

# Identifying High-Risk Alcohol Users Among First-Year College Students: Attitude, Intention, and Facebook

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## Abstract

**Purpose:** It is challenging to identify older adolescents at risk for alcohol dependence. This study investigated first-year college students who scored as high-risk alcohol users (HAU), and examined their alcohol use and Facebook displays.

**Materials and methods:** This longitudinal study recruited college students at two universities to complete a phone interview prior to college (Time 1) and one year later (Time 2). Interviews assessed lifetime and current alcohol use, and attitude (scale of 0=very negative to 6=very positive) and intention (scale of 0=not at all likely to 5=very likely) toward alcohol use. The alcohol use disorders identification test (AUDIT) was administered at Time 2. Facebook profiles were evaluated for the presence of references to alcohol use and intoxication/problematic drinking (I/PD) prior to and throughout the participants first year at the university. Analyses included Chi-squared tests and Wilcoxon sign rank tests.

**Results:** Of 315 participants in the study, a total of 21 (6.7%) of participants met criteria as a HAU at Time 2. HAUs were 54.5% female, 86.4% Caucasian, and 73.7% from University A. At Time 1, all HAUs reported lifetime alcohol use and 91.1% were current drinkers. At Time 2, 95.7% were current drinkers. At Time 1, HAU's mean attitude toward alcohol was 4.0 (SD=1.0) and mean intention was 4.0 (SD=1.4); by Time 2 attitude was 4.6 (SD=0.9),  $p=0.02$ , and intention was 4.9 (SD=0.3). At Time 1, 39.1% of HAUs displayed alcohol references on Facebook but only one referenced I/PD. By Time 2, 20 HAU profile owners (90.4%) displayed some reference to alcohol and 52.2% referenced I/PD.

**Discussion:** Findings suggest areas in which dependence could be identified early, specifically attitude towards alcohol and assessment of Facebook profiles for references to alcohol. These findings have the potential to guide future intervention efforts for this high-risk population.

**Keywords:** Alcohol dependence; College; First year; Social networking sites; Facebook

**Abbreviations:** HAU: High-risk Alcohol User; AUDIT: Alcohol Use Disorders Identification Test; (I/PD): Intoxication or Problematic Drinking

## Introduction

It is challenging to identify older adolescents who are at risk for alcohol dependence. The first year at college is a critical time in which alcohol dependence may first arise [1-3]. Alcohol use is often considered a social norm in college, making those who may be dependent even harder to identify. Additionally, individuals with alcohol use problems in college are unlikely to seek treatment [3]. There is a need for better understanding of college student alcohol dependence, in order for healthcare professionals to be able to reach the high-risk drinkers at the appropriate time.

A novel approach in understanding and identifying these individuals may be through Facebook, as alcohol use references are frequently displayed on this site [4]. Social networking site profile ownership and use are at their highest among this age demographic [5]. Research suggests social networking sites are commonly seen as not separate from everyday life, but as an extension of a person's offline life [6]. Previous studies have demonstrated a link between real-time consumption of alcohol and Facebook alcohol displays, as those who scored higher on an alcohol abuse test were more likely to display problematic alcohol use on their profiles [7]. It is unclear if and how high-risk individuals, in particular, are displaying references to alcohol

on Facebook especially during the critical time period of their first year in college.

Little is known about first-year dependent alcohol users in college, specifically alcohol attitudes, intentions, and behaviors as well as how first-year dependent alcohol users display alcohol on Facebook. Additionally, innovative methods are needed to identify this hard to reach population early in college. Thus, the purpose of this study is to investigate first-year college students who met criteria as high-risk alcohol users (HAUs) and examine characteristics of their alcohol attitudes, intentions, and behaviors as well as their Facebook displays.

## Materials and Methods

### Setting

This retrospective longitudinal study took place at two large state universities, one in the Midwest and one in the Pacific Northwest from May 2011 through August 2012. The University of Wisconsin-Madison and the Seattle Children's Research Institute IRBs approved this study.

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## Participants

Participants in this study included incoming first-year students at one of the two study universities. Potential participants were randomly selected from the incoming class rosters at each university of about 6,000 students, 400 from each university were selected to be evaluated for eligibility. They were initially contacted through a pre-recruitment post card informing them about the study and that they would be contacted in the next few weeks, as well as a series of emails, phone calls, and Facebook messages. Inclusion criteria included being a full time first-year student at one of the two affiliated universities, and between 18 and 19 years of age, English-speaking, a US resident, and owner of a Facebook profile. Approximately 640 students were eligible for the study, and of those 338 were recruited into the study (RR=54.6%). The sample recruited from each university were representative of the overall university populations in gender and ethnicity. At the time of consent, the participants were asked to “friend” a research assistant Facebook profile. In the consent process, the “friending” of the research assistant profile was explained to be an important part of the study and that content of their profile would be viewed.

