

# The Effect of Alcohol Advertising on Immediate Alcohol Consumption in College Students: An Experimental Study

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**Background:** Survey studies have emphasized a positive association between exposure to alcohol advertising on television (TV) and the onset and continuation of drinking among young people. Alcohol advertising might also directly influence viewers' consumption of alcohol while watching TV. The present study therefore tested the immediate effects of alcohol advertisements on the alcohol consumption of young adults while watching a movie. Weekly drinking, problem drinking, positive and arousal expectancies of alcohol, ad recall, attitude, and skepticism toward the ads were tested as moderators.

**Methods:** An experimental design comparing 2 advertisement conditions (alcohol ads vs. non-alcohol ads) was used. A total of 80 men, young adult friendly dyads (ages 18 to 29) participated. The study examined actual alcohol consumption while watching a 1-hour movie with 3 advertising breaks. A multivariate regression analysis was used to examine the effects of advertisement condition on alcohol consumption.

**Results:** Assignment to the alcohol advertisement condition did not increase alcohol consumption. In addition, no moderating effects between advertisement condition and the individual factors on alcohol consumption were found.

**Conclusions:** Viewing alcohol advertising did not lead to higher alcohol consumption in young men while watching a movie. However, replications of this study using other samples (e.g., different countries and cultures), other settings (e.g., movie theater, home), and with other designs (e.g., different movies and alcohol ads, cumulative exposure, extended exposure effects) are warranted.

**Key Words:** Alcohol, Media, Advertising.

ALCOHOL MARKETING PLAYS an important role in the lives of young people. Alcohol brands are integrated in youths' social lives since alcohol brands are often part of the entertainment and sports industry (Center on Alcohol Marketing and Youth, 2010). For example, beer brewery Heineken is the sponsor of a music hall in Amsterdam where many concerts and events for young people take place, and the Dutch soccer league is named after the beer brand Jupiler. Television (TV) is another important medium of alcohol marketing. In 2009, nearly 317 alcohol advertisements were broadcasted in the Netherlands every week (Nielsen Media Research, 2009). Longitudinal studies have emphasized a positive association between exposure to alcohol advertising on TV and the onset and continuation of drinking among young people (Anderson et al., 2009; Collins et al., 2003; Nelson, 2010; Smith and Foxcroft, 2009). Very few studies have experimentally tested the direct causal effects

of TV alcohol advertising on alcohol consumption. Exposure to alcohol advertisements might affect alcohol consumption immediately, since TV watching is often accompanied by drinking alcohol, just like eating snacks (Anschutz et al., 2009; Halford et al., 2004). The present study tested the immediate effects of TV alcohol advertising on the alcohol consumption of young adults.

The exposure to advertisements in which actors drink alcohol can prime positive alcohol expectancies (Dunn and Yniguez, 1999) and alcohol consumption (Roerich and Goldman, 1995) among viewers. Social behavior such as alcohol consumption can be activated by relevant primes, even when an individual has no behavioral intentions regarding the primed behavior or is not aware of the influence (Dijksterhuis et al., 2007). The process of priming shows an overlap with imitation and mimicry processes (Chartrand and Bargh, 1999) and operates as an association between representations activated by the perception of a given type of behavior and actual behavior (Dijksterhuis and Bargh, 2001). Even though nonheavy drinkers are not inclined to drink alcohol as strongly as heavy drinkers, they might still be affected by the alcohol cues because they are in a social situation where actors prime them with drinking. However, the effects might be more profound in heavy drinkers, as Sheeran and colleagues (2005) demonstrated. When strong drinking habits are established, activation of the goal to socialize automatically elicits drinking in habitual drinkers. The authors showed

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that habitual drinkers' readiness to drink increased automatically after being primed with the goal of drinking (in our case actors' drinking). In addition to these priming effects, in experienced drinkers, cue-reactivity processes might account for higher drinking levels while watching TV. According to the incentive sensitization theory of Robinson and Berridge (2004), repeated use of a substance produces a dopaminergic response that becomes sensitized every time the drug is used. Consequently, these cues become more salient and receive a disproportionate amount of attention (attentional bias). Once the attention is focused on visual alcohol cues, especially experienced drinkers respond with increased levels of craving the substance (Franken et al., 2003). Hence, seeing actors holding a drink or drinking on the screen might provoke feelings of craving and subsequently affect drinking behavior.

