Text Messaging and Social Network Site Use to Facilitate Alcohol Involvement: Comparison of US and Korean College Students

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Abstract:

Alcohol-related content on public social networking sites (SNS) has been linked to collegiate alcohol use, but we know little about whether and how private forms of computer-mediated communication (CMC), like text messaging, are related to collegiate drinking, nor how alcohol-related CMC content and drinking are associated in non-Western cultures. We examined the ways in which private text messaging and SNS are used to facilitate alcohol involvement among U.S. ($n = 575$) and Korean ($n = 462$) college students (total $N = 1037$), two technologically wired cultures with prevalent collegiate alcohol misuse. Results show that college students prefer private text messaging over SNS to find parties and facilitate alcohol involvement, and this preference tends to be stronger in Korea than the United States. Private text messaging is more consistently and strongly associated with alcohol use frequency and heavy episodic drinking than SNS posts in both countries, with particularly robust associations between private text messaging and drinking in the United States. Findings underscore the role of CMCs in facilitating alcohol involvement and highlight the potential for analysis of private message content to further understand computer-mediated social processes in college student drinking.

Keywords: alcohol | cross-cultural | texting | social networking site | college

Article:

Introduction

Computer-mediated communication (CMC) pervades the social lives of young adults around the world, particularly in high income countries where virtually all young adults have access to the internet or a smartphone (99 percent of U.S. and 100 percent of Korean young adults).[1,2] A growing body of literature demonstrates that posting and viewing alcohol-related content on social networking sites (SNS) is related to self-reported alcohol use, misuse, and alcohol-related

problems.[3–11] Although most studies to date focused on risk associated with the *quantity* of alcohol-related SNS posting, some have examined the function of alcohol-related posts and the motivations about decisions to post alcohol-related content online. Some motivations promote posting (e.g., to coordinate and build excitement for drinking, to glamorize heavy drinking[12]) whereas others discourage posting (e.g., to avoid potential repercussions if posts are seen by professional contacts[13,14]). It is not clear whether these motivations for SNS posting hold for more private CMC forums that are used with a closer circle of relational partners than SNS[15] and therefore may be better suited to the sharing of potentially damaging alcohol-related content. Currently, we know little about the extent to which college students use private messaging around alcohol use or to what extent private messaging is related to drinking behavior.

The small existing literature on alcohol-related content sharing via CMCs focuses on U.S. and (to a lesser extent) European samples, with a dearth of evidence in non-Western populations. Nonetheless, there is reason to believe that sharing of alcohol-related content might vary based on cultural values such as individualism and collectivism. For instance, research suggests that people from individualist cultures generally (and the United States specifically) tend to be more open in their online self-disclosures than people from collectivist cultures generally (and Korea specifically).[16–18] U.S. students also tend to have wider and shallower SNS networks (characterized by more connections, which tend to be more casual, superficial, and short-term in nature) whereas Korean students tend to have smaller, deeper SNS networks (characterized by fewer connections, which tend to be more intimate and longer lasting).[19–21] Informed by this literature, which emphasizes a Korean tendency toward caution in public self-disclosure and pursuit of close CMC ties, the present study tests the hypotheses that (a) private messaging will be used more frequently than SNS posts to facilitate alcohol involvement (in both the United States and Korea), (b) Korean students will show a stronger preference for private messaging over SNS posts for alcohol-related content (when compared to U.S. students), and (c) alcohol facilitative private messages will be more closely tied to frequency of alcohol use and heavy episodic drinking (HED) than SNS posts (in both the United States and Korea). A comparison of these two countries may highlight important cultural variation given similar rates of access to CMCs[1,2] and high rates of collegiate alcohol misuse[22–26] in each.

