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Display of Alcohol Use on Facebook: A Content Analysis

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Abstract

The present study has two main objectives. First, to examine how alcohol use is portrayed in the visual and textual references on Facebook, and second, to determine how friends react to these alcohol-related postings. A theoretically based content analysis of 160 Facebook profiles generated 2,575 pictures and 92 status updates referring to alcohol use, which represented about 6.50% of the pictures in the total sample and 2.90% of the status updates. These visual and textual references, as well as the peer reactions to these posts, mostly referred to alcohol use in a positive context (72.23% of the pictures and 72.83% of the messages). Furthermore, multiple regression analyses identified the number of Facebook friends and the number of status updates referring to alcohol use as significant predictors of the total number of uploaded pictures containing alcohol use. The results of this study are discussed within the framework of expectancy models of behavior and media effects theories, and show that alcohol-related references are quite common, while negative reactions to these posts are seldom. Further research into the effects of these visual and textual messages is warranted.

Introduction

Over the last decade, a growing number of scholars have uttered their concerns about the portrayal of alcohol consumption in the media and the effects of these portrayals.[1–4] Despite the growing interest in this relationship, one source of potential influence has remained largely unexamined, namely social media. Therefore, this work examines the portrayal of alcohol use on one specific social networking site—Facebook. In particular, the two main objectives of the present study are, first, to examine how alcohol use is depicted and referred to in a sample of Belgian Facebook profiles, and second, to examine how people react to the references made to alcohol use on Facebook. Profound knowledge of the portrayal of alcohol on social networking sites is vital for several reasons.

Several recent studies evidenced that almost all young people use Facebook for a number of hours a week.[5,6] Social media have different features from more traditional media such as television in that they allow users to both create and display content.[7] For instance, on Facebook a web profile can be created in which users display certain aspects of their life and personality by uploading pictures, texts, and videos, and by commenting on their friends' profiles. As such, Facebook provides a venue for identity exploration and interaction with friends.[8] These specific attributes, together with the fact that social networking sites can easily be accessed everywhere nowadays through the use of different platforms such as computers and smart phones, increase the chances that these sites affect their users. Through the use of social networks users receive feedback on their own behavior, see which behaviors are exhibited by their peers, and how others react to these behaviors. As such, they create and maintain certain expectations, norms, and behaviors.[8–9] This is important, especially in regard to displaying alcohol use, because a consistent body of research has identified alcohol expectancies (defined as the perceived outcomes of alcohol consumption) and perceived peer drinking as predictors of alcohol use.

A series of behavioral theories, including expectancy models of behavior,[10] theory of planned behavior,[11] and social learning theory,[12] has emphasized that people's expectancies toward the outcome of a specific behavior will influence their engagement in the same behavior.[13,14] It has been argued that perceived positive outcomes of a certain behavior are often more immediate and powerful in influencing behavior than perceived negative outcomes.[10,12,15] Moreover, research has identified these expectancies as one of the pathways through which media use might affect alcohol consumption.[16–18.] Another factor that has been identified as one of the pathways through which media use influences alcohol consumption is peer alcohol use.[17] The perception of peer alcohol use has been consistently found to predict alcohol consumption and drinking onset.[19–22]

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Following these theories, and given the specific attributes of social networking sites, the use of these sites might be more strongly associated with alcohol consumption than other media. However, before these effects are examined, it is imperative that we gather profound knowledge of the depiction of alcohol use on Facebook.

Only a limited number of studies have examined the portrayal of risk behavior on social media.[7–8,23] Moreno et al.[7–8] analyzed a variety of health-risk behaviors on MySpace. These studies reported that between 37% and 56% of the analyzed Web sites contained references to substance use, with males displaying more alcohol use than females. In a third study on an all-male sample of Facebook profiles, Egan and Moreno[23] found alcohol references on 85% of the profiles. The number of references was associated with the number of Facebook friends.

