that have been strong predictors of violence in other studies.[18] This ground-breaking research suggests that the benefits of reducing outdoor alcohol advertising could extend beyond young people to women in general, particularly if the removed advertising sexualizes women, as a substantial proportion of alcohol advertising does.[19]

Local governments have a unique opportunity to address youth exposure to alcohol advertising, and the City of Los Angeles is yet another example of cities taking local action to address the critical public health issue of underage drinking.

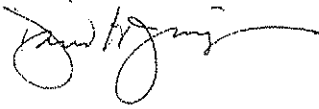
Baltimore led the nation more than a decade ago in making the city safer for young people by banning alcohol and tobacco advertising in its residential neighborhoods. In 2003, Philadelphia's City Council unanimously passed an ordinance banning future alcohol advertising on city-owned property as a way to reduce the exposure to alcohol advertising to the nearly 27,000 school children who rode public transit to school every year.[20]

In 2012, the Massachusetts Bay Transportation Authority in Boston eliminated all alcohol advertising on its property including subway cars, trains, buses, and in the stations. A study published in 2009 found that alcohol ads were viewed an estimated 18,269 times by Boston public school student transit passengers during an average weekday, reaching the equivalent of 54.1% of that population.[21] The argument raised in the Report of the Chief Legislative Analyst that the proposed ordinance would result in a loss in revenues to the City of between \$400,000 and \$600,000 assumes that the banned alcohol advertising would not be replaced by other, non-alcohol advertising. This argument was raised in Boston as well, but in practice has not proven to be true, since there is often a high level of demand for these public advertising spaces.

In 2003, Congress requested the National Research Council and the Institute of Medicine to recommend a strategy to reduce and prevent underage drinking based on a review of the evidence. They concluded that we need a "broad societal commitment" to reducing underage drinking, including reducing youth exposure to alcohol advertising.[22]

Alcohol is indeed too attractive and too easy to obtain for our youth. Policy measures, such as File #11-1429, are among the most effective strategies communities can do to reduce youth exposure to alcohol marketing and prevent underage drinking.

Sincerely,

A handwritten signature in black ink, appearing to read "David H. Jernigan", with a long horizontal flourish extending to the right.

David H. Jernigan, PhD
Director, Center on Alcohol Marketing and Youth;
Associate Professor, Johns Hopkins Bloomberg School of Public Health

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JONATHAN E. FIELDING, M.D., M.P.H.
Director and Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

313 North Figueroa Street, Room 708
Los Angeles, California 90012
TEL (213) 240-6156 • FAX (213) 481-2739

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April 8, 2013

The Honorable Richard Alarcón
Councilmember, Seventh District
City of Los Angeles
200 North Spring Street, Room 470
Los Angeles, California 90012

Dear Councilmember Alarcón:

Thank you for the opportunity to review the *Report of the Chief Legislative Analyst: Prohibiting Alcohol Advertising on City Property*, and to provide written testimony regarding the social impact of underage alcohol consumption and related health consequences.

Attached is information on the role of advertising and consumption by minors, as well as data on alcohol use and related consequences. This data clearly illustrates that limiting alcohol advertising is an evidence-based approach to reducing alcohol consumption in minors.

I have also attached a recent report prepared by the Department of Public Health titled *Reducing Alcohol-Related Harms in Los Angeles County: A Cities and Communities Health Report*. Reducing alcohol advertising in public places and in areas commonly seen by minors was one of the eight recommendations of how to reduce local alcohol-related consequences. Research suggests that youth who view more alcohol advertisements on average drink more and each additional advertisement seen increases consumption by one percent. Furthermore, youth who reside in markets with greater alcohol advertising tend to drink more than those who do not.¹ Another study found that exposure to alcohol advertisements and/or liking of such advertisement by seventh graders influenced the severity of alcohol-related problems in the tenth grade.² It is important to implement a variety of efforts to reduce the impact of alcohol-related consequences among youth and young adults.

According to the *Annual Catastrophe of Alcohol in California, Los Angeles County July 2008* report prepared by the Marin Institute, the total economic burden of alcohol use in this County is \$10.8 billion or \$1000 per resident annually. This included costs related to illness (\$5.4 billion), crime (\$2.4 billion), traffic including driving under the influence (\$2.0 billion), and injury (\$1.0 billion). For Los Angeles County, this translates to 2,297 lives lost per year, and 28 incidents per hour (e.g., injuries, crime, and high risk sexual activity) that can be attributed to alcohol use.


¹ L.B. Snyder, F.F. Milici, M. Slater, H. Sun, and Y. Strizhakova. *Effects of Alcohol Advertising Exposure on Drinking Among Youth*. Archives of Pediatrics and Adolescent Medicine. 160 (2006):18-24.

² J.L. Grenard, C.W. Dent, A.W. Stacy. *Exposure to Alcohol Advertisements and Teenage Alcohol-Related Problems*. Pediatrics. 131(Febuary 2013): 369-379.

The Honorable Richard Alarcon
April 8, 2013
Page 2

In addition to my letter and the attached information on this important matter, I look forward to submitting oral testimony, if necessary. If you have any questions or need additional information, please call John Viernes, Jr., Director, Substance Abuse Prevention and Control, at (626) 299-4595.

Sincerely,


Jonathan E. Fielding, M.D., M.P.H.
Director and Health Officer

JEF:jv:mg
35983

Attachment

Department of Public Health, Substance Abuse Prevention and Control
Research on Alcohol Advertising and Minor Consumption

Prepared and distributed in a Letter to Councilmember Alarcón originally on August 12, 2012 and updated on April 4, 2013

Alcohol Industry Advertising

In a May 2012 publication entitled, "*State Laws to Reduce the Impact of Alcohol Marketing on Youth: Current Status and Model Policies*," the Center on Alcohol Marketing and Youth, at the John Hopkins University Bloomberg School of Public Health reported the following advertising efforts made by the alcohol industry:

- The alcohol industry spent more than \$4 billion each year marketing its projects.¹
- Underage youth receive substantial exposure to this marketing, and multiple longitudinal studies have correlated this exposure with greater likelihood of drinking, or if young people have already initiated alcohol use, drinking more.²

The Marin Institute in its March 2009 publication entitled, "*Out-of-Home Alcohol Advertising: A 21st-Century Guide to Effective Regulation*,"³ cited the following:

- Spending on out-of-home advertising grew to over \$8 billion dollars in 2008.
- The term "out-of-home advertising" has replaced "outdoor advertising" because advertisers are no longer just using billboards and signs to reach consumers; some of the newer techniques, such as video display terminals, are placed indoors.
- High-tech out-of-home advertisements such as digital billboards, video networks, and digital ads on buses were expected to grow to over \$2.65 billion in 2009.
- Historically, the alcohol industry has been one of the largest purchasers of outdoor advertising.
- Since 2006, the alcohol industry increased total advertising spending 4.8 percent to total \$2.2 billion.

Alcohol Advertisement Bans

Two research projects funded by grants from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to the National Bureau of Economic Research found the following on alcohol ad bans and alcohol consumption:

- Saffer (2000) found that alcohol advertising bans decrease alcohol consumption and alcohol consumption has a positive effect (i.e., increases) on the legislation of alcohol advertising bans.⁴
- Saffer & Dhaval (2003) utilized data from The Monitoring the Future (MTF) and the National Longitudinal Survey of Youth 1997 (NLSY97), which included only data for adolescents, to estimate the effects of alcohol advertising on adolescent alcohol consumption (consumer demand). Results based on the NLSY97 suggest that a complete ban on all alcohol advertising could reduce adolescent monthly alcohol participation by about 24 percent and binge participation by about 42 percent. Both advertising (i.e. ad banning) and price policies were shown to have the potential to substantially reduce adolescent alcohol consumption (impact on demand curve). The results from the MTF and the NLSY97 generally showed that alcohol advertising has a positive effect on annual alcohol participation, monthly participation and binge participation (i.e., demand increases), though effects may vary by race and gender. Alcohol price generally has a negative effect on these participation measures.⁵

Link Between Ads and Minor Consumption

- Long-term studies have shown that youth who see, hear, and read more alcohol ads are more likely to drink and drink more heavily than their peers.⁶

