

Collegiate Binge Drinking and Social Media Use Among Hispanics and Non-Hispanics

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ABSTRACT. Objective: College students' reliance on social media is both a risk factor for alcohol-related problems and a possible avenue for intervention. Greater understanding of students' social media habits in relation to drinking may lead to more effective prevention efforts. This study examined the use of alcohol and social media in Hispanic and non-Hispanic college students with and without a history of binge drinking. **Method:** Participants ($N = 424$; age 18–25; 84% female) completed online surveys of alcohol use, intensity of use for Snapchat, Instagram, Facebook, and Twitter, social media addiction, and retrospective frequency of social media use while drinking and after intoxication. **Results:** Historical binge drinkers had greater intensity scores for Snapchat, Instagram, and Twitter, and were more likely to report using

social media and alcohol concurrently, even while intoxicated ($ps < .05$). Compared with Hispanics, non-Hispanics exhibited greater intensity of use for Instagram ($ps = .001$). Quantity and frequency of alcohol use was positively correlated with intensity scores for Snapchat, Instagram and Twitter ($ps < .001$), as well as social media addiction ($p < .001$), and use of social media while drinking and after intoxication ($ps < .001$). Age at first alcohol use and first intoxication were negatively correlated with use of social media while drinking and after intoxication ($ps < .001$). **Conclusions:** The results of this study may inform intervention efforts aimed at curbing hazardous college drinking by highlighting a context in which students could be exposed to harm-reduction messages presented through social media. (*J. Stud. Alcohol Drugs*, 79, 000–000, 2018)

NEARLY A DECADE AGO, a mixed-methods study by Pempek et al. (2009) identified collegiate social media behaviors that were characteristic of addiction, with one participant noting that, “people are obsessed with using these sites” (p. 234). Since then, social media platforms have blossomed, with recent lay descriptions dubbing them “as habit-forming as crack cocaine” (Elgan, 2015). Although social media addiction is not currently recognized in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), problematic social media use overlaps with addiction criteria in many ways (Golbeck, 2017). Researchers have noted tolerance, withdrawal, craving, and anger or irritability when participants are unable to access social media sites (Hormes, 2016; Hormes et al., 2014). Further, those who are addicted to social media engage in compulsive use, which continues despite negative consequences (Andreassen, 2015). This pattern is similar to that of internet gaming disorder, a “tentative disorder” that is being considered for possible future inclusion in a future DSM (American Psychiatric Association, 2013; Golbeck, 2017).

Problematic social media use may negatively affect psychosocial functioning (Tsitsika et al., 2014) and may increase risk of problem drinking, particularly when content

is alcohol related (D’Angelo et al., 2014; Geusens & Beulens, 2017; Glassman, 2012; Moreno et al., 2012; Ridout et al., 2012; Thompson & Romo, 2016; Westgate et al., 2014). For example, Marcuzinski et al. (2016) found that college students’ alcohol-related Facebook activity (e.g., written postings or photos/images depicting alcohol) predicted hazardous drinking. In a longitudinal study of college students, Boyle et al. (2016) found that exposure to *peers’* alcohol-related content on Facebook, Instagram, and Snapchat predicted alcohol use at a 6-month follow-up, even after controlling for the drinking habits of participants and close friends. In light of such findings, Boyle et al. (2016) cautioned that unless universities update their alcohol education programs to address such issues, prevention efforts could be undermined by students’ “glamorized portrayals of alcohol use” on social media (p. 26). This is a crucial issue, as hazardous collegiate drinking continues to be a significant public health concern for which effective interventions are needed (Kuntsche et al., 2017; Rinker et al., 2016; Steers et al., 2016).