The present study adds to this literature in a number of ways. First, following expectancy models of behavior, theory of planned behavior, and social learning theory, it is important to not only assess the mere presence of alcohol use on social networking sites, but also to know *how* the alcohol use is depicted. After all, research shows that media use may affect alcohol expectancies, and that positive expectancies are a better predictor of alcohol use than negative expectancies.[10] Second, given the central role of peers' norms, it is also crucial to know how peers react to this alcohol-related content on Facebook. Therefore, the following research questions are addressed in this work:

RQ1: How is alcohol use depicted on Facebook?

RQ2: How do peers react to alcohol-related content on Facebook?

These questions are examined among a sample of Belgian Facebook profiles. Previous research on the representation of alcohol use on social networking sites was conducted on U.S. Facebook or MySpace profiles.[7,8,23] Yet, as has been discussed by Egan and Moreno,[23] generalization to other populations is unknown. Alcohol policies, consumption rates, and acceptance differ substantively across countries and even across different populations within one country.[24–27] In Belgium, the minimum legal drinking age is 16 (compared to 21 in the United States), and the consumption of alcohol is generally not considered to be deviant. The estimated cumulative incidence of alcohol use by the age of 15 is 67%, compared to 50% in the United States. By the age of 21, this percentage increases to 89% in Belgium and to 93% in the United States.[28] Cultural differences have also been found in the extent to which certain factors predict alcohol use.[24] For instance, Farhat and colleagues[25] reported that the association among perceived peer use and adolescent use differed among countries and assumed that these differences could be explained by variations in drinking culture, policies, values, and norms.[25] Given these cultural differences, variations may also exist in the extent to which people refer to alcohol use on social network sites. Therefore, the present study aims to examine the depictions of alcohol use on Belgian Facebook profiles and how peers react to this content.

Methods

A sample of Belgian Facebook profiles was used for the present study. In line with previous research,[29–31] a goal sample size of 160 profiles was chosen. In order to gain access to these profiles, a new Facebook profile was constructed by a research assistant (second author). Through this profile, friend requests were sent to 166 college students. In these requests, it was explained that the research assistant was looking for participants for a scientific study (master's thesis) on Facebook uses, and that he therefore wanted to gain access to their profile. Confidentiality of the gathered data was assured and those who accepted (115) the request were encouraged to forward it to other acquaintances with Facebook profiles. This sampling method was used until access was gained to a sample of 160 profiles.

After developing a codebook based on a test sample of profiles, the definitive sample was content analyzed by a trained research assistant. This sample consisted of 83 female and 77 male profiles, born between 1958 and 1996 (median = 1990), and with 426.37 (SD = 189.97) Facebook friends on average. All profiles were analyzed once online; for privacy purposes these profiles were not retained in any form and identifying personal information was not used. In order to assess inter-rater reliability, a random sample of 20 profiles (12.5%) was simultaneously coded by a second trained coder (Cohen's kappa) (Table 1).

Table 1 gives a detailed overview of the code book, containing three levels. First, summarizing data on the level of the profile was collected. Next, every picture containing references to alcohol, as well as picture comments, was coded. Thereby, a distinction between profile and personal pictures was made, while it has been argued that profile pictures contain less risk-taking.[29] Finally, a last dataset that contained information on the textual references (status updates) that were made to alcohol use, and the comments to these references, was constructed. Given that we wanted to avoid the overrepresentation of frequent and active Facebook users, for each profile the 20 last status updates were coded. All data were analyzed using SPSS 20.0.

