# Alcohol Advertising Exposure Among Middle School–Age Youth: An Assessment Across All Media and Venues

REBECCA L. COLLINS, PH.D.,[a,*] STEVEN C. MARTINO, PH.D.,[b] STEPHANIE A. KOVALCHIK, PH.D.,[a] KIRSTEN M. BECKER, M.S.,[a] WILLIAM G. SHADEL, PH.D.,[b] & ELIZABETH J. D'AMICO, PH.D.[a]

[a]*RAND Corporation, Santa Monica, California*
[b]*RAND Corporation, Pittsburgh, Pennsylvania*

**ABSTRACT. Objective:** The purpose of this study was to quantify middle school youth's exposure to alcohol advertisements across media and venues, determine venues of greatest exposure, and identify characteristics of youth who are most exposed. **Method:** Over a 10-month period in 2013, 589 Los Angeles–area youth ages 11–14 from diverse racial/ethnic backgrounds completed a short paper-and-pencil survey assessing background characteristics and then participated in a 14-day ecological momentary assessment, logging all exposures to alcohol advertisements on handheld computers as they occurred. **Results:** African American and Hispanic youth were exposed to an average of 4.1 and 3.4 advertisements per day, respectively, nearly two times as many as non-Hispanic White youth, who were exposed to 2.0 advertisements per day. Girls were exposed to 30% more advertisements than boys. Most exposures were to outdoor advertisements, with television advertisements a close second. **Conclusions:** Exposure to alcohol advertising is frequent among middle school–age youth and may put them at risk for earlier or more frequent underage drinking. Greater restrictions on alcohol advertising outdoors and on television should be considered by regulators and by the alcohol industry and should focus particularly on reducing exposure among minority youth. (*J. Stud. Alcohol Drugs, 77,* 384–392, 2016)

IN THE UNITED STATES, 70%–80% of adolescents have consumed alcohol, and half have been drunk by the end of high school (Eaton et al., 2012; Johnston et al., 2014). Underage drinking is a major public health problem, contributing to a host of problems during youth and later in life (Ellickson et al., 2003; Grant & Dawson, 1997; Hingson et al., 2001, 2009; Stueve & O'Donnell, 2005).

Studies indicate that exposure to alcohol advertising may hasten initiation of drinking and increase consumption among underage drinkers (Anderson et al., 2009; Collins et al., 2007; Ellickson et al., 2005; Snyder et al., 2006). Other research extends these associations to youth problem drinking (Grenard, 2013; Morgenstern et al., 2014; Tanski et al., 2015) and bolsters causal interpretation with evidence of brand-specific associations (Siegel et al., 2016), and processes mediating and moderating associations (e.g., attitudes, Morgenstern et al., 2011; self-control, Wills et al., 2010). This evidence raises substantial concern about the contribution of advertising to underage drinking. However, the extent of this concern should be proportionate to the level of youth exposure to alcohol advertising. We know surprisingly little about this. The alcohol industry has self-regulatory procedures in place to ensure that youth are not more likely than adults to be exposed to any individual advertisement (Federal Trade Commission, 2014). However, this standard does not address, and tells us nothing about, the percentage of youth exposed to alcohol advertising overall or the frequency of youth exposure.

Only one study has provided an estimate of something close to total alcohol advertising exposure among youth. Snyder and colleagues (2006) surveyed youth ages 15–26 residing in 75 major alcohol markets and estimated that they were exposed to an average of 23 alcohol advertisements each month across television, radio, magazines, and billboards—approximately 0.76 advertisements each day. However, their estimates were based on retrospective self-reports, and a portion of reports was made on Likert scales and recoded to numeric values (e.g., "some" became "3"); therefore, they are inexact at best. The study also omitted wine advertisements, online advertisements, promotional items, and product placements. More accurate and current estimates of total exposure are sorely needed.

