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Like to drink: Dynamics of liking alcohol posts and effects on alcohol use

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ABSTRACT

Alcohol posts on social media frequently receive likes that are often perceived by emerging adults as peer approval of alcohol consumption and have been linked to their drinking intentions in previous research. This research, however, has generally not considered the fact that liking is a reciprocal behavior that differs from day to day. By conducting an app-integrated daily diary study and employing a network analytic approach, the current study contributes to this line of research by providing a better understanding of the dynamics of likes for alcohol posts and how these likes, in turn, affect emerging adults' actual alcohol use. In total, 265 college students (M_{age} = 20.49, SD_{age} = 1.89, 74% female) participated in the daily diary study. They answered daily questionnaires about their alcohol use, and we monitored their online activities (posting and liking) via an app. We used exponential random graph models to predict the probability of receiving a like on a post and generalized linear mixed effect models to estimate the likelihood of participants drinking alcohol. First, the results showed that participants received, on average, more likes for alcohol posts than for non-alcohol posts (30 vs. 15 likes). Second, likes were given more often if they were reciprocal. Last, liking alcohol posts significantly predicted participants' alcohol consumption on the same day. The fact that liking alcohol posts relates to daily drinking behavior is disconcerting because one click or 'like' might reinforce a young person's drinking behavior on that day; hence, future research and interventions should focus more thoroughly on this worrying form of online approval.

1. Introduction

Emerging adulthood (age 18–25) is known for an increase in risky behaviors, such as the use of alcohol (World Health Organization, 2018). The frequency of heavy episodic drinking (HED)[2] peaks in the 20–24-year-old age group, and the number of deaths attributable to HED in this group is higher than for any other age group (World Health Organization, 2018). Increasingly, emerging adults portray the consumption of alcohol in the online environment because they share alcohol-related posts on social networking sites (SNS), ranging from party pictures displaying people clearly drinking alcohol to portrayals of drunkenness (Boyle et al., 2017; Hendriks et al., 2018). These pictures have consequences, since previous research has indicated that social media use in general (Vannucci et al., 2020), and exposure to these pictures specifically, reinforces individuals' alcohol use (Geusens & Beullens, 2018; Vanherle et al., 2021).

Moreover, alcohol posts on SNS, particularly those displaying alcohol in a positive context, are often endorsed by SNS users liking them (Beullens & Schepers, 2013; Hendriks et al., 2018). These likes are frequently interpreted as a sign of peer approval (Boyle et al., 2018), which is worrisome because the work of Cialdini et al. (1991), the social norms approach (Perkins & Berkowitz, 1986), and the theory of

normative social behavior (Real & Rimal, 2007) have all shown that emerging adults' perceptions of peer approval reinforce their actual alcohol use. The current study, therefore, aimed to provide detailed insights into the specific social dynamics underpinning the liking of alcohol posts and their role in emerging adults' offline alcohol use. More specifically, the study makes four contributions:

Standard research methods such as surveys and content analyses usually fail to capture the complex social dynamics of likes on SNS (Marshall et al., 2015). Therefore, building on the gift-giving theory (Mauss, 2002), which holds that reciprocally exchanged likes between users resemble gift-giving, the current study first contributed to research on the subject by using app-integrated daily diary and network analytical approaches to closely monitor likes and account for the daily variations and reciprocal structures of liking. Second, based on social norms research (Boyle et al., 2018), which has indicated that likes can guide normative perceptions of acceptable drinking, the research considered whether posts about alcohol receive more likes than posts with other content, thus providing further insight into how displayed risk behavior may provoke risk behavior. Additionally, given that receiving many likes can be perceived as peer approval of drinking, which might have severe consequences for the posting individuals themselves, the study examined who, specifically, receives more likes on alcohol posts. Building on previous research (Gilbert et al., 2013; Hong et al., 2017) indicating that females give and receive more likes, the research examined whether liking, and more specifically reciprocal liking, is gender specific (Hong et al., 2017). Lastly, since individuals' perceptions of peer approval have been shown to play a role in individuals' actual alcohol use (Geusens & Beullens, 2018), the study investigated whether liking (i.e., a more direct and online form of endorsement) could also predict real-life drinking behavior. This study examined these associations based on a sample of emerging adult college students aged 18–25 to determine whether alcohol drinking and the online sharing of this drinking were popular behaviors within this age group.

2. Alcohol, group norms, and social media

Emerging adulthood is known as a period during which people increasingly form friendships and want to belong to specific social groups (White & Jackson, 2004). To achieve this goal, emerging adults feel that they have to behave according to certain social (group) norms, including alcohol-related peer norms (Chung & Rimal, 2016). These norms often develop from observing peers' drinking activities (i.e., descriptive norms) as well as from peers' approval of these activities (i. e., injunctive norms). Nowadays, such norms can also be formed based on experiences in the online environment because emerging adults often share pictures of their offline drinking activities, which portray drinking in a social and positive context (e.g., having drinks with friends or attending a party) on various SNS (Beullens & Schepers, 2013; Hendriks et al., 2018).