- The first national long-term study of youth throughout the United States, funded by the NIAAA, found that for underage youth, exposure to an additional alcohol ad was correlated with a one percent increase in drinking, and that youth drank three percent more for every additional dollar per capita spent on alcohol advertising in a local market.⁷
- This study comes on the heels of two other long-term federally-funded studies as well as a variety of studies from other countries that, taken together, present an increasing compelling picture that alcohol marketing has an effect on young people's drinking.⁸
- A study of 2,250 middle-school students in Los Angeles found that a one standard deviation increase in exposure to television programs containing alcohol commercials in seventh grade was related to a 1.4-fold increase in the likelihood of beer consumption, a 1.3-fold increase in wine/spirits consumption, and a 1.3-fold increase in consuming at least three drinks in a row one year later.⁹
- Another study, of middle-school students in South Dakota, found that exposure in seventh grade to beer advertising via magazines, concession stands at sporting and music events, and in-store displays, but not television, predicted frequency of drinking in ninth grade.¹⁰
- Numerous long-term studies in other countries have found as well that youth who see, hear, and read more alcohol ads are more likely to drink and drink more heavily than their peers.¹¹
- A study of 253 10 to 17 year olds in California found that specific elements of beer ads (such as humor or use of animal characters) significantly contributed to how much the young people liked the ads, which in turn increased these young people's intentions to purchase the product and beer brand promoted by these advertisements. In contrast, ads that focused on product-related characteristics or sent a message about the minimum drinking age reduced young people's desire to purchase the product associated with them.¹²
- Valentine G., Jayne M., Gould M. indicated that "increased counter-advertising" may be more effective public policy than advertising bans.¹³
- According to Grenard JL, Dent CW, Stacy AW, younger adolescents seem to be more susceptible to the alcohol TV commercials and exposure to alcohol ads influence some youth to drink more and "experience drinking-related problems later in adolescence".¹⁴
- A systemic review of prospective cohort studies by Smith L.A. and Foxcroft D.R. revealed that baseline non-drinking youth were significantly more likely to have become drinkers "at follow-up with greater exposure to alcohol advertisements". Moreover, in studies that included drinkers and non-drinkers, increased exposure at baseline led to significant increased risk of drinking at follow-up.¹⁵
- Fleming K, Thorson E, Atkin CK tested the impact of alcohol advertising exposure on intentions to drink and actual consumption. The findings supported that alcohol advertising influenced young people's attitudes and perceptions, predicting intentions to drink especially among underage drinkers between the ages of 15 and 20.¹⁶
- Anderson et al reported in a systematic meta-review of longitudinal studies that exposure to media and commercial communications on alcohol is associated with the likelihood that adolescents will start to drink alcohol, and with increased drinking amongst baseline drinkers. Based on the strength of this association, the consistency of findings across numerous observational studies, temporality of exposure and drinking behaviors observed, dose-response relationships, as well as the theoretical plausibility regarding the impact of media

exposure and commercial communications, it was concluded that alcohol advertising and promotion increases the likelihood that adolescents will start to use alcohol, and to drink more if they are already using alcohol.¹⁷

- Advertising is only one of the marketing tools that are used to develop and manage brands. The World Health Organization (WHO) Global Status Report on Alcohol and Young People (41) emphasized the growing trend for marketing expenditure to shift away from traditional forms of direct advertising in the print and broadcast media (known as "above-the-line" activity), to "below-the-line" activity, such as sponsorship, competitions and special promotions. The report further estimated that since 1993, in the United States, around 75% of marketing expenditure went below-the-line. Furthermore, these communications activities are in turn just part of the overall marketing effort by the alcohol industry, which links promotional activity with product development, pricing and distribution.¹⁸
- Stanley et al (1985) identified that, in the case of beer, the primary influence on demand is the youthfulness of the population and that control laws with the strongest relationship to beer are minimum legal age and Sunday sales. The authors found that price and income are far more inelastic for this type of alcoholic beverage (demand is less affected) than for distilled spirits, implying that control laws influencing price will have a relatively lesser effect on beer consumption than on spirits consumption. From a public policy perspective these results can be used for a segment-based demarketing of alcohol. In other words, price intervention through tax increases, resale price maintenance, or bans on price advertising will have a much larger effect on spirits consumption than on beer consumption.¹⁹
- Although the majority of studies support an advertising ban to reduce underage drinking, a meta-analysis by Aspara J. and Tikkanen H. recommended against advertising bans, based on their assessment of previous study limitations on focusing specifically on adolescent consumption and advertising.²⁰

Prevalence and Toll of Underage Drinking in America

In September 2011, a report entitled "Costs Associated with Underage Drinking in the United States and California", produced by the Pacific Institute for Research and Evaluation (PIRE), stated that underage drinking cost the citizens of the United States \$62.0 billion in 2010. Some of these costs "include medical care, work loss, and pain and suffering associated with the multiple problems resulting from the use of alcohol by youth" which translates to a cost of \$2,070 per year for each youth or \$3.17 per drink consumed by youth.²¹

Alcohol Use Among Young People Under 21 is the Leading Drug Problem in the United States

- More youth in the United States drink alcohol than smoke tobacco or marijuana, making it the drug most used by American young people.²²
- Every day, 5,400 young people under 16 take their first drink of alcohol.²³
- In 2005, one out of six eighth-graders, one in three tenth-graders, and nearly one out of two twelfth-graders were current drinkers.²⁴
- More than 7 million underage youth, ages 12 to 20, reported binge drinking – having five or more drinks on at least one occasion in the past 30 days – in 2004, according to data released in September 2005.²⁵

Underage Drinking has Serious Consequences

- The Centers for Disease Control and Prevention estimates that 4,571 deaths of youth under age 21 were attributable to excessive alcohol use in 2001.²⁶
- Every day, three teens die from drinking and driving.²⁷
- At least six more youth under 21 die each day of non-driving alcohol-related causes, such as homicide, suicide, and drowning.²⁸
- More than 70,000 college students are victims of alcohol-related sexual assault or date rape each year.²⁹
- Recent studies have found that heavy exposure of the adolescent brain to alcohol may interfere with brain development, causing loss of memory and other skills.³⁰

Alcohol is Used More by Young People than Tobacco or Marijuana

- More youth in the United States drink alcohol than smoke tobacco or marijuana, making it the drug most used by American young people. In 2005, 17.1 percent of eighth-graders had consumed alcohol within the previous 30 days, compared with 9.3 percent who had smoked cigarettes and 6.6 percent who had used marijuana.³¹
- In 2005, 17.1 percent of eighth-graders had consumed alcohol within the previous 30 days, compared with 9.3 percent who had smoked cigarettes and 6.6 percent who had used marijuana.³²

Early Initiation into Alcohol Use Puts Young People at Much Greater Risk of Negative Consequences Later in Life

- Survey data indicate that those who start to drink before age 13 are nine times more likely to binge drink frequently (five or more drinks per occasion at least six times per month) compared with high school students who begin drinking later, according to an analysis published in 2005 by NIAAA.³³
- Compared with non-drinkers, frequent binge drinkers (nearly 1 million high school students nationwide) were more likely to engage in other risky behaviors in the previous 30 days including carrying a gun, using marijuana, using cocaine, and having sex with six or more partners.³⁴
- Compared with persons who wait until age 21 or older to start drinking, those who start to drink before age 15 are 12 times more likely to be unintentionally injured while under the influence of alcohol, seven times more likely to be in a motor vehicle crash after drinking, and at least 10 times more likely to be in a physical fight after drinking later in life.³⁵
- Those who start to drink before age 15 are also four times more likely to meet the criteria for alcohol dependence at some point in their lifetime.³⁶

Drinking and Driving Lead to Numerous Fatalities

- According to data published by the U.S. National Highway Traffic Safety Administration (NHTSA), every day approximately three teens die from drinking and driving.³⁷
- NHTSA reports that 3,523 young driver ages 16 to 20 died in motor vehicle crashes in 2004. Of these, 1048 (30 percent) had been drinking.³⁸

- Driving while intoxicated increase significantly between 1998 and 2001 among college students and others in the 18 to 24 age group, from 26.5 percent to 31.4 percent.³⁹

Drinking Results in Non-Driving-Related Fatalities

- Every day, at least six teens die of non-driving alcohol related causes, such as homicide, suicide, and drowning.⁴⁰
- Alcohol has been reported to be involved in 36 percent of homicides, 12 percent of male suicides, and 8 percent of female suicides involving people under 21—a total of about 1,500 homicides and 300 suicides in 2000.⁴¹

Drinking is Strongly Linked to Violent Crime

- Young people under the age of 21 commit 45 percent of rapes, 44 percent of robberies, and 37 percent of other assaults.⁴²
- It is estimated that nearly half (47%) of assaults are alcohol-related.⁴³
- More than 70,000 college students are victims of alcohol-related sexual assault or date rape each year.⁴⁴
- An estimated 1,400 college students die each year from alcohol-related injuries and 500,000 students are injured while under the influence of alcohol each year.⁴⁵

Drinking Increases Likelihood of Sexual Activity

- Teenage girls who binge drink are up to 63 percent more likely to become teen mothers.⁴⁶
- In 2001, eight percent or an estimated 400,000 full-time college students ages 18 to 24 in the United States had unprotected sexual intercourse as a result of drinking.⁴⁷
- Among Black and Hispanic youth, early alcohol initiation is positively associated with number of sexual partners and pregnancy, as well as sexual initiation and recent intercourse. Black and Hispanic females who used alcohol by seventh grade were more likely than those who were non-drinkers to report recent sexual intercourse as tenth-grade students.⁴⁸

