BSc in Psychology

Alcohol Consumption among University Students in Iceland:
Effects of Peer Influence on Hazardous Alcohol Use

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Foreword

Submitted in partial fulfillment of the requirements of the BSc Psychology degree, Reykjavík University, this thesis is presented in the style of an article for submission to a peer-reviewed journal.
Abstract
Harmful use of alcohol is one of the leading causes of death and disability worldwide. One group that is particularly at risk for the negative consequences of alcohol is the college population, where risky alcohol consumption is common. This study examined alcohol consumption among university students in Iceland and the effects of peer influence on alcohol use among male and female students. Altogether, a sample of 712 participants (412 university students and 300 non-university peers) completed an online survey that included the Alcohol Use Disorder Test (AUDIT) and an 11-item scale which assessed perceived peer influence regarding alcohol use. The results provided support for the primary hypothesis; university students drank more alcohol on average than their non-university peers. Contrary to the secondary hypotheses, findings indicated that female students perceived more peer influence than male students and a negative relationship existed between perceived peer influence and level of alcohol use. Lastly, male and female students were equally as likely to meet the criteria of showing hazardous alcohol consumption. In conclusion, findings of the current study provide important evidence about drinking behavior of university students in Iceland. Further research is needed in a sample that better represents the population of university students to draw a more definitive conclusion.

Keywords: AUDIT, peer influence, university students, hazardous alcohol use

Útdráttur
Alcohol consumption among university students in Iceland: Effects of peer influence on hazardous alcohol use

Harmful use of alcohol is one of the leading causes of death and disability worldwide causing approximately 3.3 million deaths per year, which is nearly 6% of all deaths in the world (WHO, 2014). One group that is particularly at risk for the negative consequences of alcohol consumption is the college population, where heavy episodic or binge drinking is common (Johnston, O'Malley, Bachman, & Schulenberg, 2013). College students harmful alcohol use has been associated with a range of negative health and psychological consequences, such as accidents, injuries, legal problems and decreased academic performance (Kypri, Langley, McGee, Saunders, & Williams, 2002; Pascarella et al., 2007; Acuff et al., 2017). Former findings are mainly based on research conducted in America and Canada as few empirical studies have been conducted among European university students (Wicki, Kuntsche, & Gmel, 2010). Doubts have been raised whether findings of drinking behavior among American and Canadian college students can be generalized to European university students (Kuntsche, Rehm, & Gmel, 2004), as drinking cultures among those groups are considerably different (Heath, 1995).

The terms heavy episodic and binge drinking both refer to heavy alcohol consumption over a short period of time (Dawson, Grant, Stinson, & Chou, 2004; Wechsler & Nelson, 2001). For the typical adult drinking five or more drinks for men and four or more drinks for women in about two hours is considered heavy episodic or binge drinking (the National Institute on Alcohol Abuse and Alcoholism - NIAAA).

Although many begin to drink prior to attending college (Miller, Naimi, Brewer, & Jones, 2007) an increase in consumption has been noted among students when they enter the college environment (Baer, Kivlahan, & Marlatt, 1995; Weitzman, Nelson, & Wechsler, 2003; Johnston, O'Malley, & Bachman, 2000). Also, college students drink alcohol at heavier
drinking rates and more frequently than their non-student peers, which implies that something about the college experience and the environment encourages drinking behaviors among students (Johnston, O'Malley, & Bachman, 2001; Johnston, O'Malley, Bachman, & Schulenberg, 2006; Schulenberg et al., 2001).

A number of researchers have over the years stated that male college students tend to binge drink more compared to female college students (Wechsler, Dowdall, Davenport, & Castillo, 1995; Piane & Safer, 2008; Holmila & Raitasalo, 2005; Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). Several recent studies have, however, failed to report gender differences in binge drinking (Weitzman, Nelson, & Wechsler, 2003; Teevale et al., 2012) and others show that the gender gap is decreasing, as an increase in hazardous drinking has been reported among young women (Keyes, Grant, & Hasin, 2008; OECD, 2015; Bratberg et al., 2016; Betts et al., 2018). Young women are considered to drink alcohol to an equal extent to their male peers, if not more (Dir, Bell, Adams, & Hulvershorn, 2017).