Method

Participants and procedure

U.S. Sample. As part of a larger study in 2015, 840 college students at a Southeastern university completed computerized surveys over two lab-visits that were separated by 2 weeks. Inclusion criteria were university enrollment, alcohol use within the past year, and being 18–23 years old (the legal minimum drinking age in the state is 21). Participants were recruited from a pool of 9000 students randomly selected by the registrar's office, with oversampling for male and African American students to achieve a more balanced sample. Surveys took about an hour and participants received $45. By design, the study administered several survey versions; the present analytic sample utilized only those participants who completed the same measures of drinking behaviors and thus excluded 217 participants with alternate measures and an additional 48 participants who did not complete measures of CMC use, resulting in an analytic sample of $n = 575$.

Korean sample. In 2016, a parallel sample of Korean participants was recruited from targeted departments among 6 colleges at a National University located in southwest Korea, where the minimum legal drinking age is 20 years.[27] Participating professors within targeted departments explained the purpose of the study to participants before asking them to complete an anonymous questionnaire (no incentive was offered and there were no other inclusion criteria). The Korean sample excludes 37 participants with unfinished surveys, and 53 participants who endorsed no past year alcohol use (to enable comparisons to the U.S. sample) yielding an analytic sample of $n = 462$. The English survey was translated into and back-translated from Korean by different bilingual individuals. An English-speaking investigator reviewed the back translation to ensure the questions had the same connotative meanings as the original.

The demographic characteristics of both samples are found in Table 1. This comparative analysis of the two existing samples was approved through the U.S. University's Institutional Review Board (approval #16-2739).

Table 1. Demographic Features by Country

	United States		Korea			
	M	*SD*	*M*	*SD*	*t(df)*	*p*
Age	19.90	1.37	21.22	1.84	−12.87 (830.7)	<0.001
Parent Education	4.76	1.29	3.52	1.18	15.66 (946.1)	<0.001
Year in College	2.49	1.19	2.42	0.90	1.08 (1021.9)	0.279
	%		**%**		χ^2**(df)**	**p**
Gender					3.14 (1)	0.077
Female	54.9		50.1			
Male	45.1		49.9			
Living Situation					346.34 (4)	<0.001
Alone	9.0		11.3			
With roommates	90.1		40.8			
With parents and siblings	0.3		45.0			
With siblings	0.5		1.9			
With spouse or romantic partner	0.0		1.0			

Note. Response scale: 0 = I don't use this, 1 = 1 hour or less, 2 = 1–2 hours, 3 = 2–4 hours, 4 = 4–6 hours, 5 = 6–8 hours, 6 = 9 hours or more.

Measures

Frequency of CMC. Nine items from the Electronic Interaction Scale for Time[28] asked how much time on a typical day students spent engaging in various types of communication (Table 2). Response options ranged from 0 ("I don't use this") to 6 ("9 or more hours a day"). Examples of "private social media" included SnapChat, private messaging on Facebook, and emailing in both samples (Korean survey included additional examples of KakaoTalk and Nateon) and examples of "public social media" included Facebook, Instagram, and Twitter in both countries (U.S. survey included additional examples of Pinterest and Tumblr, Korean survey included additional example of KakaoStory).

Sources of information about parties. Subjects who reported ever drinking at bars or parties (95 percent of the total sample, with comparable rates across countries) answered seven items

developed for this study on digital sources of information to learn about parties and drinking opportunities (Table 3; response options ranged from 0 = "Never" to 5 = "Always").

Table 2. Face to Face and Computer-Mediated Communication by Country

Time engaged in each type of communication on a typical day	United States M	United States SD	Korea M	Korea SD	Difference t	Difference p
Friends						
Face to face	2.76	1.20	2.25	1.06	7.27	<0.001
Text messaging	2.45	1.40	1.93	1.45	5.76	<0.001
Private social media	1.75	1.21	2.74	1.50	−11.67	<0.001
Public social media	1.53	1.12	1.66	1.43	−1.68	0.093
Phone calls, FaceTime, Skype	0.97	0.90	1.58	0.92	−1.85	<0.001
Parents						
Phone calls, FaceTime, Skype	1.06	0.68	1.29	0.75	−5.10	<0.001
Text messaging	1.20	0.74	1.13	0.84	1.33	0.184
Private social media	0.45	0.70	0.90	0.86	−9.37	<0.001
Public social media	0.42	0.65	0.25	0.62	4.46	<0.001

