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How Viewing Alcohol Posts of Friends on Social Networking Sites Influences Predictors of Alcohol Use

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Young adults are frequently exposed to alcohol posts from their friends on social networking sites, and little research has investigated the influences of these posts on alcohol use. Therefore, this study investigated how exposure to alcohol posts influenced determinants of alcohol use, and whether alcohol posts of close friends influenced these determinants more strongly compared to alcohol posts of distant friends. Students from Dutch universities ($N = 210$) participated in an experiment with a 2 (post condition: alcohol or neutral) x 2 (friend condition: close or distant) between-subjects design. Participants that were exposed to alcohol posts reported higher intention to use alcohol, $F(1, 204) = 4.32$, $p = .039$, willingness to use alcohol, $F(1, 204) = 8.15$, $p = .005$, and more positive affective attitudes about alcohol, $F(1, 204) = 5.84$, $p = .017$, than participants that were exposed to neutral posts. Additionally, participants who viewed alcohol posts of close friends reported more positive affective attitudes about alcohol compared to participants who viewed alcohol posts of distant friends, $F(1, 204) = 5.15$, $p = .024$. Developers of health interventions could use these findings to raise awareness about the unhealthy influences of alcohol posts on determinants of young adults' alcohol use.

Young adults consume excessive amounts of alcohol (Johnston et al., 2018), which has detrimental outcomes (Ewing, Sakhardande, & Blakemore, 2014). Despite the negative consequences, young adults consider drinking as socially desirable (Ridout, Campbell, & Ellis, 2012) and have posted alcohol-related content (hereafter: alcohol posts) on social networking sites (SNS; Egan & Moreno, 2011; Hendriks, Van den Putte, Gebhardt, & Moreno, 2018). However, little research has experimentally investigated influences of alcohol posts on other SNS users.

Studies indicate that exposure to alcohol posts from others is related to drinking behavior. For example, a meta-analysis on non-experimental studies showed that frequent exposure to alcohol posts related to both higher alcohol consumption and more alcohol-related problems (Curtis et al., 2018). To our knowledge, two studies have experimentally demonstrated causal effect of viewing alcohol posts on alcohol cognitions and drinking behavior (Fournier, Hall, Ricke, & Storey, 2013; Litt & Stock, 2011). In these studies, experimenter-created Facebook profiles were used. As people are more likely exposed to posts from friends, our study investigated how exposure to alcohol posts of actual friends influenced drinking behavior.

In addition, we investigated influences of alcohol posts from close and distant friends on alcohol use predictors. As close friends influence drinking behavior more strongly compared to distant relations (Cruz, Emery, & Turkheimer, 2012; Glaser,

Shelton, & van den Bree, 2010), alcohol posts from close friends could be more influential than posts from distant friends. Therefore, investigating interpersonal closeness provides valuable insights into how alcohol posts influence alcohol use predictors. In sum, our study had two main goals. First, we aimed to experimentally investigate how exposure to alcohol posts on Facebook placed by friends influenced alcohol use predictors. Second, we aimed to investigate whether the influence of alcohol posts on alcohol use predictors depended on whether the post was placed by a close and distant friend.

Theoretical Framework

The social cognitive theory (SCT; Bandura, 2001) and prototype willingness (PWM; Gibbons, Gerrard, Reimer, & Pomery, 2006) are relevant theoretical frameworks for our research. First, the SCT states that people can learn behaviors through interactions and observations, and this is especially likely when the behavioral consequences are perceived positively (Bandura, 2001). During young adulthood, social behaviors like alcohol use are mainly learned from peers through social interactions (Oetting & Donnermeyer, 1998). In line with this theory, a meta-analysis found relations between exposure to alcohol posts of peers and drinking behavior (Curtis et al., 2018), suggesting that behaviors can also be learned through online observations. Sharing posts on SNS can be perceived as a social interaction, from which people learn social behaviors (e.g., alcohol use) as shown in previous research (Oetting & Donnermeyer, 1998). We therefore expect that exposure to alcohol posts can influence the determinants of alcohol use.