College students’ intense attachment to social media may itself provide an effective avenue for intervention. In their review of social media-based health interventions, Korda and Itani (2013) discussed opportunities to harness the strength of social media to trigger behavioral change, noting that theory-based interventions are most effective (Webb et al., 2010). Applying this approach, Ridout and Campbell (2014) used Facebook to deliver an intervention based on social norms theory, which resulted in a clinically significant, lasting reduction in alcohol use for above-average drinkers who

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received Facebook messages about the actual (vs. perceived) drinking patterns of their proximal peers. These reductions in drinking were apparent after 1 month and persisted at a 3-month follow-up (Ridout & Campbell, 2014). However, because the social media landscape is ever-changing, the optimal platform for collegiate interventions may be a moving target. Further, most students use multiple social media platforms, and intervention via one platform may be undermined by students' glamorization of risky behaviors on another (Boyle et al., 2016). The timing of delivery for alcohol-related interventions is also an area through which prevention programs could improve to ensure that messages are reaching students at the times of greatest impact.

Thus, it is important to understand the current social media habits of college students at risk for hazardous drinking—to determine which platforms they use and the contexts in which they use them. The potential interactions of social media use with alcohol-related risk and resiliency factors are also of interest. To this end, we surveyed college students to determine possible differences in social media habits between historical binge drinkers (BDs) and non-binge drinkers (NBDs) of Hispanic or non-Hispanic ethnicity. The inclusion of ethnicity as a between-subjects factor was motivated by studies suggesting that Hispanic ethnic identity may confer protection against or resilience to addictive behaviors for some populations (Brook et al., 1998; Ceballos et al., 2012; Marsiglia & Waller, 2002). Students reported their use of different social media platforms (i.e., Snapchat, Instagram, Facebook, Twitter, and/or "other") and their personal and familial drinking patterns. Importantly, beyond mere usage metrics, an *intensity* scale was also used to measure social media activity, allowing us to capture participants' emotional investment in social media and the extent to which social media had become part of their identities (Ellison et al., 2007). In terms of context, we focused on concurrent use of alcohol and social media. Participants gave retrospective reports of their personal social media use while drinking and after intoxication. Social media addiction was also measured.

Based on previous research (Hormes, 2016), we hypothesized (a) that BDs would exhibit greater intensity of social media use, including posting while drinking and intoxicated. We also hypothesized (b) that BDs would be more addicted to social media, and (c) that personal alcohol consumption would be positively related to social media addiction. The influences of an alcohol-related risk factor (i.e., family history of alcohol use; Mayfield et al., 2008) and a potential resiliency factor (i.e., Hispanic ethnicity; Ceballos et al., 2012) were also explored.

Method

This study was approved by the university's institutional review board and performed in accordance with the ethical

standards of the Declaration of Helsinki. Students gave informed consent before participation.

Participants

As part of a larger study of social media use and health, college undergraduates ($N = 424$; 84% female) were recruited from Mass Communication and Psychology courses at a large Hispanic Serving Institution in Central Texas, United States. Participants were 18–25 years of age; had a positive, self-reported drinking history (i.e., affirmatively answered "Have you ever consumed an alcoholic beverage?"); and used at least one social media platform. They were compensated with class credit or extra credit.

Participants were grouped as Hispanic (H) or non-Hispanic (NH) based on their responses to the following: "Do you identify as a Latino or Hispanic person (A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish cultural origin regardless of race)?" (National Institutes of Health, 2015). Participants were grouped as historical BDs or NBDs based on their responses to the following: "Since you first started drinking alcohol, have you ever engaged in 'binge drinking,' that is, have you ever consumed 4 or more drinks (for women) or 5 or more drinks (for men) over the course of a drinking episode?" (Cranford et al., 2008). Using these criteria, four participant groups were established: Hispanic binge drinkers (H/BDs, $n = 97$), Hispanic non-binge drinkers (H/NBDs, $n = 57$), non-Hispanic binge drinkers (NH/BDs, $n = 186$), and non-Hispanic non-binge drinkers (NH/NBDs, $n = 84$).