Drinking is Tied to Delinquent Behaviors

- In 2003, the percentage of youth who engaged in delinquent behaviors (such as stealing, fighting, selling illegal drugs, or carrying a handgun) increased significantly with the level of past year alcohol use. Approximately 66 percent of youth who engaged in any of the delinquent behaviors listed above reported frequent binge drinking, compared with 57 percent of youth who reported binge alcohol use, 44 percent who reported past month alcohol use, 44 percent who reported alcohol use but not in the past month, and 30 percent who reported no alcohol use.⁴⁹
- For example, the percentage of youth who carried handguns increased significantly as the level of youth drinking increased, according to an analysis published in 2005.⁵⁰

Effective Strategies to Reduce the Burden of Alcohol

- Hollingworth et al indicated that a tax increase and an advertising ban were the most effective interventions to reduce alcohol burden in the community. "A tax-based 17% increase in the price of alcohol of one dollar per six pack of beer could reduce deaths from harmful drinking by 1,490, equivalent to 31,130 discounted years of potential life saved or 3.3% of current alcohol-attributable mortality. A complete ban on alcohol advertising would reduce deaths from harmful drinking by 7,609 and result in a 16.4% decrease in alcohol-related life-years lost. A partial advertising ban would result in a 4% reduction in alcohol-related life-years lost." Environmental interventions to prevent underage drinking can lead to reductions in adult mortality. "Among interventions shown to be successful in reducing youthful drinking prevalence, advertising bans appear to have the greatest potential for premature mortality reduction".⁵¹

Model Language from Current Laws

In the March 2009 publication previously cited above entitled, "*Out-of-Home Alcohol Advertising: A 21st-Century Guide to Effective Regulation*," the Marin Institute recommends that the most direct and powerful way that government can restrict advertising that appears on its property is to pass a law or an ordinance stating what content is prohibited. The Marin Institute gave the example that a locality could pass an ordinance prohibiting the placement of any alcohol-related advertising on public property.⁵² This study cited the following model language from current laws:

California (Cal Bus & Prof Code §25612.5)

Type of law: State level/content-neutral regulation

Relevant language: The Legislature finds and declares that it is in the interest of the public health, safety, and welfare to adopt operating standards as set forth in this section for specified retail premises licensed by the department. The standards set forth in this section are state standards that do not preclude the adoption and implementation of more stringent local regulations that are otherwise authorized by law. (*This is important to avoid preemption, which could preclude localities from going further than state law.*) No more than 33 percent of the square footage of the windows and clear doors of an off-sale premises shall bear advertising or signs of any sort, and all advertising and signage shall be placed and maintained in a manner that ensures that law enforcement personnel have a clear and unobstructed view of the interior of the premises, including the area in which the cash registers are maintained, from the exterior public sidewalk or entrance to the premises.

San Diego, California (§58.0501)

Type of law: City level/content-based regulation of alcohol ads aimed at reducing underage drinking

Relevant language: It is unlawful for any person, business, or retailer to place or maintain, or cause to be placed or maintained, any advertising of alcoholic beverages on a billboard that is within 500 feet of a school, playground, recreation center or facility, child care center, or library or that is more than 500 feet and the billboard face and its advertisement are clearly visible from a school, playground, recreation center or facility, child care center, or library. This section does not apply to any noncommercial message.

San Francisco, California

Type of law: Ban of alcohol advertisements on public transit

Note: this language can be quite simple. Most transit advertising policies already include a list of prohibited content, so just add alcohol to that list. You may also consider excluding other potentially harmful products, as this policy does.

Relevant language: Policy governing advertising on Municipal Transportation Agency (MTA) property. No advertisement posted on MTA property shall:

- Be false, misleading, or deceptive
- Appear to promote the use of firearms
- Be clearly defamatory
- Be obscene or pornographic
- Advocate imminent lawlessness or violent action
- Promote alcoholic beverages or tobacco products

San Jose, California (Ord. 27626)

Type of law: City level/content-based regulation of alcohol ads aimed at reducing drinking and driving

Relevant language: No beer and wine advertising shall be located on motor fuel islands and no self-illuminated advertising of beer or wine shall be located on buildings or windows.

Philadelphia, PA (Bill No. 030713)

Type of law: City level/content-based, government property/contracts

Relevant language: Every contract which permits any person to place advertising on City owned or controlled property shall include a provision prohibiting the placement on such property of advertisements for alcohol. For purposes of this section, City owned or controlled property does not include property used to hold professional sporting events. Good example of legislative findings (i.e., the evidence needed) The City Council finds that.

- (a) A September 10, 2003 report entitled, *Underage Drinking: A Collective Responsibility*, released by the National Academy of Sciences stated that more youth drink alcohol than smoke tobacco or use other illegal drugs;
- (b) In the most recent national survey on drug use, the 2002 Monitoring the Future report, almost half or 48.6 percent of twelfth graders reported recent alcohol use;
- (c) Underage drinking plays a substantial role in the three leading causes of death among youth—motor vehicle fatalities, suicide and homicide;
- (d) According to the American Medical Association, underage drinking is a factor in nearly one-half of all teen automobile crashes, the leading cause of death among teenagers;
- (e) Alcohol abuse among young people is also linked to two-thirds of all sexual assaults and date rape, and is a major factor in unprotected sex among youth, thereby increasing their risk of sexually transmitted diseases;
- (f) The National Academy of Sciences estimates that the social cost of underage drinking is \$53 billion;
- (g) In the Philadelphia Safe and Sound Report Card 2003, substance abuse among high school youth was rated "challenging, with major obstacles;"
- (h) The most recent Youth Risk Behavior Survey compiled in 2001, which is based on self-reports by Philadelphia public high school students, found that 31.6 percent of high school youth report having had one drink in the most recent 30-day period;
- (i) Research by the National Institute on Alcohol Abuse and Alcoholism, entitled *Effects of the Mass Media on the Use and Abuse of Alcohol* has found that exposure to alcohol advertisements affects young people's beliefs about drinking, intentions to drink, and actual drinking behavior;
- (j) A substantial proportion of alcohol advertising reaches an underage audience and is presented in a style that is attractive to youth;
- (k) A 1996 study of children ages 9 to 11 found that children were more familiar with Budweiser's television frogs than with Kellogg's Tony the Tiger or Smokey the Bear;
- (l) In a survey conducted for the Center on Alcohol Marketing and Youth in June of 2003, two-thirds of parents say that seeing and hearing alcohol advertisements makes teens more likely to drink alcohol and 82 percent of the parents surveyed said that the risky behavior teens engage in while under the influence of alcohol is a problem in society today;

(m) Children and youth utilize city owned and controlled property on a daily basis, such as school buildings, recreation centers, libraries and bus shelters; and

(n) To the extent that commercial advertising is allowed in these public facilities, the City of Philadelphia can play a positive role in reducing exposure of youth to alcohol advertisements by prohibiting the placement of such advertisements on publicly owned or controlled property.

Los Angeles County Current Law

The Los Angeles, California County Code, Title 2 Administration, Part 2 Advertising, Chapter 2.132 Commercial Marketing-Promotion and Advertising, under 2.132.120 Authorization and 2.132.130 Limitations, C.,⁵³ mandates the following:

- **2.132.120 Authorization** - Notwithstanding any other provision of the Los Angeles County Code, the Board of Supervisors is authorized to sell the right to advertise on property that is owned or operated by the County of Los Angeles (Ord. 91-0039 § 2 (part), 1991).
- **2.132.130 Limitations, C.** - No advertising for alcohol or tobacco products is permitted.

In conclusion, reducing the impact of alcohol marketing on young people is an important public health goal since underage drinking is a significant contributor to youth alcohol-related motor vehicle crashes and other forms of injury, violence, suicide, and problems associated with school and family.⁵⁴

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USC School of Social Work

May 15, 2013

The Honorable Antonio Villaraigosa
Mayor, City of Los Angeles
Room 303, City Hall
200 North Spring St.
Los Angeles, CA 90012

RE: Prohibiting Alcohol Advertising on Los Angeles City Public Property

Dear Mayor Villaraigosa,


As a faculty researcher committed to the reduction of alcohol and substance use among our youth, I ask you to support a citywide ordinance prohibiting alcohol advertising in future city contracts. Recently the L.A. City Council agreed with the Coalition to Ban Alcohol Ads on Public Property in Los Angeles and excluded alcohol advertising in the new 10-year city bus bench contract granted to Martin Outdoor Media LLC.

I am deeply troubled by the over abundance of alcohol ads on public property in Los Angeles such as in bus shelters and street furniture. Significant research shows a relationship between alcohol advertising and use patterns by youth – this is well established! The City should not be a partner in promoting alcohol, particularly when so much of the advertising is visible by our youth due to the ads proximity to schools, bus stops and parks.

