

The Myriad Influences of Alcohol Advertising on Adolescent Drinking

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Published online: 28 April 2017
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Abstract

Purpose of Review This review investigates effects of alcohol advertising on adolescent drinking. Prior reviews focused on behavioral outcomes and long-term effects. In contrast, the present review focuses on subgroups with greater exposure to alcohol advertising, research methods to study alcohol advertising, potential mechanisms underlying relationships between adolescent exposure to alcohol advertising, and increased drinking and points to prevention/intervention strategies that may reduce effects of alcohol advertising.

Recent Findings Alcohol advertising influences current and future drinking. Further, evidence suggests that adolescents may be targeted specifically. Alcohol advertisements may influence behavior by shifting alcohol expectancies, norms regarding alcohol use, and positive attitudes. Media literacy programs may be an effective intervention strategy.

Summary Adolescents are exposed to large quantities of alcohol advertisements, which violate guidelines set by the alcohol industry. However, media literacy programs may be a promising strategy for adolescents to increase critical thinking and create more realistic expectations regarding alcohol.

Keywords Young adult · Alcohol marketing · Mechanisms · Media literacy · Digital alcohol advertising

Introduction

Background

The use of media, including television, music, computer and internet, print material, and movies, is omnipresent among young people. On average, adolescents spend 7.5 h a day interacting with media through various outlets [1]. As such, media are used as a tool for knowledge acquisition that offers a steady stream of messages regarding myriad social, environmental, individual, and interpersonal values, norms, and customs [1]. Prior research indicates that not only are young people disproportionately exposed to alcohol advertisements in print and television but also that exposure to alcohol advertisements influences drinking behaviors and may accelerate the initiation of alcohol consumption among underage drinkers [2].

In the USA, a majority of adolescents has consumed alcohol by their senior year of high school and half report getting drunk [3, 4]. While alcohol use disorders (AUDs) are still prevalent within the USA, young people are among the most affected [5]. The most recent National Epidemiologic Survey of Alcohol and Related Conditions (NESARC-III) found that young adults aged 18–29 have the highest past year and lifetime rates of AUDs [5]. This may be due, in part, to frequent heavy drinking among 15- and 16-year olds [2]. Further, the economic impact of underage drinking is substantial, costing the USA as much as \$61.9 billion [6], and recent estimates found the overall economic impact of excessive alcohol use to total \$249 billion [7]. Thus, examining how factors such as alcohol advertising relate to adolescent drinking initiation and AUDs is of substantial importance for public health.

This article is part of the Topical Collection on *Alcohol*

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Regulation of Alcohol Advertising via Voluntary Marketing Codes

Because heavy drinking is prevalent among adolescents and young adults, it is important that alcohol advertising be properly regulated. Voluntary marketing codes are the primary way in which alcohol promotion is regulated in the USA [8]. Currently, three trade groups (i.e., Beer Institute; Wine Institute; Distilled Spirits Council of the United States [DISCUS]) have established voluntary marketing codes that provide guidelines for alcohol advertising [9–11]. In general, these codes specify that alcohol advertising should be restricted to media where 71.6% of the expected audience is of legal drinking age (over 21 years), should not depict excessive drinking or acceptance of drunken behavior, and should not claim or represent that alcohol consumption is related for success or status. Other provisions of the codes specify that nudity, lewd, or sexually explicit behavior should not be depicted. Some of the codes prohibit advertising within specified distances from schools or churches (e.g., 500 ft). However, guidelines differ for beer, wine, and spirits [8, 12]. Although guidelines have been put into place regarding advertising content and placement, the codes encourage companies to establish internal procedures for monitoring their adherence to the code and ensuring compliance [12], which may constitute a conflict of interest, as self-imposed sanctions for circumventing these guidelines may not be in the alcohol industries' best interests. Similarly, these codes have been criticized due to a lack of independent oversight, monitoring, and enforcement [8]. Further, codes aimed at restricting underage individuals from viewing digital alcohol advertisements can be easily bypassed [13]. In some cases, age verification restrictions are nonexistent on social media platforms [14]. Specifically, a recent study examining youth access to alcohol brands found that on Instagram, users of any age were able to follow alcohol brand pages and were subsequently exposed to an average of 362 alcohol advertisements within the past 30 days [14].