**Alcohol consumption in Iceland**

Alcohol consumption among adolescents in Iceland has decreased from 42% reporting having been intoxicated at least once the past 30 days in the year 1998 to only 5% in the year 2016 (Guðmundsdóttir et al., 2016). This pattern of decrease in alcohol consumption was further acknowledged in a report published by the European School Survey Project on Alcohol and Other Drugs (ESPAD Group, 2016). The main purpose of ESPAD is to collect data on substance use among 15 to 16-year-old students in 48 European countries. Students in Iceland showed the lowest rates of all participants when asked if they had used alcohol (14%) and/or had become intoxicated (2%) at a young age. That is a substantial decline in drinking since the earlier ESPAD survey from 1999 where Iceland had one of the highest levels of reported youth intoxication (Plant & Miller, 2001).

Despite Iceland showing the lowest prevalence of alcohol consumption among
adolescents, an increase by 73% has occurred in overall alcohol consumption between the years 1980 and 2016 (Hagstofa Íslands, 2017a). The latest Global Status Report on Alcohol and Health published by the World Health Organization showed that 34.9% of all current drinkers in Iceland show a pattern of alcohol consumption that resembles heavy episodic drinking (WHO, 2014). Furthermore, according to the latest data on alcohol use from the Directorate of Health, nearly 32% of males and 27% of females in Iceland show hazardous drinking pattern. The youngest age group proved to have the most hazardous consumption pattern as nearly every other male and one in every three women at the age of 18 to 34 year old showed a hazardous drinking pattern (Landlæknir, 2018).

**Alcohol consumption and peer influence**

Peer influence is considered one of the most important predictors of college students drinking behavior (Teunissen et al., 2012). Peer influence is a process that does not seem to have a single clear definition. Peer influence has been defined as a social process with peers that can lead to changes in one's attitude, thoughts and behavior (Arnett, 2007; Bristol & Mangleburg, 2005). Peer influence has also been defined as a phenomenon characterized by the presence of both selection and socialization (Brechwald & Prinstein, 2011; Hall & Valente, 2007). Selection effects refer to the tendency to seek out friends who possess similar attitudes and behaviors as you and socialization effects refer to a tendency for behaviors and attitudes of friends to become similar over time (Brechwald & Prinstein, 2011).

Weitzman, Nelson and Wechsler (2003) examined factors associated with students' binge drinking uptake in college and found that peer influence was one factor associated. Students who took up binge drinking in college were more likely than their non-binge drinking peers to claim the reasons for their consumption to be a result of trying to fit in and because everyone else did it. Also, the majority of the students who reported most of their close friends binge, were students who took up binge drinking in college (Weitzman, Nelson,
& Wechsler, 2003). Hence, friendship networks where binge drinking is common encourages binge-drinking uptake. However, it must be taken into account that social norms change as we age and that the environment students enter when they attend college appears to be an influential factor underlying binge drinking (Carey, 1993, 1995; Gotham, Sher, & Wood, 1997; Wechsler, Lee, Kuo, & Lee, 2000). Still, the role of peer in alcohol use has long been confirmed (Borsari & Carey, 2001). Adolescents use their peers as a guide when making decisions regarding alcohol consumption and excessive alcohol consumption is linked to social affiliation and wanting of social acceptance (Maggs, 1997).

Gender moderates the effect of peer influence on personal alcohol use (Borsari & Carey, 2006). Men are more likely to use drinking as a way to socialize and gain support from peers than women (Wiggins & Wiggins, 1992; Nezlek, Pilkington, & Bilbro, 1994; Karwacki & Bradley, 1996) and men tend to seek social reinforcement from peers more than women in drinking situations (Borsari & Carey, 2006). Thus, drinking appears to be a bigger part of men's social lifestyle than of women's (Sher, Wood, Wood, & Raskin, 1996; Roche & Watt, 1999) and the more men interact with peers, the more alcohol they consume (Dorsey, Scherer, & Real, 1999).