It is also important to determine through which media or venues youth are most likely to be exposed to alcohol advertisements. With this information, policy makers could focus on reducing advertising in these places, or parents could limit youth exposure to them. There are some published data about alcohol advertising exposure in specific media and venues. Using Nielsen television ratings data, researchers from the Center on Alcohol Marketing and Youth (2010c) found that the average person ages 12–20 in the United States is exposed to one television alcohol advertisement per day. Other studies provide rates of exposure to outdoor advertisements, radio advertisements, advertisements in magazines, and ownership of promotional items. But these

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*Correspondence may be sent to Rebecca L. Collins at RAND Corporation, 1776 Main Street, Santa Monica, CA 90407-2138, or via email at: Collins@rand.org.

data generally appear in separate studies with different samples, study years, and locations of data collection, and no study has assessed rates of exposure to product placements, online advertisements, or newspaper advertisements. Thus, it is impossible to determine where the highest rates of alcohol advertising exposure occur.

Last, we have only sporadic information about the relative exposure of various demographic groups to alcohol advertising. It has been speculated that younger adolescents are more vulnerable to alcohol advertising effects than older youth (Collins et al., 2007); therefore, testing whether they are exposed to advertisements as often is especially important. One study found that boys are more exposed to television advertisements than girls and that African Americans are more exposed to television advertisements than Whites (Ringel et al., 2006). Another study found that girls see more alcohol advertising in magazines than boys (Jernigan et al., 2004). Still other studies found that African Americans are exposed to more alcohol advertising in magazines, billboards, and storefronts than other youth (Alaniz, 1998; Altman et al., 1991; Hackbarth et al., 1995; McKee et al., 2011). Some associations between exposure and race/ethnicity may stem from greater use of media among minorities (Rideout, 2015).

It is unsurprising that little data on these important issues are available. Measuring the amount of alcohol advertising exposure among youth in and across multiple media and venues is difficult, requiring a comprehensive set of assessments tapping a broad array of circumstances. Surveys asking youth to recall advertisements they saw or heard by retrospecting over a period of time are subject to recall bias (Hammersley, 1994) and, if comprehensive in their coverage of media and venues, highly burdensome for participants.

We undertook the Tracking and Recording Alcohol Communications (TRAC) study to address these issues and other related gaps in our knowledge. TRAC youth participate in ecological momentary assessment (EMA), logging each alcohol advertisement they encounter for 14 days, immediately upon exposure, using a handheld electronic device. They also respond to a short survey that includes questions about the advertisement. This method captures the number and types of advertisements to which youth are exposed without relying on participants' recall or requiring them to complete a survey item for every medium and venue of potential exposure. EMA has proven to be a valuable tool for minimizing recall biases and obtaining a detailed portrait of behavioral contexts. We report data from the baseline EMA data collection that took place from September 2013 through June 2014. We used a rolling enrollment process (each 14-day data-collection period began as another was concluding, with new enrollees) so that data cover nearly a full calendar year (10 months) of advertising.

## Method

Procedures were approved by RAND's institutional review board. Parents/guardians provided consent, and adolescents provided assent for participation.

TRAC is a longitudinal study. We recruited 606 middle school students from two large school districts, afterschool clubs, and community organizations in Southern California with flyers and other notices. One school district includes a large city, smaller municipalities, unincorporated areas, and both high- and low-income neighborhoods. The other district includes small, middle-income cities and their surrounds. The two districts have very different racial/ethnic composition. One district is 30% White, 4% African American, 23% Hispanic, and 43% other race; the other is 9% White, 10% African American, 73% Hispanic, and 8% other race. Recruiting across both districts allowed us to capture more diverse youth and settings. Because prior studies have found differential exposure to alcohol advertising by race/ethnicity, a key goal was to recruit sufficient numbers of White, Hispanic, and African American youth to power accurate within- and between-group estimates. Thus, we focused recruiting on neighborhoods and afterschool clubs within each district with concentrations of a given race/ethnicity (e.g., predominantly African American or predominantly White).

At baseline and every 8 months thereafter, students complete a paper survey assessing demographics, social context (e.g., parental and peer characteristics), and drinking behavior. Each paper assessment is followed by a 2-week EMA during which students report any alcohol advertising they observe via handheld computers. Thus, there are multiple waves of device data; this article focuses on the baseline wave.