Beyond these voluntary codes, the Federal Trade Commission (FTC) recommends that the alcohol industry refrain from using advertisements with substantial appeal to underage consumers [12, 15]. However, a recent study exploring adolescent and young adults' perceptions of alcohol advertisements found that alcohol advertisements facilitated relaxation and social success, improved mood, and increased confidence [16]. Additionally, a latent class analysis found alcohol advertisements exploited specific themes such as partying and relaxation [17]. Further, a sample of high school and university students believed that alcohol advertisements portrayed themes including the removal of negative emotions and several students believed that these advertisements were aimed at individuals younger than themselves [18]. These findings illustrate the circumvention of specific codes (i.e.,

creating advertisements with substantial appeal to underage consumers) by suggesting that alcohol increases social and sexual success while also increasing positive affect and decreasing negative affect [16, 18]. This violates specifically the marketing code that states, "beer advertising and marketing materials should not convey the impression that a beer has special or unique qualities if it in fact does not" [10]. Recently, an exhaustive review examined the content of and exposure to alcohol marketing relative to the alcohol industry's self-regulated guidelines. Results suggest that violations are prevalent and do not meet the standards set to protect vulnerable populations [19]. As such, it appears that self-regulation may not be working optimally and can be improved.

Goals of the Present Review

Given these findings, extensive research has investigated the associations between alcohol advertising and adolescent drinking. Prior reviews have focused on indices of alcohol marketing (i.e., price, promotion, product, and placement) and behavioral drinking outcomes [20], the role of digital media and its influences on adolescent drinking behavior [21, 22], and the effects of youth exposure to alcohol advertising longitudinally [23]. However, gaps in the literature remain, including whether specific demographic groups are over exposed to alcohol advertisements, mechanisms underlying how alcohol advertisements influence behavior and potential interventions geared towards reducing the effects of alcohol advertisements among youth. As such, the aims of this critical review are to (1) address whether certain demographic groups are disproportionately exposed to alcohol advertising, (2) review how alcohol advertising exposure is measured in traditional and digital venues, (3) investigate mechanisms by which alcohol advertising may influence drinking behavior, and (4) evaluate whether media literacy programs can ameliorate the effects of alcohol advertising among adolescents and young adults.

Race, Ethnicity, Gender, and Age

While the overwhelming majority of adolescents are exposed to and interact with media on a consistent basis, certain races, ethnicities, and genders are differentially exposed to alcohol advertisements [24••, 25, 26]. Previous results have been equivocal [27], but a recent longitudinal study among 11- to 14-year olds found that females were exposed to more alcohol advertisements on a daily basis than males [24••]. Further, African-Americans and Hispanics were exposed to nearly two times more alcohol advertisements than non-Hispanic white youths were [24••]. Findings similar to these have been replicated previously [25, 27–29]. These findings translate to digital media as well. D'Amico and colleagues [30] found statistically significant associations between African-

American race and increased self-reported exposure to online alcohol advertising. Alaniz and Wilkes [31] hypothesized that differential rates of exposure among groups exist because alcohol companies use cultural symbols (e.g., red, green, and white colors representing the Mexican national flag) as a way to market to minority and disenfranchised populations. However, it may be the sheer volume in which ethnic minorities are exposed to alcohol advertisements in their communities that explains this disparity. Specifically, prior research suggests that more densely populated minority neighborhoods are exposed to more outdoor alcohol advertisements (i.e., billboards) and storefront malt liquor advertisements [25, 28]. Although research has found lower substance use rates among racial/ethnic adolescent minorities, those who do use have greater long-term adverse outcomes relative to Caucasians [32, 33]. Thus, future research should determine whether overexposure to alcohol advertisements influences subsequent drinking behaviors to a greater extent among certain ethnic and racial groups.

Underage drinkers are also exposed to alcohol advertisements more frequently than of age drinkers through myriad media [26, 34, 35, 36, 37••, 38]. Specifically, a study using Nielsen data found advertisement placements for alcoholic beverages increased as a function of adolescent viewership [34]. Similar results have been replicated in the UK, where adolescents aged 10–15 were exposed to 51% more ready-mix drink (i.e., alcopops) alcohol advertisements than individuals aged 25 and older [26]. In a recent study, examining exposure rates across multiple marketing media, youths reported greater past-month alcohol advertisement exposure relative to adults (i.e., >21) on the internet, radio, and billboards [38]. These findings, coupled with longitudinal studies reporting that exposure to alcohol-related media was associated with a greater likelihood of adolescent drinking initiation and greater increases in alcohol consumption among adolescents already drinking [2], illustrate the need for more effective policies that reduce advertisement exposure and media literacy programs. For example, increasing the percentage of adult audiences from 71.6 to 80% for advertisement placements in radio, television, and print media may help to decrease overexposure to underage drinkers.