## Measures

**The interview:** Data for this study included the Alcohol Use Disorders Identification Test (AUDIT) as an outcome variable at Time 2. This test is a commonly used problem-drinking screen used in clinics across the United States [8-10]. This test is a 10-item questionnaire that focuses on an individual's alcohol consumption in the past 12 months; specifically, the questions in the test are focused on problem drinking behavior. Examples of the questions included on the AUDIT are: “How often do you have six or more drinks on one occasion?”, “How often have you failed to do what was normally expected of you because of your drinking?”, “How often have you had a feeling of guilt or remorse after drinking?” or “Has a relative, friend, doctor, or health care worker been concerned about your drinking or suggested you cut down?”. Example responses include a) never, b) monthly or less, c) monthly, d) weekly, or e) daily or almost daily. The scoring range for the AUDIT is as follows: 0-7 low-risk, 8-15 risky or hazardous level, and 13 and above for females and 15 or above for males high-risk, in particular for alcohol dependence issues [11,12]. Previous studies in college students found the AUDIT to have a sensitivity of 0.84 and specificity of 0.71 for identifying problem alcohol use [8].

Data for this study also included questions about the participant's attitudes, intentions, and behaviors related to alcohol use. To assess attitude toward alcohol, during the interviews participants were asked to respond to “On a scale between 0 and 6, with 0 as very negative, 3 as neutral, and 6 as very positive, what would you say your own attitude toward alcohol is?”. This question was based off of previous work that developed Likert scales to assess young adults' attitudes toward alcohol [13-15]. Participants' attitude responses were scored and categorized exactly how they appeared on the Likert scale, with 0=very negative, 1=negative, 2=somewhat negative, 3=neutral/don't know, 4=somewhat positive, 5=very positive, and 6=very positive.

To assess intentions to use alcohol in the future participants were asked to respond to “On a scale between 0 and 5, how likely do you think it is that you will consume this substance in the next 6 months? Please answer from 0=not at all likely to 5=very likely.” This answer scale was used in previous work on alcohol assessment and was found to have an alpha of 0.93 [13]. Participants' intention responses were scored and categorized exactly how they appeared on the Likert scale, with 0=not at all likely, 1=unlikely, 2=somewhat unlikely, 3=somewhat likely, 4=likely, 5=very likely.

Finally, to measure alcohol behaviors we asked the question “Have you ever used alcohol in your life?”, and if they had “At what age did you have your first full alcoholic drink”? Additionally to measure current drinking behavior we asked “Have you drunk alcohol in the past 28 days”?

Demographic data such as gender, ethnicity, and university attending was collected in the interviews as well.

**Content analysis of Facebook profiles:** For this study, we applied a codebook that has been used for evaluation of Facebook alcohol references in previous studies [4,7]. The alcohol references collected were categorized into two groups: alcohol displays or intoxication/problematic alcohol displays (I/PD displays) [4,7]. Alcohol displays consisted of any reference to alcohol. Examples of this include “liking” a beer brand page, discussing a drinking experience on the wall of their profile, or holding a clearly identified alcoholic drink in a photo. Intoxication/problematic displays consisted of any reference to intoxication, and or synonyms of intoxication. Some common synonyms seen were: “drunk”, “wasted”, and “hammered”. I/ PD displays also consisted of any reference found on the profile that included information about high-risk alcohol behaviors as identified by the CRAFFT screening tool [4,7,16]. Like the AUDIT, the CRAFFT screening tool is used commonly in clinics across the United States [16]. The risky behaviors screened for in the CRAFFT are as follows: riding or driving in a car where intoxication is present (C), drinking to relax, feel better about oneself or fit in (R), drinking to forget (F), prior concerns from family or friends about the individual's alcohol use (F), and trouble resulting from the use of alcohol (T) [16]. Examples of I/ PD references include “liking” an intoxication supporting page, talking about any of the criteria described above on their wall in a status update or comment, or a photograph of the profile owner unconscious by the toilet.

## Procedures

Data collection took place through two processes: two brief phone interviews and content analysis of Facebook profiles.