Questionnaires

Alcohol use. Participants reported the age at which they took their first drink of alcohol and experienced their first intoxication. The Quantity Frequency Index (QFI; Cahalan et al., 1969) was used to measure the average ounces of absolute ethanol consumed per day over the previous 6 months, resulting in a total score that included wine, beer, and distilled spirits. The QFI is a valid and reliable measure of alcohol use, giving higher positive predictive values for binge drinkers than other measures such as the 7-day diary (O'Hare et al., 1997). Family history of alcohol use was measured with a pedigree method (Mann et al., 1985), which has satisfactory test-retest reliability ($\kappa = .78-.94$). Participants labeled primary and secondary relatives whom they identified as having had a "problem with alcohol only, or with alcohol and drugs." Affected relatives received one point (primary relative) or one-half point (secondary relative). Summation provided a quantitative family history measure (qFH, continuous variable), in which higher scores indicated a greater familial density of problematic alcohol use.

Social media use. Participants answered yes/no questions about use of Snapchat, Instagram, Facebook, Twitter, and

“other” social media; summed values created a continuous variable reflecting concurrent use of multiple platforms.

Participants also completed the Social Media Intensity Scale, which was designed by Ellison and colleagues (2007) to provide a better measure of social media usage than frequency or duration indices. The scale includes six attitudinal statements that tap into participants’ emotional connections to social media and the extent to which social media sites are integrated into participants’ daily activities (Cronbach’s $\alpha = .83$) (Ellison et al., 2007). Items are measured on a 5-point scale (*strongly disagree* to *strongly agree*). The scale was completed separately for Snapchat, Instagram, Facebook, and Twitter. Example items included, “I feel I am part of the Facebook community” and “Twitter has become part of my daily routine.”

Social media addiction was measured using the Bergen Social Media Addiction Scale (Andreassen et al., 2012). This six-item scale measured the past-year frequency of negative effects on participants’ lives because of social media use. It was scored on a 5-point scale (*very rarely* to *very often*). In previous studies, the coefficient α for this scale was .83 (Andreassen et al., 2012).

In terms of context, questions focused on concurrent use of alcohol and social media. To measure retrospective frequency of using social media while drinking or after intoxication, participants were instructed to “. . . indicate the extent to which you use social media while under the influence” using a 4-point scale (*never* to *always*). “Posting while drinking alcohol” and “posting while drunk” were the two alcohol-related items.

Data analysis

Demographics and alcohol use. Chi-square analyses examined the distribution of categorical variables across the four groups: H/BD, H/NBD, NH/BD, and NH/NBD. Separate 2 (BDs vs. NBDs) \times 2 (Hispanic vs. Non-Hispanic) analyses of variance were used to examine continuous variables. Before analysis, QFI was square root transformed to reduce positive skew (Osborne, 2002).

Social media use. Separate chi-square analyses examined group differences in the use of Snapchat, Instagram, Facebook, and Twitter (yes/no, categorical variable). Age, a correlate of online activity (Hargittai, 2004), differed significantly between BD and NBD groups and was controlled in analyses of continuous social media variables. Separate 2 (BDs vs. NBDs) \times 2 (Hispanic vs. non-Hispanic) analyses of covariance (ANCOVAs) covarying for age examined continuous social media variables. Separate analyses of intensity were conducted for Snapchat, Instagram, Facebook, and Twitter with each analysis restricted to only those participants who reported using that particular platform (subset analyses had $ns < 424$). Partial correlations controlling for age examined relationships between continuous alcohol and social media variables.

A post hoc power analysis based on an ANCOVA with $\alpha = .05$ ($n = 410$) and a small effect size ($f = 0.15$) using four comparison groups demonstrated sufficient power ($1 - \beta = .86$).

Results

Missing data

Values for variables that were examined in the entire participant sample were 98% complete with a random distribution of missing data. There were two exceptions. First, for the separate categorization of ethnicity and race (National Institutes of Health, 2015), 100% of Hispanics indicated their ethnicity, but only 22% of Hispanics selected a racial category. Second, for age at first intoxication, NBDs had a higher percentage of missing data (38%) than BDs (2%); however, both BDs and NBDs had less than 1% missing data for frequency of posting while intoxicated. For subset analyses of social media intensity, each platform subset had 98% complete intensity values and a random distribution of missing data.