Traditional and Digital Exposure Venues

Television

As recently as 2014, the majority of alcohol companies' marketing budgets were allocated to television (TV), radio, and magazine advertisements [15]. This is important, as a study found that of 3719 TV viewers, 57% reported that they acquired health-related information from daytime and primetime TV dramas [39]. Further, recent research suggests that in the

USA, alcohol advertisements on TV appeared at a rate of one advertisement every 3 min [17]. It is plausible that inaccurate information regarding alcohol is acquired along with other health-related information from watching TV. One study used Nielsen data from 2005 to 2011 and found evidence indicating that alcohol companies were targeting specifically underage viewers with concentrated advertisements on cable TV at a rate much greater than adult (i.e., >21) groups [37••]. This is problematic considering that increased alcohol advertisement exposure on TV is positively associated with past-month drinking among underage drinkers [40].

Further, alcohol depictions and product placements in TV programming are common [41]. These depictions and product placements may reinforce alcohol advertisements. This practice is particularly problematic when the depictions and product placements occur during TV shows that adolescents watch frequently. Multiple studies have examined the relationship between recent alcohol use and brand-specific exposures to alcohol advertising on 20 commonly watched TV shows [42••, 43, 44]. Results suggest that prevalence of alcohol use among youths was approximately four times higher for alcohol brands that had advertisement exposures on the 20 commonly watched shows. Thus, assessing which brands young people consume may give a more fine-grained analysis of how alcohol advertisements may influence behavior.

Studies examining whether exposure to alcohol advertisements increases alcohol demand have yielded equivocal results [45, 46]. However, two studies [47, 48] found that alcohol marketing receptivity was significantly related to binge drinking at baseline and binge drinking initiation longitudinally. These results persisted even after controlling for time spent watching TV, personality characteristics, and perceived peer drinking behaviors. Indeed, it appears that alcohol advertisements influence several psychosocial factors, which ultimately may influence drinking behavior.

Magazines and Print Material

Alcohol advertisements are also commonly found in magazines, and alcohol companies spent over 3.3 billion dollars on product advertising for almost 35,000 advertisements over a 10-year span from 2001 to 2011 [36]. Of those advertisements, over 1000 were deemed noncompliant (i.e., alcohol advertisements that appeared in magazines with over 30% underage readership) and an additional 11,569 were deemed as constituting overexposure [36]. Even though alcohol advertising in magazines has decreased recently [36, 49], magazine advertisements still provide a fruitful marketing avenue for alcohol brands, as underage youths are exposed to such advertising to a greater degree than adults on a per capita basis [49]. A recent study found 13,513 alcohol advertisements in 118 sampled magazines over a 5-year span [50]. Further, Ross and colleagues [50] examined alcohol advertisements within

these magazines and found that the most commonly consumed alcohol brands by underage youths were also the most commonly advertised in magazines with predominately underage readers. Parallel to results by Chen and colleagues [51] regarding alcohol advertisements increasing as a function of adolescent TV viewership, Ross and colleagues [50] found that as youth readership rose, so too did advertising for premium beer, low calorie beer, vodka, and rum. These results provide strong evidence that alcoholic beverages commonly consumed by youths are advertised excessively in magazines with the largest youth audience. Whether brand-specific alcohol advertising in magazines causes subsequent brand-specific drinking among underage youths lacks concrete evidence but highlights the fact that youths are inundated by advertising for the specific brands that they are most likely to consume.

Digital Social Media

Currently, over 90% of adolescents report daily online activity and 71% report using multiple social networking sites [52]. As such, the alcohol industry went from spending \$2 billion on social media in 2008 to \$3.5 billion in 2013, which reflects changes in the way young people view and access information [53]. Recently, the European Centre for Alcohol Marketing (EUCAM) estimated that online advertising resulting from a recent deal between Google and Heineken has the ability to reach 103 million minors monthly [54]. Thus, examining whether these shifts equate to actual changes in drinking behaviors is important. Hoffman and colleagues [55, 56] utilized cross-sectional data from a large sample of college students and found that students' use of alcohol-marketing social media on Facebook and Twitter was a significant predictor of drinking frequency, drinks per drinking day, and problem drinking, whereas general social media use was not. However, it may be that drinkers are more likely than abstainers to seek out alcohol-related social media sites. Regardless, it appears that alcohol advertising on social media may directly influence drinking behaviors in similar ways as traditional alcohol advertising does.