Participants underwent a 1-day training session on the operation of the handheld devices and on the study definition of an alcohol advertisement. Participants were instructed to keep their device turned on at all times, charge the device at night while they slept, respond to random prompts issued by the device, and initiate data entry each time they encountered an alcohol advertisement. Participants were told that they should only record advertisements that they naturally encountered and should not deviate from their normal activities to "find" advertisements. They were trained to report exposure to a broad range of advertising types in a variety of venues and media. Multiple examples were provided of television, radio, newspaper, mailed flyer, and magazine advertisements; billboards and transit advertisements; signs outside bars, restaurants, and convenience stores; signs and logos seen during live or televised sporting events; sponsorship of music and sporting events or individual athletes, musicians, or actors; retail point-of-sale (POS) advertisements (i.e., posters, product displays, and placards inside grocery stores, convenience stores, restaurants, and bars); brand-logoed promotional items such as hats, t-shirts, and

glassware; and various forms of online advertising, including Google search advertisements, email advertisements, banner advertisements, streaming advertisements, alcohol-branded websites, and advertisements appearing on social networking sites or mobile applications such as Facebook, Twitter, Instagram, and Tumblr. Trainings also provided examples of drinking in movies and music, and participants were taught to distinguish portrayals that are incidental or generic versus portrayals constituting product placements in which an alcohol brand is evident.

Before leaving the study center, participants practiced recording an advertisement (practice data were excluded from analysis). Participants then carried the device with them at all times for 14 days but were instructed to leave the device in their locker or backpack while at school. All device functions besides the EMA software were disabled. At the end of the assessment, participants returned the device to the study center where data were uploaded. Participants earned $60 for completing these procedures.

*Exposure surveys*

At each advertisement exposure, participants were asked first to categorize the advertising venue or medium as follows: "What type of ad did you see? (select one) . . . television, print (newspaper, magazine, etc.), radio, outdoor (billboard, store window, etc.), indoor (e.g., inside a store or restaurant), item with a brand name (e.g., hat, shirt), online ad (e.g., banner or side ad), product placement (e.g., in a movie), or other?"

Participants were then asked to categorize the beverage type in the advertisement: "What type of alcoholic drink is advertised? (check all that apply) . . . beer, wine, liquor (e.g., Captain Morgan's rum, Absolut vodka), other alcoholic drink (e.g., Bacardi Breezer, Mike's Hard Lemonade), or don't know/can't tell?"

Advertisement reports were time stamped and date stamped electronically.

*Random prompts*

To test hypotheses not examined in the current report, participants were also prompted by the device, three times each day, to complete very brief assessments of their alcohol-related beliefs. Prompts were audible and spread throughout the waking day.

*Participant characteristics*

Characteristics of participants measured by the baseline paper survey included gender, age in years, family structure (lives with both parents vs. other), weekly hours of television viewing, and whether they had ever had a whole drink of alcohol.

*Analysis*

Five participants lost or broke their devices, and their data were irretrievable. Another 13 participants responded to less than 1% of random prompts, suggesting poor overall data quality; their data were not included in analyses. Thus, the analytic sample consisted of 589 youth.

Best practices for survey research include correction for nonresponse, which can bias estimates if left unaddressed (Rubin, 1996). It was not possible to directly observe failure to report advertisement exposures (a form of nonresponse), but we could do so with regard to random prompts. On average, random prompt compliance was 67%. Hispanics and African Americans exhibited lower compliance than Whites; having a sibling in the sample and getting good grades were positively associated with compliance. Examination of advertisement reports revealed a very large drop in reported exposures on the 14th (final) day of monitoring, suggesting that most participants were not aware they should report exposures on this day. We therefore only examine reporting on the first 13 days of event sampling. Last, detailed analyses of the advertisement-exposure data provided evidence of a fatigue effect (Courvoisier et al., 2012): Respondents reported fewer advertisements as the 13-day period progressed. To more accurately represent the level of advertisement exposure throughout the data-collection period, we derived nonresponse weights to correct for participant differences in compliance and reporting fatigue (technical notes available on request).

Analyses consist of weighted point estimates (means and percentages), as well as *t* tests for differences in advertisement exposure across demographic groups. As a validity check, we also examined bivariate associations between hours of television viewing and exposure to advertisements on television and in other venues.