In addition, particular advertising strategies might contribute to an increased intake of alcohol while watching. Research showed that in the last 20 years, advertising has become directed more toward consumer's desires and less toward product (Casswell, 1995). Brands of alcohol attempt to communicate social status and aspirations (Jackson et al., 2000). Alcohol ads often contain music, characters, storylines, and humor aimed specifically at young people, persuading them to consume particular alcohol brands (Chen and Grube, 2002; Chen et al., 2005). The design of alcohol advertisements might contribute to a social climate that tends to normalize and underestimate the negative consequences of alcohol (Wallack et al., 1990). Consequently, alcohol advertising might lead to more positive expectancies and attitudes not only toward the marketed brands but also toward alcohol consumption among young people in general (Snyder et al., 2006; Wallack et al., 1990; Wyllie et al., 1998).

Some previous studies experimentally tested the immediate effects of TV alcohol advertising on alcohol consumption (Kohn and Smart, 1987; Sobell et al., 1986), finding no effects of alcohol advertising. However, these studies were conducted in the 1980s, and advertising strategies have changed since then (Casswell, 1995). In addition, differences in studies' design, including assessing drinking after the exposure rather than during the exposure (Kohn et al., 1984; Sobell et al., 1986) and small sample sizes, make the studies difficult to compare. Two recent experimental studies showed immediate effects of exposure to alcohol advertising on behavior. Koordeman and colleagues (2011a) showed that exposure to alcohol advertisements prior to a movie in a movie theater led to higher levels of alcohol consumption, but only in heavy drinkers. In a similar vein, Engels and colleagues (2009) showed that alcohol advertisements in combination with movie alcohol portrayal led to increased alcohol consumption while watching. However, a few major issues in the design needed improvement. First, there was no control condition without any alcohol portrayal. Engels and colleagues (2009) included alcohol portrayals in the stimuli materials in all 4 conditions of the study to a more or lesser extent, which might have affected their results. Second, alcohol advertisements and movie alcohol portrayals were tested in the same design, so

they might have interacted and affected the results. Third, the sample was rather small, and moderators were not tested. Therefore, in a second study, Koordeman and colleagues (2011b) improved the design of Engels and colleagues's (2009) study to test the single effect of movie alcohol portrayal and found that movie alcohol portrayal increased alcohol consumption among men while watching. Nonetheless, this study tested the effects of movie alcohol portrayal rather than advertisements on alcohol use. As an important next step in this line of research and a follow-up to the 2 latter studies, the current study aimed to test the single effects of alcohol advertising by replicating the Engels and colleagues's (2009) study using an improved design. First, this study included 1 condition without any alcohol portrayal. We focused exclusively on alcohol advertisements rather than alcohol portrayals in movies. Second, we used a larger sample. Third, we tested potential moderators of alcohol use and marketing to assess whether they affected the relation between alcohol advertising and alcohol consumption.

We hypothesized that participants would drink more alcohol if exposed to alcohol ads during a movie than they would if exposed to nonalcohol ads. Further, we expected a stronger effect on drinking in heavy drinkers, as they are more susceptible to alcohol cues (Franken et al., 2003). As positive expectancies are related to higher alcohol use (Bot et al., 2005), we expected that having more positive alcohol expectancies would increase the effect of alcohol advertisements on alcohol consumption. In addition, we expected to find stronger effects of alcohol advertisements among participants who had more favorable attitudes toward the advertisements, as research has shown that positive attitudes toward alcohol advertising leads to increased intentions of young people to drink (Casswell et al., 2002). Finally, higher levels of skepticism toward the advertisements were expected to lead to lower drinking levels, as skepticism toward advertisements can affect alcohol consumption (Friestad and Wright, 1994).