Further, a small, but growing literature suggests that restrictions on internet alcohol advertising fall short of industry standards. One study was able to access and subscribe to 100% of official alcohol YouTube channels using fictitious underage user profiles [57]. Using similar procedures, 22 official alcohol pages were fully accessible on Instagram and Twitter [14]. These findings call for regulatory changes, such as tightening restrictions on accessibility to official alcohol company pages via social media platforms by implementing age restrictions for YouTube, Instagram, and Twitter and by making already existing age restrictions harder to bypass.

Measuring Alcohol Marketing Exposure

Cross-Sectional and Longitudinal Surveys

Cross-sectional surveys are widely utilized to examine relations between alcohol marketing exposure and alcohol use and rely on self-reported exposure and outcome measures [55, 56, 58, 59]. Specifically, these studies have been utilized due to their cost-effective and efficient nature while also allowing for large sample sizes. For example, one study surveyed 3415 adolescents and found that exposure to and recognition of masked alcohol advertisement images (e.g., snapshot of the Most Interesting Man in the World with any reference to Dos Equis removed) were related to ever drinking, ever binge drinking, and current drinking [58]. Another study found significant associations between involvement with and awareness of alcohol advertisements and greater intentions to drink in the future [59]. While cross-sectional studies offer insight into the associations between alcohol advertising and alcohol use, limitations exist, such as recall bias and the correlational nature of results.

To improve upon the inherent limitations of cross-sectional surveys, longitudinal surveys have been utilized previously to assess temporal relations between alcohol marketing exposure and alcohol consumption (for a review, see [38]). In particular, one study found that greater exposure to alcohol advertising during adolescence predicted drinking and intentions to drink 1 year later, even after controlling for current drinking [60]. Similar research including underage youth in Taiwan [61], Germany [62], and the USA [48, 63] has replicated these results. Further, among a large sample of low-risk adolescent non-drinkers, greater exposure to alcohol portrayals in movies was an independent predictor of drinking initiation and binge drinking initiation 1 year later [64]. Two other studies found that alcohol marketing receptivity (i.e., cued recall of alcohol advertisement images) predicted binge drinking longitudinally [47, 48]. In fact, it appears that a reciprocal relation exists between alcohol marketing exposure and drinking outcomes [65, 66]. Thus, one study found increased alcohol marketing exposure predicted binge drinking frequency 6 months later and, at the same time, binge drinking predicted later exposure to alcohol marketing [66]. However, it may be that specific types of alcohol advertisements confer increased risk. One study found increased exposure to alcohol advertisements with a "partying theme" predicted drinking and binge drinking onset 2 years later, whereas non-partying themed advertisements did not, even after controlling for age, gender, alcohol expectancies, and sensation-seeking [67••].

Ecological Momentary Assessments

A growing number of studies have utilized ecological momentary assessments (EMA) to examine detailed real-time

information regarding events of interest including alcohol advertising exposure among youth and adolescents [24••, 30, 68, 69]. EMA are an extension of self-report surveys but can be administered at random or at predetermined times and in any location using a smartphone or related device [70]. EMA studies are particularly useful as they can examine exposures across time and context while reducing recall bias [70]. Moreover, EMA have the ability to examine within-person variability (i.e., does drinking occur more frequently when advertising exposure is higher?) and between-person variability (i.e., are those with greater exposure more likely to drink relative to those who are less exposed?). Recently, Collins and colleagues [24••] utilized EMA in a sample of 11- to 14-year olds over a 2-week span and logged exposures to 6695 alcohol advertisements. Results indicated that the greatest proportion of alcohol ad exposure was through outdoor advertisements and television, which equated to almost two advertisements viewed per youth, per day. However, exposure rates may be underestimated as participants reduced their reporting later in the study, potentially due to study fatigue. Martino and colleagues [68] examined within-person temporal relations between alcohol advertisement exposure and beliefs about alcohol. Results suggest that youths view peers who drink more favorably and perceive alcohol use as more normative (e.g., “most teenagers drink alcohol”) after being exposed to an alcohol advertisement. Further, these results suggest that youths are exposed to an estimated 1000 alcohol advertisements yearly. Indeed, EMA studies help advance our understanding of how alcohol advertisements influence certain beliefs regarding alcohol. Altogether, EMA allow for the collection of more fine-grained data than typical retrospective self-reports (time-point).