The Current Study

The main aim of the current study was to examine alcohol consumption among university students in Iceland. Moreover, the aim was to assess if peer influence is one of the possible reasons for university students' hazardous drinking behavior. The European term "university student" corresponds to the North American term "college student" and will be used in this study. Based on the literature reviewed above the following hypotheses were put forward:

1) University students consume more alcohol than their non-university peers.
2) Male students perceive more peer influence than female students.
3) There is a positive relationship between student's perceived peer influence and alcohol use.
4) Male students show more hazardous drinking pattern compared to female students.

**Method**

**Participants**

A nonprobability sampling was used as respondents volunteered themselves to undertake the research. A total of 1312 individuals enrolled in the study but 600 participants were not included based on exclusion criteria; 258 participants had not reached the minimum age of 18 and 342 participants did not meet the criteria of being either a university student or a non-university peer (i.e., some participants were secondary school students and therefore not included). The final sample consisted of 712 individuals, of which 412 were university students and 300 non-university peers. The gender distribution was 53.8% female (N = 383) and 46.2% male (N = 329). The youngest participant was 18 years old, the oldest was 64 years old and the mean age of the sample was 25.15 years (SD = 6.5). No compensation was given for participation in the study.

**Instruments and Measures**

*Background information* was assessed with questions considering basic demographic information such as gender, age, education and whether or not the participant had children.

*Level of alcohol use* was measured with the Alcohol Use Disorder Identification Test (*AUDIT*). *AUDIT* was originally developed by The World Health Organization to screen for hazardous alcohol use (Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). *AUDIT* is a 10-item screening questionnaire including three items on the amount and frequency of drinking, three items on alcohol dependence, and four items on common problems caused by alcohol (Aertgeerts et al., 2000). Only nine questions were used in this study but that did not affect the internal reliability of the measure. The following item was not included; "How often during the last year have you needed a first drink in the morning to get yourself going
after a heavy drinking session?". Eight questions gave possible scores from 0 to 4 points and one question from 0 to 5 points. Maximum total score for the current study was 37. Higher score indicated a greater likelihood of hazardous drinking (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Initially, a total score of 8 or more on AUDIT was recommended as an indicator of harmful or risky alcohol use for both genders (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The cut-off point for women was later lowered to 6 as the cut-off point of 8 proved to be less sensitive and more specific for women compared to men (Reinert & Allen, 2002). In this study, the cut-off levels used were ≥8 for men and ≥6 for women. One standard drink in Iceland refers to an amount that contains approximately 12 g of pure alcohol (SÁÁ). Studies have shown that AUDIT is a valid instrument for identifying current hazardous use of alcohol among college students with Cronbach's alpha of .81 (Allen, Litten, Fertig, & Babor, 1997; Fleming, Barry, & Macdonald, 1991; Kokotailo et al., 2004).

Cronbach's alpha for the current sample was .829.

Peer influence was assessed with 13 items based on The Perceived Sociocultural Pressure Scale (PSPS; Stice, Ziemba, Margolis, & Flick, 1996) (Appendix). The questions were intended to assess participants' perceived peer influence regarding alcohol consumption (e.g., "I feel pressured by my friends to drink alcohol", "If I am offered an alcoholic drink, I will accept it even if I don't want it"). Participants stated their level of agreement on 5-point scales (1 = Strongly agree, 5 = Strongly disagree). Exploratory factor analysis showed that two items reduced the internal reliability of the scale. Thus, only 11 items were recoded into a single factor yielding a total score of perceived peer influence. Maximum total score possible was 55. Higher score indicated greater perceived influence from peers. Cronbach's alpha was .835 for the current sample of university students.
Procedure

Data were collected via questionnaire through the online survey tool Google Forms. The survey was originally distributed via link on the researcher's own Facebook page where its purpose was introduced. The survey was posted in several Facebook groups where the aim was to reach both university students and their non-university peers. The researcher's family members and friends also shared the survey link on their own Facebook pages. The goal was to get at least 1000 participants. The survey was accessible for approximately four weeks, from February 18th until the 23rd of March 2018. Participants received instructions about the research at the beginning of the survey and informed that they could opt out at any time. Participants were also informed that their responses were completely anonymous. By answering the questionnaire, participants would agree to an informed consent.