Exposure to such alcohol-related pictures might play a role in individuals' estimations of how often their peers engage in drinking behavior (i.e., reflecting descriptive norms). Moreover, SNS additionally provide the possibility of these pictures reinforcing social norms. Previous research has found that alcohol posts generally receive positive feedback and likes (Beullens & Schepers, 2013; Hendriks et al., 2018). This positive reinforcement, in turn, can be perceived as peer approval of drinking (i.e., reflecting injunctive norms; Beullens & Vandenbosch, 2016; Boyle et al., 2018). Boyle et al. (2018), for instance, indicated that observing likes on alcohol posts predicted perceptions of peer approval for risky drinking behaviors among non-drinking participants. According to previous research, these perceptions of peer approval appear to be a primary mechanism through which alcohol use occurs after individuals' exposure to alcohol-related content (Beullens & Vandenbosch, 2016).

However, the mentioned studies mostly investigated peer approval by relying on participants' own thoughts and using survey measures,

such as asking individuals whether their peers would approve or disapprove of them drinking (Beullens & Vandenbosch, 2016; Collins & Spelman, 2013). Direct, online measures of peer approval, such as likes, which are especially relevant in the social media environment, remain understudied. Surveys may be unreliable for measuring this behavior because SNS users may not recall the received, and especially the given, number of likes accurately over a long period. To account for this problem, this study opted for a daily diary study with an integrated app that made it possible to objectively measure liking behavior on a daily basis.

3. Likes as reciprocal behavior

According to the literature, likes are associated with interpersonal generosity (Hong et al., 2017): by giving likes, an individual helps others to make their desired impressions in the online environment. However, liking someone's post should not be regarded as a one-way sign of appreciation, but rather as an act that is expected in a reciprocal relationship (Skågeby, 2010). In fact, according to the gift-giving theory (Mauss, 2002), a like can be seen as both an other-oriented and a self-centered act (Skågeby, 2010). Individuals may give likes to help others build positive impressions but simultaneously expect to receive likes in return to boost their own desired online impressions (Hong et al., 2017).

Such desired online impressions might also be linked to the sharing and, perhaps, liking of alcohol-related content; for example, research has shown that users of SNS deliberately display alcohol posts to create an alcohol identity in keeping with peer norms while distinguishing themselves from others (Atkinson et al., 2015). These peers, in turn, provide positive feedback and appraisal, thereby further endorsing the alcohol-related identities. Although the research of Atkinson et al. (2015) touched on the concept of reciprocity, the researchers did not focus on likes as a particular form of endorsement. Nevertheless, it is possible that liking a peer's alcohol post may constitute an open sign of approval that subsequently enhances a person's own status within the social group (Boyle et al., 2018). The receiver of the like may acknowledge this approval by reciprocally approving future alcohol-related content posted by the liker on SNS, thereby reinforcing the constructed alcohol identities of the users.

However, although previous research has indicated that alcohol posts might be shared to fit in with peers, and that liking these posts can generate positive responses such as likes (Atkinson et al., 2015; Hendriks et al., 2018), these studies did not compare alcohol posts with general posts. Given that the use of alcohol is perceived to be a popularity-enhancing behavior and a facilitating tool for forming friendships (Brown & Murphy, 2020), it is likely that posts showing alcohol consumption will receive more likes than non-alcohol posts. Our research, therefore, contributes to the existing literature by distinguishing between these two types of posts when examining the number of likes. This should provide insight into whether emerging adults are more approving of posts displaying alcohol use compared to other posts, in turn strengthening the assumption that both alcohol use and the online portrayal and liking of this use constitute popularity-enhancing behaviors. We formulated the first hypothesis as follows:

H1. The posting of alcohol posts generates more likes than the posting of non-alcohol posts.

Moreover, given that likes are often exchanged reciprocally (Skågeby, 2010), this research adds substantially to the current literature by accounting for this reciprocity in the applied method and analyses. Specifically, in the current study, we used a daily diary method with a fixed number of participants (monitored by an integrated app) to capture the reciprocity posited by the gift-giving theory. In other words, the study examined whether the participants liked each other's posts. By considering this reciprocity (i.e., dyadic ties between likes) and

employing a network analytical approach, it was possible to predict the number of likes for an alcohol post more accurately than with a standard regression model, which is more biased when applied to dependent data. Consequently, based on this reciprocity, we formulated the second hypothesis:

H2. The likelihood of receiving a like is higher when the (potential) liking is reciprocated.

Since an additional gap in the literature seems to be a lack of focus on who specifically receives more likes on alcohol posts, we considered this a crucial factor to examine, because the receiving of many likes might have severe consequences for the posting individuals themselves due to their perceived approval of drinking. Lyons et al.'s (2016) research indicated that females spend more effort on sharing aesthetically attractive alcohol posts on social media than males. Such posts are often products of conscious or unconscious editing by the poster to project a desirable drinking identity (Lyons et al., 2016; Niland et al., 2014). Given that SNS research in general has indicated that females give and receive more likes than males (Gilbert et al., 2013; Hong et al., 2017), we expected that this would be the case for alcohol-related content. Specifically, by testing the following hypothesis, our research is one of the first studies to account for gender differences in the online endorsement of alcohol-related content:

H3a. Females receive more likes for alcohol and non-alcohol posts than men.