The L.A. County Department of Public Health recommends, "reducing alcohol advertising in public spaces and in areas commonly seen by minors," as a way to help discourage underage drinking. Currently the Los Angeles MTA does not allow alcohol advertising on its buses, trains and other transit facilities. The research is clear, the more alcohol advertisements young people see, the more likely they are to drink and drink to excess. Restricting youth exposure to alcohol advertising has important benefits, including reducing youth drinking and binge drinking.

I respectfully urge you to adopt a citywide policy prohibiting alcohol ads on public property.

Sincerely,


Jeremy T. Goldbach, Ph.D., LMSW
Assistant Professor
University of Southern California
School of Social Work

University of Southern California
1234 Trousdale Parkway, Los Angeles, California 90089-1234 • Tel: 213 740 1234 • Fax: 213 740 1234





School of Community and Global Health

May 22, 2013

The Honorable Richard Alarcón
Councilmember, Seventh District
City of Los Angeles
200 North Spring Street, Room 470
Los Angeles, California 90012

Dear Council member Alarcón:

Thank you for the opportunity to provide you with information on the influence of alcohol advertisements on underage drinking. This letter supplements the letters that you have already received from Dr. Nobel at UCLA and Dr. Fielding from the LA County Department of Public Health. I agree with the summary of studies they have provided that show the negative impact alcohol advertising can have on youth consumption of alcohol and the increased risk to the health of those youth due to that consumption.

My colleagues, Dr. Alan W. Stacy and Dr. Clyde Dent, and I recently published in *Pediatrics* (1/28/2013), a well-respected medical journal, our report on a large study of alcohol advertising, alcohol use, and alcohol-related problems among adolescents in the greater Los Angeles area. We recruited nearly 3,000 students in 7th grade from randomly selected middle schools and surveyed them once a year across a 4 year period. The results showed that the level of exposure to televised alcohol advertisements in the 7th grade predicted the increase in alcohol use in 7th, 8th, and 9th grades, which in turn predicted the number of problems related to alcohol use in 10th grade. Problems ranged from failing to do homework to getting into fights because of drinking alcohol. Our study replicates previous findings on the influence of alcohol advertising on underage drinking, and importantly, this was the first study to demonstrate the link from exposure to alcohol advertising to problems related to underage drinking.

I strongly support your effort to protect the health of our youth by limiting their exposure to alcohol advertising through passage of the ordinance to ban alcohol advertisements from city owned and controlled property.

Sincerely,

Jerry L. Grenard, Ph.D.
Assistant Professor
School of Community and Global Health
Claremont Graduate University

Attachment: Pediatrics Article from 1/28/2013

PEDIATRICS®

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Exposure to Alcohol Advertisements and Teenage Alcohol-Related Problems

Jerry L. Grenard, Clyde W. Dent and Alan W. Stacy
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The online version of this article, along with updated information and services, is
located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/early/2013/01/23/peds.2012-1480>

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American Academy of Pediatrics

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Exposure to Alcohol Advertisements and Teenage Alcohol-Related Problems

AUTHORS: Jerry L. Grenard, PhD,^a Clyde W. Dent, PhD,^b and Alan W. Stacy, PhD^a

^a*School of Community and Global Health, Claremont Graduate University, Claremont, California; and* ^b*Office of Disease Prevention and Epidemiology, Oregon Department of Human Services, Portland, Oregon*

KEY WORDS

alcohol advertising, alcohol drinking, adolescent, statistical model

ABBREVIATIONS

CI—confidence interval

OR—odds ratio

Dr Grenard contributed to the conception of the statistical model, analyzed the data, and prepared the manuscript; Dr Dent contributed to the acquisition of data and analysis of the data, revised the methods and analysis sections of the document, and provided final approval of the manuscript; and Dr Stacy contributed to the conception and design of the study, revised the introduction and discussion sections for intellectual content, and approved the final version of the manuscript.

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Address correspondence to Jerry L. Grenard, PhD, School of Community and Global Health, Claremont Graduate University, 675 West Foothill Blvd, Ste 310, Claremont, CA. E-mail: jerry.grenard@cgu.edu

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WHAT'S KNOWN ON THIS SUBJECT: The influence of alcohol advertising on underage drinking has been demonstrated in both cross-sectional and prospective studies. What is not well known is whether this increase in drinking leads to more problems related to alcohol consumption.

WHAT THIS STUDY ADDS: Exposure to alcohol advertising and liking of those ads in grade 7 has a significant influence on the severity of alcohol-related problems in grade 10 and that influence is mediated by growth in alcohol use from grades 7 to 9.

OBJECTIVE: This study used prospective data to test the hypothesis that exposure to alcohol advertising contributes to an increase in underage drinking and that an increase in underage drinking then leads to problems associated with drinking alcohol.

METHODS: A total of 3890 students were surveyed once per year across 4 years from the 7th through the 10th grades. Assessments included several measures of exposure to alcohol advertising, alcohol use, problems related to alcohol use, and a range of covariates, such as age, drinking by peers, drinking by close adults, playing sports, general TV watching, acculturation, parents' jobs, and parents' education.

RESULTS: Structural equation modeling of alcohol consumption showed that exposure to alcohol ads and/or liking of those ads in seventh grade were predictive of the latent growth factors for alcohol use (past 30 days and past 6 months) after controlling for covariates. In addition, there was a significant total effect for boys and a significant mediated effect for girls of exposure to alcohol ads and liking of those ads in 7th grade through latent growth factors for alcohol use on alcohol-related problems in 10th grade.

CONCLUSIONS: Younger adolescents appear to be susceptible to the persuasive messages contained in alcohol commercials broadcast on TV, which sometimes results in a positive affective reaction to the ads. Alcohol ad exposure and the affective reaction to those ads influence some youth to drink more and experience drinking-related problems later in adolescence. *Pediatrics* 2013;131:e369–e379

Alcohol use among adolescents and young adults is a major health concern in the United States. According to a Substance Abuse and Mental Health Services Administration report published in 2004,¹ ~10.9 million (29%) adolescents reported drinking alcohol in the past month, 16.6% reported problem behaviors related to alcohol use, and 6.2% met *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* criteria for substance abuse or dependence.² Because of the risks involved, considerable attention has been given to the influence of alcohol advertising on underage drinking. Cross-sectional studies have consistently shown a small but significant association between exposure to alcohol ads and alcohol use.³⁻⁶ More importantly, prospective studies have shown similar findings providing support for a temporal relationship between exposure to ads and alcohol use,⁷⁻¹³ which has been confirmed in a systematic review of 13 longitudinal studies.¹⁴ Few studies, however, have successfully used prospective data to demonstrate the temporal relationship among exposure to alcohol ads, alcohol consumption, and problem behaviors associated with alcohol use.

The current study examined the effects of alcohol ad exposure on consumption and problem behaviors across 4 years of data collection to test 2 hypotheses. First, the influence of exposure to alcohol ads on underage drinking was hypothesized to interact with an effect modifier (or moderator): an affective reaction to alcohol ads, self-reported as a liking of alcohol ads.^{5,15} It was anticipated that adolescents who like alcohol advertisements will be more likely to elaborate on the content of the ads (eg, imagine themselves in the scene), and as a result, they will be more likely to be persuaded to try the product.^{16,17} Studies on copy testing by advertisers have shown that liking of advertisements

is predictive of sales for consumer products.¹⁸ In addition, drinking among adolescents and young adults is associated with desirability and identification with characters in alcohol ads⁵ and with liking of alcohol ads.^{10,19} Second, it was hypothesized that the growth in alcohol use over the first 3 years of the study would significantly mediate the relationship between exposure to alcohol ads in year 1 and alcohol-related problems in year 4 (see paths a and b in Fig 1). That is, effects of Year 1 alcohol ads on the growth in alcohol consumption over time (path a) was expected to translate into later (Year 4) levels of alcohol problems (path b). Figure 1 depicts a conceptual model that incorporates both key hypotheses within a moderated-mediation model.

METHODS

Participants

The current data were collected as part of a prospective study on the influence of alcohol advertising on underage drinking.^{12,13} Participants recruited from public schools were surveyed during regular school hours from the 7th through 10th grades. Of the 4186 students recruited to participate in the study, 3890 (93% of consented) students completed the survey in at least 1 wave: 2986 (77%) were surveyed in 7th grade, 2849 (73%) in the 8th grade, 2093 (54%) in the 9th grade, and 1609

(41%) in the 10th grade. Dropout in the 9th and 10th grades was largely because of failure of entire schools to remain in the study after initial agreements by the schools to participate. Thus, most dropouts were not because of subject self-selection factors that could confound results. Further, the data analysis (outlined below) thoroughly addresses missing data. A total of 23 public middle schools, randomly selected from all middle schools in Los Angeles County, agreed to participate in the study. The goal was to recruit a sample representative of students attending Los Angeles County high schools.