Design and Statistical analysis

The research design was quantitative cross-sectional design. The independent variables used were gender and university enrollment, both measured on a binomial scale, and perceived peer influence. Participants that did not declare their gender were excluded from the analysis. The dependent variables used were AUDIT total score and perceived peer influence total score. The data collected through Google Forms were exported to Microsoft Excel from which it was transferred to SPSS version 24 for further analysis.

To examine the construct of the scale yielding perceived peer influence, an exploratory factor analysis was conducted on the 13 items, followed by a varimax rotation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .854, which indicated that the variable selection was well suited for factor analysis and Bartlett's test of sphericity was significant ($\chi^2 (78) = 1402.3, p < .001$). A scree plot indicated one-dimensional factor structure of the scale. The following items were eliminated from the analysis as they reduced the internal reliability of the scale; "I will not have an alcoholic drink if my friends are not
drinking, even though I want to" and "I will have an alcoholic drink even though none of my friends are drinking". The final version consisted of 11 items with good internal reliability for the current sample of university students (α = .835).

Descriptive statistics for all variables were calculated as well as the distribution of AUDIT total scores and perceived peer influence total scores.

An independent t-test was used to determine if a significant difference existed between university students and non-university peers concerning total AUDIT score. An independent t-test was also used to examine if a significant difference existed between male and female students regarding perceived peer influence.

Pearson correlation was used to assess the association between students' perceived peer influence and alcohol use and a chi-square test was used to assess whether male students showed more hazardous drinking pattern compared to female students. In order to do so, AUDIT total scores were divided in two; participants that reached the criteria for hazardous alcohol consumption and participants that did not reach the criteria. Males that got the total score of 8 or higher and females that got the total score of 6 or higher were grouped as displaying hazardous alcohol consumption. The rest were grouped as not reaching the criteria of showing hazardous alcohol consumption.

Results

Of the 712 participants, 58% were university students (N = 412) and 42% were non-university peers (N = 300). Of the 412 university students, 55.6% were male (N = 230) and 44.2% were female (N = 182) and their ages ranged from 18 to 55 years old (M = 23.7, SD = 3.6). Of all the university students, 69% (N = 262) reached the criteria of showing hazardous alcohol consumption. Descriptive statistics for AUDIT total scores and perceived peer influence total scores are shown in table 1.
Table 1

Descriptive statistics for AUDIT total scores and Peer Influence total scores for the sample altogether and for the university students exclusively.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Minimum value obtained</th>
<th>Maximum value obtained</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total participants scores on AUDIT</td>
<td>7.9</td>
<td>4.8</td>
<td>0</td>
<td>37</td>
<td>708</td>
</tr>
<tr>
<td>University students scores on AUDIT</td>
<td>8.3</td>
<td>4.85</td>
<td>0</td>
<td>37</td>
<td>412</td>
</tr>
<tr>
<td>University students scores on Peer Influence</td>
<td>35.14</td>
<td>7.35</td>
<td>11</td>
<td>55</td>
<td>410</td>
</tr>
</tbody>
</table>

In order to determine if a significant difference existed in AUDIT total scores between university students and their non-university peers, an independent samples t-test was conducted. On average, university students scored higher on the scale measuring AUDIT total score ($M = 8.29$, $SD = 4.85$) than their non-university peers ($M = 7.57$, $SD = 4.7$). This difference was significant, $t(706) = 1.971$, $p = .049$. These results indicate that university students drink slightly more alcohol on average than their non-university peers.