Demographics

For ethnicity (National Institutes of Health, 2015), 36% of participants were Hispanic, regardless of race. Participants indicating a racial category (National Institutes of Health, 2015) were 57% White, 11% African American/Black, 3% Asian, and 1% American Indian/Alaska Native, and distribution did not differ across the four groups ($p = .15$). Gender did not differ across the four groups ($p = .33$). However, BDs were older than NBDs, $F(1, 420) = 15.12, p < .001, \eta^2_{\text{partial}} = .04$. No other main effects or interactions were noted ($ps > .40$). These data are shown in Table 1.

Alcohol use

Familial alcohol use (qFH; range: 0–9.5) did not differ across the four groups ($p = .26$); however, personal alcohol use differed significantly, as expected. BDs (vs. NBDs) reported earlier ages at first drink, $F(1, 414) = 15.19, p < .001, \eta^2_{\text{partial}} = .04$, and first intoxication, $F(1, 414) = 6.50, p = .01, \eta^2_{\text{partial}} = .02$. BDs (vs. NBDs) had significantly higher transformed QFIs, $F(1, 371) = 76.34, p < .001, \eta^2_{\text{partial}} = .17$. No other main effects or interactions were significant ($ps > .28$). These data are shown in Table 1

Mean untransformed QFI values translated to approximately seven drinks per week for BDs and one to two drinks per week for NBDs. BDs generally consumed their weekly beverages over one or two drinking episodes, reporting a typical episode average of approximately five drinks (for women) and six drinks (for men).

TABLE 1. Demographics and alcohol use

Variable	H/BD (<i>n</i> = 97) <i>M</i> (<i>SD</i>) or %	H/NBD (<i>n</i> = 57) <i>M</i> (<i>SD</i>) or %	NH/BD (<i>n</i> = 186) <i>M</i> (<i>SD</i>) or %	NH/NBD (<i>n</i> = 84) <i>M</i> (<i>SD</i>) or %	<i>p</i>
Gender, female	84%	77%	86%	81%	n.s.
Age	20.0 (1.7) ^b	19.1 (1.5) ^a	19.9 (1.6) ^b	19.4 (1.6) ^a	<.001
qFH	1.7 (1.9)	1.5 (2.0)	1.4 (1.6)	1.3 (1.8)	n.s.
First drink	13.6 (3.6) ^b	15.2 (3.5) ^a	14.3 (2.9) ^b	15.4 (3.1) ^a	<.001
First intoxication	16.7 (2.1) ^b	17.2 (1.9) ^a	16.4 (1.8) ^b	17.2 (1.5) ^a	.01
QFI	0.62 (0.83) ^b	0.17 (0.32) ^a	0.75 (1.10) ^b	0.16 (0.32) ^a	<.001

Notes: Significant differences are noted with superscripts. Age at participation and ages at first drink and first intoxication are shown in years. H = Hispanic; BD = binge drinker; NBD = non-binge drinker; NH = non-Hispanic; n.s. = not significant. qFH = Quantitative Family History of Alcohol Use (Mann et al., 1985); QFI = Quantity Frequency Index (Cahalan et al., 1969), shown before square root transformation.

Social media use

Any use. All participants used at least one type of social media, and 98% used more than one platform concurrently. When platforms were examined separately, 97% of participants reported using Snapchat, 93% used Instagram, 86% used Facebook, 78% used Twitter, and 11% used “other” social media. BDs (vs. NBDs) were more likely to use Snapchat, $\chi^2(1) = 6.25, p = .01$, and Facebook, $\chi^2(1) = 6.25, p = .01$, but did not differ on use of Instagram, Twitter, or “other” social media ($ps > .16$). Non-Hispanics’ greater use of Facebook (vs. Hispanics) approached significance ($p = .06$), but no other ethnicity differences were noted ($ps > .33$).