Moreover, the analysis not only considered the gender of the poster as a predictor of receiving likes but also the gender of the liker, because likers have also been found to influence the number of likes (Hong et al., 2017). To account for this, we considered matching genders when investigating gender-related liking behavior:

H3b. The likelihood of receiving a like is higher when the poster and the liker have the same gender.

4. liking and drinking

Gaining insight into the liking dynamics of alcohol-related posts is important, given that these likes have been linked to predictors of alcohol use (e.g., intentions to drink) in previous literature. Specifically, the findings of Alhabash et al. (2015) showed that intentions to *give* likes to alcohol marketing posts are linked to intentions to consume alcohol. Naturally, we considered it important to extend this finding to the context of liking alcohol posts shared by peers, rather than only alcohol advertisements. In particular, Mayrhofer et al.'s (2020) research indicated that exposure to user-generated content led to higher purchase intentions than exposure to advertisements and brand posts, possibly because individuals may more easily identify with peers in user-generated posts than with unknown people in brand posts. The liking of an alcohol post shared by peers, with whom one identifies, might also be more strongly related to behavioral intentions (i.e., drinking intentions) than the liking of alcohol marketing posts. Additionally, we found it interesting not only to consider intentions to consume alcohol but also to relate such liking to actual alcohol consumption. A substantial number of studies have already indicated that social media use, exposure to alcohol posts, and perceptions of peer approval can increase individuals' alcohol use (Beullens & Vandenbosch, 2016; Geusens & Beullens, 2018; Vannucci et al., 2020). Consequently, our research extends these findings by examining whether the liking of alcohol posts (rather than simple exposure to them) is linked to emerging adults' alcohol use. Moreover, given that liking is a common daily practice among emerging adults, this research, with its daily diary design, examined the following hypothesis:

H4. The liking of an alcohol post is linked to an increase in the liker's daily alcohol consumption.

In summary, our daily diary study, with its use of an app-integrated research design, not only focused on whether alcohol-related posts received more likes than non-alcohol-related posts, and whether this liking depended on the gender of the person who posted the content, but also whether this liking, in turn, increased the liker's own alcohol use.

5. Method

5.1. Participants

For this study, we focused on emerging adulthood, which is known as a school–work transition period that delays entry into marriage and parenthood (Tanner & Arnett, 2011). To represent this period, we decided to ask college students on campus and at student facilities to participate in the study. The students had to participate in groups (e.g., participate together with friends or classmates); hence, the study participants knew at least some of the other study subjects because they were living in the same student dormitories or had classes with them. We recruited in groups because we wanted participants to know some, but not all, of the other participants. Participants would therefore see posts featuring both familiar and unfamiliar people, thereby simulating an actual social media environment.

Initially, after providing information about the study and obtaining informed consent, 306 college students completed the pre-survey. However, given that not all 306 participants actively participated in the second part of the study (i.e., the daily diary study), our final sample consisted of 265 college students who were part of 49 groups, ranging from 2 to 18 participants each. Six participants were excluded from the research because they shared eight times as many posts as an average user. The participants' mean age was 20.49 ($SD = 1.89$), and 74% were female ($n = 197$). Most participants were aged 18–25, thereby representing the period of emerging adulthood (Tanner & Arnett, 2016). Three participants were 17, 26, and 30 years old but were kept in the sample because they were college students like all the other participants. All participants were Dutch, and the study was conducted in the Netherlands, where the legal age for purchasing alcoholic beverages is 18 years.

5.2. Procedure

This study formed part of a larger six-week longitudinal study (Hendriks et al., 2021). However, for this specific study, the observational phase of the first 21 days was considered. The study consisted of a pre-survey, a 21-day daily diary survey, and an app that was specifically developed for the current study (with the support of the software company *Akyla*) to monitor participants' online activities.

5.2.1. Pre-survey and daily diary survey
First, we asked participants to complete a pre-survey that measured variables including gender, study year, habitual frequency of alcohol use, and habitual quantity of alcohol use. One week after answering the pre-survey, the daily diary study was launched. Participants automatically received push messages at 9 a.m. for 21 consecutive days, reminding them to complete their daily diary entries about their alcohol consumption on the previous day. This resulted in 4,962 assessments completed by 265 emerging adults.

5.2.2. SNS-app
Additionally, during the daily diary study, participants had to visit and interact with an SNS app on a daily basis.