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Second, the PWM (Gibbons et al., 2006) poses that health behavior can be influenced via a reasoned and a social reaction pathway. The reasoned pathway concerns planned behavior, whereas the social reaction pathway concerns a reactive response in risk-conducive situations such as social influences, which is often unplanned. Given that SNS platforms are also social by nature, the PWM is relevant to study drinking behavior in SNS context. The reasoned pathway is assessed using the behavioral determinants' attitudes toward behavior, subjective norms (i.e., descriptive and injunctive norms), and behavioral intention, which are also included in other health behavior models such as the theory of planned behavior (Ajzen, 1991). The PWM is also relevant for our study because drinking behavior can be both planned and unplanned (Gerrard et al., 2006). To understand how exposure to alcohol posts potentially influences drinking behavior, we included determinants of planned and unplanned drinking based on the PWM.

Attitudes are evaluative summaries of objects or behaviors. For our study, we examined cognitive and affective aspects of attitudes. According to Fazio and Olson (2003), cognitive attitudes describe whether an object or behavior possesses (un)favorable characteristics or outcomes, and affective attitudes arise from people's emotional reactions toward an object or behavior. These affective and cognitive components have been shown as separate components of attitudes (Breckler, 1984; Trafimow & Sheeran, 1998). We expect that cognitive attitudes are unaffected by exposure to alcohol posts, because SNS posts generally show experiences with positive affect (Utz, 2015). We expect, however, that affective attitudes are influenced by exposure to alcohol posts because most alcohol posts display alcohol in positive contexts, and these posts elicit positive responses in others (Beullens & Schepers, 2013; Hendriks, Van den Putte et al., 2018). From these posts, people can learn that alcohol is associated with positive affect, leading to unhealthier affective attitudes (Walther, Weil, & Düsing, 2011). Because alcohol posts mainly portray affective experiences, these portrayals are expected to influence affective, rather than cognitive attitudes.

Subjective norms consist of injunctive and descriptive norms (Ajzen, 2006). Injunctive norms are perceptions of how important others approve or disapprove a behavior (Ajzen, 1991), and descriptive norms are perceptions of how others behave (Fishbein, 2007). Descriptive and injunctive norms can be perceived as separate constructs, with each construct having unique associations with drinking behavior (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007; Park, Klein, Smith, & Martell, 2009). According to the social norms theory (Perkins & Berkowitz, 1986), peer influences could lead to overestimations of injunctive and descriptive norms, which may increase behavioral intentions. In line with this theory, research showed that communicating about alcohol with peers indeed increased descriptive norms, that is estimations of how much alcohol peers consumed (Real & Rimal, 2007). In the context on SNS, exposure to alcohol posts on fictitious Facebook profiles significantly increased drinking norms (Fournier et al., 2013). Additionally, given that alcohol is mainly positively portrayed (Hendriks, Van den Putte et al., 2018), viewers of these posts may infer that most people approve of using alcohol, which likely influences viewers' injunctive norms. Therefore, exposure to alcohol posts from friends could result in unhealthier injunctive and descriptive norms. As these determinants predict behavioral intention, we expected that exposure to alcohol posts also increased intentions to drink.

In addition to the reasoned pathway, the PWM poses that health behavior can be unplanned (Gibbons et al., 2006), which includes alcohol use (Bishop & Rodriguez Orjuela, 2018). Therefore, we investigated how exposure to alcohol posts influenced predictors of unplanned drinking. According to the PWM, attitudes, and injunctive and descriptive norms not only predict behavioral intention (i.e., planned behavior), but also behavioral willingness (i.e., unplanned behavior), which assesses an individual's engagement in risk behavior under certain risk-conducive circumstances such as social influences (Gibbons, Houlihan, & Gerrard, 2009). Together, willingness and intention have been shown to explain significantly more variance than intention alone in smoking and drinking behavior (Gerrard et al., 2006; Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). As friends strongly affect risk behaviors of young individuals (Gerrard et al., 2008), exposure to alcohol posts portraying mainly positive consequences of alcohol likely increases the willingness to use alcohol. Based on this research, we investigated the effects of exposure to alcohol posts on affective and cognitive attitudes toward drinking, injunctive and descriptive norms, intention to drink, and willingness to drink. We hypothesized the following:

H1: Exposure to alcohol posts results in unhealthier affective attitudes (H1a), descriptive norms (H1c), injunctive norms (H1d), intention to use alcohol (H1e), and willingness to drink (H1f), and does not influence cognitive attitudes (H1b).