Mechanisms

This section provides a critical overview of the only known and recently conducted cross-sectional and longitudinal studies that provide evidence suggesting that social norms, alcohol attitudes, and alcohol expectancies help to explain associations between alcohol advertisements and adolescent drinking behavior (for a summary of these studies, see Table 1.).

Social Norms

Media help individuals learn about norms and social behaviors [74], and alcohol advertisements may influence alcohol-related beliefs by altering perceived social norms [68]. Research has identified social norms as strong predictors of alcohol use and related problems among adolescents and young adults [75, 76]. Specifically, adolescents tend to overestimate peer drinking frequency [75], which may result from messages obtained by viewing alcohol advertisements that increase media-related cognitions [71]. For instance, one

study found that among adolescents, perceiving alcohol advertisements as more realistic and alcohol portrayals to be more similar to themselves significantly increased beliefs that alcohol use is normative [71]. While some studies have reported null associations between social norms and alcohol media exposure [77], Alhabash and colleagues [72] found that level of interaction with alcohol advertisements on Facebook (e.g., “likes” and “shares”) was a significant predictor of intentions to consume alcohol among underage college students. In this study, likes and shares were used as a proxy for social norms, as status updates with more likes and shares were indicative of acceptability of drinking and the perception of increased alcohol use. It may be that alcohol advertising generally, and specifically on social media sites, facilitates beliefs that alcohol use is normative because of their vast reach and perceived acceptability.

Alcohol-Related Attitudes

Broadly, prior literature provides evidence that exposure to alcohol advertising relates to more favorable attitudes regarding alcohol use [16, 58]. Namely, one study found that among adolescents and young adults, alcohol advertisements conveyed messages that alcohol relates to social success, relaxation, increased confidence, and improved mood [16]. Indeed, another study found positive attitudes towards alcohol use to partially mediate the association between alcohol advertising exposure and alcohol use longitudinally [58]. Coupled with recent findings that alcohol advertisements utilize humor and friendship to exploit predominately themes of partying, love, and sex [17], it is not surprising then that young people may be influenced to believe alcohol engenders mainly positive effects. Going forward, regulations should be enacted to help counterbalance these themes. For example, requiring the alcohol industry to air one public safety announcement regarding harms of excessive alcohol use for every advertisement containing this type of positive portrayal of alcohol may help to create more realistic attitudes towards drinking.

Alcohol Expectancies

There is reason to believe that alcohol advertisements seen by persons under the legal drinking age may subsequently influence their beliefs about alcohol [78]. This is particularly true even among very young children, as positive alcohol expectancies increase as a function of age, but particularly so during the third and fourth grade [79]. Further, these results have been replicated among adolescents aged 11 to 14 years old [80]. Specifically, Chen and colleagues [51] found that 10 and 12 year olds who watched more than 2 h of TV per day were more likely to have greater positive alcohol expectancies and decreased negative alcohol expectancies. Similar results focusing on online alcohol marketing exposure have been

Table 1 Summary of nine studies with findings detailing potential mechanisms between alcohol advertisements and adolescent drinking