## MATERIALS AND METHODS

### *Participants*

This study included 80 male college students dyads with the mean age of 21.08 ( $SD = 2.70$ ). Participants were recruited via flyers and an Internet system at Radboud University Nijmegen. In this system, students could voluntarily sign up for participation in ongoing research; however, students enrolled in certain courses of study (e.g., psychology) had to participate in experiments for a specific number of hours during their first year to obtain a course credit (Koordeman et al., 2010). All were asked to come with a friend. Students received either US\$20 or course credits. The Institutional Review Board of the Faculty of Social Sciences of the Radboud University approved the study protocol and participants submitted written informed consents.

### *Design*

This study used a randomized between-subject experimental design to compare 2 advertisement conditions (alcohol and nonalcoholic ads). Participants watched a 60-minute movie clip in dyads, interrupted by 3 advertising breaks (15 ads in total). In the alcohol

condition, each break contained 2 alcohol advertisements (Brand Beer, Amstel Beer, Warsteiner Beer, Bacardi, Jillz Cider, and Martini) and 3 neutral advertisements (e.g., promoting a car). Neutral ads were included in the experimental condition to distract participants from the exact purpose of the study. In the nonalcoholic condition, each break contained 5 neutral advertisements. In the nonalcoholic condition, the 6 alcohol advertisements were carefully replaced by nonalcoholic ads, which contained similar features as the alcohol ads (see Appendix 1 for details about the ads).

### Procedure

A semi-naturalistic home setting was created to increase ecological validity and minimize demand characteristics (Bot et al., 2005). Relaxing couches and decorations were placed in the room. Sessions were conducted Tuesday through Friday from 5 until 9 PM and lasted 1.5 hours. As a cover story, participants were told that they participated in a study in which they had to judge different documentaries. We told them that we aimed to investigate their judgments in a naturalistic setting, that we created a living room setting, and that we included advertisement breaks for that purpose. First, to further distract them from the real aim of the study, participants completed a questionnaire containing demographic questions and questions about their viewing behavior. Next, they learned they would watch a movie clip for 1 hour interrupted by 3 commercial breaks. They were told they could get free drinks from the refrigerator. Participants could choose from beer, wine, soda, or water in 20 or 25 cl bottles.

The informative movie *Planet Earth* was chosen for its emotionally neutral content (cf. Koordeman et al., 2010). Our edited movie clip did not contain human movie characters or really dramatic or humorous scenes, which could distract participants too much. After 11, 28, and 43 minutes, advertisement breaks of 2.5 minutes interrupted the movie. We did not aim to test the brand effects; hence, the brands of the alcoholic drinks offered to the participants differed from the brands promoted in the commercials.

We video recorded each session using a camera hidden in the corner of the room. The researcher observed and coded the drinking behavior in a separate observation room. We informed participants about the observations afterward. We explicitly asked participants whether they agreed to use these observations, and none of them declined. After watching the movie, participants completed a second questionnaire containing questions about the advertisements and their drinking habits. In addition, we asked participants whether they became aware of the real aim of the study. Of the participants, 15 indicated they had more or less understood the aim of the study. The remaining participants did not think alcohol was involved in the study objectives. When conducting the analyses with and without these participants, the beta coefficients did not change significantly. The mean alcohol consumption of participants who were not aware of the study's aim was 1.32 glasses compared to 1.30 glasses for those who were aware of the aim. Therefore, we decided to include these participants in the analyses. Participants who consumed more than 2 alcoholic consumptions were offered a taxi.

### Measures

**Alcohol Consumption (Observations).** The researcher coded the amount of bottles and the amount of centiliters consumed and subtracted this amount from the remaining amount in the bottle after the session ended (cf. Larsen et al., 2009). The wine offered contained 2.5 cl of pure alcohol per bottle. The beer offered contained 1.25 cl of pure alcohol per bottle. As more beer had to be consumed to equal the alcohol contained in 1 glass of wine, the total amount of beer consumed per participant was divided by 2 (i.e., based on the difference in pure alcohol between wine and beer bottles:  $2.5/1.25 = 2$ ). In addition, we subtracted the drink(s) consumed before the first commercial break from the total consumption, because these beverages

could not be affected by type of commercial exposure. We used this standardized measure as dependent variable in our analyses.