Additionally, we investigated whether interpersonal closeness with the person placing alcohol posts influenced the effect of alcohol posts on determinants of alcohol use. According to the primary socialization theory (Oetting & Donnermeyer, 1998), formation of attitudes, norms, and behaviors mainly occurs within smaller groups of close friends compared to groups of distant friends. In accordance with this theory, studies showed that close friends indeed influenced young people's alcohol use more than distant peers (Beckmeyer & Weybright, 2016; Smith, Alhabash, Kanver, Tan, & Viken, 2020). In addition to the formation of attitudes, norms, and behaviors in offline contexts, interpersonal closeness has been found relevant for the SNS domain. Seeing people use alcohol influenced beliefs about alcohol more strongly if participants identified with these persons and were perceived as similar (Collins et al., 2017; Hoffman, Austin, Pinkleton, & Austin, 2017). As close friends are more similar than distant relations (Veenstra, Dijkstra, Steglich, & Van Zalk, 2013), alcohol posts from close friends likely influence determinants of alcohol use more strongly compared to alcohol posts of distant friends. Therefore, we hypothesized the following:

H2: Exposure to alcohol posts of close friends results in unhealthier affective attitudes (H2a) injunctive norms (H2b), descriptive norms (H2c), intention to use alcohol (H2d), and willingness to drink (H2e), compared to alcohol posts of distant friends.

Materials and Methods

Participants and Design

Of the 319 initial participants recruited on two Dutch Universities, 9 participants refused participation, 42 participants did not finish the study, 42 failed the manipulation, and 16 participants did not take sufficient time to complete the study, resulting in a final sample of 210 participants (179 females, $M_{age} = 20.50$, $SD_{age} = 2.31$). Owning a Facebook account was needed to participate. Of the final sample, the ethnic background of 199 participants was Dutch and the other 11 participants had a non-Dutch background. On average, participants consumed 9.66 alcoholic drinks within 7 days. The median for Facebook use was four to five times a day. Participants were randomly assigned to a 2 (alcohol post versus control post) x 2 (close friend versus distant friend) between-subjects design. Participants received course credit for their participation and had a chance of winning a €20 gift card.

Procedure

After providing informed consent, participants were instructed that the study aimed to investigate Facebook use and various health behaviors. First, we assessed demographic and background information. Then, participants were instructed to log in on Facebook. We informed participants that no information about their profile was saved during the study. We asked half of the participants to find a close (close friend condition) or distant friend (distant friend condition) on Facebook. On their friend's timeline, participants were asked to find either an alcohol post (alcohol post condition) or a nature-related post (control condition) in the past 12 months. Participants in the alcohol post condition were shown the following (participants in distant friend condition also read text between brackets):

> Find a friend on Facebook of similar age with whom you have a close [distant] relationship and who is [not] important to you. These are for example friends that you [do not] speak to in daily life. Then, search for a Facebook post about alcohol on the timeline of this Facebook friend, which was posted in the past twelve months. After, continue with the questionnaire.

Alcohol posts are posts about alcohol or posts in which alcohol is visible. See examples of alcohol posts:

1) Posts in which alcohol is coincidentally shown (during a dinner party)
2) Posts in which alcohol is prominently displayed (photo of alcoholic drinks)
3) Posts in which someone is very drunk

4) Posts of a drinking game

These types of alcohol posts are prototypical alcohol posts (Hendriks, Gebhardt, & Van den Putte, 2017). After the instruction about finding a Facebook friend, participants in the control condition were shown:

Then, search for a Facebook post in the past 12 months about nature on the timeline of this Facebook friend.

Nature posts are posts about nature or posts in which nature is visible.

1) These could be posts in which people are also visible
2) These could be posts in which only nature is visible

Then, participants indicated whether they found an appropriate post and how they perceived their relationship with their friend (manipulation checks for post and friend condition). To ensure that participants seriously examined target posts, we asked participants' information about the target post. Participants reported the number of likes and comments, number of people on the picture, presence of their friend on the picture, and whether participants themselves were on the post. Before participants were debriefed, participants logged out of Facebook and continued the alcohol questionnaire.

Measures

Manipulation Check

Post Condition. A total of 30 participants in the control condition and 12 participants in the alcohol condition were unable to find a post in the past 12 months, and were excluded from further analyses.