**The interview:** The interviews were completed prior to (Time 1) and immediately succeeding (Time 2) the participant's first year at one of the two universities in this study. In the interview at Time 1, the participants were asked to give basic demographic information as well as answer questions about their attitudes, intentions, and behaviors related to alcohol. In the interview at Time 2, the same information was collected as at Time 1 however the AUDIT was administered in addition. All interviews were completed by a trained research assistant. The responses were recorded on a paper and then entered into a database immediately following completion of the interview.

**Content analysis of Facebook profiles:** The content analysis of the Facebook profiles took place over the course of the participant's first year at the university. The profiles were examined monthly for alcohol references, both alcohol displays and I/PD displays. This monthly coding process began at the start of the participants' first year in college and ended during finals week of their first year. A baseline analysis (Time 1) of their Facebook profiles was conducted immediately after the participant was consented into the study. This analysis consisted of examining profile content from three months (March, April, and May) during the spring of the participants' senior year in high school. The content analysis process was done by trained research assistants. The analysis of the profiles was done manually; no computer software was used in this process. The research assistant evaluated each part of the

participant profile starting with the information section, the wall, and last the photos section. If an alcohol reference was found on a profile, the reference text or description (e.g. a photo of the profile owner passed out with beer cans next to them), was then entered into the database. Each alcohol reference was categorized as an alcohol display or I/PD display. For this study, the participants were placed in a displayer category at Time 1 and Time 2. The categories consisted of: non-displayer, which meant there were no references to alcohol present on the participant's profile, an alcohol-displayer, which meant they displayed references to alcohol but there were no references to I/PD on their profile, or the last category of I/PD-displayer, which meant they displayed a reference to intoxication or problematic behavior as defined above.

A total of 7 research assistants took part in the content analysis of the Facebook profiles. All of the research assistants went through an extensive three-month training process to acquire the skills and expertise they would need for this procedure. A 20% random subsample of profiles were evaluated by all coders to test inter-rater reliability, and Fleiss' Kappa statistic was used to evaluate the extent to which there was overall agreement in the coding of the presence or absence of alcohol references on a profile, as well as agreement among coders for the number of references on a profile. Fleiss' kappa was 0.82 for the presence or absence of alcohol references present on profiles indicating near-perfect agreement, and 0.74 for the agreement among all coders for the number of alcohol references indicating substantial agreement.

## Analysis

Participants identified at Time 2 as high-risk alcohol users (AUDIT score=13 or higher for females or 15 or higher for males) were examined in this study. Descriptive statistics were used to examine gender, ethnicity, and university differences in the HAU group compared to the rest of our sample. Chi-squared tests were used to examine these demographic differences. Wilcoxon sign-rank tests were used to examine changes in attitude and intention toward alcohol of the high-risk group over their first year in school. In examining the Facebook displays of the high-risk individuals, each person was categorized as a non-displayer, an alcohol displayer, or an I/PD displayer at Time 1 and Time 2. Descriptive statistics were used to examine differences in display category over time, as well as frequencies of alcohol and I/PD displays over the course of the participants' first year.

## Results

### Demographics

Of 315 participants (retention rate=93.1%), 6.7% scored as high-risk alcohol users (HAUs) on the AUDIT. Of the 6.7% HAUs, 42.9% were male and 90.4% were Caucasian. A large proportion of the HAUs (71.4%) were from University A. There were no differences between HAUs and non-HAU groups in gender, ethnicity, or university (Table 1).

### Attitude, intention, and behaviors

Prior to the first year, the mean attitude towards alcohol for those who scored in the HAU category was 4.0 (SD=1.0). At Time 2, the mean attitude toward alcohol was 4.6 (SD=0.9). This represented a positive change in the participant's attitude toward alcohol over the course of freshman year ( $p=0.02$ ).

The mean intention to consume alcohol of HAU prior to freshman year was 4.0 (SD=1.4). After completion of their first year in college, their mean intention to drink was 4.9 (SD=0.3).

	Remaining Sample (N=294)	High-risk (N=21)	P-value
	N (%)	N (%)	p>0.05
<b>Gender</b>			
Male	129 (43.9)	9 (42.9)	0.927
Female	165 (56.1)	12 (57.1)	
<b>Ethnicity</b>			
Caucasian	219 (74.5)	19 (90.4)	0.684
Asian	34 (11.6)	1 (4.8)	
Hispanic	10 (3.4)	0 (0)	
More than One	20 (6.8)	1 (4.8)	
Other	6 (2.0)	0 (0)	
<b>University</b>			
A	172 (58.5)	51 (71.4)	0.244
B	122 (41.5)	6 (28.6)	

**Table 1:** Gender, ethnicity, and university differences among high-risk individuals compared to the rest of their peers.

