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# Advertising Content, Platform Characteristics and the Appeal of Beer Advertising on a Social Networking Site

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## Abstract

**Aims:** The current study was conducted to investigate how changes in the content of a social media ad, user engagement values associated with the ad and user-generated comments (UGCs) associated with the ad can influence the appeal (i.e. source appeal, informational appeal and emotional appeal) of a social media ad.

**Short summary:** Facebook beer ads that violated the guidelines of a relevant marketing code were rated as more emotionally appealing compared to Facebook beer ads that did not violated the guidelines. Increased emotional appeal in beer advertising increases the probability that the ad will be remembered and influence future drinking occasions.

**Methods:** A 2 (ad regulatory compliance: compliant vs. non-compliant) × 2 (user engagement: low vs. high) × 2 (UGC congruence: pro- vs anti-alcohol) mixed factorial experiment was conducted with 120 young adults, 21–24 years old. Each participant viewed four Facebook beer ads that were previously evaluated for thematic content and regulatory compliance. Participants were randomized to view either high or low user engagement values and either pro- or anti-drinking user-generated comments. After each ad exposure, ad appeal was assessed. Statistical analysis was conducted using hierarchical linear modeling. Models were adjusted for demographics, Alcohol Use Disorders Identification Test (AUDIT) scores and Facebook involvement.

**Results:** Source appeal ($P = 0.034$) and informational appeal ($P < 0.001$) were significantly higher among ads that were compliant with existing advertising regulations. Emotional appeal was significantly higher among ads that were non-compliant ($P = 0.004$). The effect of user engagement and UGCs were non-significant ($p$'s $> 0.05$). Additionally, AUDIT scores ($p$'s $< 0.01$) and Facebook involvement scores ($p$'s $< 0.01$) were positively associated with all forms of ad appeal.

**Conclusion:** The appeal of Facebook beer ads may be primarily determined by ad content. Increased emotional appeal in advertising caused by non-compliant advertising may increase the probability that the ad will be remembered and influence future drinking occasions.

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# INTRODUCTION

The appeal of an advertisement to the consumer is strongly associated with positive attitudes towards a product and future product purchase intentions (Petrescu *et al.*, 2015). For instance, humor, sex and informational appeals have been shown to positively increase positive attitudes towards the products depicted in advertising (Petrescu *et al.*, 2015). Similarly, positive consumer attitudes, which were created through appealing advertising, significantly increased purchase intentions of the distilled spirit vodka among a sample of Australian adults (Prentice and Handsjuk, 2016).

## Effect of prior heavy alcohol use

The notion that appealing advertising increases positive brand attitudes, which subsequently increases purchase intentions, may be particularly salient to individuals with a history of heavy alcohol use. Alcoholics may have difficulty resisting a drink after exposure to alcohol pictures, indicating pre-attentive processing and autonomic attentional focusing of alcohol information (Ingjaldsson *et al.*, 2003). Binge drinking (i.e. commonly defined as ≥5 drinks per session for men, ≥4 drinks per session for women) has been associated with higher reactivity to alcohol-related stimuli and lower reactivity to non-alcohol-related stimuli (Petit, *et al.*, 2014), and research has demonstrated that heavy drinkers or drinkers with symptoms of alcohol dependence have greater reactions to drinking contexts, such as party atmospheres, than visualization of the drink itself (Mason *et al.*, 2008).

## Alcohol advertising

Although limited, research indicates that heavy alcohol users may respond to alcohol advertising in a manner similar to generic alcohol-related cues. In a sample of undergraduate students, social drinkers attended to alcohol advertisements irrespective of content and viewed the ads as a means to receive new information, and moderate social drinkers displayed signs of cue reactivity in anticipation of alcohol-related stimuli when such stimuli were expected to occur (Cassisi *et al.*, 1998).

Several factors may moderate the responses to alcohol advertising. Ad interpretations have been found to be dependent on cognitions individuals develop about themselves and the role of advertising (Parker, 1998). For example, United States (US) college students with alcohol dependence symptoms perceived more drinking among male characters depicted in alcohol ads than female characters (Proctor *et al.*, 2005), and Brazilian teenagers with a history of alcohol consumption viewed alcohol ads more positively than non-drinking teens (Vendrame *et al.*, 2009).