Friend Condition. We assessed the relationship with the friend using the statement "How is your relationship with this Facebook friend?," followed by five semantic differential items: (1) *not a very good friend* to (7) *a very good friend*, (1) *I know this friend a short time* to (7) *I know this friend a long time*, (1) *I do not know this friend very well* to (7) *I know this friend very well*, (1) *This friend is not important to me* to (7) *This friend is very important to me*, and (1) *I do not speak to this friend at all in daily life* to (7) *I speak to this friend very often in daily life*. We averaged these five items to compute a scale score ($M = 4.73$, $SD = 1.84$, $\alpha = .93$).

Randomization Check

Weekly Alcohol Use. We assessed weekly alcohol use with "On average, on how many days per week do you drink alcohol?" and "On average, how many drinks do you consume on one occasion?" Alcohol consumption was computed as the product of both statements ($M = 9.66$, $SD = 9.72$).

Facebook Use. Facebook use was assessed with "How often do you use Facebook?" Response options were (1) = *Never*, (2) = *once every six months*, (3) = *once every three months*, (4) = *once every month*, (5) = *two to four times a month*, (6) = *two to six times a month*, (7) = *once a day*, (8) = *two to three times a day*, (9) = *four to five times a day*, (10) = *six to seven times a day*, (11) = *eight to nine times a day*, (12) = *10 times a day or more* ($M = 9.62$, $SD = 1.92$).

Alcohol Use Predictors

Affective Attitudes. Affective attitudes were assessed with "If I drink alcohol in the upcoming month, I find that …, " followed by three semantic differential items: (1) *very unpleasant* to (7) *very pleasant*, (1) *very unenjoyable* to (7) *very enjoyable, and* (1) *very negative* to (7) *very positive*. Items were averaged to compute a scale score ($M = 4.94$, $SD = 1.10$, $\alpha = .88$).

Cognitive Attitudes. Cognitive attitudes were assessed with "If I drink alcohol in the upcoming month, I find that …, " followed by three semantic differential items: (1) *very unwise* to (7) *very wise*, (1) *very harmful* to (7) *very harmless* and (1) *very bad* to (7) *very good*. Items were averaged to compute a scale score ($M = 3.74$, $SD = .88$, $\alpha = .78$).

Injunctive Norms. We assessed injunctive norms with "If I would drink alcohol in the upcoming month, people who are important to me would …, " followed by three semantic differential items: (1) *totally disapprove* to (7) *totally approve*, (1) *totally be negative toward it* to (7) *totally be positive toward it*, and (1) *totally not accept it to* (7) *totally accept it*. Items were averaged to compute a scale score ($M = 5.18$, $SD = 1.17$, $\alpha = .88$).

Descriptive Norms. We assessed descriptive norms with "How likely is it that people that are most important to you would drink in the upcoming month?," varying from (1) *very unlikely* to (7) *very likely*, and "How often do you think that people most important to you drink alcohol in the upcoming month?," varying from (1) *very little* to (7) *very often*. Items were averaged to compute a scale score ($M = 5.45$, $SD = 1.15$).

Intentions. We assessed intentions with "I plan to drink alcohol in the upcoming month," "I intend to drink alcohol in the upcoming month," "I predict to drink alcohol in the upcoming month," and "I expect to drink alcohol in the upcoming month," varying from (1) *totally disagree* to (7) *totally agree*. Items were averaged to compute a scale score ($M = 5.04$, $SD = 1.75$, $\alpha = .92$).

Willingness. We assessed willingness with "Imagine, you are at a party where people consume alcohol. You have not drunk alcohol yet but a friend offers you a drink, what would you do?", "Imagine, you are in a bar with your friends. You feel that you already drank too much alcohol but someone hands you a new drink. What would you do?", and "Imagine, you are on a holiday with your friends. You are sitting together in the evening and you already feel quite tipsy, what would you do?", varying from (1) *I would certainly not drink alcohol* to (7) *I would certainly drink alcohol*. Items were averaged to compute a scale score ($M = 4.91$, $SD = 1.56$, $\alpha = .71$).

Results

Manipulation Check

An independent samples t-test showed that the relationship with the friend in the close friend condition ($M_{close} = 6.04$, $SD_{close} = 1.10$) was significantly more close than in the distant friend condition ($M_{distant} = 3.40$, $SD_{close} = 1.43$), $t(195.36) = -15.12$, $p < .001$. Thus, the manipulation of the friend condition was successful.