Results

Descriptive analyses

Pictures. The sample of 160 profiles included 36,339 personal (mean = 227.12, SD = 177) and 3,084 profile pictures (mean = 19.28, SD = 15.46), of which 2,370 personal and 205 profile pictures portrayed alcohol use in one way or another. Thus, about 6.50% of the pictures in the sample referred to alcohol use. Only 4.38% of the profiles (7 out of 160) contained no pictures in which references to alcohol use were made. The remaining profiles displayed 2,575 pictures containing alcohol use, or, in other words, per profile on average 16.96 (SD = 12.30) pictures that referenced alcohol use were found. In 86.40% of the pictures containing alcohol use, this use was shown in an implicit way. Explicit consumption was found in 10.22% of the cases. In 3.38% of the cases, the logo of a specific alcohol brand was present. Alcohol use was shown in a positive context in the large majority of the pictures (72.23%), whereas it was depicted in a negative context in only 1.90%, neutral in 23.22% of the cases, and impossible to discern in 2.64%.

Comments on a particular picture were given in 25.83% of the pictures containing alcohol use, and the comments seemed to be positive in 87.21% of the cases, negative in 5.41%, and neutral in 7.37%. On average, one reaction (mean = 0.76, SD = 1.96) and/or one "like" (mean = 0.67, SD = 1.77) were given on each picture containing risk behavior. Furthermore, the

Table 1. Code Book

Variables	*Variable coding*
Level of the profile	
ID number, sex, age, number of friends, relationship status, total number of photos, total number of photos containing alcohol use, total number of profile pictures, total number of profile pictures containing alcohol use, total number of status updates, total number of status updates with references to alcohol use	
Level of the personal/profile picture (all pictures, including self-uploaded pictures and pictures uploaded by others, containing alcohol are analyzed)	
ID picture	Number
Profile picture versus regular photo	(1) Profile picture (2) Regular picture
Time of day	(1) Day,(2) Night, (3) Unknown
Number of persons on picture	(1) Alone (2) With others
Type of use[32]	(1) Implicit use, e.g., a picture of a person holding a beer (2) Explicit use, e.g., a picture of someone drinking a beer (3) Alcohol logo, e.g., a picture containing a label of an alcoholic beverage, for instance, on a T-shirt, or a picture of a beer without people in the picture
Evaluation of use	(1) Positive: the picture shows alcohol use in a positive context, e.g., a picture showing someone proposing a toast to someone with a smile on his or her face (2) Negative: the picture shows alcohol use in a negative context, e.g., a picture showing someone looking disapprovingly at a drunk person (3) Neutral: the picture shows alcohol use in a neutral context, e.g., no explicit emotion on face (4) Unknown: impossible to discern based on the picture, e.g., when no face is shown
Number of comments	Number
Number of "likes"	Number
Tone of comments	(1) Positive, e.g., "Great picture! Desperados for the win" (2) Negative, e.g., "Outrageous, you're not doing so well" (3) Neutral, e.g., "What are you drinking in that picture? I've been to that club too" (4) No comments
Level of the status updates (text references; only if status update refers to alcohol use)	
ID update	Number
Time of day	(1) Day (between 6 a.m. and 6 p.m.), (2) Evening (between 6 p.m. and 12 p.m.), (3) Night (between 12 p.m. and 6 a.m.)
Context use	(1) Message refers to profile owner only, (2) Message also refers to others, (3) Impossible to discern
Type of reference[7]	(1) Explicit reference to drinking alcohol, e.g., "I love champagne" (2) Explicit reference to alcohol abuse, e.g., "Completely wasted yesterday night," (3) Figurative use, e.g., song lyrics or quote
Tone of reference	(1) Positive, e.g., "I feel like getting loaded tonight" (2) Negative, e.g., "Drank way too much yesterday" (3) Neutral, e.g., "Going to the bar tonight" (4) Unknown, impossible to discern based on the message
Number of comments	Number
Number of "likes"	Number
Tone of comments	(1) Positive, e.g., "Nice! We will drink together tonight" (2) Negative, e.g., "I told you to drink less" (3) Neutral, e.g., "Did you have a good time?" (4) No Comments

Intercoder reliability was assessed with Cohen's kappa. This measure was higher than 0.90 for all the variables, except for the assessment of the "evaluation of use" (kappa = 0.81) and "type of use" (0.89).

analyses showed that most pictures (73.94%) were taken during the evening or night, for 9.94% of the pictures the time of day was indiscernible. In 86.52% of the pictures depicting alcohol, people were portrayed together with others.