## Alcohol advertising on social networking sites (SNSs)

An alcohol SNS ad is a SNS post published by an alcohol brand on a corporate-sponsored alcohol-branded SNS account, and in the past decade, alcohol advertising on SNSs has proliferated (Lobstein *et al.*, 2017). For instance, the top 20 Australian alcohol brands had 2.5 million Facebook followers by the end of 2012, and the followers Liked, Shared, or Comments on an SNS ad 2.3 million times. Also, in 2012, 1017 Facebook pages were located for 898 unique alcohol brands in the US.

## Regulation of alcohol advertising

Although specific alcohol marketing regulations vary by political jurisdiction, in the US and elsewhere, alcohol marketing is self-regulated. In these systems, the alcohol or advertising industries have created a set of marketing regulations, implemented the regulations and adjudicate complaints that ads may have violated the regulations without significant input from government agencies or public health organizations (Campbell, 1999). SNS advertising is similarly regulated, with all major alcohol producers agreeing to follow a code of digital marketing practices that includes content restrictions for SNS alcohol advertising (IARD, 2014).

## Attitudes toward SNS advertising

SNS platforms allow SNS users to interact with advertising in multiple ways. First, users can indicate their support of an ad message through the user engagement functions, such as Facebook's 'Like' button. Second, users can write a user-generated comment (UGC) in direct response to an SNS ad. The ability to interact with SNS advertising was the strongest predictor of favorable ad attitudes among a sample of young adults (Deraz *et al.*, 2015).

## Purpose and hypotheses

SNS platforms are an inherently different mode of marketing communication than traditional media platforms. In addition to the ad message, the interactivity of the SNS platforms allows SNS users to directly interact with the ad publishers and observe how others have responded to the ad. For those reasons, the current study investigated how changes in the ad content, user engagement values and UGCs can influence the appeal of an SNS alcohol ad. Ad appeal included source appeal (i.e. the perceived attractiveness of the message senders), informational appeal (i.e. the appeal of a product's qualities) and emotional appeal (i.e. how the emotions of the audience change in response to an ad). It was hypothesized that ads that were non-compliant with the content guidelines of a self-regulated alcohol advertising code, ads associated with high user engagement values and ads associated with pro-drinking user-generated comments would be perceived as having greater appeal.

# METHODS

The study utilized a 2 (ad regulatory compliance: compliant vs. non-compliant) × 2 (user engagement: low vs. high) × 2 (UGC congruence: pro- vs. anti-alcohol) mixed factorial design. User engagement values and UGC congruence were manipulated between subjects. Ad regulatory compliance was manipulated within subjects.

## Participants

In all, 120 young adults participated. The inclusion criteria included being 21–24 years old, living in the US, and having Internet access. Participants were recruited through Amazon's Mechanical Turk (AMT), which is an online crowdsourcing service where anonymous individuals complete web-based tasks for small sums of money.

Participant recruitment occurred in two stages. First, a public invitation to complete a screening survey was posted on AMT. Respondents were reimbursed $0.05 through AMT for completing the screening survey. Second, individuals who met the inclusion criteria were sent a private invitation to participate and those who completed the study were reimbursed $10.00. Of the 1759 individuals who were screened, 200 (11%) met the inclusion criteria, of which 120 (60%) completed the study.

## Ad content

Ad content was determined based on the compliance of a Facebook beer ad with a model self-regulated alcohol advertising code. Ad regulatory compliance was defined as following all regulations within the said code. For example, non-compliant advertisements may promote the excessive consumption of beer or promote the idea that alcohol is needed for positive social experiences. Four Facebook beer advertisements, previously evaluated for thematic content and compliance with a model self-regulated alcohol advertising code, were included (Noel and Babor, 2017). Two ads were published by Budweiser, and two ads were published by Bud Light. Facebook was selected because it is the largest SNS in the US (Statista, 2016), and is the most popular SNS among teens and young adults (Lenhart, 2015). Budweiser and Bud Light were selected because they were the official beer brands of the 2015 National Football League Super Bowl, which was selected as an anchor point because it was the largest US advertising event of 2015 (Schneider, 2015). One Budweiser and one Bud Light ad were compliant, and non-compliant, with a model self-regulated alcohol advertising code, respectively. Each compliant ad was matched with a non-compliant ad based on brand and thematic content.