An independent t-test was also used to assess if a significant difference existed between male and female students regarding perceived peer influence. On average, female students scored higher on the scale measuring peer influence total score ($M = 36.23$, $SD = 6.57$) than male students ($M = 34.27$, $SD = 7.8$). This difference was significant, $t(408) = -2.704$, $p = .007$. These results suggest that female students perceive more peer influence on average than male students.

Pearson correlation was used to assess association between students perceived peer influence and alcohol use. Perceived peer influence was significantly correlated with AUDIT total score, $r = -.546$, $p < .001$. Thus, there was a negative correlation between perceived peer influence total scores and AUDIT total scores which indicates that the more perceived peer influence participants reported, the lower they scored on AUDIT.
A chi-square test was conducted in order to assess whether male students show more hazardous drinking pattern than female students. Of all the university students, 69% reached the diagnostic criteria of hazardous alcohol consumption. As previously stated, the criteria varies by gender as the risky consumption criteria for males is a total score of 8 or more and 6 or more for females. 66% of the male students reached the diagnostic criteria and 73% of the female students. However, there was not a significant association between showing or not showing a risky pattern of alcohol consumption and whether you were a male or a female student $\chi(1, N = 380) = 2.142, p = .143$. Thus, male and female students were as likely to meet the criteria of showing hazardous drinking pattern.

**Discussion**

The main aim of the present study was to examine alcohol consumption among university students in Iceland, as well to assess if peer influence is one of the possible reasons for students' hazardous drinking behavior.

The results supported the primary hypothesis, that university students drink more alcohol than their non-university peers. These findings are consistent with previous studies that have shown college students to drink alcoholic beverages more frequently and at heavier drinking rates than their non-student peers (Johnston, O'Malley, & Bachman, 2001; Johnston, O'Malley, Bachman, & Schulenberg, 2006; Schulenberg et al., 2001). Social norms change as we grow older, but the environment students enter as they attend college seems to be an influential factor in itself, for students drinking.

The results did not support the remaining hypotheses (hypotheses 2 through 4). The findings of female students perceiving more peer influence regarding alcohol use than male students is contrary to previous studies. Previous studies imply that males are more likely than females to both seek social reinforcement from peers in drinking situations and use drinking as a way to gain support from peers (Borsari & Carey, 2006; Wiggins & Wiggins,
The results revealed a negative relationship between perceived peer influence and level of alcohol use, which is also contrary to previous studies. The literature argues that peers play a critical role in alcohol use and the more male students interact with peers, the more alcohol they consume (Dorsey, Scherer, & Real, 1999). A possible explanation for these results may be that of selection and socialization effects, which are different manifestations of peer influence. As stated previously, selection effects refer to the tendency to seek out friends who possess similar attitudes and behaviors as yourself and socialization effects refer to the tendency of behaviors and attitudes of friends to become similar over time (Brechwald & Prinstein, 2011). Thus, participants who reported high levels of alcohol use are possibly surrounded by a group of friends that also show high levels of alcohol consumption. However, the fact that high levels of perceived peer influence regarding alcohol use did not seem to have any effect on the drinking behavior of some participants, is worth investigating further.

Finally, results revealed that male and female students are equally as likely to meet the criteria of showing risky alcohol consumption. Previous studies have been inconsistent regarding gender difference and alcohol consumption. Results of the current study are in line with prior studies which argue that young women drink alcohol to an equal extent to their male peers (Dir, Bell, Adams, & Hulvershorn, 2017; Keyes, Grant, & Hasin, 2008; OECD, 2015; Bratberg et al., 2016; Betts et al., 2018). It has been suggested that an increase in alcohol consumption among women is a result of growing equality in gender roles (Holmila & Raitasalo, 2005).

This study had some limitations. First, the use of non-probability sampling makes it difficult to know how well the results represent the population and therefore not generalizable to the population at large. Second, the assessment of level of alcohol use and perceived peer
influence was self-reported and thus might be biased in terms of social approval, as excessive drinking is considered socially unacceptable. Finally, the questionnaire used did not allow for the participants to state if they were former university students, which could possibly have affected their drinking behavior as they had previously been involved in the university environment. Hence, the results should be interpreted with these limitations in mind.