**Alcohol Consumption (Self-Reports).** Weekly alcohol consumption was tested with 2 questions: "On how many days during the past 7 days did you consume alcohol?" and "How many glasses did you drink?" In the analysis, we used the sum of the last 7 days (Hajema and Knibbe, 1993). Further, problem drinking (Cornel et al., 1994) was assessed using 6 questions with possible responses of "yes" or "no." For example, "In the past 12 months, have you tried to stop drinking without succeeding?"

**Alcohol Expectancies.** Alcohol expectancies were tested in terms of valence (negative and positive) and arousal (arousal-sedative) (Wiers et al., 2002). In the present study, we analyzed only positive and arousal expectancies. The 2 scales consist of 6 items. Participants indicated their level of agreement with the statement: "Drinking makes me....". For the positive expectancies, scale items were, for example, "fun, happy" (Cronbach's  $\alpha = 0.90$ ). For the arousal expectancies, scale items were, for example, "impulsive, energetic" (Cronbach's  $\alpha = 0.72$ ).

**Recall and Attitudes Toward the Advertisements.** Participants were asked to write down as many brands and products from as many ads as they could remember. The number of remembered ads was added to obtain the recall score for each participant.

To measure attitudes toward the advertisements, participants filled out a 9-item questionnaire in which they indicated their agreement with the statements on a 5-point Likert scale ranging from "totally do not agree" to "totally agree" (cf. Anschutz et al., 2008). Examples of items were "I found the ads interesting" and "I was aware of the presented products in the ads." The items were added together to yield a score that showed to what extent a participants' attitude toward the ads was positive. Cronbach's  $\alpha$  was 0.76.

### Skepticism

Participants indicated their level of agreement on a 4-point scale (1 never—4 very often). Examples of statements are "How often do you think an advertisement is honest?" and "How often do you believe in an advertisement message?" A mean score represented overall skepticism (Obermiller and Spangenberg, 1998). Cronbach's  $\alpha$  was 0.74.

### Strategy for Analysis

First, analyses of variance were conducted to test whether randomization was successful for age, self-reported weekly alcohol use, problem drinking, attitude toward the advertisements, skepticism toward advertising, and time and day of the week during which the experiment took place.

Second, to examine the effects of advertisement condition on alcohol consumption, we applied linear regression analysis using the software package MPLUS 5.1 (Muthén and Muthén, 1998–2007), which allows the handling of nested data. Drinking of individuals was nested within dyads. A failure to consider this could have inflated the effects. To correct for the potential nonindependence of the data, the TYPE = COMPLEX procedure was used. This procedure corrects the standard errors of the parameter estimates for dependency, leading to unbiased estimates (Koordeman et al., 2011b; Kuntsche and Jordan, 2006).

First, we tested main effects of advertisement condition. Second, we examined whether weekly drinking, problem drinking, recall, positive and arousal expectancies, attitude, and skepticism toward the commercials moderated the relation between alcohol conditions and alcohol consumption. To test the moderating effects, interaction terms of weekly drinking, problem drinking, recall, positive and

arousal expectancies, attitude, and skepticism with advertisement condition were made. Linear regression analyses were performed with the independent variable and the interaction terms. As the chi-square goodness-of-fit test is sensitive to sample size, we evaluated comparative fit index, with a cutoff value of 0.95, and root-mean-square error of approximation fit indices, with a cutoff value of 0.06 (Kaplan, 2000).

## RESULTS

### *Randomization*

Randomization checks showed no differences between the 2 advertisement conditions concerning age, self-reported weekly alcohol use, problem drinking, attitude toward advertisements, skepticism toward advertising, and time and day of the week the experiment took place ( $p > 0.05$ ). Interestingly, participants in the alcohol condition recalled more advertisements compared to participants in the nonalcohol condition,  $F(1, 157) = 39.96, p < 0.001$ . Of all participants, 26% did not consume alcohol during the experiment. The intraclass correlation for drinking within the dyads was 0.674, which means the similarity of alcohol consumption within the dyads was moderately high. Table 1 shows the means and standard deviations of the model variables for the total sample and for the alcohol and nonalcohol conditions separately.