Procedures

All seventh grade students in each school at the time of the study were invited to participate. Data collectors visited classrooms to distribute consent and assent forms to students about 2 weeks before administering the surveys. Parents of the students either signed a consent form brought home from school by the student or gave verbal consent to data collectors via telephone if the consent forms were not returned. Students signed assent forms before completing the surveys. The surveys and all procedures were approved by the University of Southern California Institutional Review Board. Students completed paper-and-pencil questionnaires during regular classroom hours at their school.

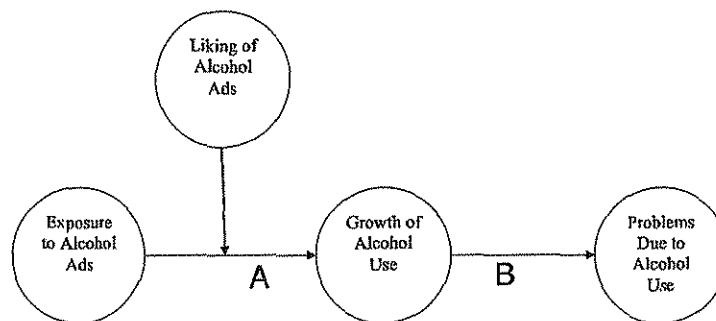


FIGURE 1
Conceptual model of primary hypothesized paths tested in the moderated-mediation models.

Outcome Measures

Current alcohol use was assessed with a total of 9 self-report items. Five items²⁰ assessed on how many days during the past 30 days the participant drank beer, wine, or liquor; drank 3 or more beers in a row; drank 3 or more glasses of wine or liquor; and drank enough to get drunk. An additional 4 items asked how often in the past 6 months participants drank beer, drank wine or wine coolers, drank liquor, or got drunk. An index was formed from all 9 items (coefficient $\alpha = 0.91$). Problems due to alcohol use were assessed with 8 self-report items.²¹ Participants indicated how often their alcohol use caused them problems, such as not being able to do their homework, getting into fights, neglecting responsibilities, or causing someone shame or embarrassment. An index score was formed from the 8 items (coefficient $\alpha = 0.93$).

Independent Variables

Four measures of exposure to alcohol advertising were assessed: (1) Exposure to alcohol advertising on popular shows. Participants indicated how frequently they watched 20 popular TV shows during the past month on a 6-point scale ranging from 1 (never) to 6 (every day). The frequency of watching each show was multiplied by the average frequency of alcohol advertising broadcast on each show during the 10 months before the survey.²² Data on televised alcohol advertising during the popular shows was purchased from Nielsen Media Research (New York, NY). The weighted items were summed to yield an index score for the number of alcohol ads each participant was exposed to during a typical day of watching popular shows (coefficient $\alpha = 0.79$). This measure of exposure does not directly ask about exposure to alcohol ads, and it has been predictive of alcohol use in past studies.^{13,22} (2)

Exposure to alcohol advertising on sports programs. This measure was similar to the popular shows assessment except that it asked about the frequency of watching college and professional sports programs (coefficient $\alpha = 0.80$), which often include a higher frequency of alcohol advertisements than other programming.²³ (3) Memory for alcohol ads: cued recall. Surveys included still pictures captured from TV advertisements including 2 example and 15 test ads.²⁴ The still pictures extracted from advertisements did not contain brand names or logos. An open-ended item asked participants to write down what product was being advertised. Independent judges coded the responses as being related to the advertisement or not ($\kappa = 0.88$). (4) Self-reported observation of alcohol advertising. Participants were asked 4 items²⁵ about how often they saw alcohol commercials on TV (coefficient $\alpha = 0.72$).

The survey included 3 items assessing how much participants like alcohol ads on TV.²⁶ The items assessed whether participants thought that alcohol ads are funny or sexy, and whether they like the alcohol ads better than other ads (coefficient $\alpha = 0.78$). These items measured an affective or emotional reaction to alcohol ads that has been useful in both the study of alcohol advertising^{5,15,19} and by the advertising industry in general to estimate the potential effectiveness of advertising copy.¹⁸ Additional covariates associated with advertising exposure, alcohol use, or alcohol-related problems included the amount of time watching television^{27,28}; observing friends drinking²⁹; observing well-known adults drinking³⁰; participating in sports³¹; age, gender, ethnicity, language acculturation^{32,33}; and parents' occupation and education (see Appendix for assessments).

Data Analyses

Construction of the structural equation models used to test the hypotheses

involved 2 steps.³⁴ First, a measurement model established the simple structure of the model, measurement invariance across gender,³⁵ and acceptability of parcels as indicators.³⁶ The second step involved fitting of 4 latent growth-curve models, one for each measure of exposure to alcohol advertising. Goodness-of-fit statistics³⁷ included the χ^2 test, Comparative Fit Index, Tucker-Lewis Index, Root Mean Squared Error of Approximation, and the Standardized Root Mean Square Residual. The current analyses used full information maximum likelihood estimation³⁸ to adjust for uncertainty associated with missing data. Mediation effects (ie, specific and total indirect effects) were assessed using the multivariate δ method.³⁹ This method estimates significance for the product of 2 regression coefficients, the coefficient for the mediator regressed on the predictor and the coefficient for the outcome regressed on the mediator adjusted for the predictor and is consistent with criteria recommended by MacKinnon et al.⁴⁰ Mplus⁴¹ was used to fit the measurement and the latent growth models. SEs were adjusted for clustering by school.⁴¹

RESULTS

Demographic characteristics for time 1 of the study, as shown in Table 1, indicated that the students in seventh grade were 12.51 (SD = 0.54) years old. Thirteen percent were non-Hispanic whites and 48% were Hispanic. Boys reported significantly more alcohol use than girls for past 30-day use of beer, lifetime binging with beer, and past 30 days binging with beer, and boys reported more negative consequences as a result of alcohol use. Participants more likely to have been lost to follow-up included those in wave 1 who knew peers (odds ratio [OR] = 1.30; 95% confidence interval [CI] = 1.16–1.44) or adults (OR = 1.13; 95% CI

= 1.05–1.21) who drank alcohol, were exposed to more alcohol commercials on popular shows (OR = 1.28; 95% CI = 1.01–1.61), or were Asian compared with whites (OR = 2.00; 95% CI = 1.30–3.08). There was no difference for those lost to follow-up based on gender, age, acculturation, participation in sports, parents' education, lifetime or past 30-day alcohol use, alcohol-related problems, TV viewing, self-reported exposure to advertisements, or liking of alcohol advertisements.

Measurement Model

The measurement model examined the factor loading, simple structure, and measurement invariance of the latent variables proposed for the models. Indicators loaded well on their hypothesized latent variables in separate models for girls and boys. Examination of a priori hypothesized modification indices for cross-loadings among the alcohol use, alcohol-related problems, ad exposure, and liking of ads target latent factors provided support for a simple structure among the factors. The measurement model findings for the alcohol-related problems factor warranted the use of parcels of indicators in the structural model to provide more stable model estimation.^{36,42} Tests for invariance of loadings and thresholds in a multigroup model by gender was adequate to compare structural models across gender.⁴³ Similar tests for invariance of loadings and thresholds in a multigroup model by grade provided evidence for invariance across time for items measuring alcohol use in the growth curves.

Latent Growth Models

The latent growth factors for alcohol use over times 1 through 3 and the latent factor for alcohol-related problems were regressed on each of the 4 alcohol ad exposure measures in 4 separate series of model evaluations.