## User engagement

Facebook posts are associated with several indicators of user engagement, including the number of Likes, Shares and Comments, and user engagement was defined as the total number of Likes, Shares and Comments. As such, each ad included in the study was associated with a unique set of user engagement values. The user engagement values used were real-world values taken from the Budweiser and Bud Light Facebook ads that were evaluated in a previous study (Noel and Babor, 2017). Participants were randomized to view either very high or very low user engagement values. Extreme values were selected to increase the probability that between-group differences in ad appeal could be detected.

## UGC congruence

Facebook posts are associated with UGCs, and UGCs were defined as comments left by Facebook users in response to a Facebook beer ad. In the current study, each beer ad was associated with two unique comments, which mimicked the current Facebook format. Participants were randomized to view either pro-drinking or anti-drinking UGCs. These comments were real-world comments written by Facebook users in response to a previously evaluated Budweiser or Bud Light Facebook ad (Noel and Babor, 2017) and were selected based on the results of a thematic content analysis, which was conducted by 2 raters ($\kappa_{pooled} = 0.785$) (Supplementary Tables 1 and 2). Participants who viewed pro-drinking comments viewed one 'positive consequences' of drinking and one 'past drinking' comment. Participants who viewed anti-drinking comments viewed one 'negative consequences' of drinking and one 'abstinence/sobriety' comment. Extreme comments were selected to increase the probability that between-group difference in ad appeal could be detected.

Sample combinations of ads, user engagement values and UGCs are included in Supplementary Figure 1.

## Ad appeal

Ad appeal was assessed using the Persuasive Disclosure Inventory (PDI), which consists of 17 semantic differential items measuring a viewer's impressions of a recently seen advertisement (Feltman, 1994).

The PDI contains three sub-scales: source appeal (five items), informational appeal (five items) and emotional appeal (seven items). Source appeal measures the perceived attractiveness of the message senders (i.e. Bud Light and Budweiser) ($\alpha$'s = 0.89–0.94). Informational appeal measures the appeal of the product qualities displayed in the ad ($\alpha$'s = 0.87–0.89). Emotional appeal measures how much the emotions of the participant were changed based on the content of the ad ($\alpha$'s = 0.89–0.93). The change in emotions was non-specific (e.g. 'does not touch me emotionally' to 'touches me emotionally') and could have been interpreted by the participant to be either positive or negative. Total ad appeal is the combination of source, informational and emotional appeal ($\alpha$'s = 0.93–0.94). The PDI was completed after each ad exposure, and respondents were instructed to pick the response that best describes the Facebook ad they just saw on visual-analog scales (VAS), whose response options ranged from 0 to 100.

## Covariates

Demographic characteristics included age, sex, race, ethnicity, household income and marital status. Alcohol use history was measured using the Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993), which consists of 10 questions about past year alcohol use, alcohol dependence symptoms and harmful effects ($\alpha = 0.83$). AUDIT scores of 0–7 signify abstinence or low-risk drinking. AUDIT scores from 8–15 indicate drinking above low-risk guidelines, defined as <5 drinks per session or <14 drinks per week for men and <4 drinks per session or <7 drinks per week for women (CDC, 2016), and scores of 16–19 indicate hazardous alcohol use. Alcohol dependence is suggested with AUDIT scores are ≥20. Facebook involvement was assessed using a 29-item questionnaire based on the technology acceptance model and designed specifically for use with Facebook ($\alpha = 0.93$) (Rauniar et al., 2014).

## Study Procedures

After accepting the invitation to participate, eligible participants provided consent by affirmation. Participants viewed the same four Facebook beer ads, but the user engagement values and UGCs associated with the Facebook beer ads varied between groups. Participants were randomized into one of four between-subjects groups based on used engagement and UGCs (i.e. high user engagement/pro-drinking UGCs, low user engagement/pro-drinking UGCs, high user engagement/anti-drinking UGCs and low user engagement/anti-drinking UGCs). The four Facebook beer ads were viewed sequentially and were ordered using a Latin Square design, ensuring each group viewed the ads in a unique order. The PDI was completed after each Facebook ad exposure. After viewing the ads, participants answered the demographic, Facebook involvement and AUDIT questions. The UConn Health Institutional Review Board approved all study procedures.