### *Effect of Advertisement Condition on Alcohol Use*

First, we tested the main effect of advertisement condition on alcohol consumption. We did not find an effect of advertisement condition (reference category) on alcohol consumption ( $\beta = -0.060, p = 0.514$ ). The results indicated a main effect of weekly alcohol consumption ( $\beta = 0.408, p < 0.001$ ), implying that high weekly drinkers also consumed more alcohol in the laboratory. Overall, 12 participants (7.6%) did not drink alcohol in the last week and 4 participants (0.6%) did not drink alcohol in the past 12 months. We conducted the main analysis with and without these participants and did not find different effects of condition (nondrinkers included:  $\beta = -0.060, p = 0.514$  vs.

nondrinkers excluded:  $\beta = -0.052, p = 0.516$ ) and weekly alcohol consumption (nondrinkers included:  $\beta = 0.408, p < 0.001$  vs. nondrinkers excluded  $\beta = 0.448, p < 0.001$ ).

Second, we tested the role of several possible moderators in the relation between advertisement condition and alcohol consumption while watching. We did not find moderating effects of weekly alcohol consumption ( $\beta = 0.007, p = 0.627$ ), problem drinking ( $\beta = -0.266, p = 0.307$ ), positive ( $\beta = -0.149, p = 0.142$ ) or arousal ( $\beta = 0.014, p = 0.920$ ) expectancies, advertisement recall ( $\beta = -0.020, p = 0.753$ ), attitude ( $\beta = 0.013, p = 0.795$ ), or skepticism ( $\beta = -0.149, p = 0.760$ ) toward the advertisements on the relation between advertisement condition and alcohol consumption during the movie.

## DISCUSSION

The present study found no effect of TV alcohol advertising on alcohol consumption while watching a movie. In addition, we tested the potential effect of several moderators, showing no effect of weekly drinking, problem drinking, positive and arousal alcohol expectancies, advertisement recall, attitude, and skepticism toward the advertisements on the relation between alcohol advertising exposure and young adult alcohol consumption. Cross-sectional and longitudinal studies showed effects of alcohol advertising on alcohol consumption (Anderson et al., 2009; Collins et al., 2003; Nelson, 2010). Nonetheless, in line with experimental studies from the early 1980s (Kohn and Smart, 1987; Kohn et al., 1984; Sobell et al., 1986), we did not find any immediate effects of exposure to alcohol advertising on actual alcohol consumption. The results did not confirm the findings of the study of Engels and colleagues (2009), which indicated a direct relation between exposure to alcohol advertisements and alcohol consumption.

There are some possible explanations for not finding an effect of alcohol advertising on immediate drinking. First, research showed that the same ad might provoke different reactions in the same audience, depending on the program in

**Table 1.** Sample Means (M) and Standard Deviations (SD)

	Total ( $n = 159$ )	Alcohol ad condition ( $n = 80$ )	Nonalcohol ad condition ( $n = 79$ )	
	M (SD)	M (SD)	M (SD)	F-value
Alcohol consumption <sup>a</sup>	1.33 (1.17)	1.45 (1.26)	1.24 (1.02)	1.89
Weekly alcohol consumption	15.90 (12.37)	17.8 (13.4)	14.01 (11.0)	3.57
Problem drinking	1.20 (1.39)	1.32 (0.27)	1.25 (0.22)	0.089
Positive expectancies	4.52 (1.14)	4.47 (1.06)	4.45 (1.19)	0.01
Arousal expectancies	3.63 (1.15)	3.63 (1.05)	3.57 (1.08)	0.08
Recall	3.84 (2.45)	4.81 (0.99)	2.68 (1.82)	39.96*
Attitude toward advertisements	2.64 (0.61)	2.87 (0.67)	2.34 (0.56)	22.91*
Attitude toward movie	3.90 (0.52)	3.82 (0.52)	3.91 (0.52)	0.50
Skepticism toward advertisements	2.17 (0.44)	2.03 (0.38)	2.08 (0.44)	0.01

<sup>a</sup>The results are given in glasses of 15 cl.