Table 3. Sources of Party Information by Country

How often do you find out about parties that you attend from these sources?	United States M	United States SD	Korea M	Korea SD	t	p
Word-of-mouth or phone calls from my friends	3.12	1.26	2.84	1.13	3.70	<0.001
Texts from my friends	2.83	1.32	3.33	1.07	−6.59	<0.001
Word-of-mouth or phone calls from people I meet	1.59	1.32	2.67	1.14	−13.81	<0.001
Postings on open media forums like Facebook or Snap Chat	1.45	1.45	0.74	1.04	8.88	<0.001
Texts from social organizations (frats, sports groups, clubs)	1.22	1.40	1.82	1.44	−6.58	<0.001
Texts from people other than my friends	0.97	1.18	1.68	1.34	−8.68	<0.001
Texts from bars	0.30	0.73	0.56	1.01	−4.39	<0.001

Note. Response scale: 0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Frequently, 4 = Often, 5 = Always

Table 4. Alcohol-Facilitative Private Text Messaging and Social Networking Sites Use by Country

Please indicate how true each reason is for you	US Private text messaging	US SNS	US Difference	Korea Private text messaging	Korea SNS	Korea Difference
To find parties	55.5	46.9[c]	8.6[a]	50.2	29.2	21.0[ab]
To find rides home after I have been drinking or using drugs	37.6[c]	17.7[c]	19.9[ab]	21.2	8.7	12.5[a]
To find places where I can drink with others	37.4	24.9	12.5[a]	50.4[c]	22.9	27.5[ab]
To find a post-party when my friends go home	25.7	15.1	10.6[a]	30.1	18.0	12.1[a]
To watch my friends party	17.7	30.6	−12.9[a]	48.5[c]	38.3[c]	10.2[ab]
To feel like I am with my friends when I am drinking alone	12.7	8.9	3.8[a]	20.8[c]	12.6	8.2[ab]

Note. Values indicate the percentage of the sample (United States or Korea) who endorsed that each item is at least "a little bit true" for SNS or text messaging separately, and the difference in endorsement of private text messaging compared with public SNS (per item, within country).
[a] Indicates a statistically significant difference within country between private text messaging and SNS use.
[b] Indicates that a statistically higher difference score between the United States and Korea (quantifying a stronger preference for one type of CMC over the other).
[c] Indicates more frequent endorsement of an item between countries (i.e., SNS use to find parties is more common in the United States than Korea). Korean translation of the item, "To find rides home after I have been drinking or using drugs" item omitted "or using drugs" and just referred to drinking.
CMC, computer-mediated communication; SNS, social networking sites.

Alcohol-facilitative private messaging and SNS use. A 10-item scale developed for this study assessed ways in which CMC is used to facilitate drinking experiences, with each item asked for private text messaging ("Please indicate how true each reason is for you with regard to your text messaging") and SNS ("Please indicate how true each reason is for you with regard to your use of other social media platforms") separately. Given the greater prevalence of private messengers in Korea[29] and its use on smart phones as a text message replacement, Korean participants were instructed to include CMC via private messengers (e.g., KakaoTalk) in the text messaging questions on this survey. Participants rated how true each item was for them using a Likert scale (0 = "Not at all true", 4 = "Extremely true"). Responses were dichotomized to reflect any endorsement of an item (1–3) versus none (0). Two items were dropped due to low endorsement (<20 percent, "to figure out how to get drunk without consuming too many calories" and "to figure out how to get drunk quickly") and two items were dropped due to ambiguous wording in the Korean translation ("to find escorts to walk me home after I have been partying" and "to let others watch me party"). Thus, six alcohol-facilitative text messaging and six alcohol-facilitative SNS items were used in analyses (Table 4).