Concurrent use and addiction. Results are shown in Table 2 and summarized below. BDs (vs. NBDs) used more platforms concurrently, $F(1, 419) = 4.80, p = .03, \eta^2_{\text{partial}} = .01$. No other main effects or interactions were noted for platform number ($ps > .36$). BDs (vs. NBDs) reported greater frequency of posting on any platform while concurrently drinking alcohol, $F(1, 419) = 54.43, p < .001, \eta^2_{\text{partial}} = .12$. BDs (vs. NBDs) also reported greater frequency of posting while intoxicated, $F(1, 418) = 54.16, p < .001, \eta^2_{\text{partial}} = .12$. No other significant main effects or interactions were noted for concurrent alcohol use ($ps > .13$). For social media addiction, BDs (vs. NBDs) trended toward higher addiction levels ($p = .08$). No other significant main effects or interactions were noted ($ps > .10$).

Intensity of use. Results are shown in Table 3 and sum-

marized below. Among Snapchat users ($n = 410$), BDs (vs. NBDs) had greater intensity of use, $F(1, 400) = 5.42, p = .02, \eta^2_{\text{partial}} = .01$. For Instagram ($n = 396$ users), BDs (vs. NBDs) had greater intensity of use, $F(1, 384) = 4.67, p = .03, \eta^2_{\text{partial}} = .01$. Further, non-Hispanics (vs. Hispanics) reported a greater intensity of Instagram use, $F(1, 384) = 12.13, p = .001, \eta^2_{\text{partial}} = .03$. Among Facebook users ($n = 366$), there was a trend ($p = .06$) toward greater intensity of use for non-Hispanics (vs. Hispanics). For Twitter ($n = 329$ users), BDs (vs. NBDs) had a greater intensity of use, $F(1, 316) = 3.95, p < .05, \eta^2_{\text{partial}} = .01$. No other significant main effects or interactions were noted for the four platforms ($ps > .33$).

Correlations

Concurrent use and addiction. Results are shown in Table 4 and summarized below. Number of platforms used was positively correlated with QFI, $r(372) = .15, p = .004$, but not related to other alcohol-related variables, $rs < |-.06|, ps > .20$. Posting while drinking was positively correlated with QFI, $r(372) = .47, p < .001$, and negatively related to ages at first drink, $r(415) = -.17, p < .001$, and first intoxication, $r(360) = -.25, p < .001$. Frequency of posting while intoxicated was positively correlated with QFI, $r(371) = .50, p < .001$, and familial alcohol use (qFH), $r(411) = .11, p = .02$, and negatively related to ages at first drink, $r(414) = -.19, p < .001$, and first intoxication, $r(359) = -.30, p < .001$. Social

TABLE 2. Concurrent use and addiction

Variable	H/BD (<i>n</i> = 97) <i>M</i> (<i>SD</i>) or %	H/NBD (<i>n</i> = 57) <i>M</i> (<i>SD</i>) or %	NH/BD (<i>n</i> = 186) <i>M</i> (<i>SD</i>) or %	NH/NBD (<i>n</i> = 84) <i>M</i> (<i>SD</i>) or %	<i>p</i>
No. of platforms	3.7 (0.08) ^b	3.6 (0.10) ^a	3.7 (0.06) ^b	3.5 (0.09) ^a	.03
Posting/drinking	1.63 (0.12) ^b	0.88 (0.15) ^a	1.62 (0.09) ^b	0.53 (0.13) ^a	<.001
Posting/intoxicated	1.45 (0.12) ^b	0.70 (0.16) ^a	1.65 (0.09) ^b	0.51 (0.13) ^a	<.001
SM addiction	2.63 (0.09)	2.53 (0.12)	2.85 (0.06)	2.61 (0.10)	n.s.

Notes: Analyses controlled for age. Locations of significant differences are noted with superscripts. H = Hispanic; BD = binge drinker; NBD = non-binge drinker; NH = non-Hispanic; no. of platforms = the number of social media platforms the participant used concurrently (i.e., Snapchat, Instagram, Facebook, Twitter, and/or other); posting/drinking = posting while drinking, measured on a scale of 0 (never) to 4 (always); posting/intoxicated = posting while intoxicated, measured on a scale of 0 (never) to 4 (always); SM addiction = social media addiction, measured on a scale of 0 to 5 (greatest addiction); n.s. = not significant.