Randomization Check

For age, gender, weekly average alcohol use, Facebook use, total completion duration of the study, and participants' presence on the post, we checked whether the randomization was successful. Regarding age, weekly average alcohol use, and Facebook use, two-way ANOVAs showed that these variables were evenly distributed across all conditions, $p > .05$. Regarding gender, a Chi-square test showed that gender was evenly distributed across the friend condition, $p > .05$, but not across the post condition, $X^2(1, N = 210) = 5.81$, $p = .016$. The alcohol post and close friend condition contained 12 men and 43 women, alcohol post and distant friend condition contained 11 men and 48 women, control post and close friend condition contained 6 men and 44 women, and control post and distant friend condition contained 2 men and 44 women.

Additionally, we wanted to account for posts that participants may have seen during the search task other than the target post. As all participants answered the same number of questions, we used the total completion duration of the study to account for differences in time searching for the target post, and thereby exposure to non-target posts. A two-way ANOVA showed that the total completion duration was similar across all conditions, $p > .05$, indicating that exposure to non-target posts did not differ. Finally, we tested whether participants were equally displayed on the posts across conditions. A Chi-square test showed that participants were equally displayed across the post conditions, $p > .05$, but were displayed more in posts from close friends compared to distant friends, $X^2(1, N = 210) = 15.34$, $p > .001$. Participants were shown on 25,5% of the alcohol posts from close friends, 6,8% of the alcohol posts from distant friends, 18% of the control posts from close friends, and 0% of the control posts from distant friends. Given that gender and participants' presence on the posts were not evenly distributed, we included these variables as covariates in our main analyses.

Main Analyses

Means and standard deviations are shown in Table 1. A series of two-way ANCOVAs were conducted to investigate effects of the post and friend condition on alcohol use intentions, affective and cognitive attitudes toward alcohol, injunctive and descriptive norms, and willingness to drink alcohol, controlling for gender and participants' presence on the post (see Table 2 for test statistics). Findings showed that exposure to alcohol posts resulted in higher intention to drink, $F(1, 204) = 4.32$, $p = .039$, $\eta_p = .02$, willingness to drink, $F(1, 204) = 8.15$, $p = .005$, $\eta_p = .04$, and more positive affective attitudes, $F(1, 204) = 5.84$, $p = .017$, $\eta_p = .03$, compared to neutral posts, supporting H1a, H1e, and H1f. No significant main effects were found of post condition on cognitive attitudes, injunctive norms, and

Table 1. Means (and standard deviations) of alcohol use determinants controlled for gender and participants' presence on the Facebook post.

	Alcohol post	Neutral post
Affective attitudes	5.09 (.99)	4.76 (1.19)
Cognitive attitudes	3.79 (.89)	3.68 (.88)
Injunctive norms	5.19 (1.22)	5.16 (1.12)
Descriptive norms	5.50 (1.12)	5.43 (1.20)
Intention	5.28 (1.64)	4.76 (1.84)
Willingness	5.20 (1.41)	4.58 (1.67)

Note. Willingness was measured on a 8-point scale and all other variables were measured on a 7-point scale.

Table 2. Test statistics of two-way ANOVA with gender and participants' presence on the post as covariates

Independent variable	Dependent variable	F	p
Post condition	Affective attitudes	5.84	.017
	Cognitive attitudes	1.36	.246
	Injunctive norms	.01	.915
	Descriptive norms	.37	.541
	Intention	4.32	.039
	Willingness	8.15	.005
Friend condition	Affective attitudes	.06	.814
	Cognitive attitudes	.06	.810
	Injunctive norms	1.39	.241
	Descriptive norms	2.38	.125
	Intention	.32	.570
	Willingness	1.64	.202
Post x friend	Affective attitudes	5.15	.024
	Cogntive attitudes	.03	.860
	Injunctive norms	2.26	.134
	Descriptive norms	.75	.387
	Intention	.29	.588
	Willingness	1.63	.203

descriptive norms, $p > .10$, supporting H1b, and rejecting H1c and H1d. Additionally, we found no effects of the friend condition on determinants of alcohol use, all $p > .05$. In response to our second hypothesis, we found one significant interaction effect of post and friend condition on affective attitudes, $F(1, 204) = 5.15$, $p = .024$, $\eta_p = .03$, such that affective attitudes were more positive about alcohol after exposure to alcohol posts of close friends ($M = 5.25$, $SD = 1.02$) compared to distant friends ($M = 4.94$, $SD = .95$). No other significant interactions were found, all $p > .05$.