Frequency of alcohol use. Students responded to a single item that asked them to rate how many times in the past year they had drank more than just a few sips of alcohol.[22] Response choices ranged from 0 (0 occasions) to 6 (40 or more occasions). U.S. (mean = 4.14, SD = 1.59) and Korean (mean = 4.10, SD = 1.80) students reported comparable frequency of past year alcohol consumption [t (874.5) = 0.31, p = 0.760].

Frequency of HED. Students responded to a single item that asked them to rate how many times in the past year they drank more than five consecutive drinks on any single occasion.[22] Response choices ranged from 0 ("0 occasions") to 6 ("40 or more occasions"). HED was more frequent among Korean (mean = 3.3, SD = 1.9) than U.S. (mean = 2.55, SD = 1.93) students (t (861.8) = −5.5, p < 0.001).

Statistical analyses

Between-country differences were tested using independent samples t-tests (for continuous variables) and chi-square tests (for categorical variables). Within country comparisons between alcohol-facilitative CMCs were made using McNemar's test, which allows for paired comparisons of dichotomous measures. Multi-group models in Mplus 7.2 examined relations between alcohol-facilitative CMC and drinking, using MLR estimation (robust to non-normality) and FIML to account for missing data on alcohol use frequency (5.2 percent of Korean sample and 0.2 percent of U.S. sample missing) and HED (6.7 percent of Korean sample and 1.4 percent of U.S. sample missing). Alcohol use frequency and HED were regressed on items tapping using (a) private messaging and (b) SNS for each of the six items separately, alongside covariates (age and parent education). Between country differences in the magnitude of preference for private text messaging over SNS use and the magnitude of regression coefficients were tested using Wald tests of parameter constraints. Confirmatory factor analysis (CFA) (WLSMV estimation for categorical indicators) was used to test a single factor structure for alcohol-facilitative private text messaging and SNS separately, and multiple group factor analysis tested measurement

invariance, examining the assumption that items reflected the factors equivalently across the two countries.

Results

Descriptive statistics

As seen in Table 1, gender composition and year in college were similar in the U.S. and Korean samples, but the U.S. sample was younger, had more highly educated parents, and were much more likely to live outside the home. Given these sample differences, age and parent education were included as covariates in regression analyses. Living situation was not included as a control variable because it was confounded with country.

Frequency of CMC

As seen in Table 2, compared to U.S. students, Korean students spend more time talking to friends via phone calls or camera-based applications and through private social media, whereas U.S. students spend more time talking with friends face-to-face and texting. U.S. and Korean students demonstrated similar rates of time spent interacting with friends via public social media. U.S. students reported spending the most time interacting with friends in person, followed closely by time spent interacting with friends through texting. Korean students reported spending the most time interacting with friends via private social media messengers, followed by spending face to face time with friends.

CMC to learn about parties and facilitate alcohol involvement

Students from both countries rated private communications with friends as the most frequent sources of information about parties (Table 3). U.S. students learned about parties through open social media more frequently than Korean students. U.S. students also reported learning of parties more frequently by word-of-mouth and phone calls from friends than their Korean counterparts. In contrast, Korean students learned about parties via word-of-mouth or phone from acquaintances, via texts from friends, via texts from other people, via texts from social organizations, and via texts from bars more often than U.S. students.

Within both samples, there was a clear preference for private text messaging over SNS for almost all alcohol-facilitative items (Table 4). The magnitude of these differences between private text messaging and SNS posts tended to be larger among the Korean students, with the exception of finding rides home, where U.S. students showed a stronger preference for private text messaging, and to find a post-party, where differences were comparable in the United States and Korea. Although Korean, versus U.S., students reported more frequent use of either CMC to watch their friends party, U.S. students reported using SNS more than text messaging to watch their friends party whereas Korean students did the opposite.

Compared to Korean students, U.S. students were more likely to endorse using both SNS and text messaging to find rides home after drinking or using drugs, and U.S. students were more likely to endorse using SNS to find parties (Table 4). Korean students were more likely to

endorse using both SNS and text messaging to watch their friends party as well as using text messaging to feel like they are with friends when they are drinking alone and to find places where they can drink with others. U.S. and Korean students were equally likely to endorse using text messaging and SNS to find a post-party once their friends go home, using text messaging to find parties, and using SNS to feel like they are with their friends when drinking alone.