Among HAUs, at Time 1, 91.1% had consumed alcohol in the past 28 days prior to the time of their interview. At Time 2, 95.7% reported drinking alcohol in the past 28 days. All of HAUs reported previous lifetime alcohol use, with a mean age of their first alcoholic beverage of 15.1 (SD=1.6).

### Facebook displays

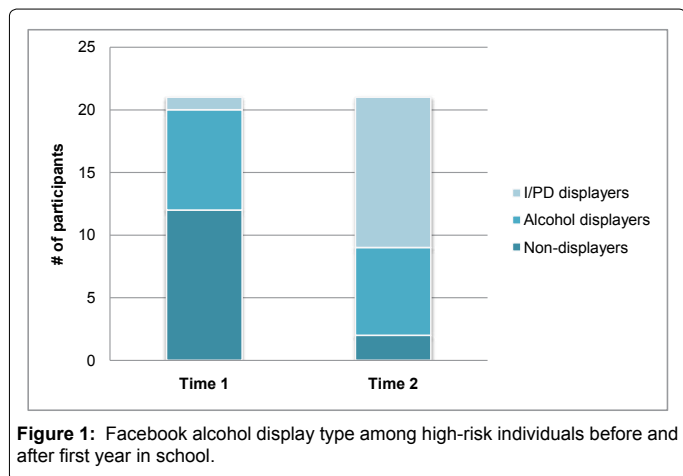
When examining the Facebook displays of HAUs prior to entering college, 57.1% had not displayed any references to alcohol on their profile, while the remaining had displayed references to alcohol, and only one of those participants had displayed content referencing intoxication/problematic drinking behavior (Figures 1-3). At Time 1, overall, HAUs referenced alcohol a mean number of 0.8 (SD=1.3) times. The mean number of intoxication/problematic drinking behavior at Time 1 was 0.0 (SD=0.2) times.

At Time 2, 52.4% of HAUs displayed references to intoxication/problematic drinking behavior. Of the remaining individuals, 38.1% displayed references to alcohol in general, with a mean number of alcohol references of 10.5 (SD=7.8). Two individuals had not displayed any references to alcohol or intoxication/problematic drinking behavior by Time 2 (Figures 1-3). At Time 2, overall, the HAUs referenced alcohol and I/PD behavior a mean of 11.7 (SD=8.2) times and referenced intoxication/problematic drinking behavior a mean of 1.2 (SD=1.8) times.

## Discussion

In this study of first-year college students, a subsample of students with high-risk alcohol use, were identified after the first year in college. Demographically the high-risk group looked similar to the rest of the sample. Attitude toward alcohol increased over the first year, and drinking behavior was sustained. Alcohol displays on Facebook became more prevalent, in particular those references discussing intoxication or problematic drinking behavior.

It may be surprising to some that among this sample of first-year college students, high-risk for dependence can be identified as early as the first year in college. Very few studies have reported prevalence rates of high-risk/dependence in first-year college students, an important time to acknowledge potential problems. Prior research suggests that Anglo-Americans or whites are more likely to have alcohol use problems, as well as males [17]. However, those who were identified as HAUs in our study looked demographically similar to the rest of the sample. This highlights consideration that alcohol abuse is a condition



**Figure 1:** Facebook alcohol display type among high-risk individuals before and after first year in school.

Alcohol displays	
Location found	
Information section/wall	Photo section
<b>Like of a page:</b> Mifflin Street Block Party (a drinking party at a university)	
<b>Status Update:</b> its my way or the margarita expressway	
<b>Status Update:</b> when I wake up from a night of drinking and see our remaining alcohol supply...	
Friend posts: "you drink too much, you swear a ton, you have absolutely no morals. you are everything I've ever wanted in a friend." <b>Profile owner likes the post.</b>	
<b>Status update:</b> It's thirsty thursday bitch.	

**Figure 2:** Qualitative displays of alcohol references found on Facebook profiles of high-risk sample.

**Note:** Bold face text indicates the type of content that was recorded and counted as a reference to alcohol behavior for the profile owner

that can impact any college student. Further, high-risk alcohol users may be challenging to identify in the general college student population.