## Statistical analysis

The analysis was conducted using hierarchical linear modeling (HLM). Two-level HLM models were specified. The within-subjects effect of ad content was included at Level 1. Level 2 consisted of the user engagement groups, the UGC groups and the covariates. In the unadjusted and adjusted models, the ad content, user engagement and UGC variables were contrast coded, where non-compliant ads, high user engagement and pro-drinking UGCs equaled 1/2. Compliant ads, low user engagement and anti-drinking UGCs equaled −1/2. The within/between interactions were specified by including the between-subjects variables as independent variables of

the Level 1 ad content slope. In the adjusted model, sex, race, ethnicity and marital status were dummy coded, with men, white, non-hispanic and single, never married used as the reference groups. Race and marital status were collapsed due to low numbers of racial minorities and non-single individuals. Age and income were treated as continuous variables and were grand-mean centered.

Separate random-intercept/random slope models were specified for total ad appeal and each appeal sub-scale. Total ad appeal was defined as the aggregate score of all PDI items. Each sub-scale was calculated as the aggregate score of the responses associated with that sub-scale. The items in each sub-scale were mutually exclusive. The distribution of the dependent variable was specified as normal (skew $_\text{PDI total}$ (SE) = −0.16 (0.11), $z = −1.45$, $P = 0.07$) with an identify link function. Full maximum likelihood estimation and a homogeneous covariance structure were used. Changes in model fit from the unadjusted to adjusted models were assessed using the $\chi^2$ difference test. Statistical significance was set at 0.05 *a priori*. Intra-class correlations were determined from the unconditional models. The analysis was performed using HLM for Windows Version 7.01 (Scientific Software International, Inc., Skokie, IL).

## RESULTS

### Participant Characteristics

Participants' mean age was 22.7 years; a slight majority (50.8%) was male; 68.3% were Caucasian; and 86.7% were non-Hispanic. Median household income was $40,000–$49,999 per year, and 88.3% of participants were single, never married. Mean AUDIT and Facebook involvement scores were 5.8 and 82.3, respectively. When comparing demographic and behavioral characteristics across study conditions, no statistically significant differences were found ($p$'s > 0.05). Two participants had missing data at level 2 of the HLM models and were excluded from the final HLM analysis.

### Total Ad appeal

Mean ad-specific scores for total ad appeal ranged from 693 to 865 across the ads ($\bar{x}_\text{total} = 790.5$), and ICC = 0.47 in the unconditional model. In the unadjusted model, neither ad content ($P = 0.192$), user engagement ($P = 0.580$) nor user-generated comments ($P = 0.264$) were significantly associated with changes in total ad appeal (Table 1).

None of the interaction terms were statistically significant ($p$'s > 0.05). Similar results were observed in the adjusted model (Table 2).

### Source appeal

Mean ad-specific scores for source appeal ranged from 247 to 299 ($\bar{x}_\text{source} = 280.8$), and ICC = 0.49 in the unconditional model. In the unadjusted model, source appeal was approximately 5% lower among ads that were non-compliant with a self-regulated alcohol advertising code ($P = 0.034$), but approximately 11% higher in the pro-drinking user-generated comments group ($P = 0.039$) (Table 1). The main effect of user engagement and the interaction terms were not statistically significant ($p$'s > 0.05). These relationships were maintained in the adjusted model (Table 2).

### Informational appeal

Mean ad-specific scores for informational appeal ranged from 184 to 286 ($\bar{x}_\text{info} = 244.5$), and ICC = 0.28 in the unconditional model. Informational appeal was 17.5% lower among ads that were non-compliant with a model self-regulated alcohol advertising code compared to compliant ads ($P < 0.001$) (Table 1). The main effects of user engagement and user-generated comments, along with the interaction terms, were non-significant ($p$'s > 0.05). The main effect of ad content remained statistically significant in the adjusted model (Table 2).

### Emotional appeal

Mean ad-specific scores for emotional appeal ranged from 216 to 295 ($\bar{x}_\text{emo} = 265.3$), and ICC = 0.49 in the unconditional model. Emotional appeal was approximately 11% greater among non-compliant ads compared to compliant ads ($P = 0.004$), although the main effects of user engagement and user-generated comments, and the interaction terms, were non-significant ($p$'s < 0.05) (Table 1). In the adjusted model, the effect of ad content on emotional appeal remained statistically significant (Table 2).