Alcohol facilitative CMC and drinking

As seen in Table 5, all types of alcohol-facilitative private messaging were related to increased alcohol use frequency and HED in the United States; in Korea, more frequent alcohol use and HED were associated with using private text messaging to find parties, get rides home, and to find places to drink (but not finding a post-party, watching friends party, or feeling like not drinking alone). In the United States, most types of alcohol-facilitative SNS use were not related to frequency of alcohol use or HED (over and above effects of alcohol-facilitative private text messaging). The one exception was that endorsing using SNS to find rides home after drinking or using drugs was associated with more frequent alcohol use and HED. Korea similarly saw that alcohol facilitative SNS use was less consistently linked with drinking than private text messaging, though using SNS to find places to drink with others was related to alcohol use frequency and HED, and to find a post-party was both related to higher HED (though not alcohol use frequency) in the Korean sample.

Table 5. Alcohol Facilitative Computer-Mediated Communication and Drinking

	Alcohol use frequency						Heavy episodic drinking					
	US		Korea		Difference		US		Korea		Difference	
	β	p	β	P	Wald	p	β	p	β	p	Wald	p
To find parties												
Private Text Msg.	0.32	<0.001	0.13	0.012	6.50	0.011	0.33	<0.001	0.17	0.001	3.62	0.057
SNS	0.06	0.141	0.03	0.518	0.08	0.782	0.03	0.472	0.02	0.679	0.01	0.944
To find rides home												
Private Text Msg.	0.27	<0.001	0.14	0.005	1.25	0.264	0.20	<0.001	0.11	0.027	0.45	0.504
SNS	0.11	0.007	−0.01	0.824	1.96	0.162	0.22	<0.001	0.09	0.069	1.11	0.293
To find places to drink												
Private Text Msg.	0.37	<0.001	0.29	<0.001	0.43	0.510	0.36	<0.001	0.25	<0.001	1.88	0.171
SNS	0.06	0.122	0.11	0.015	1.11	0.292	0.08	0.081	0.18	<0.001	3.15	0.076
To find a post-party												
Private Text Msg.	0.24	<0.001	0.06	0.242	5.6	0.018	0.28	<0.001	0.06	0.273	8.81	0.003
SNS	0.02	0.662	0.07	0.199	0.41	0.521	0.05	0.376	0.16	0.002	2.57	0.109
To watch friends party												
Private Text Msg.	0.16	<0.001	0.03	0.570	4.6	0.032	0.19	<0.001	0.05	0.341	5.05	0.025
SNS	0.01	0.772	0.05	0.393	0.22	0.641	0.06	0.197	0.09	0.106	0.15	0.698
Drinking alone												
Private Text Msg.	0.16	0.001	0.08	0.108	1.53	0.216	0.18	<0.001	0.08	0.113	2.19	0.139
SNS	0.07	0.176	0.03	0.575	0.27	0.606	0.09	0.084	0.06	0.268	0.19	0.666

Note. Alcohol use frequency and HED are regressed on items tapping using (a) private messaging and (b) SNS for each of the six items separately, alongside age and parent education. U.S. and Korean samples analyzed in multiple group analysis. β = Standardized regression coefficient. Difference in the magnitude of each coefficient (between United States and Korea) is tested using a 1degree of freedom Wald test of parameter constraints.
HED, heavy episodic drinking.

CFA confirmed adequate fit of the single factor structure for alcohol-facilitative text messaging and alcohol facilitative SNS use within the U.S. and Korean samples separately, but the

measures were not invariant across samples. Multiple group CFA results for alcohol-facilitative private text messaging indicated noninvariance for all six item intercepts and for one item's loading, suggesting that the alcohol-facilitative private text messaging items do not equally assess the same latent factor in the United States and Korea. Results for the alcohol-facilitative SNS model suggested that the measure was partially invariant, with invariance achieved for three item intercepts and all six factor loadings.