TABLE 3. Intensity of use for four social media platforms

Variable	H/BD <i>M (SE)</i>	H/NBD <i>M (SE)</i>	NH/BD <i>M (SE)</i>	NH/NBD <i>M (SE)</i>	<i>p</i>
Snapchat (<i>n</i> = 410)	3.94 (0.09) ^b	3.67 (0.12) ^a	3.98 (0.07) ^b	3.78 (0.10) ^a	BD group, <i>p</i> = .02
Instagram (<i>n</i> = 396)	3.32 (0.11) ^{b.1}	2.98 (0.14) ^{a.1}	3.65 (0.08) ^{b.2}	3.47 (0.12) ^{a.2}	BD group, <i>p</i> = .03 Ethnicity, <i>p</i> = .001
Facebook (<i>n</i> = 366)	2.49 (0.11)	2.42 (0.15)	2.61 (0.08)	2.75 (0.12)	N.S.
Twitter (<i>n</i> = 329)	3.62 (0.14) ^b	3.29 (0.18) ^a	3.74 (0.10) ^b	3.46 (0.16) ^a	BD group, <i>p</i> < .05

Notes: Analyses controlled for age. Locations of significant differences are noted with superscripts; letters indicate a main effect of binge drinking group and numbers indicate a main effect of ethnicity. Intensity scores were measured on a scale of 0 to 5 (*greatest intensity*). H = Hispanic; BD = binge drinker; NBD = non-binge drinker; NH = non-Hispanic;

media addiction was positively correlated with QFI, $r(371) = .22, p < .001$, but was not related to ages at first drink or first intoxication, or qFH, $r_s < |-.06|, ps > .24$.

Intensity of use. For Snapchat users, intensity was positively correlated with QFI, $r(355) = .21, p < .001$, but was not related to age at first drink or first intoxication, $r_s < -.07, ps > .21$. For Instagram users, intensity was positively correlated with QFI, $r(341) = .21, p < .001$, negatively correlated with first intoxication, $r(341) = -.12, p < .03$, and unrelated to first drink ($p = .57$). For Facebook users, intensity was not correlated with QFI, first drink, or first intoxication, $r_s < .11, ps > .09$. For Twitter users, intensity was positively correlated with QFI, $r(277) = .19, p = .001$, but was not correlated with first drink or first intoxication ($ps > .16$).

Discussion

Social media use can be problematic and may even be addictive. Studies suggest that the content to which college students are exposed through social media may influence their behavior, leading to increased drinking following glamorized alcohol images (Boyle et al., 2016) or reduced alcohol use following intervention messages (Ridout & Campbell, 2014). Alcohol-related intervention efforts could improve by

harnessing the power of social media; however, to intervene effectively, it is important to understand which platforms college students are using and the contexts in which they are used. Our study focused on one context for social media use—during concurrent alcohol consumption. Researchers should also consider the possibility that social media use could interact with the risk and resiliency factors that influence alcohol use. The current study addressed several of these issues.

In terms of which platforms are used most commonly, in the entire participant sample, we found that students most frequently reported using Snapchat, then Instagram, then Facebook, followed by Twitter. This is consistent with other studies, which suggest that Facebook is waning in popularity among younger users, whereas Snapchat is becoming more popular (Boyle et al., 2016, 2017). In a recent article, Boyle et al. (2017) recommend that college drinking prevention researchers should shift their focus to Instagram and Snapchat. Further, longitudinal work by Boyle et al. (2016) suggests that, if ignored, students’ glamorized alcohol-related content on Snapchat and Instagram could actually interfere with Facebook-based social norm interventions. In response to our yes/no questions about social media use, BDs were more likely (vs. NBDs) to report using Snapchat and Facebook, suggesting that (in our sample) these platforms might

TABLE 4. Correlations between social media activity and alcohol-related variables