### Additional findings

AUDIT scores were significantly associated with all forms of ad appeal. Each 1 unit increase in AUDIT scores resulted in a 1.4%

**Table 1.** Unadjusted HLM results for the effects of ad content, user engagement and user-generated comments on ad appeal

| Variable | Total ad appeal | | Source appeal | | Informational appeal | | Emotional appeal | |
|---|---|---|---|---|---|---|---|---|
| Fixed effects | $\beta$ | $P$ | $\beta$ | $P$ | $\beta$ | $P$ | $\beta$ | $P$ |
| For intercept | | | | | | | | |
| High user engagement | 25.3 | 0.580 | 11.6 | 0.455 | 10.3 | 0.451 | 3.4 | 0.882 |
| Low user engagement | | | | | | | | |
| Pro-drinking user-generated comments | 51.2 | 0.264 | 32.2 | 0.039 | 10.4 | 0.445 | 8.5 | 0.713 |
| Anti-drinking user-generated comments | | | | | | | | |
| User engagement by user- generated comments | 34.5 | 0.706 | 31.1 | 0.318 | 12.1 | 0.657 | −8.6 | 0.852 |
| For slope | | | | | | | | |
| Non-compliant ads | −28.2 | 0.192 | −15.4 | 0.034 | −42.8 | <0.001 | 30.1 | 0.004 |
| Compliant ads | | | | | | | | |
| User engagement by ad content | 36.0 | 0.403 | 10.3 | 0.475 | 16.3 | 0.327 | 9.5 | 0.648 |
| User-generated comments by ad content | 3.2 | 0.941 | 1.1 | 0.939 | −2.5 | 0.879 | 4.6 | 0.825 |
| User engagement by user-generated comments by ad content | −54.2 | 0.529 | −47.9 | 0.098 | −28.2 | 0.395 | 21.9 | 0.598 |
| Random effects | $\chi^2$ | $P$ | $\chi^2$ | $P$ | $\chi^2$ | $P$ | $\chi^2$ | $P$ |
| Intercept | 536.9 | <0.001 | 551.2 | <0.001 | 326.3 | <0.001 | 594.7 | <0.001 |
| Slope | 89.8 | >0.500 | 93.4 | >0.500 | 92.8 | >0.500 | 92.0 | >0.500 |

**Table 2.** Adjusted HLM results for the effects of ad content, user engagement and user-generated comments on ad appeal