Text references. Text references to alcohol use appeared to be less common than pictures referring to alcohol use. On a total of 3,200 messages, 92 messages referring to alcohol use were identified (2.87%). On 61.25% of the profiles, no update referring to alcohol use was found, and 38.75% had at least one reference to alcohol use.

Of these messages, 72.83% showed a positive attitude toward alcohol use, whereas only 3.26% were negative. Figurative use was only found in 4.35% of the cases, while 60.87% were related to explicit use, and 34.78% expressed alcohol abuse.

Table 2. Linear Regression Analysis (Forced Entry) with the Total Number of Pictures Containing Alcohol Use as a Dependent Construct

	Unstandardized	*Bootstrap*			
	B	*Std. error*	*Sig. (2-tailed)*	*95% CI lower*	*95% CI upper*
(Constant)	−413.89	305.49	0.118	−860.86	329.02
Gender	1.83	1.99	0.359	−2.21	5.78
Year of birth	0.21	0.15	0.118	−0.16	0.44
Number of friends	0.02	0.01	0.003	0.01	0.03
Relationship status	−3.10	1.89	0.110	−6.86	0.67
Total number of status updates with alcohol use	4.40	1.16	0.001	2.06	6.63

$R^2 = 0.23$; $F = 8.46$; $Df = 5$; $p < 0.001$
CI, confidence interval.

On average, a message had three reactions (mean = 2.58, SD = 3.18) and three "likes" (mean = 2.71, SD = 3.47). In 74.19% of the cases, these reactions seemed to be positive, versus 11.29% negative, and 14.52% neutral.

Advanced analyses

Pictures. A linear regression analysis was conducted in order to examine which constructs predict the total number of uploaded pictures containing alcohol use. Based on the literature,[23,33] gender, year of birth, number of friends, relationship status, and the total number of status updates referring to alcohol use were considered to be meaningful predictors and were entered simultaneously in the regression (forced entry). This regression analysis was bootstrapped in order to increase its robustness (confidence interval [CI] 95%; 1,000 samples). The results of this analysis are shown in Table 2 ($R^2 = 0.23$; $F = 8.46$; $df = 5$; $p < .001$). The total number of uploaded pictures containing alcohol use is significantly higher for those with more friends and for those with more status updates referring to alcohol use.

We also conducted one-way analysis of variance (ANOVA) (bootstrapped; 1,000 samples; CI 95%). For these models, Levene's test to examine the homogeneity of variances was calculated. When the hypothesis that the variances of each group are equal was not supported, Welch's F was used. The Games-Howell procedure for post-hoc testing was used (with Bonferroni correction), because the sample sizes among the different groups were often unequal. These analyses indicated no significant differences in the number of reactions for different ways of depicting alcohol use [implicitly, explicitly, or logo only; Welch's $F(2,188.29) = 1.01$; $p > 0.05$], or for pictures showing alcohol use in a different context [positive, negative, neutral, indiscernible; $F(3,2571) = 1.90$, $p > 0.05$). However, differences were observed among the mean number of "likes" for these variables. Pictures that showed a logo of a particular brand received significantly more "likes" than pictures showing explicit or implicit use (Welch's $F(2,185.80) = 5.70$, $p < 0.01$). Likewise, pictures showing alcohol use in a positive context had more "likes" than pictures showing alcohol in a neutral context (Welch's $F(3,140.46) = 5.13$, $p < 0.01$).

Text references. Gender, age, being in a relationship, and the total amount of pictures and friends on one's profile were not significant predictors of the number of alcohol-related text references, but the number of alcohol-related pictures was (Kendall's tau b = 0.21, $p < 0.01$).