5.2.2.1. Coding of alcohol posts.
The stimuli material in the app consisted of participants' own posts from Facebook (all participants agreed to use their Facebook posts). We used a codebook developed by Author X (names withheld for blind peer review) et al. (2018), which was

validated by multiple studies (Author X 2018a; Author X 2018b); names withheld for blind peer review) and had acceptable intercoder reliability (i.e. kappa = 0.683–0.912; Author X 2018a; Author X 2018b). One author who participated in the coding of these studies coded the posts according to whether they displayed alcohol-related content or not. If a post clearly showed pictures of alcohol or referred to alcohol in the header, it was coded as an alcohol post; for example, when alcohol was the focus of the post, when alcohol was displayed in the background (e. g., a bottle of wine on a table), or when the header contained alcohol information (e.g., *borrel* = drink). However, if the header contained alcohol emoticons or a comment on the picture referred to alcohol, it was not coded as an alcohol post, since the content did not specifically refer to alcohol. Other examples can be found in the Appendix.

During the study, users' Facebook profiles were continuously checked for new posts, and these were then added to the app feed after the likes and comments were removed; thus, likes could only be given by study participants. The posts were added throughout the whole study at specific time points; the app synced with Facebook every 2 h, so new posts were added to the app every 2 h (if they were added in those 2 h on Facebook). The specific sync scheme can also be found in the Appendix.

5.2.2.2. Facebook environment. The app mimicked features of the Facebook app, meaning that users were able to see the posts of other individuals participating in the study and could engage with their posts by commenting and liking. We particularly chose to mimic the Facebook environment because (1) this was the platform most frequently used by our sample during the study period and (2) alcohol posts appeared regularly on this platform (van der Veer et al., 2018; van Hoof et al., 2014). The app recorded the author, the time and content of the posts, the number of related likes, and the specific participants giving the likes.

5.2.2.3. User instructions. We gave instructions for using this specific SNS app (e.g., downloading, installing, and usage) at the beginning of the study. Participants had to visit and interact with the app daily. Additionally, their logging in and engagement with the app was monitored, but not the time they spent on it. If they did not log in, push messages reminded them to engage with the app. The use of the app had two major advantages over Facebook. First, we could determine exactly which posts participants were exposed to in the app. Second, we only collected these posts, thereby decreasing privacy concerns. We were therefore able to obtain a closed network, which facilitated the network analysis.

A debriefing was sent out after the study, and participants received a 30-euro gift voucher in return for their participation. The study was approved by the University's ethical board (XXX; name withheld for blind peer review).

5.3. Measures

5.3.1. Alcohol use

Alcohol consumption was measured on a daily basis for its occurrence (whether people drank) and quantity (how much they drank). The occurrence was measured by the question "Did you drink alcohol yesterday?" ("yes" for 33% of the study days) and, if participants did so, the quantity was measured by "How many alcoholic drinks did you consume?" ($m_{\#glasses} = 1.57$, $SD_{\#glasses} = 3.27$, $range_{\#glasses} = 0$–50). The analysis was corrected for the retrospective measurement of alcohol consumption, meaning that liking and drinking were regarded as occurring on the same day.

5.3.2. Control variables

In our models, we controlled for gender (male or female), age, baseline drinking according to the pre-survey, and whether the alcohol post occurred on a drinking day.

Baseline drinking was measured with an item from the AUDIT scale

(Saunders et al., 1993), which asked respondents how frequently they usually consumed alcohol, with answer options ranging from (1) "never" to (8) "every day of the week" on an eight-point scale.

Drinking day was measured by coding the timestamps of the posts. All posts that occurred on Thursdays, Fridays, or Saturdays were considered drinking days, reflecting days on which emerging adults usually go out (Lau-Barraco et al., 2016; van Damme et al., 2018).

5.4. Data analysis

All analyses were conducted using R v. 3.6.2 software. To investigate the hypotheses, we employed descriptive statistics, t-tests, and exponential random graph models (ERGMs) for H1, H2, H3a, and H3b, and generalized linear mixed-effect models (GLMMs) for H4, which were necessary to account for the longitudinal structure of the data. To determine robustness, we also checked whether the association was specific to the same day. Additionally, ERGMs, in particular, were necessary for predicting the number of likes someone received because the SNS data had a network structure, meaning that likes represented dyadic ties. Fig. 1 illustrates the structure, displaying likes as lines between individuals in the first eight days of the study.[3] Classic statistical procedures (e.g., regressions) are biased when applied to network data, because it is more likely that users will mutually like each other's posts, and data will therefore be socially nested. Another advantage of ERGMs is that they simultaneously account for structural (e.g., mutuality) and actor-based (e.g., gender) characteristics (Robins et al., 2007). In this study, we used ERGMs to describe the probability that a like would be given for a post based on reciprocity, the gender of liker and poster, and the number of shared alcohol and non-alcohol posts. Specifically, we used the Markov chain Monte Carlo method to estimate a likelihood function. This simulated a variety of networks based on the empirical network and the model specifications, making it possible to judge whether certain characteristics were statistically relevant or not (Hunter et al., 2008).

Note: Red lines reflect likes for alcohol posts.