| Variable | Total ad appeal | | Source appeal | | Informational appeal | | Emotional appeal | |
|---|---|---|---|---|---|---|---|---|
| Fixed Effects | $\beta$ | $P$ | $\beta$ | $P$ | $\beta$ | $P$ | $\beta$ | $P$ |
| For Intercept | | | | | | | | |
| High user engagement | 9.2 | 0.809 | 4.7 | 0.724 | 4.3 | 0.709 | −0.5 | 0.978 |
| Low user engagement | | | | | | | | |
| Pro-drinking user-generated comments | 72.6 | 0.060 | 35.5 | 0.009 | 14.6 | 0.215 | 18.2 | 0.370 |
| Anti-drinking user-generated comments | | | | | | | | |
| User engagement by user-generated comments | 17.7 | 0.815 | 26.4 | 0.319 | 6.9 | 0.766 | −4.5 | 0.910 |
| Age | −22.1 | 0.213 | −4.3 | 0.486 | −3.8 | 0.486 | −18.0 | 0.056 |
| Female | −101.2 | 0.013 | −9.4 | 0.499 | −30.8 | 0.013 | −59.9 | 0.005 |
| Male | | | | | | | | |
| Non-white | 53.5 | 0.203 | 2.9 | 0.843 | 17.2 | 0.179 | 36.7 | 0.098 |
| White | | | | | | | | |
| Hispanic | 50.3 | 0.373 | 25.4 | 0.198 | 12.2 | 0.477 | 22.5 | 0.450 |
| Non-hispanic | | | | | | | | |
| AUDIT | 163.2 | <0.001 | 4.0 | <0.001 | 2.7 | 0.009 | 6.7 | <0.001 |
| Facebook involvement | 5.5 | <0.001 | 1.9 | <0.001 | 1.9 | <0.001 | 1.7 | 0.006 |
| Income | 5.2 | 0.392 | 3.1 | 0.150 | −0.6 | 0.762 | 1.4 | 0.651 |
| Married, divorce, separated, widowed | 132.7 | 0.039 | 48.3 | 0.031 | 34.3 | 0.079 | 48 | 0.154 |
| Single, never married | | | | | | | | |
| For slope | | | | | | | | |
| Non-compliant Ads | −28.2 | 0.192 | −15.4 | 0.034 | −42.8 | <0.001 | 30.1 | 0.004 |
| Compliant Ads | | | | | | | | |
| User engagement by Ad content | 36.0 | 0.403 | 10.3 | 0.475 | 16.3 | 0.327 | 9.5 | 0.647 |
| User-generated comments by Ad content | 3.2 | 0.941 | 1.1 | 0.939 | −2.5 | 0.879 | 4.6 | 0.825 |
| User engagement by user-generated comments by Ad content | −54.2 | 0.529 | −47.9 | 0.098 | −28.2 | 0.395 | 21.9 | 0.597 |
| Random Effects | $\chi^2$ | $P$ | $\chi^2$ | $P$ | $\chi^2$ | $P$ | $\chi^2$ | $P$ |
| Intercept | 355.9 | <0.001 | 387.2 | <0.001 | 228.0 | <0.001 | 427.5 | <0.001 |
| Slope | 89.7 | >0.500 | 93.6 | >0.500 | 92.9 | >0.500 | 91.7 | >0.500 |
| Model Fit[a] | $\chi^2_\Delta$ | $p$ | $\chi^2_\Delta$ | $p$ | $\chi^2_\Delta$ | $p$ | $\chi^2_\Delta$ | $p$ |
| | 51.0 | <0.001 | 51.2 | <0.001 | 45.4 | <0.001 | 38.0 | <0.001 |

[a]Compared to unadjusted models.

increase in source appeal ($P < 0.001$), a 1.1% increase in information appeal ($P = 0.009$) and a 2.5% increase in emotional appeal ($P < 0.001$) (Table 2). Similarly, Facebook involvement scores were associated with all forms of ad appeal. Each 1 unit increase in Facebook involvement resulted in a 0.7% increase in source appeal ($P < 0.001$), a 0.8% increase in information appeal ($P < 0.001$) and a 0.6% increase in emotional appeal ($P = 0.006$). Moreover, informational appeal ($P = 0.013$) and emotional appeal ($P = 0.005$) were significantly lower among females compared to males.

## DISCUSSION

The appeal of beer advertising published on Facebook may be determined primarily by ad content. Specifically, ads that were non-compliant with a model self-regulated alcohol marketing code were rated significantly lower on source and information appeal while scoring significantly higher in emotional appeal. The findings indicate that SNS ad appeal may be more nuanced that originally predicted.

### Emotion in advertising

By voluntarily placing restrictions on the content of alcohol advertising, the alcohol industry tacitly suggests that ads that are in violation of such restrictions may be harmful to public health. The results presented here suggest that non-compliant beer ads significantly increase the emotional appeal of the ad, which enhances the probability that the ad will be remembered by the viewer (LeBlanc *et al.*, 2015). Similar results have occurred when comparing emotional versus neutral music (Eschrich *et al.*, 2008).

Memory for emotional beer advertising may be enhanced due to increased attention paid to the ad (Talmi and McGarry, 2012). Emotion can increase the attention paid to a cue, and more neural processes are used when encoding an emotional cue into memory (Cona *et al.*, 2015). The additional neural resources devoted to emotional cues result in preferential memory encoding for emotional information compared to neutral information (Yick *et al.*, 2016), which, in turn, increases the likelihood an emotional cue will be stored in long-term memory. Emotional information also requires significantly less overt attention paid to the stimulus, and such information is remembered more accurately, even after very brief exposures (Kensinger *et al.*, 2016).