One-way ANOVAs indicated that the number of reactions and "likes" did not differ significantly depending on whether the message referred to explicit use, misuse, or figurative use [reactions: $F(2,89) = 1.22$, $p > 0.05$; likes: $F(2,89) = 1.28$, $p > 0.05$), nor depending on the tone of the message (reactions: $F(3,88) = 0.52$, $p > 0.05$; likes: $F(3,88) = 0.66$, $p > 0.05$).

Discussion

The results of the present study seem to indicate that alcohol use is more present on Facebook than might be expected based on previous research.[7,8,23] The majority of Facebook profiles (95.62%) out of the sample contained pictures that referenced alcohol use. About 40% of the profiles had at least one text reference to alcohol use. However, compared to the total number of pictures and references, these alcohol-related references represented about 6.50% of the pictures and about 2.90% of the total number of status updates. The analyses indicated that these posts, as well as peer reactions to these posts, seemed to show alcohol use in a positive context in the majority of cases. The number of alcohol-related pictures on one's profile appeared to be associated with the number of Facebook friends and with the number of status updates referring to alcohol use. Pictures showing alcohol use in a positive context and pictures showing an alcohol logo received significantly more "likes" than others.

Given that it has been shown that people try to make positive self-representations on Facebook, these results may be unsurprising.[5] As indicated by Chou and Edge,[5] Facebook posts are usually socially desirable and mostly refer to positive life events and happy moments. In real life, alcohol use is frequently involved in such positive moments, especially among young people (e.g., pictures of parties, receptions, etc.). As such, the portrayal of alcohol use on social network sites may (in part) be explained by the overrepresentation of these positive moments on these sites.

However, compared to previous research, more references to alcohol use were found on participants' profiles. Several explanations might account for this finding. First, previous studies on this subject were mostly conducted in the United States.[7,8,23] In the present study, a Belgian sample was used. The differences in the prevalence of alcohol-related references might be explained by larger cross-cultural differences in alcohol use and acceptance. Epidemiological studies have documented differences in alcohol use across cultures and

nations.[24–28] The per capita consumption in liters of pure alcohol is higher in Belgium (10.8 liters) compared to the United States (9.4 liters).[34] Apart from differences in use, the social acceptance of alcohol use might be higher in Belgium. While the United States drug policy seems to be abstinence-based,[35] the Belgian policy is more tolerant. Given that it has been reported that posts on social networking sites are usually in line with social desirability,[5] this general tolerance toward alcohol use might explain the "liking" of alcohol-related posts, the positive reactions to these posts, and the fact that no differences were found in the number of alcohol references for different sexes, age categories, and relationship statuses. Likewise, the finding that pictures with an alcohol logo had more "likes" than others might reflect a general positive attitude toward alcohol use. While, for instance, a party picture showing someone drinking alcohol might be "liked" because of the happiness and fun being portrayed, the "liking" of an alcohol logo seems to refer more explicitly to a brand preference and tolerance toward the use itself.

Second, compared to previous studies, a different sampling technique was used.[7,8,23] Despite that, at first sight, sample bias might occur when using a combination of active targeted recruitment and snowball sampling, there are advantages in using this method for encouraging people to take part in a study. In line with what has been argued,[36] a virtual snowball sampling method provides opportunities to reach hidden or hard-to-involve populations. When people are invited to take part in a study through another user with which they share a connection, they might be more likely to accept the invitation. As such, the representativeness of the results might increase among certain populations.[36] Given the public debate around Facebook's (lack of) privacy policy, users might be more inclined to make use of Facebook's privacy settings. It has been stated that 91% of the users reported being familiar with Facebook's privacy settings, 77% also restricted their profiles, and 69% reported that they had changed the default privacy settings of their profile.[37] Thus, the sampling method might have led to the inclusion of people with more advanced privacy settings on their profiles, and these profiles might differ substantively from publicly available profiles. Unfortunately we do not have data on the content differences between public and private profiles.