To test H1, H2, and H3, we constructed the ERGMs iteratively. Starting from a model with only a constant, reflecting the probability of a like being present, we added reciprocity between likes[4] and modeled gender specifics (i.e., the gender of the poster as a predictor and the matching gender of the liker and poster). This model was referred to as Model 1.1. In the final model, we included variables reflecting the number of user-shared alcohol posts and non-alcohol posts to predict the number of likes a user received (Model 1.2).

To test H4, flexible modeling approaches (GLMMs) were used because the daily diary study involved collecting intensive longitudinal data. Consequently, we considered individual differences between participants. Specifically, we included varying individual intercepts to reflect participants' different baseline likelihoods of drinking. This model was also constructed iteratively. Again, starting with a model with only a constant, we constructed a model containing only the control variables (Model 2.1). In the final model (Model 2.2), we also added liking of alcohol and non-alcohol posts as predictors of actual alcohol consumption, which were centered to account for individual differences.

6. Results

H1: Likes for Alcohol Posts versus Non-alcohol Posts.

On average, based on the descriptive statistics, participants' alcohol posts were liked 30.14 times (SD = 18.20), whereas non-alcohol posts

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[3] The figure is for illustration purposes only and not to be used for inference.
[4] We also checked for triad closure. We assumed that, if user A likes content posted by users B and C, user B might also be more inclined to like content from user C, but the results indicated that this was not the case. Consequently, we removed that specification from the model.
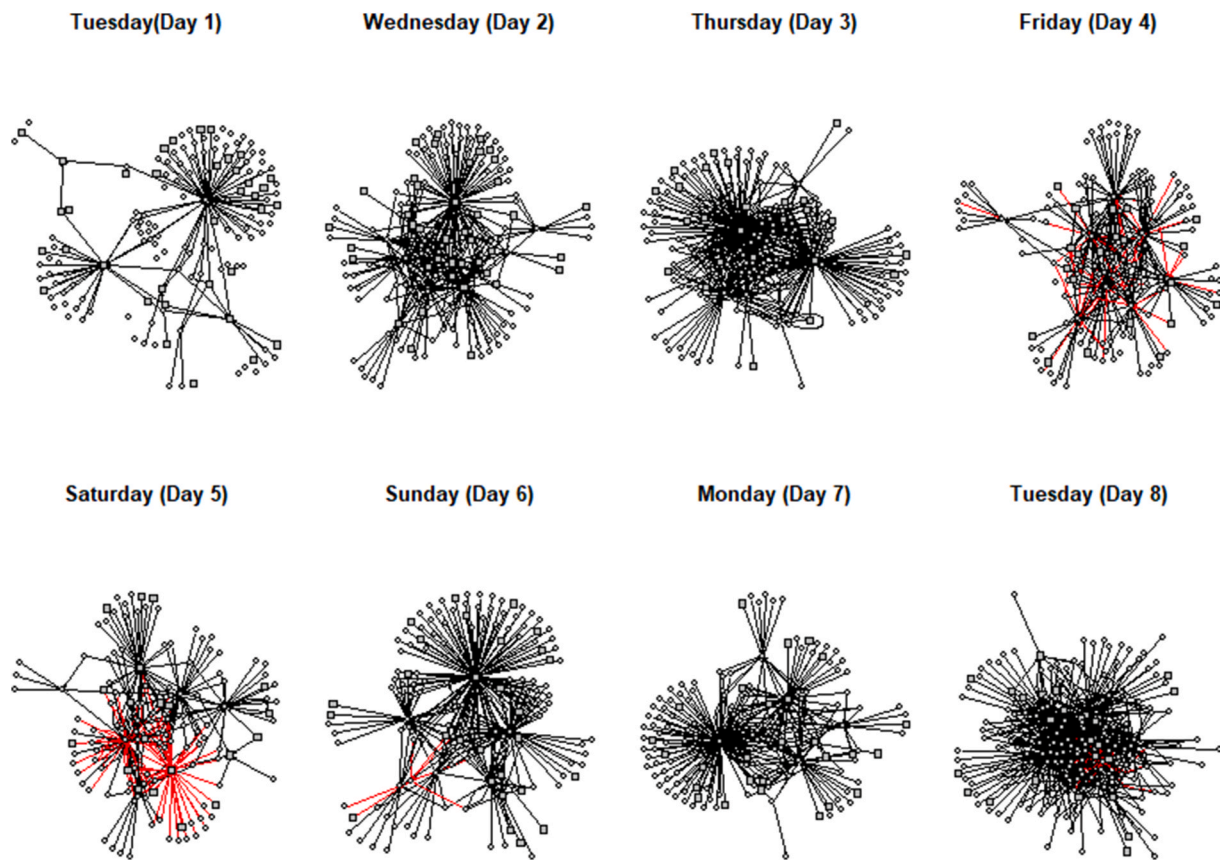
Tuesday(Day 1) Wednesday (Day 2) Thursday (Day 3) Friday (Day 4)

Saturday (Day 5) Sunday (Day 6) Monday (Day 7) Tuesday (Day 8)

Fig. 1. Network structure of the data.

were liked 14.72 times (SD = 10.41). A Welch corrected *t*-test showed that the difference was statistically significant (t = 3.13, df = 14, p = <0.01).