Alcohol-related variables	Social media activity							
	No. of platforms		Posting while drinking		Posting while intoxicated		Addiction to social media	
	<i>r</i>	(<i>df</i>)	<i>r</i>	(<i>df</i>)	<i>r</i>	(<i>df</i>)	<i>r</i>	(<i>df</i>)
qFH	.001	(412)	.09	(412)	.11*	(411)	.01	(411)
Age at first drink	-.007	(415)	-.17**	(415)	-.19**	(414)	-.04	(414)
Age at first intoxication	-.068	(360)	-.25**	(360)	-.30**	(359)	-.06	(359)
QFI	.15*	(372)	.47**	(372)	.50**	(371)	.22**	(371)

Notes: Analyses controlled for age. No. of platforms = the number of social media platforms the participant used concurrently (i.e., Snapchat, Instagram, Facebook, Twitter, and/or other); qFH = Quantitative Family History of Alcohol Use (Mann et al., 1985); QFI = Quantity Frequency Index (Cahalan et al., 1969).

* $p < .05$; ** $p < .001$.

be logical starting points for planning social media-based interventions to reduce hazardous drinking.

BDs (vs. NBDs) reported concurrent use of a greater number of social media platforms, a measure that was positively correlated with QFI. We also examined the *intensity* of participants' social media use. The intensity measure was designed by Ellison and colleagues (2007) to extend beyond yes/no categorization to encompass users' emotional investment and identity relating to a social media platform. BDs (vs. NBDs) had higher intensity scores for Snapchat, Instagram, and Twitter, suggesting that these platforms had become a more meaningful part of BDs' identities (Ellison et al., 2007). Further, although many BDs in our sample reported using Facebook, they reported lower intensity scores for this platform compared with NBDs. Thus, intensity scores suggested that BDs were differentially invested in the social media platforms they reported using. The number of platforms used, and the intensity of that use, may be important aspects to consider when planning targeted intervention efforts via social media. For instance, participants with more intense use of a larger number of platforms might be exposed more regularly to interventions delivered via their preferred platforms.

In terms of context, analyses focused on concurrent use of alcohol and social media. Based on their retrospective reports, BDs were more likely (vs. NBDs) to use social media while drinking and while intoxicated. Previous studies suggest that this practice may lead to regret and other negative consequences, as people are generally less inhibited while drinking and may be more likely to make poor decisions (Barnes et al., 2016). Further, a study by Thompson and Romo (2016) found that, compared with drinking alcohol, *posting about alcohol* on social media was actually a stronger predictor of alcohol-related negative consequences. However, some types of content posted while drinking and/or intoxicated may reinforce problematic alcohol use, particularly when posts depict alcohol-related fun, excitement, and pleasure (Barnes et al., 2016). BDs' greater likelihood of using alcohol and social media concurrently may provide an avenue for timely intervention through social media. For example, ecological momentary interventions (EMIs) can be used to intervene via mobile devices in real-time, at the "point of choice," when participants make decisions about drinking (Beckjord & Shiffman, 2014). Research is underway to determine the effectiveness of EMI in reducing episodic drinking when messages are deployed during a single occasion drinking event (Wright et al., 2017). However, studies from the pathological gambling literature have already shown that electronic harm-reduction messages are optimally effective "in the moment" when messages create an interruption in play and require active removal by the player (Ginley et al., 2017). Both at-risk gambling and binge drinking feature episodic escalations in an addictive behavior (Sundqvist

et al., 2015); thus, in-the-moment interventions might improve both conditions. We propose that, if BDs' concurrent use of alcohol and social media could be leveraged to inform the optimal timing and content of EMIs, then individually tailored harm-reduction messages delivered via social media while BDs are only moderately consuming alcohol (i.e., before significant impairment) might be useful in preventing an episode of social drinking from escalating into a binge.