Discussion

Despite that most young adults place alcohol posts (Hendriks, Gebhardt et al., 2018), to our knowledge, this study is the first to experimentally investigate the effects of viewing alcohol posts from actual Facebook friends on determinants of alcohol use. Our study has two goals. First, we aimed to investigate the influences of alcohol posts on determinants of alcohol use. Our

findings show that viewing alcohol posts of friends increases the intention and willingness to drink, and affective attitudes, but not injunctive norms, descriptive norms, and cognitive attitudes. Second, this study examines whether the relationship with the Facebook friend influences how viewing alcohol posts affects determinants of alcohol use. Our findings show that viewing alcohol posts of close friends results in unhealthier affective attitudes compared to distant friends, but does not affect other determinants of alcohol use.

Our study has several interesting contributions. First, our findings demonstrate that exposure to alcohol posts has undesired effects on some determinants of alcohol use. This is partly in line with our hypothesis and studies showing relations between alcohol-related SNS use and self-reported alcohol use (Fournier & Clarke, 2011). Although these studies demonstrate relationships, few studies have experimentally tested its causality. Our study adds to these findings by showing that exposure to alcohol posts of friends influences drinking determinants. Post-hoc analyses showed that the effect of exposure to alcohol posts on intention to drink was fully mediated by affective attitudes, and the effect on willingness was partly mediated by affective attitudes. This suggests that exposure to alcohol posts might influence drinking behavior through stimulating positive emotions toward alcohol, which coincides with research showing young adults drink alcohol to feel good (Benţea, 2014).

In contrast to our hypotheses, our findings show that viewing alcohol posts do not influence injunctive and descriptive norms. A possible explanation is that participants were exposed to one alcohol post only, and perceived drinking norms may be based on more frequent exposure and during a longer timeframe. This is in line with studies showing that frequent exposure to alcohol posts related to both injunctive and descriptive drinking norms (Beullens & Vandenbosch, 2016; Brunelle & Hopley, 2017), suggesting that frequent exposure to alcohol posts is needed to affect drinking norms. Nevertheless, one study found that even a one-time exposure to alcohol-related content on a fictitious Facebook profile increased perceived drinking norms of college students (Fournier et al., 2013). A difference between their and our study is that in their study, multiple alcohol-related posts were shown on that fictitious Facebook profile, which may have been sufficient to influence perceived drinking norms compared to a single alcohol post in our study. However, this argument is a post-hoc explanation and future experimental studies could further investigate the number of alcohol posts that is needed to influence injunctive and descriptive drinking norms.

Second, our findings show that exposure to alcohol posts of close friends result in unhealthier affective attitudes compared to alcohol posts of distant friends. For affective attitudes, seeing close friends drink may have reminded participants of specific positive experiences in which they consumed alcohol with that friend, reexperiencing that situation, leading to more positive attitudes. In contrast to our hypothesis and research showing that close friends have stronger influence on alcohol use of emerging adults than other same-aged peers (Morgan & Grube, 1991), our findings mainly show that young adults are more inclined to drink alcohol after seeing friends drink on SNS, regardless of whether that person is a close or a distant

friend. Possibly, it was difficult to think of distant Facebook friends. This explanation is also supported by the manipulation checks showing that, on average, distant friends were evaluated on the midpoint of the scale, rather than the lower end. Therefore, differences in interpersonal closeness between close and distant friends may not have been sufficient.

Practical Implications

Emerging adults frequently place alcohol posts on SNS (Hendriks et al., 2018). Our findings demonstrate that viewing these alcohol posts has undesired effects on determinants of drinking. These findings are alarming considering that young people spend much time on SNS (Smith & Anderson, 2018) and thereby, expose themselves to alcohol posts, which may subsequently influence their alcohol use. Given that most alcohol posts portray alcohol in the background (Hendriks et al., 2018), people might not be aware of placing alcohol posts and how it influences drinking behavior of others. Our findings help to raise awareness about the influences of alcohol posts and help developers of health intervention to convince users of SNS platforms to reduce alcohol-related posts on SNS. Another consequence of our findings is that alcohol posts create a belief among younger SNS users that positive outcomes are associated with alcohol use, which predict drinking behavior (Austin & Knaus, 2000). In fact, exposure to alcohol posts of older peers has increased interest in alcohol among underage SNS users (Litt & Stock, 2011). Therefore, policymakers and SNS platforms could explore possibilities to let users indicate whether their posts contain alcohol to hide these posts from minors, creating a healthy environment for younger people.