Additionally, H1 was tested by simulating ERGMs. The coefficients of the ERGMs (Table 1, Model 1.2) indicated that participants had higher logarithmic odds of receiving a like per alcohol post they posted than per non-alcohol post (0.83 vs. 0.42). Given the results, H1 was confirmed, indicating that participants received more likes per alcohol post than per non-alcohol post.

The ERGMs in Table 1 showed that mutuality significantly increased the likelihood of giving a like. In other words, if person A liked a post from person B, person B was more likely to like a post from person A in return. Specifically, the chance of a like being present was more than three times higher (exp. [1.23] = 3.42) under conditions of mutual liking (Table 1, Model 1.1), and H2 was consequently confirmed.

The descriptive statistics in Table 2 provide initial evidence against H3, showing that the number of likes for non-alcohol posts was about the same for both genders (13.88 vs. 14.45). However, with regard to

Table 1
Estimation of the likelihood of giving a like.

Predictor	Model 1.1			Model 1.2		
	Estimate	SE	z-value	Estimate	SE	z-value
Constant	−3.86***	0.05	−78.56	−4.82***	0.06	−82.12
Mutual liking	1.23***	0.10	13.00	1.25***	0.10	13.09
Matching gender	0.37***	0.05	7.18	0.39***	0.05	7.77
Poster is female	0.26***	0.06	5.47	0.32***	0.06	5.06
Alcohol post				0.83***	0.04	18.34
Non-alcohol post				0.42***	0.01	43.47

Note: *** refers to p < 0.001. SE refers to standard error. Estimates can be interpreted as logarithmic odds of a like being present.
H2: Reciprocity of Liking.

Table 2
Received likes per post according to the Poster's gender.

Received Likes	Males			Females		
	n	$\bar{x}$	SD	n	$\bar{x}$	SD
Per alcohol post	3	22.50	21.92	11	31.83	18.39
Per non-alcohol post	30	13.88	11.16	151	14.45	9.82

Note: n refers to the number of posts.
H3: Receiving of Likes for (Non)-alcohol Posts: Females versus Males.

alcohol posts, the results indicated a possible gender effect, with females receiving more likes (31.83 vs. 22.50), although a *t*-test revealed that this difference was not significant (0.56, df = 2, p = 0.33). ERGM 1.2 (Table 1) showed that the likelihood of a post shared by a female receiving a like was about 38% higher (exp. [0.32] = 1.38) than for a post shared by a male. Overall, the analysis did not show that females receive more likes per se, but there seemed to be an initial tendency for them to receive more likes for alcohol posts (Table 2); however, H3a cannot be fully confirmed.

H3b posited that the likelihood of receiving a like increases if the person sharing content and the person (potentially) liking it are of the same gender. Table 1 indicates that the likelihood of receiving a like was higher if the gender of the poster and liker matched than for posters with differing genders. Model 1.1 indicates that if the liker's and poster's gender matched, the likelihood for a like to occur was about 45% higher (exp. [0.37] = 1.45). Consequently, H3b was confirmed.

Overall, the GLMMs provided support for H4: liking an alcohol post was linked to a higher likelihood of drinking alcohol on the same day. Table 3 shows that the odds of drinking alcohol were 80% higher (exp. [0.59] = 1.80) if a respondent liked an alcohol post on that day. Furthermore, the control variables (drinking day, age, gender, and

Table 3
Estimation of the likelihood of drinking alcohol.

Predictor	Model 2.1			Model 2.2		
	Estimate	SE	z-value	Estimate	SE	z-value
Constant	−3.64***	0.60	−6.07	−3.67***	0.60	−6.08
Drinking day (Thu, Fri., Sat.)	0.61***	0.07	8.50	0.62***	0.07	8.62
Age	0.13***	0.03	4.56	0.13***	0.03	4.56
Female (gender)	−0.33**	0.12	−2.75	−0.34**	0.12	−2.76
Baseline drinking frequency	0.16***	0.03	6.11	0.16***	0.03	6.13
Liking alcohol posts				0.59**	0.23	2.60
Liking non-alcohol posts				−0.12***	0.03	−4.01

Notes: *** refers to p < 0.001; ** refers to p < 0.01. SE refers to standard error. Estimates are logarithmic odds of a respondent drinking alcohol on a given day. Models used random intercepts and fixed slopes. $R^2_{2.1} = 0.161$; $R^2_{2.2} = 0.176$. H4: Liking and Drinking.

baseline drinking frequency) had a significant influence on the probability of drinking. A positive estimate indicated an increase in the probability of drinking, while a negative estimate indicated a decrease. Males were more likely to drink alcohol than females; for example, Model 2.2 (Table 3) indicated that the probability of a 20-year-old male drinking on a Friday would be 38.9% compared to 31.4% for a same-aged female. The likelihood of drinking was obtained by using the standard logistic function for the odds of Model 2.2 in Table 3. The likelihood was obtained by applying the inverse logit formula; thus, for the 20-year-old male to drink on a Friday: (exp. [−3.67 + 0.62 + 20 * 0.13]/(1 + exp. [−3.67 + 0.62 + 20 * 0.13]) = 0.389. The fictional male would increase his likelihood of drinking further if he also liked an alcohol post, from 38.9% to approximately 53.5%. In summary, we could confirm H4, which posited that liking an alcohol post is linked to participants' alcohol use on the same day. This was further substantiated by the robustness analysis showing that the effect of liking alcohol posts on drinking was only significant for the same day but not for the following day.