## Results

The 589 participants were about evenly distributed across ages 11–14, 46% were female, 62% were from intact nuclear family households, and 3% had ever had a drink of alcohol. As anticipated, Hispanics, non-Hispanic Whites, and African Americans were about equally represented (at 26%, 25%, and 29%, respectively; 21% were another race). This racial and ethnic makeup differs from that for the two school districts where we recruited and from the nation but provides adequate samples for making comparisons across groups. These individuals logged exposures to a total of 6,695 alcohol advertisements across the 13-day period. After applying nonresponse weights to these data, we estimate participants were exposed to 23,446 advertisements or approximately 3.1 advertisements per youth per day. To provide a sense of what might be expected in a sample with the same racial/ethnic composition as the United States (17% Hispanic, 62%

TABLE 1. Characteristics of alcohol advertisements to which youth were exposed in a 13-day period, weighted (unweighted youth $N = 589$; unweighted advertisement $N = 6,695$)

| Characteristic | No. of ads | % of ads | Daily rate per youth [95% CI] |
|---|---|---|---|
| Total advertisements | 23,446 | 100 | 3.062 [3.043, 3.069] |
| Exposure venue | | | |
| Outdoor | 9,016 | 38.5 | 1.177 [1.147, 1.180] |
| Television | 6,131 | 26.2 | 0.801 [0.775, 0.818] |
| Point of sale (on- or off-premise) | 2,063 | 8.8 | 0.269 [0.254, 0.285] |
| Print | 1,667 | 7.1 | 0.218 [0.209, 0.232] |
| Radio | 1,356 | 5.8 | 0.177 [0.180, 0.189] |
| Online | 877 | 3.7 | 0.115 [0.103, 0.120] |
| Product placement | 819 | 3.5 | 0.107 [0.097, 0.111] |
| Promotional item | 731 | 3.1 | 0.095 [0.086, 0.100] |
| Other | 439 | 1.9 | 0.057 [0.059, 0.066] |
| Missing | 346 | 1.5 | 0.045 [0.036, 0.047] |
| Beverage type | | | |
| Beer | 15,412 | 65.7 | 2.0130 [1.995, 2.047] |
| Wine | 4,091 | 17.4 | 0.534 [0.518, 0.538] |
| Distilled spirits | 5,268 | 22.5 | 0.688 [0.669, 0.699] |
| Alco-pop | 2,069 | 8.8 | 0.270 [0.263, 0.279] |
| Unknown | 569 | 2.4 | 0.074 [0.072, 0.085] |
| Missing | 408 | 1.7 | 0.053 [0.044, 0.058] |

*Notes:* CI = confidence interval; no. = number.

non-Hispanic White, 13% African American, 8% other), we weighted to this population, obtaining an estimate of 2.7 advertisements per day for the average middle school student nationally.

*Exposure venue and beverage type*

Thirty-eight percent of alcohol advertisements seen by youth were outdoor advertisements, representing the largest exposure venue (Table 1). The second largest percentage was television, at 26%. Other venues accounted for substantially fewer advertisements. This means that the average youth was exposed to 1.18 outdoor advertisements, 0.8 television advertisements, and 1.08 advertisements for alcohol across other or unknown venues, each day. Two thirds (66%) of all advertisements seen were for beer, 23% for distilled spirits, and 17% for wine, translating to 2.01 advertisements per youth per day for beer, 0.69 for distilled spirits, and 0.53 for wine.

Beer was the most commonly encountered alcoholic beverage across every advertising venue (Table 2). But there was also variation in the mix of beverage types by venue. The print advertisements to which youth were exposed had by far the greatest proportion of wine advertisements (30%) relative to other venues. Product-placement exposures had the highest percentage of distilled-spirit advertisements (27%) relative to other venues. Advertisements for beer, wine, and distilled spirits were all most commonly encountered outdoors (not tabled), with outdoor ads making up 42%, 34%, and 34% of beer, wine, and distilled spirit ads, respectively, and television ads making up 28%, 21%, and 29% of ads within each beverage category. Sixteen percent of wine ads appeared in print, while each other venue accounted for less than 10% of ads for a given beverage.