Despite the fact that the portrayal of alcohol use on social networking sites might be explained by an overrepresentation of positive events and by a general acceptance of alcohol use, the results remain concerning. In line with what is argued in media effect theories and socio-cognitive theories (e.g. social learning theory[12]), exposure to these posts and comments might affect alcohol-related attitudes, outcome expectancies, and perceived norms. In this respect, Brown et al.[38] have argued that the media may function as a kind of "super peer" for young people in that they provide models and information about alcohol use and thereby ultimately affect behavior. Given the large number of positive alcohol references on Facebook, the central role of peers in social networking sites, and the positive nature of peers' comments to friends' alcohol use, this assertion might even be more true for social network sites. After all, research has indicated that perceptions of peer drinking, along with holding positive expectancies toward drinking, are two important predictors of alcohol use.[10–12,14] For instance, within the theory of planned behavior,[11] these outcome expectancies are called behavioral beliefs and, in combination with the subjective value of these beliefs, they are seen as an indirect predictor of behavior. If the outcome expectancies of a particular behavior are considered to be positive, the chances of exhibiting this behavior increase. Similarly, people's perceived behavioral expectations of important friends and family are considered to be another important predictor of behavior within this theory.[11]

Furthermore, Austin et al.[16] have indicated that if mediated messages are perceived desirable or realistic, they are more strongly associated with decision-making outcomes. Moreno et al.[9] have asserted that this is the case for Facebook. Adolescents tend to interpret alcohol-related Facebook messages as reflecting actual use and also acknowledge their potential impact on behavior. Recently initial support for such effects has been reported.[5,33,39]

Although the present study cannot answer the question whether exposure to alcohol-related content affects its users, the study adds to the literature in several ways. First, although research has consistently found a relationship between media use and alcohol consumption, research into the way that substance use is portrayed on social networking sites (and the reactions to these portrayals) is scarce. Second, the studies that have been conducted mainly used U.S. samples of publicly available profiles. Yet, the importance of cultural heterogeneity in relation to alcohol use has been emphasized.[24] The present study provides a first insight in the representation of alcohol use on Belgian social networking sites. Compared to previous studies, a different sampling method and more elaborate coding scheme was used, allowing us to examine this portrayal on three different levels (profile, picture, and status updates) and allowing the examination of peers' reactions to alcohol-related posts.

Despite these strengths, the study suffers from several shortcomings. First, although intercoder reliability measures were good, some constructs (e.g., evaluation of use, tone of comments) required interpretation from the coders. For instance, it is difficult to assess whether a positive comment refers to the situation or the alcohol use itself. Further validation of these measures is required. Second, a convenience sample of Belgian Facebook profiles was used. As argued above, the sampling technique might have led to the inclusion of profiles with advanced privacy settings (making the sample more representative), but it might as well have resulted in a less representative sample. Unfortunately we do not know to what extent the present sample is representative of the Belgian Facebook population. Furthermore, by analyzing 20 status updates per profile, we made sure that frequent users were not overrepresented in the dataset on text references, but we cannot warrant this for the pictures dataset while other users can upload pictures on a friends' profile.

Finally, we were unable to control what happened to the profiles before and after the participants agreed to take part in the study. Participants might have made certain parts of their profile unavailable before or immediately after accepting the request. Yet, the fact that the examined profiles contained so many pictures with references to alcohol make this scenario unlikely.

These methodological questions constitute an important avenue for future research. This research should examine the effects of different sampling techniques for examining social media. Furthermore, more research is needed on the content of social network sites (in different samples) and on whether exposure to this content affects alcohol-related attitudes and

behavior. Thereby attention should be given to cultural differences regarding alcohol use and acceptance. Eventually, this research might generate crucial information for practitioners aiming to reduce alcohol consumption through educational and policy-related measures.

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Author Disclosure Statement

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