7. Discussion

By using a network analytical perspective, the present daily diary study contributes to a better understanding of the dynamics of likes for alcohol posts and how these likes, in turn, are associated with emerging adults' actual alcohol use on the same day.

The results of this study first provided evidence that posts displaying alcohol-related content receive more likes than posts with non-alcohol-related content. Also, this study provides strong evidence that likes are often reciprocally exchanged, thereby supporting H2. Building on previous findings, people are thus not only more likely to share alcohol posts if their friends do so (Kurten et al., 2021) but they also appear to mutually approve of this portrayal within their social networks. Presumably, this can be explained by the common use of alcohol within different social settings (Grüne et al., 2017), since alcohol is often perceived as a tool for fostering friendships and fitting in with a group, which is particularly important during the college years. Moreover, building on the gift-giving theory (Mauss, 2002) and our findings, emerging adults will probably expect likes from their group in return as a sign of group acceptance. The liking of alcohol posts, hence, seems to be a reciprocal process, which is worrisome, because exposure to likes on alcohol posts may give emerging adults the idea that the display of alcohol consumption is something that others approve of (Boyle et al., 2018).

Second, female participants did not receive more likes than men per se. In fact, the number of likes for non-alcohol posts did not differ between women and men, whereas there was an initial tendency among

women to receive more likes for alcohol posts. This could be explained by the fact that females share alcohol posts differently than men (Hutton et al., 2016; Lyons et al., 2016). Lyons et al. (2016), for example, found that although men's profiles displayed various alcohol posts, these posts mostly consisted of glamorized pictures for which they had been tagged by women. Moreover, if men actively post something, the content will more likely display intoxicated drinking behaviors. Primack et al.'s (2015) research, for instance, found that 89% of intoxication videos on YouTube included men, whereas women were only present in 49% of the videos. It follows that such intoxication content, as opposed to glamorized alcohol portrayals, might receive fewer likes, since research has shown that they are mostly considered to be inappropriate by emerging adults (Wolfer, 2014, 2018). Overall, women may spend more time photographically capturing and airbrushing drinking events (Lyons et al., 2016; Niland et al., 2014), which might result in more appealing alcohol posts and eventually translate into a higher number of likes. However, it might also be possible that there are confounding factors explaining this relationship. Specifically, it might be the case that young adults who engage in drinking are more popular than non-drinkers and therefore receive more likes. Consequently, more research is needed to investigate whether and why females receive more likes for alcohol posts.

The study further showed that matching gender was significantly associated with giving a like. In particular, females were more active in liking the content of other females because they mutually approved of each other's displayed drinking behaviors. This might be explained by the concept of *sociotropy* (Beck, 1983), which is the tendency to overemphasize the maintenance of positive social relationships. According to a meta-analytic study by Yang and Girgus (2019), females scored higher on this characteristic and were thus more invested in maintaining interpersonal relationships. This might also be the case for liking: females may feel the need to endorse content posted by their friends to maintain good relationships. Additionally, they might also hope to receive a like in return, since the women on the other side are expected to be equally invested in the relationships. These findings seem to further support the fact that liking in general is a reciprocal process, specifically among females (Gilbert et al., 2013; Hong et al., 2017).

Finally, our findings extend previous research by investigating the link between emerging adults' liking of alcohol posts and their alcohol consumption (Alhabash et al., 2015; Boyle et al., 2018). Building on previous research that focused on the liking of alcohol advertisements and intentions to consume alcohol (Alhabash et al., 2015), this research further supported the literature by identifying a link between emerging adults' liking of alcohol-related content posted by peers and their actual drinking behavior on the same day. When people are scrolling through social media, they might like an alcohol post, which in turn may play a role in their alcohol use. However, it could also be the other way around: people who drink more might also like more alcohol posts from others, specifically because the displayed behavior aligns with their own behavior; for example, by giving a like, an individual expresses approval of the behavior (Balsa et al., 2011; Boyle et al., 2018; Brown & Murphy, 2020), thereby possibly further enhancing their own social status within the group.

Liking might thus precede drinking, but drinking might also precede liking. Based on the reinforcing spirals model (Slater, 2015), a dynamic and iterative relationship seems to be the most plausible: drinkers might seek alcohol-related content consistent with their own attitudes, and by liking this content, their drinking dispositions might be further sustained. However, this study, which used one measurement point a day, provided no evidence for this transactional relationship. Still, given that both behaviors seemed to co-occur on the same day, future research using experience sampling studies with multiple assessments per day could focus more thoroughly on the specific interplay between liking and drinking on a daily basis.