*Demographic differences in exposure*

Overall, girls saw more advertisements than boys (3.5 vs. 2.7 advertisements per day; $t = 2.45$, $p < .05$, $df = 468$). Girls and boys saw equal numbers of television advertisements ($p = .50$), but girls were more exposed than boys to outdoor advertisements ($t = 2.44$, $p < .05$, $df = 468$) and to advertisements in other venues ($t = 3.06$, $p < .01$, $df = 468$). As shown in Figure 1, African American and Hispanic youth (4.1 and 3.4 advertisements per day, respectively) saw more advertisements than non-Hispanic Whites (2.0 advertisements per day) (Hispanic vs. White: $t = 3.20$, $p < .01$, $df = 198$, and African American vs. White: $t = 5.20$, $p < .01$, $df = 266$). This same pattern was observed for television adver-

TABLE 2. Exposures to advertisements for different beverage types by exposure venue (percentages)

| | Beverage type | | | | |
|---|---|---|---|---|---|
| Venue | Beer | Distilled spirits | Wine | Alco-pop | Missing |
| Outdoors | 70 | 14 | 11 | 3 | 2 |
| Television | 65 | 17 | 9 | 5 | 3 |
| Indoors | 66 | 14 | 14 | 5 | 1 |
| Print media | 41 | 21 | 30 | 6 | 2 |
| Radio | 53 | 20 | 13 | 8 | 6 |
| Online | 56 | 16 | 16 | 8 | 4 |
| Product placement | 52 | 27 | 11 | 6 | 4 |
| Promotional item | 66 | 13 | 8 | 9 | 4 |
| Other | 65 | 13 | 7 | 8 | 7 |
| Missing | 9 | 6 | 5 | 1 | 78 |

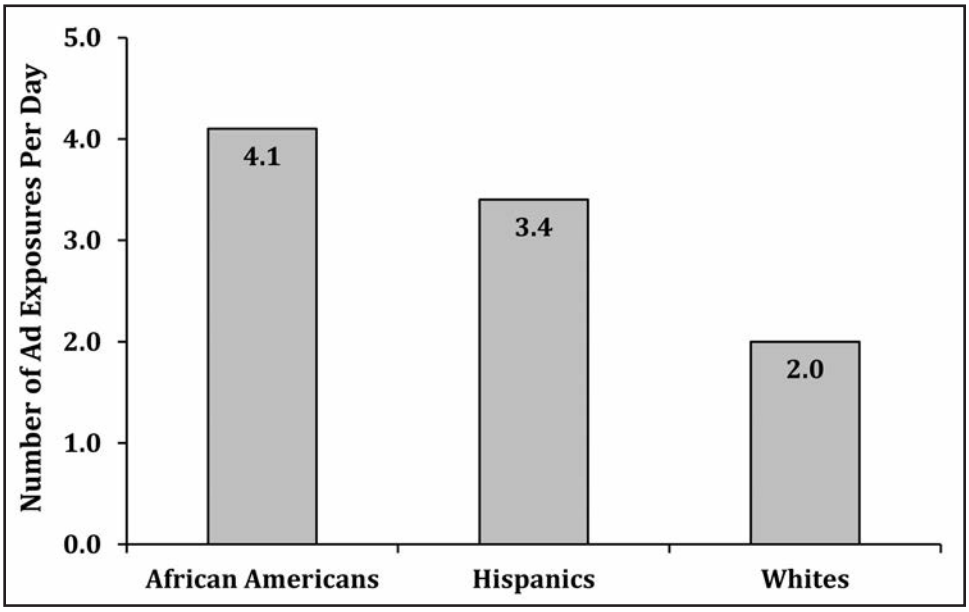


FIGURE 1. Racial and ethnic differences in exposure to alcohol advertising

tisements, outdoor advertisements, and advertisements in other venues (all *p*s < .01). There were no age differences in advertisement-exposure rates.

*Hours of television viewing*

Youth who watched less than an hour of television each day reported exposure to fewer advertisements overall ($p = .04$, $df = 563$) and fewer television advertisements, specifically ($p = .02$, $df = 563$), than those who watched 1–3 hours. No differences were observed for those who watched 4 hours or more compared with the 1–3 hour group. Television viewing was unrelated to exposure to alcohol advertisements outdoors or for venues other than television and outdoors.