Study citation	Country(s)	Sample characteristics	Construct(s) assessed	Study design	Outcome measure(s)	Brief summary of results
Martino et al. [68]	USA	606 middle-school students; 46% female; 25% Non-Hispanic White; 23% ever tried alcohol	Norms	2-week longitudinal study design using EMA procedures	1. Prototype perception 2. Perceived norms 3. Positive outcome expectancies 4. Negative outcome expectancies	Drinking alcohol was viewed as more normative at times of exposure to an alcohol advertisement relative to randomly sampled moments of nonexposure; this effect was significant for non-Hispanic Whites but not for Hispanic Ethnicity or black race.
Elmore et al. [71]	USA	817 adolescent high school students aged 12–19; 48% female; 64.4% Caucasian; 24.1% reported previous alcohol use	Norms	Cross-sectional baseline assessments	Substance use norms	There was a significant relationship between media-related cognitions and perceptions of descriptive and injunctive norms for both alcohol and tobacco use.
Alhabash et al. [72]	USA	379 college students; mean age = 20.58 years; 57.1% female; 77.2% Caucasian	Norms; Alcohol attitudes	Cross-sectional online survey	1. Attitudes towards alcohol advertisement and status updates 2. Viral behavioral intentions for advertisements and status updates 3. Intentions to consume alcohol	Intentions to consume alcohol were higher when attitudes towards alcohol advertisements and viral behavioral intentions for advertisements and status updates were more positive. Higher likes and shares were indicative of greater drinking norms.
Weaver et al. [16]	Australia	172 adolescents and young adults aged 16–29; 15% aged 16–17; 34% aged 18–24; 50% aged 25–29; 63% female; 53% reported having a drink containing alcohol at least twice a month; 40% 1–2 drinks on a typical drinking day; 17% 6 or more drinks at least once a month	Alcohol attitudes	Cross-sectional online survey	1. Perceived main messages of prompted and unprompted alcohol advertisements through Facebook 2. Perceived key messages of alcohol advertising through Facebook 3. Perceived target audience of alcohol advertisements on Facebook	Unprompted main messages of alcohol advertisements included social success and partying. Prompted messages of alcohol advertisements included inducing relaxation, improving mood, making one feel more social and outgoing, and increased personal confidence. Younger participants (i.e., 16–17 year olds) were more likely to agree that alcohol advertisements presented these themes in the alcohol advertisements. Most 16–17 year olds perceived alcohol advertisements were directed at individuals slightly older or much older than them. Most 18–24 year olds perceived alcohol advertisements were targeted at people their age. Slightly over half of 25–29 year olds perceived alcohol advertisements were directed at individuals their age.
Morgenstern et al. [62]	Germany	3415 adolescents aged 11–17 years at baseline; mean age = 12.2 years;	Alcohol attitudes	Longitudinal survey design	1. Alcohol Attitudes 2. Current alcohol use	Five hundred eighty-one (28%) of the baseline nondrinkers were current drinkers at

Table 1 (continued)

Study citation	Country(s)	Sample characteristics	Construct(s) assessed	Study design	Outcome measure(s)	Brief summary of results
		53% female; 2130 (70%) nondrinkers; 3029 (88%) retained at follow-up			3. Lifetime binge drinking	follow-up and 276 (15%) of baseline never-bingers drank at least once between baseline and follow-up. Nine hundred eighty (46%) held more positive alcohol attitudes at follow-up. Exposure to alcohol advertising was positively correlated with alcohol use, binge drinking initiation and more positive alcohol attitudes. More positive alcohol attitudes partially mediated the relations between baseline alcohol advertising exposure, baseline alcohol-related attitudes, baseline alcohol use of peers and alcohol use at follow-up.
Chen et al. [51]	Taiwan	1547 adolescents aged 10–12 years; 50.3% female; 64.9% never drinkers	Alcohol expectancies	Longitudinal survey design	1. Positive alcohol expectancies 2. Negative alcohol expectancies	Positive alcohol expectancies increased with television viewing amount. Specifically, more time spent watching TV was associated with increased expectations that alcohol facilitated relaxation and tension reduction 1 year later. More time spent watching TV was associated with dampened negative alcohol expectancies.
Dal Cin et al. [77]	USA	6522 adolescents aged 10–14 years; mean age = 12.05 years; 49% female; 66% Caucasian; 81% non-hispanic	Alcohol expectancies; social norms	Longitudinal, nationally representative, random-digital telephone survey	1. Adolescent alcohol consumption 2. Willingness to use alcohol	Alcohol expectancies, but not norms related to alcohol use, mediated the relationship between alcohol exposure in movies and alcohol consumption. Specifically, greater alcohol exposure in movies at time one and time two predicted greater alcohol expectancies at time three, which was associated with a greater willingness to use alcohol at time three, and was a significant predictor of alcohol consumption at time four.
de Bruijn et al. [73]	Germany, Italy, the Netherlands, Poland	6651 adolescents, mean age = 13.95 years; 51.1% female; 21% current smokers	Alcohol expectancies	Longitudinal online survey	1. Positive alcohol expectancies 2. Negative alcohol expectancies 3. Arousal expectancies 4. Sedation expectancies 5. Alcohol use	The association between online alcohol marketing and both positive and negative alcohol expectancies was greatest when no alcohol use was reported at time one. Alcohol use at baseline was positively associated with both arousal and sedation expectancies. Further, online