7.1. Practical implications

In all, the findings of this study have several implications for future research and interventions. First, earlier research has shown that the posting of alcohol posts (Lyons et al., 2016) varies among genders. Results of the present study indicate that there might be differences between likes towards female's and male's alcohol posts. It therefore seems desirable that future research on the endorsement of alcohol portrayals on SNSshould specifically focus on females and their mutual appreciation for alcohol posts. Second, it seems advisable for future studies to explore other factors that might predict the liking of alcohol posts. Research could, for instance, focus on personality factors such as sensation seeking and the need for popularity, which have been linked to the sharing of alcohol in previous literature (Geusens & Beullens, 2018; Goodwin et al., 2016). Third, given that the liking of alcohol content online might have negative consequences, SNS could raise awareness about this behavior by integrating automated warning messages (e.g., "You are about to endorse risky behavior") concerning the risks of alcohol use whenever an individual is about to like an alcohol post. However, future research should first rigorously test the effectiveness of such messages. On the one hand, research showed that health warning labels reduced drinking intentions and desires (Noel & Lakhan, 2021), but on the other hand, these warning labels combined with family and peer alcohol posts increased purchase intentions among participants in another study (Noel, 2021). Future research should, thus, examine warning messages more thoroughly and be aware that individuals could be prompted to do the opposite of what the messages advises (known as the boomerang effect; Mann & Hill, 1984).

7.2. Limitations

Despite the study's main strengths, such as using daily diary and network approaches to examine the dynamics of liking, some limitations of the study design should be discussed. First, although this study assessed respondents' alcohol consumption on a daily basis, which is a smaller timeframe than was used in previous studies in this context (Erevik et al., 2017; Geusens & Beullens, 2018), it could not establish a causal relationship for the association between liking alcohol posts and drinking alcohol; therefore, future research should particularly examine their effects and the order in which they occur, possibly by questioning respondents at smaller time intervals (e.g., an hour after they like an alcohol post). Second, despite the expertise of the researchers and the validity of the preliminary codebook, only one researcher carried out the coding process. Consequently, future research could benefit from using multiple coders and calculating the inter-coder reliability. Third, it was not possible to control for the effect of exposure to alcohol content; therefore, it remains uncertain whether the effect of liking alcohol content actually exceeds that of exposure to alcohol content. Future research should control for this. Fourth, uncertainties about the accuracy of participants' answers remain, especially with regard to social desirability. Participants might have over- or underestimated their alcohol use to comply with perceived social drinking norms. Furthermore, we conducted the study in the Netherlands, where the legal drinking age is 18. Cross-cultural research in societies with less lenient alcohol policies is needed to generalize the results of the present study to other societies.

Finally, by using an app that simulated the Facebook environment, four specific limitations should be discussed. First, we cannot be sure that participants interacted with this app as they would on their real Facebook profiles. Second, we did not prohibit participants from using other apps and, hence, could not control for alcohol-related content that might have appeared on other platforms and might have played a role in their alcohol use. We encourage future research to account for this by monitoring participants' use of other apps or by prohibiting the use of certain apps during the study period. Third, our app made it possible to chronologically display posts to every participant, enabling us to ensure that all participants were exposed to the same posts in the same order. This uniform timeline was a strength of our current study. However, this is usually not the case in the social media environment, since the algorithmic nature of SNS plays an important role in opportunities to encounter and subsequently like alcohol posts. Future research, which might not be able to use a self-developed app, should take this algorithmic factor into account. Fourth, we also acknowledge that other platforms, apart from Facebook, which are currently more popular for the portrayal of alcohol consumption (Boyle et al., 2017), might also be interesting to examine in future studies. In particular, Instagram is known for portraying glamorized alcohol-related content and the ease of its feedback options (e.g., double-tap to heart something), which might be relevant when examining likes.

8. Conclusion

Overall, this is the first study to examine the link between liking alcohol posts on social media and alcohol consumption. Based on our findings, this form of online endorsement is a concern because alcohol posts in our sample received more likes than non-alcohol posts. Furthermore, given that the liking of alcohol posts was linked to alcohol consumption, we encourage future research to further examine this worrisome behavior and focus on the timeliness of the effect.

Credit author statement

Sebastian Kurten: Methodology, Formal analysis, Software, Validation, Data curation, Writing – original draft & Editing, They contributed to the paper equally. Robyn Vanherle: Conceptualization, Methodology, Writing – original draft & Editing, They contributed to the paper equally. Kathleen Beullens: Supervision, Writing – review & editing, Funding acquisition. Winnie Gebhardt: Conceptualization, Methodology, Writing – review & editing. Bas van den Putte: Conceptualization, Methodology, Writing – review & editing. Hanneke Hendriks: Conceptualization, Methodology, Investigation, Resources, Writing – review & editing, Supervision, Funding acquisition.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2021.107145.

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