## Discussion

Our study is the first to estimate total amount of alcohol advertising exposure among youth. We found that Southern California middle schoolers are exposed to a little more than three advertisements for alcohol each day. The largest share of these exposures is to outdoor advertising—billboards and signs outside stores and bars. Nearly as many are attributable to television viewing. We also found that girls are more exposed than boys, and African American and Hispanic youth are substantially more exposed than Whites.

With the exception of a small feasibility study (Scharf et al., 2013), our method has not previously been applied to estimating the frequency of alcohol advertising exposure. Prior studies have used EMA to estimate the prevalence or frequency of urges to smoke, eating behavior, pain, and emotional experience (Shiffman et al., 2002; Steptoe & Wardle, 2011; Stone & Broderick, 2007; Thomas et al., 2011). One study used EMA to estimate exposure to pro-tobacco marketing, finding that patterns of such exposure converge with data concerning the most advertised cigarette brands, as well as advertising expenditures across various media, suggesting the validity of their EMA measures (Martino et al., 2012). Similarly, some of the patterns observed and estimates obtained herein mirror those of studies that have focused on a smaller part of the overall alcohol advertising picture. That most advertisements reported were for beer fits with prior studies, as does the finding that wine advertisements appeared disproportionately often in print media relative to other venues (Center on Alcohol Marketing and Youth, 2010b). Our finding that youth who watch more television see more television advertisements, but not more advertisements in other venues, also lends validity to reports. Also telling is the concordance of our estimate of exposure to 0.8 television advertisements per youth per day (an estimate that does not change if we weight it to account for our minority oversample) with a prior estimate of 1 television advertisement per youth per day based on Nielsen ratings (Center on Alcohol Marketing and Youth, 2010c).

We cannot directly validate youth's EMA reports, although we note that this same limitation applies to surveys that ask youth to recall advertisements and even to Nielsen ratings. Moreover, a recent study (Scherer et al., 2015) found that reports of media use collected throughout the day via EMA closely align with reports of media use collected using detailed daily diaries. Although the dependent measure in that study differs somewhat from our own, it does enhance

the credibility of our participants' reports. If youth failed to fully comply with the task of reporting advertisements for our study, we may have underestimated advertisement exposure. Our weighting scheme, however, takes underreporting into account and adjusts for factors related to it.

Alongside our convergence with prior data, we bring a great deal of new information. Our finding that youth are most often exposed through outdoor advertisements suggests that tighter restrictions may be needed on such advertisements. It is possible that this finding is specific to the urban environment and transit patterns of Southern California. Nonetheless, it warrants close attention to, and further research examining, outdoor alcohol advertising practices as they relate to children.

No study has previously documented the greater exposure of girls to alcohol advertising overall. Greater use of print media among girls and videogames among boys (and thus more time indoors) may partially account for the difference (Rideout, 2015). Girls and boys were equally exposed to television advertisements for alcohol, failing to replicate a prior study (Ringel et al., 2006). Sports viewership is not as strongly segmented by gender as it was (Deitsch, 2014; Nielsen Company, 2014), and advertisers are placing more alcohol advertisements outside sports programming (Ross et al., 2014). Thus, more alcohol advertisements may be reaching girls through television than in the past.

Others have found greater exposure of African American youth to television, magazine (Center on Alcohol Marketing and Youth, 2010a; Ringel et al., 2006), and outdoor alcohol advertisements (McKee et al., 2011), and greater exposure of Hispanic youth through magazines (Center on Alcohol Marketing and Youth, 2005) and outdoor advertisements (Pasch et al., 2009). We extend these results to all advertising sources and find much greater disparities. Some of this difference is attributable to greater use of media among Hispanics and African Americans. A recent report indicates that African American youth spend about 8 hours a day with media, Hispanics a little less than 7 hours, and Whites a little more than 5 hours (Rideout, 2015). However, media use cannot account for greater exposure to outdoor advertisements, suggesting that advertisers could be targeting these racial/ethnic groups.