Table 1 (continued)

Study citation	Country(s)	Sample characteristics	Construct(s) assessed	Study design	Outcome measure(s)	Brief summary of results
						alcohol marketing exposure at time one was a significant predictor of past month alcohol use at time two. All four types of expectancies partially mediated the relationship between time one online alcohol marketing exposure and time two past month alcohol use.

replicated longitudinally in a large sample of European adolescents. Specifically, alcohol expectancies were found to mediate the relation between online alcohol marketing exposure and past month drinking frequency over 1 year later [73]. Further, alcohol expectancies mediated the relations between alcohol exposure in movies and alcohol consumption in a sample of adolescents [77]. Therefore, alcohol advertisements and other media exposures appear to shape expectations regarding the effects of alcohol, which also influence subsequent drinking behaviors over long periods of time.

Intervention Strategies

Studies examining how alcohol advertisements influence behavior are important, but the emphasis should be focused equally on interventions mitigating the effects of alcohol advertising. Interventions aimed at increasing media literacy may be one approach, and the available studies generally have reported positive outcomes (for a review, see [81]). Broadly, media literacy relates to the ability to utilize, comprehend, and appraise media in various forms and emphasizes improving an individual's fact-based knowledge and critical skills regarding media [82]. Increasing media literacy may help young people critically assess advertising messages that portray alcohol in an overly positive light. For example, a preventive intervention program aimed at improving media literacy skills among middle school youths found significant reductions in intentions to use alcohol in the intervention condition relative to controls [83]. Previously, Chen [82] enrolled adolescents into the TeenSmart TV media literacy program that included a negative media lesson condition and a balanced evaluative approach condition. Results showed that adolescent males in the negative media condition perceived television characters to be less realistic and considered drinking to have negative consequences. However, adolescent girls perceived greater media skepticism from the balanced evaluative approach. A more recent pilot study aimed to strengthen logical reasoning among 9–12-year olds using a media literacy program in Australia. Results suggest that the program led to increases

in media deconstruction skills, and as a result, decreased social norms of teen drinking and dampened positive alcohol expectancies [84]. Moreover, it appears that certain personality factors are important to consider when creating a media literacy program. Austin and colleagues [85] evaluated personality factors, namely need for cognition (NFC; processing images analytically) and need for affect (NFA; processing images through affective cues) in relation to media literacy and critical thinking skills. Specifically, individuals higher in NFC, but not NFA, thought more critically about media sources, which affected skepticism towards alcohol advertisements by influencing alcohol expectancies and wishful identification, or the desire to emulate others. These results indicate not only that increasing media literacy can lead to more realistic evaluations of alcohol advertisements but also that critical thinking skills regarding alcohol marketing can influence beliefs about alcohol marketing messages. Therefore, media literacy programs can and should be implemented in schools as a way to galvanize critical thinking towards alcohol advertisements and alcohol use more generally. Finally, it is vital to tailor these programs while considering gender differences and whether results may differ by race/ethnicity, and also utilizing follow-up and longitudinal study designs.

Implications and Future Directions

Media use among young people is ubiquitous, and adolescents are exposed to large quantities of alcohol advertising on a daily basis. Indeed, much alcohol advertising violates self-imposed guidelines set in place by the alcohol industry and have been shown to influence a wide range of cognitive and psychosocial factors. As such, enacting stricter policies may have a significant impact on adolescent exposure to alcohol advertising. For example, Doran and colleagues [86] proposed several implementable and cost-effective measures, namely mass media campaigns, and advertising bans. Indeed, stronger state- and local-level alcohol policies have been shown to reduce the likelihood of adolescent drinking [87, 88]. Namely, one study examined associations

between alcohol advertising restrictions and heavy drinking among older adults. Results identified an inverse association between advertising restrictions and prevalence of heavy drinking across 16 European countries [89]. While the sample consisted of older adults, it is reasonable to assume that similar relations may exist, and even to a greater extent, among young people, considering that their use of media in general is greater than that of older individuals [90]. Indeed, a cross-national study of 26 countries using aggregated data found a negative association between alcohol advertising restrictions and adolescents' drinking, heavy drinking, and early onset of drinking, although these associations were attenuated when overall per capita consumption was included in the models [91].