Findings also included that attitude toward alcohol became more positive over the first year in college among HAU participants. As previous research suggests, attitude toward alcohol predicts consumption of alcohol [18]. HAUs in our sample had positive attitudes and were current drinkers before college, yet their attitude still increased. This may be related to high prevalence of drinking on

college campuses leading to increased exposure to alcohol [1-3]. It is likely that for the dependent individuals, acceptability of use increased due to more frequent observation of those around them using alcohol. Our study highlights that college increases positive attitudes toward alcohol, which is a precursor to drinking [18], which may additionally encourage acceptability. This emphasizes that the college environment may place those who are predisposed to dependence prior to entering college at increased risk.

Finally, our findings that HAU Facebook displays of alcohol changed over their first year at the university presents novel data on how alcohol dependent college students choose to display alcohol behaviors to a public audience. The individuals who were defined as HAUs displayed more intoxication/problematic drinking behavior throughout their first year than prior to their first year. Prior research has suggested online life to be an extension of offline life [6], and undoubtedly alcohol use plays a major role in the lives of dependent users. Therefore, findings suggest attitudes, intentions, or behaviors will surface on their social networking site profiles. Social network sites are used to self-promote and portray the positive self [19], and according to our findings the individuals in our study think positively about alcohol. Due to positive attitude toward alcohol in dependent users and social networking sites facilitating the portrayal of the positive self, our study demonstrates the potential utility of social networking sites as innovative intervention tools to reach out to those individuals who may need the most help in living a healthier life.

Intoxication/Problematic Drinking displays	
Location found	
Information section/wall	Photo section
<b>Status update:</b> #whitegirlwasted	<ul style="list-style-type: none"> <li>-Friend posts picture with caption: drunk face, profile owner likes this.</li> </ul>
<b>Status update:</b> Drunk ultimate frisbee, anyone in?	<ul style="list-style-type: none"> <li>-Friend posts: you look wasted, profile owner responds: :)</li> </ul>
<b>Like of a page:</b> I'm Shmacked	<ul style="list-style-type: none"> <li>-Profile owner comments: so hammered</li> <li>-Friend comments: those are her [profile owner] drunk, pants, profile owner likes this.</li> <li>-Profile owner comments: actually wasted skirts</li> <li>-Friend posts: how are you going to survive the next 3 years of college? Profile owner responds: I don't know.</li> </ul>
Friend posts: Sounds like someone had their firsttrip to detox last night huh? <b>Profile owner responds:</b> #whiteguywasted	
<b>Status update:</b> When you wake up after a drunken night and don't know where you are.	<ul style="list-style-type: none"> <li>DRUNK WEEK</li> <li>Photo caption: "The cleaning material to clean his [profile owner] pee. "I was a just a bit drunk last night";"</li> </ul>

**Figure 3:** Qualitative displays of intoxication/problematic drinking (I/PP) behavior references found on Facebook profiles of high-risk sample.

**Note:** Bold face text indicates the type of content that was recorded and counted as a reference to alcohol behavior for the profile owner

## Limitations

This study is not without limitations. All of the information collected in phone interviews was self-report which may be susceptible to recall and social desirability bias. However, a large portion of substance use data is self-report due to the difficulty of obtaining real-time substance use data. Due to the longitudinal nature of this study, we hope that our multiple contacts with participants over time has aided in a relationship where they feel comfortable in reporting honest answers. Additionally, an extra effort was made to increase comfort level of the participants by informing them that we obtained a federal certificate of confidentiality for our study. Also, the size of our high-risk group in our sample was small, which reduced our ability to conduct analyses. However, our study provides descriptive data on a population about which little is known. Lastly, since our sample was from two large state universities, it is uncertain whether our findings can be generalized to smaller universities or private institutions.

## Implications

Although this study has limitations, it has important implications. First, findings from our study suggest it may be worth implementing an alcohol-screening program prior to entering college. Variables such as attitude, intention, current and past drinking behaviors, such as age of first alcoholic drink, may be beneficial to include on this screen. Those who have a positive attitude, high intentions to drink, have participated in prior alcohol consumption with initiation of alcohol consumption at a young age, and are current drinkers entering college may benefit more from close monitoring compared to the rest of the first-year population. Second, further investigation of the feasibility of examining Facebook profiles in a university health service setting is needed. It is possible that healthcare professionals may be able to prompt a social networking site profile viewing session during a clinic visit where displays referencing alcohol could be discussed. There are various other ways the alcohol references displayed on these high-risk individuals profiles may be noticed and discussed, one possible group that may identify these references are parents. It also may be possible for resident advisors in student housing to prompt these conversations [20]. Finally, future research should be done to examine these references, specifically the potential predictive value of these displays.

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