Limitations and Future Research

In regards to future research, our study investigated the influences of alcohol posts on Facebook only. However, the social media landscape is constantly changing. Although currently Facebook is still frequently used by young people, Instagram and Snapchat are now more frequently used (Smith & Anderson, 2018). Boyle, LaBrie, Froidevaux, and Witkovic (2016) showed that Instagram and Snapchat were more often used to share alcohol-related content with peers than Facebook, and that students' current and future alcohol use was also more strongly predicted by exposure to alcohol posts on Instagram and Snapchat, suggesting that our findings may be more pronounced on these platforms. In addition, Boyle, Earle, LaBrie, and Ballou (2017) found that students perceived Instagram and Snapchat more likely as destinations for alcohol posts compared to Facebook. Suggested reasons are that Instagram offers various photographic filters that can increase the appearance of posts (Niland, Lyons, Goodwin, & Hutton, 2014). These filters and focus on esthetic photos may bring about the positive sides of alcohol to a greater extent, which potentially is why alcohol posts could be more influential on Instagram. Additionally, posts on Snapchat disappear after a limited period of time and can be sent to a selection of people. These features may lower barriers to send alcohol posts and potentially, also more extreme alcohol posts as these posts will disappear from the platform. Therefore, alcohol posts on Snapchat may occur more frequently and hence, potentially normalize alcohol misuse. Given the specific characteristics of these SNS platforms, future studies should investigate influences of alcohol posts on other platforms, especially because alcohol post influences may be even stronger compared to Facebook.

In regards to the limitations of our study, participants did not provide information about the content of the alcohol posts, which helps to understand what type of alcohol posts result in unhealthy outcomes. We argue that viewing alcohol posts of friends leads to unhealthier determinants of alcohol use because most alcohol posts portray alcohol positively (Hendriks, Van den Putte et al., 2018). Nevertheless, some participants in our study could have seen a negative alcohol post, which may have influenced their determinants of alcohol use differently. In addition, even among alcohol posts that display alcohol positively, various types of alcohol posts exist. For example, posts in which people are shown and alcohol is more or less in the background, or posts that primarily focus on alcohol (Hendriks et al., 2018). To better understand how alcohol posts influence drinking behavior, future research could investigate influences of different type of alcohol posts.

Second, we do not know whether participants had already seen the posts. This is especially likely for posts from close friends, because the algorithm of Facebook favors content from close relations (Sethuraman, Vallmitjana, & Levin, 2019). However, this is not problematic because, in reality, SNS users are exposed to many posts over time and potentially also posts that they already have seen. Viewing one additional alcohol post might then have little effect on determinants of alcohol use, but investigating the influence of a single post is still relevant to understand the influences of alcohol posts. In fact, our study shows that exposure to one alcohol post results in unhealthier drinking predictors. Nonetheless, future studies could investigate the influence of repeated exposure to alcohol posts on drinking behavior.

Third, demand characteristics may have played a role in our study. Participants first searched for an alcohol post, and subsequently reported alcohol use predictors. Possibly, participants understood that we tested the effects of exposure to alcohol posts on alcohol use predictors and adjusted their responses. On the one hand, participants may have confirmed our expectations by expressing unhealthier alcohol use predictors. On the other hand, participants may have reported healthier predictors to act more socially desirable for the researchers. Future studies could address this by asking about the goal of the study. Fourth, our findings are based on self-reports, which introduces some degree of bias. This means that we are not entirely sure that all participants correctly followed the search instructions. Additionally, we cannot rule out that alcohol was actually consumed in all alcohol posts. For example, alcoholic beverages may not have been from their friends. However, important is that participants perceived that their friends were drinking even if they were not. This illustrates that drinking behavior can be exaggerated even more by social networking sites.

Despite these limitations, our study shows that exposure to alcohol posts of friends results in unhealthier affective attitudes, intentions, and willingness to drink. For affective attitudes, this effect was stronger if the alcohol post was placed by close friends compared to distant friends. Our findings aid both policymakers and developers of health interventions by raising awareness about the negative consequences of alcohol posts to create a healthier SNS environment.

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