### Effectiveness of alcohol advertising self-regulation

Emotionally appealing beer advertising is only relevant if such ads are likely to be regularly published. That is, the role of emotion in beer advertising is relevant only if regulatory non-compliance among beer advertising is highly prevalent. Unfortunately, such a scenario likely exists. The non-compliance rate among a sample of Facebook beer

ads was 82% (Noel and Babor, 2017), and a systematic review reported rates as high as 74% for alcohol-branded websites and 86% for alcohol ads broadcast on television (Noel *et al.*, 2017). The review also concluded that alcohol advertising self-regulation fails to protect vulnerable populations from potentially harmful alcohol ads.

Interestingly, the findings suggest that alcohol advertising self-regulation may fail because of poor implementation and enforcement. As demonstrated here, ads that are compliant with the spirit of the codes were rated significantly lower on emotional appeal and significantly higher on source and informational appeal, which is ideal from a public health perspective within the context of the US alcohol advertising regulatory structure. However, with high non-compliance rates reported in previous studies, advertising self-regulatory systems may lack proper implementation controls (e.g. pre-screening and enforcement) and deterrents for non-compliance.

### Suppression of public health messages

A high prevalence of emotional alcohol advertising, as indicated by high non-compliance rates, may suppress the impact of health promotion information presented before or after an alcohol ad is viewed (Knight and Mather, 2009). In studies of word lists, immediate recall of neutral words was suppressed if surrounded by emotional words (Hadley and MacKay, 2006). Others have shown that recall of neutral pictures was reduced when interspersed with emotional items (Watts *et al.*, 2014). These effects occur because increased attention is paid to the emotional stimulus at the cognitive level, and the efficiency at which items immediately before and after the emotional stimulus are remembered is significantly reduced (Schmidt and Schmidt, 2016).

### Secondary findings

AUDIT scores were positively associated with ad appeal, which may reflect a predilection among heavy alcohol users towards stronger psychological responses to alcohol advertising regardless of content or context. This result is consistent with the findings of cue exposure studies showing that heavy alcohol users have increased levels of craving after exposure to alcohol and alcohol-related cues (Mason *et al.*, 2008). AUDIT scores reflect personal drinking histories, and future research is needed to determine whether heavy drinking increases ad appeal, persons who find the ads appealing then become heavy drinkers, or a combination of both mechanisms.

Facebook involvement scores were also positively associated with ad appeal. This finding is consistent with research demonstrating that individuals who actively engage with SNSs have more favorable attitudes towards SNS advertising (Akar and Topçu, 2011).

Finally, females perceived the ads to contain less informational appeal and less emotional appeal. These findings are consistent with statements made by marketing executives employed by A-B InBev, the producer of Budweiser and Bud Light, indicating that their digital advertising is targeted at young men, not young women (Dupre, 2013). However, the findings do not preclude the possibility that females could be affected by SNS advertising, especially if an alcohol brand specifically targets women. Under those conditions, the direction of the significant sex associations seen here may be reversed.

### Limitations

There are several limitations to this study. A relatively small sample size was used, largely due to limited resources available to conduct the study. Because ad content was a within-subjects comparison, it is possible that study participants could have guessed the purpose of the study, which would have influenced future responses, although this is considered unlikely because the ads within the same brand were carefully matched for content. Participants may have purposefully responded differently to Budweiser and Bud Light ads, but this would likely bias the results towards the null since the comparisons of interest were across brands, not within brands. The study also relied on self-report, and it was not possible to verify the truthfulness of participant responses. Furthermore, the sample used in the study may not be representative of the population of SNS users who would encounter alcohol advertising. Additional research using representative samples is needed. The study was limited by the number of matched ads that were included, and different results could occur if other ads, brands and types of alcohol were included. The 'non-compliant' ads include a variety of thematic content elements, and it was not possible to isolate the effect of any specific element. For these reasons, appropriate caution is needed when generalizing the results.

## CONCLUSIONS

Non-compliance with a model self-regulated alcohol advertising code was associated with increased emotional ad appeal and decreased informational and source appeal. Based on previous research, non-compliant ads may be more likely to be remembered and recalled than compliant ads. Non-compliant ads may also decrease the effectiveness of public health messaging that accompanies the ad. The current findings, combined with previous work, also suggest that alcohol advertising self-regulation has failed due to poor code implementation and enforcement.

## SUPPLEMENTARY MATERIAL

Supplementary material is available at *Alcohol and Alcoholism* online.

## CONFLICTS OF INTEREST STATEMENT

None declared.

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