Moving forward, innovative methodological approaches are needed to advance our understanding regarding if and how alcohol advertising influences drinking behaviors. Specifically, future studies should obtain more comprehensive information by studying alcohol advertisement exposure from a brand level, rather than product level, perspective. Alcohol is marketed as specific brands rather than as a general product, and branding is essential to alcohol marketing [92]. Studying aggregate levels of alcohol advertising, including brands of alcohol that youths and adolescents are unlikely to drink, may produce "an averaging effect that would dilute the effect of advertising for a specific brand if it were truly influencing youth consumption" [93]. Although one can argue that advertising influences brand choice and not overall consumption, recent results do not support this notion. Specifically, as alcohol consumption of specific brands advertised on popular television shows watched by underage youth increased, consumption of alcohol brands not advertised on these shows did not decrease [40].

Further, re-conceptualizing what constitutes alcohol advertising may have research, policy, and public health implications. Traditional research examining alcohol advertising rarely, if ever, takes into consideration when an individual becomes a brand ambassador and the influence that may have among individuals within a particular social network. Determining whether circulating alcohol brand materials among peers influences norms, expectancies, attitudes, and behaviors is an important research avenue. Similarly, studies suggest that there is exponential growth in the use of product placements in television entertainment programming, film, and music as a part of the alcohol industry's marketing strategy [94]. Although there is limited research on the effects of product placements, there is some indication that they can have effects on adolescents' drinking [8]. Including a brief epilogue or warning about product placements may reduce the impact of pro-alcohol storylines [41]. Further research in this area is needed, however, to determine the most effective content and placement of such counter-messages.

EMA are one particularly useful methodological approach for studying alcohol marketing exposure as they allow for examination of both within and between person variability. Further, EMA can capture experiential attitudes and beliefs regarding alcohol advertisements in real time and across contexts. Moving forward, longitudinal research designs using EMA procedures should examine alcohol advertisement exposure from a brand level perspective and the influence of brand ambassadors within peer networks. Further, it will be important to include various age ranges and ethnicities/races to determine whether the effects exist during developmental transitions (i.e., adolescence to young adulthood) and whether these effects differ across race/ethnicity.

While racial and ethnic minorities appear to be disproportionately exposed to alcohol advertising, future research should address how different races are affected by alcohol marketing exposure. To our knowledge, only one study has examined racial differences in the influence of media and found that increased exposure to alcohol use in movies was a longitudinal predictor of alcohol consumption; however, these effects were much stronger for Caucasian adolescents than Black adolescents [95]. Thus, an important future direction is to replicate and extend work that examines if, how, and why alcohol marketing is more or less influential among ethnic minorities.

Conclusion

This narrative review identifies important ways in which exposure to alcohol advertising during adolescence influences several factors leading to underage alcohol consumption. Specifically, alcohol advertising appears to influence adolescents' attitudes towards alcohol, increase positive expectations regarding alcohol, and make alcohol use appear more normative. Further, this review identifies an underutilized approach to studying alcohol advertisement exposure (i.e., EMA) that may help to collect more fine-grained data beyond traditional methods such as cross-sectional surveys. Use of EMA may be particularly helpful when examining exposure to digital online alcohol marketing given the ubiquity of social media use among this age group. It is important to note that current voluntary marketing codes inadequately protect underage youth from overexposure to alcohol advertisements and, in many cases, can be easily circumvented or disregarded completely, especially on social media platforms. Thus, the alcohol industry should be encouraged to strictly enforce and further amend current standards to prevent marketing directly to young people. Further, a continuation of interventions aimed to increase critical thinking regarding alcohol marketing messages (i.e., media literacy) among adolescents might attenuate the effects of alcohol advertising.

Acknowledgements During preparation of this manuscript Dr. Grube was supported by grant number P60-AA06282 (Environmental Approaches to Prevention) from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) of the National Institutes of Health (NIH). The content is solely the responsibility of the authors and does not necessarily represent the official views of NIAAA or NIH

Compliance with Ethical Standards

Conflict of Interest Benjamin Berey, Cassidy LoParco, Robert Leeman, and Joel Grube declare that they have no conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as:

•• Of major importance

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