Exposure to few online advertisements was reported. Major brands do use YouTube and other social media popular with youth (Federal Trade Commission, 2014; Peterson, 2014). Youth under 13 are not permitted on Facebook, and YouTube offers alcohol marketers a method of screening out those under 21 (Federal Trade Commission, 2014). Nonetheless, these age restrictions are easily circumvented (Madden et al., 2013), so it is unclear to what extent they affect our findings. It is possible that higher estimates of online exposure would be obtained in an older sample.

POS promotions of alcohol have been little studied (Ellickson et al., 2005, and Hurtz et al., 2007, are exceptions) but constitute nearly a third of the advertising budget for the major beverage companies. We classified some POS promotions as outdoor advertisements because youth found them easier to record as such (e.g., signs displayed in store windows facing outdoors). This may partly account for our low numbers. Regardless, youth in our study reported little exposure to POS promotions indoors, suggesting that they are not spending a great deal of time in stores or restaurants where alcohol is advertised.

It is important to note that the kinds of advertisements to which youth are most exposed may not be those most likely to influence them to drink. Television advertisements may be more persuasive because they can present an engaging narrative (Green & Brock, 2000). Sponsorships of events may conflate love of team or a celebrity with love of an alcohol brand in an adolescent's mind or invoke processes that incorporate the brand in the youth's identity (e.g., "I'm a Heineken kind of guy").

Youth may also differ in their receptivity to advertising (e.g., Austin et al., 2006; Henriksen et al., 2008; McClure et al., 2013; Tanski et al., 2015). In a recent study based on the same data set examined here (Martino et al., 2016), we found that youth perceived the typical person their age who drinks alcohol more favorably, and alcohol use as more normative, when they were exposed to alcohol advertisements. Although true among youth of all racial/ethnic backgrounds, effects were greater and more likely among Whites. Therefore, although minority youth were more heavily exposed to advertising in the present study, they may be less receptive to it. This is in line with a number of other studies (Brown et al., 2006; Gibbons et al., 2010; Tanski et al., 2012). Much remains to be learned about whether, when, and why youth are more receptive to alcohol advertising to provide appropriate context for interpreting exposure rates. It is also important to put any influence of advertising in the context of other contributors to underage drinking. Although both African American and Hispanic youth are more exposed to alcohol advertisements than Whites, only Hispanic youth are more likely to drink (Centers for Disease Control and Prevention, 2014).

A few limitations of our study should be noted. Students in urban Southern California typically commute to school through areas populated with gas stations, mini-malls, and billboards where there are ample opportunities for advertising exposure. Results may not describe youth in settings without these characteristics. The study was conducted with a racial and ethnic mix different from the national average. However, the estimates we obtained for racial/ethnic subgroups are not affected by this. Our 3% rate of lifetime drinking is lower than the expected rate of 10%–12% for a cohort of similar age and racial mix (National Survey on Drug Use and Health, 2013). This may indicate a bias in our sample, perhaps associated with the burden of participation and the characteristics of youth who have sufficient time

and energy to comply with our procedures. Because alcohol advertising is targeted, we might observe a higher rate of advertising exposure in a group that includes more drinkers. Finally, youth might underreport exposure to more subtle forms of advertising such as product placements.

We are unable to weight for such effects, but this might bias (downward) both the total number of advertisements reported and the percentages in these categories. Our data-collection period excluded July and August. If youth spend time with different media or in different places during these months, or more or fewer advertisements are shown then, alcohol advertisement exposures may differ from what we observed. Nonetheless, our data represent more than 80% of the calendar year and thus the vast majority of opportunities for advertisement exposure. Our method for estimating product placements may misclassify some instances where alcohol brands appear as a result of an artistic decision rather than a paid promotion. Few product placements were reported; therefore, this potential overcounting minimally affects estimates of total exposure. Finally, we did not collect data regarding the brands to which youth were exposed. Identifying the brands that reach more youth, and the venues in which these exposures occur, could help to address failures in industry self-regulation of advertising practices. Thus, future studies should include brand measures.

### *Conclusions*

Our study indicates that middle school youth in urban Southern California see two to four advertisements for alcohol each day, depending on their race and ethnicity. These levels warrant intervention by policy makers, practitioners, and parents.

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