TABLE 3 Demographic Information for Participants in Seventh Grade

Item	Total	Girls	Boys
Gender, <i>n</i> (%)	3890 (100)	1905 (50.14)	1894 (49.86)
Age, mean (SD)	12.51 (0.54)	12.51 (0.54)	12.51 (0.53)
Ethnicity, <i>n</i> (%)			
White/non-Hispanic	520 (13.37)	261 (13.78)	259 (13.60)
Hispanic	1862 (47.87)	937 (49.47)	923 (48.45)
Asian	662 (17.02)	324 (17.11)	338 (17.74)
Black/African American	120 (3.08)	56 (2.96)	64 (3.36)
Native Hawaiian or Pacific Islander	30 (0.77)	15 (0.79)	15 (0.79)
American Indian or American Native	37 (0.95)	17 (0.90)	20 (1.05)
Don't know	491 (12.62)	196 (10.35)	206 (10.81)
Mixed	168 (4.32)	88 (4.65)	80 (4.20)
Language acculturation, mean (SD)	4.22 (0.76)	4.14 (0.79)	4.28 (0.72)
At least 1 drink of beer in lifetime, <i>n</i> (%)			
0 d	1595 (56.94)	842 (59.21)	753 (54.60)
1 d	532 (18.99)	260 (18.28)	272 (19.72)
2 d	242 (8.64)	123 (8.65)	119 (8.63)
3 to 9 d	216 (7.71)	101 (7.10)	115 (8.34)
10 to 19 d	86 (3.07)	39 (2.74)	47 (3.41)
20 to 39 d	50 (1.79)	24 (1.69)	26 (1.89)
40 to 99 d	30 (1.07)	15 (1.05)	15 (1.09)
100 or more days	50 (1.79)	18 (1.27)	32 (2.32)
At least 1 drink of beer in past 30 days, <i>n</i> (%) ^a			
0 d	2414 (83.18)	1243 (84.44)	1171 (81.89)
1 d	281 (9.68)	140 (9.51)	141 (9.86)
2 d	90 (3.10)	40 (2.72)	50 (3.50)
3 to 5 d	55 (1.90)	20 (1.36)	35 (2.45)
6 to 9 d	27 (0.93)	16 (1.09)	11 (0.77)
10 to 19 d	9 (0.31)	6 (0.41)	3 (0.21)
20 to 29 d	6 (0.21)	3 (0.20)	3 (0.21)
All 30 d	20 (0.69)	4 (0.27)	16 (1.12)
At least 1 drink of wine or liquor in lifetime, <i>n</i> (%)			
0 d	1799 (64.67)	934 (66.15)	865 (63.14)
1 d	455 (16.36)	215 (15.23)	240 (17.52)
2 d	210 (7.55)	113 (8.00)	97 (7.08)
3 to 9 d	153 (5.50)	78 (5.52)	75 (5.47)
10 to 19 d	69 (2.48)	33 (2.34)	36 (2.63)
20 to 39 d	40 (1.44)	17 (1.20)	23 (1.68)
40 to 99 d	23 (0.83)	0 (0.64)	14 (1.02)
100 or more days	33 (1.19)	13 (0.92)	20 (1.46)
At least 1 drink of wine or liquor in past 30 days, <i>n</i> (%)			
0 d	2422 (83.81)	1246 (85.05)	1176 (82.53)
1 d	272 (9.41)	124 (8.46)	148 (10.39)
2 d	105 (3.63)	54 (3.69)	51 (3.58)
3 to 5 d	34 (1.18)	17 (1.16)	17 (1.19)
6 to 9 d	23 (0.80)	14 (0.96)	9 (0.63)
10 to 19 d	10 (0.35)	5 (0.34)	5 (0.35)
20 to 29 d	6 (0.21)	2 (0.14)	4 (0.28)
All 30 d	18 (0.62)	3 (0.20)	15 (1.05)
3 or more drinks of beer in a row in lifetime, <i>n</i> (%) ^a			
0 d	2432 (88.12)	1258 (89.92)	1174 (88.26)
1 d	134 (4.86)	61 (4.36)	73 (5.36)
2 d	70 (2.54)	33 (2.36)	37 (2.74)
3 to 9 d	45 (1.63)	13 (0.93)	32 (2.35)
10 to 19 d	26 (0.94)	13 (0.93)	13 (0.96)
20 to 39 d	25 (0.91)	14 (1.00)	11 (0.81)
40 to 99 d	8 (0.29)	2 (0.14)	6 (0.44)
100 or more days	20 (0.72)	5 (0.36)	15 (1.10)
3 or more drinks of beer in a row in past 30 days, <i>n</i> (%) ^a			
0 d	2688 (92.91)	1383 (94.40)	1305 (91.39)
1 d	105 (3.63)	47 (3.21)	58 (4.06)
2 d	34 (1.18)	14 (0.96)	20 (1.40)
3 to 5 d	25 (0.86)	9 (0.61)	16 (1.12)

TABLE 1 Continued

Item	Total	Girls	Boys
6 to 9 d	11 (0.38)	5 (0.34)	6 (0.42)
10 to 19 d	7 (0.24)	3 (0.20)	4 (0.28)
20 to 29 d	6 (0.21)	2 (0.14)	4 (0.28)
All 30 d	17 (0.59)	2 (0.14)	15 (1.05)
3 or more drinks of wine or liquor in lifetime, n (%)			
0 d	2448 (89.15)	1263 (90.67)	1185 (87.58)
1 d	135 (4.82)	55 (3.95)	80 (5.91)
2 d	58 (2.11)	31 (2.23)	27 (2.00)
3 to 9 d	43 (1.57)	20 (1.44)	23 (1.70)
10 to 19 d	20 (0.73)	9 (0.65)	11 (0.81)
20 to 39 d	17 (0.62)	7 (0.50)	10 (0.74)
40 to 99 d	6 (0.22)	2 (0.14)	4 (0.30)
100 or more days	19 (0.69)	6 (0.43)	13 (0.96)
3 or more drinks of wine or liquor in past 30 days, n (%)			
0 d	2707 (93.73)	1384 (94.60)	1323 (92.84)
1 d	92 (3.19)	43 (2.94)	49 (3.44)
2 d	30 (1.04)	16 (1.09)	14 (0.98)
3 to 5 d	18 (0.62)	10 (0.68)	8 (0.56)
6 to 9 d	13 (0.45)	4 (0.27)	9 (0.63)
10 to 19 d	7 (0.24)	2 (0.14)	5 (0.35)
20 to 29 d	6 (0.21)	2 (0.14)	4 (0.28)
All 30 d	15 (0.52)	2 (0.14)	13 (0.91)
Consequences of alcohol use, mean (SD) ^b			
	0.09 (0.41)	0.08 (0.38)	0.11 (0.44)

^a Alcohol use by student gender was significant for past 30-days use of beer, lifetime bingeing with beer, and past 30-days bingeing with beer (all $\chi^2(7) > 14.07, P < .05$), but all other comparisons of alcohol use by student gender were nonsignificant (all $P > .05$).

^b Consequences of alcohol use differed by gender ($t[2648] = -2.15, P < .05$); $P =$ proportion.

The hypothesized moderator, liking of alcohol ads, was included in each of the 4 models. In addition, the growth factors were simultaneously regressed on covariates measured at time 1, including age, observing peers drink, observing adults drink, playing sports, general TV watching, language acculturation, and socioeconomic status (occupation and education of each participant's parents). All structural growth models differed by gender, so only those results for multigroup models by gender are presented here.

As shown in Table 2 and Fig 2, the coefficient for the intercept regressed on the interaction term was significant for boys and for girls. Figure 3 depicts this interaction illustrating that the level of exposure to ads was more predictive of alcohol use in seventh grade for those students who reported a greater liking of alcohol ads. There was no interaction in the prediction of the slope for the latent growth for alcohol use.

Significant mediation effects or indirect effects were observed among girls for the path from exposure to ads on popular shows at time 1 through the growth curve slopes to problems at time 4 (δ method indirect effect: $ab = 0.091, P = .02$) and for the path from liking of ads at time 1 through the growth curve intercepts to problems at time 4 ($ab = 0.105, P = .03$). Among boys, there was a significant total effect of the interaction term for popular shows and liking of ads at time 1 on problems at time 4, which included the direct effect on time 4 problems and indirect effects through the intercept and slope (δ method total effect: $b = 0.164, P = .02$). These effects among girls and boys were significant even after adjustment for time 1 problems, age, friends drinking, adults drinking, playing sports, general TV watching, acculturation, parents' jobs, parents' education, and clustering by school.

The covariates, alcohol-related problems at time 1 and friends and close

adult drinking at time 1, were significant predictors of the intercept for girls. The same covariates plus language acculturation and parent jobs were significant predictors of the intercept for boys. For boys, drinking by friends and language acculturation were significant predictors of the slope, and the sign of the coefficients for these predictors changed between the intercept and the slope, suggesting that those higher in alcohol use at time 1 might have had lower growth rates than those lower in use at time 1. None of the time 1 variables were significant direct-effect (unmediated) predictors of alcohol-related problems at time 4 for boys or girls.

Mediation models for the other 3 exposure measures (frequency of watching sports show, cued recall of ads, and self-reported frequency of seeing alcohol ads) fit the data very well (results not shown). In all 3 models for girls, the intercept for the growth of alcohol use mediated the influence of liking of alcohol ads at time 1 on alcohol-related problems at time 4. No other indirect effects were significant for girls or boys. In these 3 mediation models for girls, both the intercept and slope for the growth of alcohol use were positive predictors of the level of alcohol-related problems at time 4, whereas this was not the case for boys.

DISCUSSION

This study provides evidence supporting the hypothesis that exposure to alcohol advertising and affective reactions to those advertisements on television influence underage drinking and the development of alcohol-related problems. The growth of alcohol use from the seventh through the ninth grades is predicted by the frequency of watching popular shows and self-reports on the liking of alcohol ads. In partial support of hypothesis 1, there

is a significant interaction between exposure to ads and liking of ads in the prediction of the intercept (but not the slope) for a growth curve modeled across these grade levels for both male and female students. The interaction shows that the level of exposure to ads is more predictive of a higher level of alcohol use in seventh grade for those students who report a greater liking of alcohol ads. In addition to this interaction observed at time 1, the frequency of watching popular shows at time 1 predicts the slope for the growth of alcohol use for girls, and the liking of alcohol ads at time 1 predicts the slope for boys.