\* $p < 0.001$ .

which it is embedded (Moorman et al., 2007; Norris and Colman, 1994). Individuals who are highly involved with the program might pay more attention to the advertisements (Moorman et al., 2007). We used a clip of the movie *Planet Earth*; a rather neutral, nonemotional documentary, which could have affected the involvement of the participants in the advertisements. It is possible that participants were not that involved in our movie and therefore were also less engaged in actively processing the advertisements, as compared to the more entertaining and involving movies used in other studies (Engels et al., 2009). In line with this, Green and Brock (2000) revealed that people who are more transported tend to agree with the message of the narrative. Transportation is defined as the extent to which a person not only attends to information but also is absorbed into the narrative flow of a story in a pleasurable and active way (Wang and Calder, 2009). Being highly transported into the storyline of a movie might lead to an increased processing of the persuasive messages in alcohol advertisements. Entertaining and more arousing movies might increase transportation and subsequently attention to the alcohol ads. In addition, especially when a movie and an ad share similar themes, that is, when they are thematically compatible, this might positively affect processing of advertisements (Wang and Calder, 2009). Both movies in Engels and colleagues' (2009) study contained alcohol cues, which might have increased the attention to the alcohol cues in the ads. On the contrary, the present study did not include thematically compatible alcohol cues in the movie. More research about how movies and advertisements interact is necessary. Future studies should test whether distinctive combinations of movies and advertisements have differential effects on alcohol consumption.

Second, besides the direct media-related context, the environmental context in which the advertising exposure takes place might also influence the immediate effects on drinking. For instance, viewers are probably more transported into both movie and advertisements in a movie theater rather than in a laboratory setting. Koordeman and colleagues (2011a) demonstrated that alcohol ads in a movie theater prior to a movie increased alcohol consumption among heavy drinkers. If people had the opportunity to drink while watching—in various theaters, people can order drinks during the movie—or immediately after watching a movie in a bar, the atmosphere of the movie theater might strengthen the attention to alcohol cues in the ads and subsequently affect alcohol consumption.

Third, the cues in the selected advertisements may have been too subtle and too few compared to the alcohol cues in the movie. Actors in the advertisements did not actually sip alcohol. They were only holding a drink, which was different from alcohol portrayal in the movies. In Dutch alcohol advertisements, it is forbidden to show people actually drinking alcohol. Perhaps people respond more strongly to seeing actors drinking alcohol rather than just to seeing the glasses, bottles, or actors holding them. Further, there were only 6 moments in which alcohol cues (6 alcohol advertisements)

were present during a 60-minute movie, which might be too few to cause a direct effect on alcohol consumption. For example, in Koordeman and colleagues (2011b) where an effect of movie alcohol portrayal on immediate alcohol consumption was found, actors were sipping alcoholic beverages 25 times in addition to several other alcohol cues (e.g., beer bottles, bar). However, this amount of advertisements is almost an overrepresentation of alcohol advertisements that people view in real life on Dutch TV (Nielsen Media Research, 2009). Moreover, higher levels of alcohol advertising would probably increase participants' awareness of the aim of the study (effect alcohol ads on alcohol consumption), which might in turn affect the results (because in this study with fewer alcohol ads, already 10% indicated that they had more or less understood the aim of the study).

## LIMITATIONS AND FUTURE DIRECTIONS

We corrected statistically for the fact that participants viewed the movie clip in dyads. However, watching the movie together with a friend could have affected young people's alcohol use and therefore limited the generalizability of the results to other situations (e.g., watching a movie alone, with a stranger, or in groups). Overall, 83% of participants reported watching movies with others. Further, exposure to alcohol advertisements prior to filling out the questionnaire might have influenced participant's answers on the alcohol items, leading to order effects. We chose to administer the questionnaire afterward to avoid participants knowing the real aim of the study before the experimental session. Moreover, alcohol-related questions beforehand could have affected drinking behavior during the experiment. Future studies could administer alcohol-related questions along with other types of lifestyle questions to disguise the true purpose of the study.