Discussion

This study is the first comparison of public and private CMCs in alcohol use, with findings that show that private text messaging is more popular than SNS in facilitating alcohol use (particularly among Korean students). This finding of preference for a private medium can be interpreted as consistent with research on student motivations to avoid potentially damaging consequences if publicly shared alcohol posts are seen by professional contacts[13,14] and that collectivist cultures, like that of Korea, have heightened privacy motivations and less online self-disclosure.[16–18] Notably, the only item for which SNS was more popular than private text messaging (and only in the United States) was "to watch my friends party," a peer focused online behavior that would likely not carry repercussions to the student himself or herself. Notably, these items may not tap the same underlying construct across cultures. Factor analysis showed that items tapping alcohol-facilitative private text messaging performed differently across samples, perhaps reflecting differences in what counts as private messaging (KakaoTalk and Nateon are available only in Korea and included only in those survey items) and/or inherently different private CMC use around alcohol in the United States and Korea. This was less noteworthy for alcohol facilitative SNS use (given invariant loadings in the two samples and comparable levels of endorsement for half of the alcohol facilitative SNS items).

Friends are the chief source of information about parties for all students. Somewhat surprisingly, both U.S. and Korean students reported using open social media platforms to learn about parties *rarely*. This infrequent use of open SNS to find parties puts into perspective prior research suggesting that alcohol-related content on open social media is often centered around coordinating drinking opportunities[12] and our findings that the most frequently endorsed reason for alcohol-facilitative SNS use by U.S. college students was "to find parties." Our results suggest that indeed students are more likely to use SNS to find parties than to engage in other queried forms of alcohol-facilitation activities, but these do not appear to be widespread behaviors. Over half of U.S. students and nearly three quarters of Korean students reported *never* using SNS to find parties. This may reflect that, *when* students are using SNS around alcohol use, the primary reason may be to find parties, but overall this represents a small proportion of their total SNS engagement, and that most students are not leveraging CMCs in these ways.

Finally, our hypothesis that private text messaging would be more closely tied to drinking than SNS posts was confirmed. All types of alcohol facilitative text messaging were predictive of past year alcohol use frequency and HED in the United States, and for the most part, alcohol facilitative SNS use did not predict drinking (over and above the private text messaging effects). In Korea, drinking was also tied more strongly to private text messaging, though the relations with drinking were less robust than in the United States.

Conclusions, Limitations, and Future Directions

This study contributes substantially to our understanding of how college students use CMCs to facilitate alcohol involvement and shows the importance of previously unstudied private CMCs in facilitating alcohol use. Furthermore, this cross-cultural study extends our understanding of how CMCs impact drinking in two distinct, technologically advanced cultures. Nonetheless, study limitations include the need for additional development of key measures to assess alcohol facilitative CMC use in both countries; we cannot rule out that some differences between the U.S. and Korean samples may be artifacts of imperfect measurement of key constructs or differences in method of data collection. Second, we were unable to capture many offline social ecologies; for example, the fact that nearly all U.S. students live with peers, and many Korean students live at home with their parents may be related to alcohol-facilitative CMCs and drinking, but we were unable to account for that here. Third, this study relied on self-report of CMC; a direction for future research is the assessment of alcohol-facilitative CMC via more objective methods, including quantitative and qualitative coding of text message and SNS content directly. Lastly, this study is cross-sectional and does not permit conclusions about directionality; it is likely that frequent alcohol use results in increased use of alcohol-facilitative CMCs, which in turn impacts future drinking behaviors.

Despite these limitations, these results show that college students are leveraging mobile technologies to facilitate alcohol use and misuse in diverse ways. This study highlights that a better understanding of rarely studied private CMC may uncover important sources of peer socialization regarding alcohol involvement. Private CMCs can perhaps serve as both a window into college students' behavior a method for delivery of preventive messaging regarding alcohol misuse.

Author Disclosure Statement
No competing financial interests exist for any author.

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