Although BDs (vs. NBDs) had higher social media addiction scores, this difference was a nonsignificant trend. Although it is possible that collegiate binge drinking and social media addiction may be truly unrelated, it is also noteworthy that the relatively moderate average weekly alcohol consumption of our BDs may have limited our ability to examine this relationship using categorical variables. When alcohol consumption (i.e., QFI) and social media use were examined as continuous variables, we found that they were significantly, positively related. Heavier drinkers were more addicted to social media. This result is consistent with other studies in which alternative measures of hazardous drinking were used (e.g., Hormes, 2016). In addition, even after controlling for current age, participants who reported an earlier age at first drink and first intoxication were more likely to post while drinking and/or intoxicated. In our sample, reported ages at first drink and first intoxication ranged from those who had experienced intoxication during middle childhood, to those who had tried alcohol only after reaching legal drinking age. If maladaptive patterns of social media use are more likely among heavier drinkers and those who start drinking earlier in life, then these students may be a logical target for interventions delivered via social media.

Finally, we also examined an alcohol-related risk factor (i.e., family history of alcohol use; Mayfield et al., 2008) and a possible resiliency factor (i.e., Hispanic ethnicity; Ceballos et al., 2012). Although approximately half (55%) of our sample was FH+ (i.e., qFH scores ≥ 1), this status did not differ by BD group, ethnicity, or their interaction. In our analyses, qFH (a continuous variable) was not related to social media addiction. Further, although ethnicity-related differences in social media use were examined in each analysis, we found only limited evidence, namely that non-Hispanics (vs. Hispanics) reported more intense use of Instagram. However, the two ethnic groups were otherwise statistically similar, and ethnicity did not interact with the BD group to influence social media habits. Thus, Hispanic ethnicity did not appear to have a protective effect on the relationships between binge drinking and social media use.

Limitations and future directions. A number of issues were beyond the scope of this study and may be explored in future research. For instance, because of BDs' greater involvement with social media, BDs' *exposure* to harm-reduction messages might be increased by presenting those

messages through social media. However, it is not clear what effect this might have on BDs' *receptivity* to such messages. Source and content of messages will also be important factors. Further, social media platforms might be differentially effective for primary versus secondary interventions. Finally, peer interactions are a significant influence on alcohol use, even in digital space (Roberson et al., 2018). A more in-depth understanding of the intersecting social processes of substance use and social media use is needed to ensure maximal effectiveness of digital interventions.

Our study was also limited by a somewhat general characterization of BDs and Hispanics. The Substance Abuse and Mental Health Services Administration's definition requires binge drinking "at least one time in the last month" (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2017), whereas we used *lifetime* criteria to categorize BDs. In the NIAAA definition of binge drinking, beverages are consumed "in about two hours" (NIAAA, 2017), whereas we did not specify the duration of a single drinking episode. We also examined Hispanic culture as a categorical variable—a limited approach that does not address other relevant issues such as Hispanic subgroup (e.g., Ramisetty-Mikler et al., 2010), acculturation (e.g., Ceballos et al., 2012; Wahl & Eitle, 2010), or the nuances of ethnic label versus ethnic identity (Marsiglia et al., 2004). A more precise examination of binge drinking and ethnicity could further refine the patterns noted here.

In terms of new developments, we are encouraged by recent innovations in data collection for field studies of alcohol and social media use, such as wearable alcohol biosensors, ecological momentary assessments, and EMIs. Integration of these methods may allow researchers to more accurately time and tailor their social media-based interventions, providing harm-reduction messages at the moments when students need them the most. Although we believe that participants' concurrent use of alcohol and social media may provide an opportunity to expose drinkers to harm-reduction messages in the moment, we acknowledge that drinkers' receptivity to those messages is a separate issue to be addressed in future studies.

Conclusion

Our intensity data suggest that Snapchat, Instagram, and Twitter may be logical starting points for the planning of social media-based interventions to curb hazardous collegiate drinking, particularly among BDs. The context in which intervention messages are delivered is also important, particularly because heavier drinkers and students who start drinking earlier in life may be more likely to use alcohol and social media concurrently. Finally, we suggest that the integration of modern field study methods may provide new and innovative ways to deliver these interventions in real-time.

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