Despite these limitations, the study had some important strengths. The instruments used had good internal reliability in the current sample. AUDIT is a valid screening instrument with established cut-scores for at-risk drinking among college and/or university students. Thus, the results of the current study should be accurate and reliable. Another strength worth mentioning is the sample size of the current study, which is considerably large.

Future studies along this line should research the current topic in a longitudinal study and take into account the former limitations. The cross-sectional research design of the current study limits the ability to draw conclusions about causality and thus longitudinal studies would be more useful in examining how the variables investigated are related over time. Although peer influence did not have the effect expected in this study, more research is needed to investigate the mechanism of peer influence in a sample that better represents the population of university students in Iceland. Also, it would be interesting to examine which factors make some individuals further able to resist the pressure of peers regarding alcohol use. Future studies should also further investigate gender difference regarding alcohol consumption and examine if an increase in excessive drinking has occurred among young women.

In conclusion, findings of the current study provide important evidence about drinking behavior among university students in Iceland. A fuller understanding of gender differences regarding harmful alcohol use and individual differences regarding susceptibility
to peer influence will help in developing strategies to prevent harmful drinking among university students in Iceland.
References


Appendix

Questions assessing peer influence

Leiðbeiningar: Vinsamlegast lestu hverja spurningu vandlega og merktu við hversu sammála eða ósammála þú ert erfirfarandi staðhefingum.

1. Vinir minir stíngu ídulega upp á því að fara út á lífið til þess að drekka áfengi
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála

2. Vinir minir talðu á neikvæðan hátt um einstaklinga sem ekki drekka áfengi
   - Mjög sammála
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála

3. Vinir minir eiga það til að drekka mikið magn af áfengi
   - Mjög sammála
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála

4. Vinir minir talðu á jákvaðan hátt um einstaklinga sem að drekka áfengi
   - Mjög sammála
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála

5. Vinir minir sannfæra mig oft um að vera lengur úti á lífinu en ég hafði ætlað mér
   - Mjög sammála
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála

6. Ég finn fyrir þrístingi frá vinum mínunum til þess að drekka áfengi
   - Mjög sammála
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála

7. Ég og vinir minir hlæjum oft að því hversu drukknir/drukkanar/drukkin við eru
   - Mjög sammála
   - Sammála
   - Hvorki sammála né ósammála
   - Ósammála
   - Mjög ósammála
8. Ef mér er boðinn áfengur drykkur þá tek ég við honum jafnvel þó mig langi ekki í hann
   o Mjög sammála
   o Sammála
   o Hvorki sammála né ósammála
   o Ósammála
   o Mjög ósammála

9. Ég fæ mér drykk í samkvæmi þó enginn af vinum mínun sé að drekka áfengi
   o Mjög sammála
   o Sammála
   o Hvorki sammála né ósammála
   o Ósammála
   o Mjög ósammála

10. Vinir mínir telja það vera í lagi að verða ólsvuð/öldaður oftar en einu sinni í viku
    o Mjög sammála
    o Sammála
    o Hvorki sammála né ósammála
    o Ósammála
    o Mjög ósammála

11. Vinir mínir sannféra mig oft um að drekka með þeim áfengi, þó mig langi ekki til þess
    o Mjög sammála
    o Sammála
    o Hvorki sammála né ósammála
    o Ósammála
    o Mjög ósammála

12. Mér finnst ég vera að missa af einhverju ef ég fer ekki með vinum mínun út á lífið að drekka áfengi
    o Mjög sammála
    o Sammála
    o Hvorki sammála né ósammála
    o Ósammála
    o Mjög ósammála

13. Ef vinir mínir eru ekki að drekka áfengi í samkvæmi þá geri ég það ekki heldur þó mig langi til þess
    o Mjög sammála
    o Sammála
    o Hvorki sammála né ósammála
    o Ósammála
    o Mjög ósammála