In support of hypothesis 2, the mediation model shows that the influence of alcohol ads at time 1 on the occurrence of alcohol-related problems at time 4 is mediated by the growth of alcohol use. Among girls, there was a significant indirect effect of exposure to ads on popular shows in time 1 on problems in time 4 through the growth of alcohol use, and among boys, there was a significant total effect from the shows and liking interaction term in time 1 to problems in time 4. These relationships are significant even after adjusting for a range of other covariates measured at time 1 that are known to be associated with alcohol use. The other 3 measures of exposure to alcohol advertising show similar findings, although these measures are somewhat less predictive of the growth in alcohol use and alcohol-related problems.

Although causality cannot be verified in 1 observational study, the relevant theories and empirical evidence from the current prospective study and previous research are consistent with possible causal effects linking alcohol advertising to underage alcohol use and alcohol-related problems. In the current study, measures of exposure at time 1 are associated with the increasing use of alcohol over time and the

TABLE 3. Standardized Parameter Estimates for the Mediation Model

	Girls		Boys	
	Parameter Estimate	SE	Parameter Estimate	SE
Intercept on				
T1 alcohol use	0.759***	0.046	0.821***	0.038
T2 alcohol use	0.590***	0.060	0.643***	0.047
T3 alcohol use	0.466***	0.056	0.506***	0.030
Slope on				
T1 alcohol use	0.000	0.000	0.000	0.000
T2 alcohol use	0.404***	0.036	0.349***	0.057
T3 alcohol use	0.640***	0.056	0.549***	0.101
T4 alcohol-related problems on				
T4 problems 1	0.707***	0.029	0.720***	0.035
T4 problems 2	0.692***	0.039	0.721***	0.056
T4 problems 3	0.705***	0.038	0.736***	0.048
T4 problems 4	0.734***	0.050	0.780***	0.037
Intercept on T1 predictors				
Popular shows	-0.052	0.034	-0.027	0.031
Liking of ads	0.267***	0.047	0.171***	0.028
Shows x Liking	0.091*	0.042	0.093*	0.046
T1 problems	0.297*	0.123	0.264**	0.084
Age	0.030	0.031	0.040	0.030
Peer drinking	0.426***	0.060	0.539***	0.052
Playing sports	0.006	0.043	-0.009	0.024
Adult drinking	0.155***	0.036	0.138**	0.053
General TV viewing	0.012	0.034	0.012	0.037
Language acculturation	0.050	0.042	-0.098*	0.040
Parents' jobs	0.000	0.041	0.112*	0.046
Parents' education	-0.041	0.045	-0.002	0.030
Slope on T1 predictors				
Popular shows	0.190**	0.058	0.113	0.063
Liking of ads	-0.021	0.078	0.129*	0.060
Shows x Liking	-0.083	0.068	-0.112	0.081
T1 problems	-0.125	0.135	0.076	0.156
Age	0.031	0.039	-0.075	0.068
Peer drinking	0.057	0.075	-0.483***	0.128
Playing sports	-0.137	0.073	-0.015	0.074
Adult drinking	-0.029	0.067	-0.103	0.119
General TV viewing	-0.021	0.064	-0.059	0.062
Language acculturation	0.029	0.073	0.227*	0.097
Parents' jobs	0.130	0.075	-0.135	0.109
Parents' education	-0.085	0.064	0.009	0.090
T4 alcohol-related problems on				
Intercept	0.393*	0.166	0.177	0.303
Slope	0.478***	0.106	0.179	0.214
Popular shows	-0.054	0.065	-0.007	0.058
Liking of ads	-0.102	0.064	-0.095	0.062
Shows x Liking	0.040	0.072	0.167	0.094
T1 problems	0.050	0.070	0.014	0.090
Age	0.036	0.049	-0.004	0.034
Peer drinking	-0.022	0.085	0.234	0.214
Playing sports	0.050	0.059	0.027	0.044
Adult drinking	-0.027	0.041	0.021	0.074
General TV viewing	0.022	0.062	-0.021	0.063
Language acculturation	0.013	0.063	-0.048	0.086
Parents' jobs	-0.003	0.103	0.061	0.092
Parents' education	0.006	0.064	-0.018	0.100
Intercepts for latent factors				
Problems with alcohol at T4	0.000	0.000	0.232	0.184
Growth curve intercept	0.526***	0.032	0.496***	0.032
Growth curve slope	0.495***	0.059	0.441***	0.104
Residual variances				
T4 problems 1	0.500***	0.041	0.482***	0.050

TABLE 2 Continued

	Girls		Boys	
	Parameter Estimate	SE	Parameter Estimate	SE
T4 problems 2	0.522***	0.054	0.481***	0.080
T4 problems 3	0.502***	0.054	0.458***	0.071
T4 problems 4	0.462***	0.074	0.392***	0.058
T1 alcohol use	0.424***	0.070	0.326***	0.063
T2 alcohol use	0.513***	0.049	0.631***	0.046
T3 alcohol use	0.404***	0.075	0.648***	0.067
Intercept	0.386***	0.096	0.253**	0.077
Slope	0.921***	0.055	0.686***	0.087
T4 alcohol-related problems	0.661***	0.061	0.849***	0.054
Effects from Shows to Problems				
Total	0.017	0.051	0.008	0.046
Total indirect	0.070	0.042	0.015	0.028
Indirect Shows – I – Problems	-0.021	0.018	-0.005	0.009
Indirect Shows – S – Problems	0.091*	0.040	0.02	0.028
Direct Shows – Problems	-0.054	0.065	-0.007	0.058
Effects from Liking to Problems				
Total	-0.007	0.063	-0.042	0.041
Total indirect	0.095	0.057	0.053	0.058
Indirect Liking – I – Problems	0.105*	0.048	0.030	0.052
Indirect Liking – S – Problems	-0.010	0.058	0.023	0.030
Direct Liking – Problems	-0.102	0.064	-0.095	0.062
Effects from Interaction SxL to Problems				
Total	0.036	0.066	0.164*	0.069
Total indirect	-0.004	0.040	-0.004	0.045
Indirect from SxL – I – Problems	0.036	0.026	0.016	0.032
Indirect from SxL – S – Problems	-0.039	0.031	-0.020	0.029
Direct from SxL – Problems	0.040	0.072	0.167	0.094

I, intercept factor for growth curve; na, not available, slope variance fixed at 0; S, slope factor for growth curve; SxL, interaction term for popular shows and liking of alcohol ads; T1, time 1; T2, time 2; T3, time 3.

* $P < .05$.
 ** $P < .01$.
 *** $P < .001$.

development of alcohol-related problems at time 4, demonstrating a temporal ordering of predictors and outcomes. In addition, the models for this study control for a range of potentially confounding variables, including strong predictors, such as previous alcohol-related problems and peer influences. In previous studies, the indirect measure of exposure to alcohol ads on popular shows is predictive of alcohol use^{22,26} and measures for liking of alcohol ads are predictive of alcohol use.^{5,6,10,15}

The findings here are also consistent with well-established theories on vicarious learning, such as Social Learning Theory,⁴⁴ theories on persuasive messages in the media, such as the Elaboration Likelihood Model,¹⁶ and with the more recent Message Interpretation Process model by Austin and colleagues.⁵ Austin and colleagues⁵ provide evidence for the influence of alcohol advertising on alcohol use through a number of affective mediators, including liking of advertisements.^{5,45} Liking or desirability of alcohol advertisements predicts identification with