In line with this, although we simulated natural TV-viewing conditions as closely as possible within a controlled setting (e.g., Bot et al., 2005), participants were nonetheless aware that they were in a study. This awareness may have suppressed drinking levels. Of all participants, 91% did not understand the aim of the study. However, some participants might not have admitted that they knew the aim of the study, which might have affected the results. We decided to tell participants beforehand that we aimed to create a realistic TV-viewing setting and therefore included some advertisement breaks. We expected that not telling the participants about the advertisement breaks would alarm participants when the first advertising break would appear, leading to suspicion about the real aim of the study. However, future studies should replicate this study in a real-life setting (at home, movie theater) to test the effects of advertising in environments that are closer to a daily life situation.

Finally, we do not know whether fit between the brand, type of alcohol, and target group has an immediate effect on consumption while watching. It might be that exclusively showing beer ads would exert more influence on men because

beer ads are shown more frequently on TV and also because beer is popular among young male adults (Collins et al., 2003). Concerning beer ads, many people might prefer a specific kind of beer brand. Future studies could test the specific effects of different alcohol ads while showing ads targeting 1 specific alcoholic drink while serving the same alcoholic beverage.

Generally, alcohol portrayal in movies rather than advertising might be more powerful because the message is often not perceived as advertising. Currently, entertainment and advertising are often integrated. For example, movie alcohol portrayals are often used for advertising purposes (i.e., product placement) (Dal Cin et al., 2008). Young people view movies as a form of entertainment and may identify with alcohol using actors without being aware of the persuasive intent of this integrated advertising techniques (Dal Cin et al., 2009). It would be interesting to replicate this study with product placement portrayal in movies to test whether this has immediate effects on alcohol consumption.

In conclusion, the present study did not find immediate effects of alcohol advertising on alcohol consumption, not even in subgroups on which alcohol portrayals might have had more profound effects, such as heavy drinkers or people who like the ads. Does this mean that TV alcohol advertising has no effect? Experimental ecologically valid studies are well suited to test the immediate and causal effects of alcohol marketing on alcohol consumption. However, replications of this study using other samples (e.g., different countries and cultures), settings (e.g., movie theater, home), and designs (e.g., different movies and alcohol ads, cumulative exposure, extended exposure effects) are warranted. It might be that other forms of alcohol advertising (e.g., product placement in movies) have immediate effects on alcohol use. In addition, alcohol advertising might affect brand awareness while watching, which may later affect alcohol consumption by creating a social norm. Therefore, more research is needed before making firm conclusions and policy recommendations.

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## APPENDIX 1. Brief Description of the Alcohol Ads on Stimulus Tape

Amstel Beer; Easy bottle	Four men drinking Amstel beer manage to succeed in everything they want to achieve. <a href="http://www.youtube.com/user/Amstelcommercials#p/u/4/g01s8qpl-ZE">http://www.youtube.com/user/Amstelcommercials#p/u/4/g01s8qpl-ZE</a> .
Bacardi Mojito; Mojito song	Men and women dance at the rhythm of the bar tender mixing Bacardi Mojito. <a href="http://www.youtube.com/watch?v=RanV3FiGvRg&amp;feature=related">http://www.youtube.com/watch?v=RanV3FiGvRg&amp;feature=related</a> .
Brand Beer	A man cycles and drinks beer at the brewery of Brand, where he gets an explanation about the brewing of Brand Beer. <a href="http://www.youtube.com/watch?v=YxCNmrd7zWI">http://www.youtube.com/watch?v=YxCNmrd7zWI</a> .
Jillz Sparkling Cider	Four attractive men are working on the land to make cider. <a href="http://www.youtube.com/watch?v=6VBOSF__3SM">http://www.youtube.com/watch?v=6VBOSF__3SM</a> .
Martini Ice tea	A man and woman dance together while holding a Martini in their hands. <a href="http://www.youtube.com/watch?v=RFOI916s6OY">http://www.youtube.com/watch?v=RFOI916s6OY</a> .
Warsteiner Beer	A beer glass is filled with Warsteiner beer while entertaining music is playing. <a href="http://www.youtube.com/watch?v=VO2ZLB-1drw">http://www.youtube.com/watch?v=VO2ZLB-1drw</a> .

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