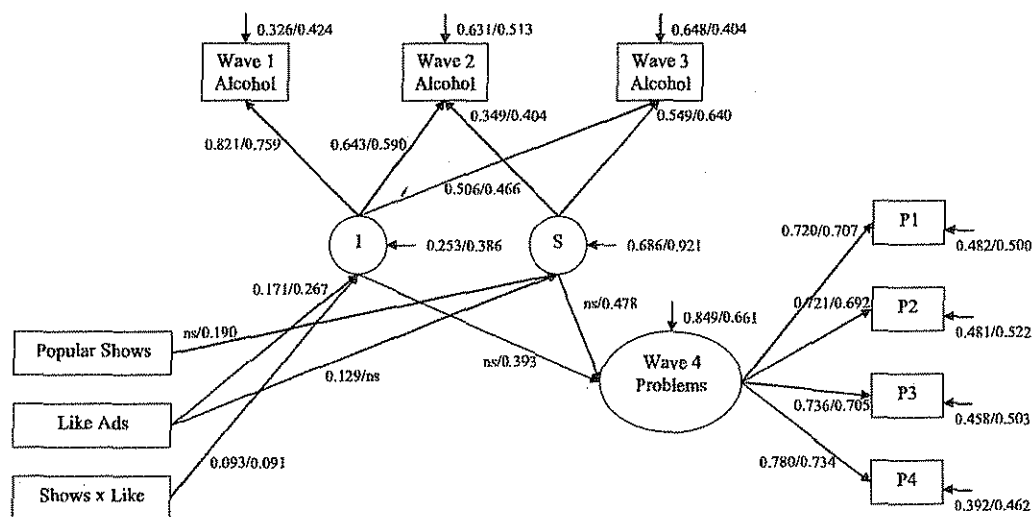


FIGURE 2

Mediation model for alcohol-related problems. Alcohol use = past 30 days + past 6 months. I, growth curve intercepts; S, growth curve slopes. Standardized parameter estimates: boys/girls ($P < .05$). Paths that were nonsignificant for both boys and girls are not included in the figure for clarity (eg, the direct effect of popular shows on wave 4 problems was not significant and is not shown). Adjusted for wave 1 problems, age, drinking peers, drinking adults, playing sports, general TV watching, acculturation, parents' jobs, parents' education, and clustering by school. Fit indices: $\chi^2(130) = 182.66, P = .002$; Comparative Fit Index = 0.98; Tucker-Lewis Index = 0.97; Root Mean Squared Error of Approximation = .015; Standardized Root Mean Square Residual = .026. ns = non-significant.

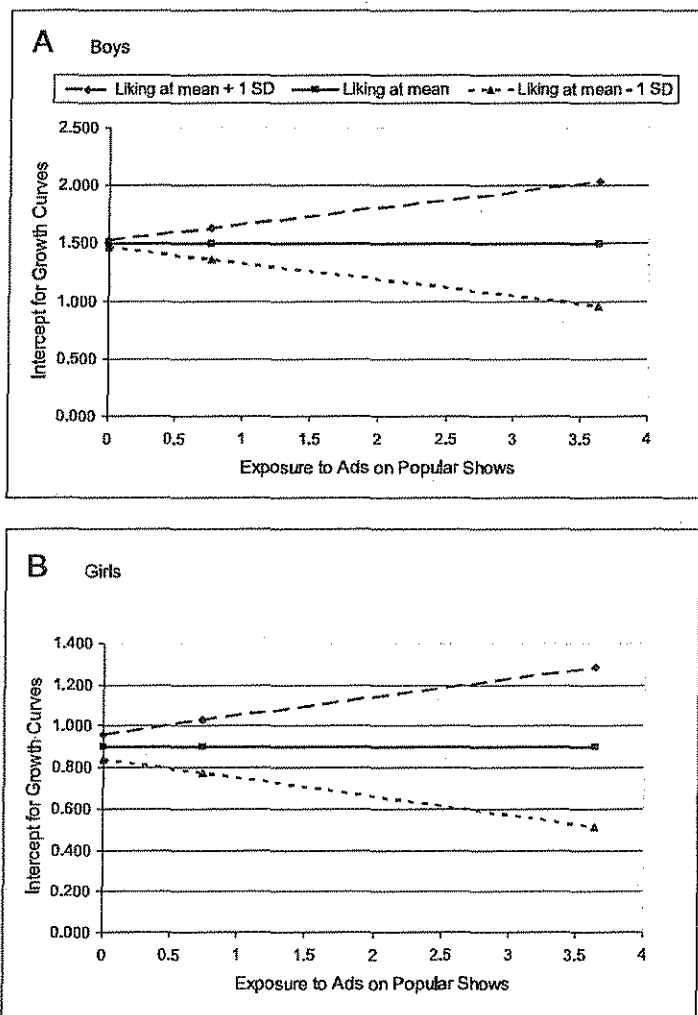


FIGURE 3 Interaction of exposure to ads with liking of ads. Liking of ads plotted at the mean, the mean plus 1 SD, and the mean minus 1 SD.

portrayals of alcohol use in advertisements, which, in turn, predicts liking of brands of beer and positive expectancies for alcohol use. The overall influence of liking of advertisements on alcohol use might be somewhat larger in the current model if these mediating pathways were taken into account. In another study of advertising, Austin et al⁴⁶ found that a media-literacy intervention increased skepticism (reduced liking) for advertising, as expected, but also increased recall of advertisement. This is consistent with the current study where memory and

liking of advertisements interact. That is, a greater memory for alcohol advertisement does not necessarily mean an increase in alcohol use; it also depends on liking of the advertisements. This combination of theory and empirical evidence across research teams provides reasonably good support for the influence of exposure to alcohol advertisements on alcohol use and alcohol-related problems among adolescents.

A few limitations warrant discussion. First, the current results may be generalized only to public school students

in the Los Angeles area. Second, alcohol use measures among young adolescents are often skewed toward 0, and this is true in the current sample. Seventh graders were actually recruited because of their low levels of alcohol use to examine the early development of alcohol use, but, unfortunately, these skewed measures may have contributed, in part, to some of the null findings in this study. Finally, not all results converge across multiple measures of exposure to advertising, but there is little literature available that indicates which exposure measures are optimal. However, it may not be surprising that cued recall of advertisements was not predictive of alcohol use. In the communication theory of Lang,⁴⁷ cued recall is thought to be a less effective measure of retrieval/accessibility of information than it is a measure of encoding/availability of information.⁴⁷ In encoding specificity⁴⁸ and transfer-appropriate processing⁴⁹ views, cued recall would reflect good accessibility and predictability at the time of drinking decisions only if the retrieval cues at test overlap well with retrieval cues during these later decisions; such overlap is unlikely, as the test cues were still pictures of commercials. However, the use of the indirect measure of exposure on popular shows and liking of ads are used successfully across a range of studies, and, in particular, liking of ads, although not strictly a measure of exposure, is used across product categories to predict the success of individual ads or ad campaigns.¹⁸

CONCLUSIONS

The accumulation of evidence for the influence of televised alcohol advertisements on underage drinking has important implications for prevention. First, children can be taught about the design of persuasive messages in the media early to help them avoid undue

influence by the media on their behaviors.^{45,50} Second, it is important to have a comprehensive policy to limit the exposure of children to alcohol ads on television and on other media, such as the Internet, print media, and display ads. Although there are other influences on

underage drinking, including those of peers and adults, prevention strategies should address the influence of alcohol ads as part of an overall strategy to prevent early initiation of alcohol use and the development of problems related to consumption.

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APPENDIX Assessments

Assessment	Items	α	Example Item	Response Option Anchors
Current frequency and quantity of alcohol use ²⁰	9	0.91	During the last 30 d, on how many days did you...have at least 1 drink of beer?	0 = 0 d 7 = all 30 d
Problems associated with alcohol use ²¹	8	0.93	How many times have you ever...gone to school drunk?	1 = never 4 = more than 10 times
Exposure to alcohol advertising ^a on popular shows ²²	20	0.79	How frequently do you watch MTV?	1 = never 6 = every day
Exposure to alcohol advertising ^a on sports shows ^{22,23}	6	0.80	How often do you watch professional football?	1 = never 6 = every day
Cued recall memory for alcohol advertisements ²⁴	15	0.74	What product is being advertised in the photo?	Open-ended
Self-reported observation of alcohol advertisements ²⁵	4	0.72	In the past week, how many commercials have you seen for alcohol drinks like beer, wine, or liquor?	0 = none 6 = 6 or more
Liking of alcohol advertisements ²⁶	3	0.78	Of all the commercials you see on TV, how much do you like the TV commercials for alcohol?	1 = I like alcohol commercials the most 4 = I like the alcohol commercials the least
Propensity to watch TV ^{27,28}	7	0.79	On a typical weekday, how many hours a day do you watch TV...after school before dinner?	1 = I do not watch TV 5 = 5 h or more
Observed drinking by peers and friends ²⁹	4	0.86	About how often did you do the following things in the last 6 mo...saw someone your age drink beer or other alcohol?	0 = never 6 = every day
Observed drinking by known adults ³⁰	3	0.84	About how often did you do the following things in the last 6 mo...saw an adult you know well drink alcohol?	0 = never 6 = every day
Participation in sports ³¹	5	0.73	About how often did you do the following things in the last 6 mo... played soccer?	0 = never 6 = every day
Language acculturation ^{32,33}	3	0.67	What language(s) do you usually speak at home?	1 = only English 5 = only another language
Socioeconomic status ⁵¹	2	na	What is the highest grade completed by your mother?	1 = not completed elementary school 6 = Completed graduate school
Socioeconomic status ⁵¹	2	na	What type of work does your father do?	Open-ended (coded)

na, not applicable.

^a The frequency of watching popular shows or sports programs was weighted by the frequency of alcohol advertisements broadcast on those shows in the previous 10 mo, as reported by Nielsen Media Research (see text).

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Jerry L. Grenard, Clyde W. Dent and Alan W. Stacy
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