PSY3009F · RESEARCH PROJECT

The Relationship Between Binge Drinking & Decision-Making in University Students

A Correlational Study Proposal

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§ Abstract

Abstract

This correlational study set out to investigate the relationship between binge drinking and decision-making in university students. Sixty students from the University of Cape Town would have been allocated to three groups — binge drinkers, social drinkers, and non-drinkers — based on their scores on the Alcohol Use Disorders Identification Test (AUDIT). We would have investigated the decision-making pattern of each group using the Iowa Gambling Task (IGT). Decision-making would have been varied using the magnitude of gains and losses in the gambling task.

We hypothesised that the binge-drinking group would incur the greatest losses in the task, indicating a negative relationship between binge drinking and decision-making. Owing to the COVID-19 pandemic, we were unable to conduct the study. However, we hypothesised what our results would have looked like under two assumptions: one in which the results supported our hypothesis, and one in which they did not.

Under the first assumption, the binge-drinking group would have made the smallest average gains, and the non-drinking group the smallest average losses; inferential analysis would have shown a significant relationship between binge drinking and decision-making. Under the second assumption, the opposite would have been true: the results would show no significant difference between groups.

Keywords: binge drinking, decision-making, university students, alcohol use, Alcohol Use Disorders Identification Test (AUDIT), Iowa Gambling Task (IGT).

§ I · Introduction

A Problem on Campus

Binge drinking is a major problem in today's world, and it is especially rife in the lives of university students. Many studies define it as the consumption of six or more units of alcohol for women and eight or more for men within a single session of about two hours (Maguire, 2016), followed by a period of abstinence (Carbia et al., 2017; Townshend et al., 2014; Yoo & Kim, 2016). There are many risk factors involved in binge drinking, especially among young adults, including psychological and neurocognitive effects. This is because the brain is still developing and is therefore much more vulnerable to the toxic effects of bingeing patterns of alcohol consumption. Recent research has shown that frequent binge drinkers engage in more risky behaviours such as unplanned sexual encounters and driving under the influence. It has also shown that there are increased levels of impaired decision-making amongst frequent binge drinkers (Townshend et al., 2014). This is the main reason our research study focuses on investigating whether there is a relationship between binge drinking and patterns of risky decision-making amongst university students.

Most of the literature on binge drinking and decision-making supports the claim that frequent binge drinking is not only linked to impulsivity but also impairs the decision-making processes involved in risk-taking, even when participants are sober. It is important to note that all but one of the studies reviewed found a negative relationship between bingeing patterns of alcohol consumption and executive functioning. The study conducted by Carbia et al. (2017) found no association between bingeing patterns of consumption and disadvantageous or risky decision-making. This contrast could potentially be accounted for by the fact that the study ran over four years, within which the Iowa Gambling Task (IGT) was repeated yearly. This is important to note because it is probable that participants became more aware of how the task worked and what was expected of them, as they were exposed to the test more than once, thus compromising the validity of the study.

Our research study will investigate the relationship between binge drinking and risky decision-making. We will utilise an adapted version of the Alcohol Use Disorders Identification Test (AUDIT) to allocate participants into one of three groups: binge drinkers (BDs), social drinkers (SDs), and non-drinkers (NDs). These allocations will be made on the basis of the scores participants obtain on the survey. We will also utilise the Iowa Gambling Task (IGT) to measure the patterns of decision-making across the three different groups. The IGT is designed to engage decision-making processes in the brain. It is sensitive to risk-reward-related decision-making — whether people make high-reward, high-risk choices or stable-reward, minimal-risk choices (Yoo & Kim, 2016) — and so participants must learn from previous picks to choose cards from advantageous decks (Xiao et al., 2009).

§ II · Rationale

Why This Matters

This research is important because binge drinking is a major problem, especially amongst university students. It has generally been found to have adverse effects on decision-making, which means that students are prone to making poor decisions that often result in them engaging in risky behaviours such as unplanned sexual encounters and driving under the influence. This is a significant problem because the consequences of these risky behaviours can be fatal.

Our study seeks to add to the growing body of research investigating the relationship between binge drinking and decision-making. We hypothesised that binge drinkers would make decisions that are more risky compared to social drinkers and non-drinkers. We assumed that binge drinkers would continue to choose from the 'disadvantageous' decks on the Iowa Gambling Task, suggesting that they have poorer decision-making skills. We hope that our findings will inform future research that may identify causal links between binge drinking and poor decision-making, and ultimately educate those who are at risk.

§ III · Methods

How the Study Would Have Run

Design & Setting

We planned a correlational study at the Psychology Department of the University of Cape Town (UCT). The independent variable (IV) was the drinking behaviours of participants and consisted of three groups: binge drinkers (BDs), social drinkers (SDs), and non-drinkers (NDs). BDs were operationally defined as men consuming five units of alcohol and women consuming four units of alcohol in about two hours. We considered a unit of alcohol to be a drink with a concentration of about 10 ml of pure alcohol, equivalent to a standard glass of wine, half a pint of beer, or a single shot of gin, whiskey, or vodka. It is important to note that, for BDs, consumption needed to be followed by a period of abstinence for one to be classified as a binge drinker. SDs were operationally defined as people who had consumed alcohol in the past 30 days but in a quantity of less than five units in about two hours, while NDs were operationally defined as people who had not consumed alcohol in the past year and/or had never consumed alcohol before. Participants were allocated to these groups according to their scores on the Alcohol Use Disorders Identification Test (AUDIT). The dependent variable (DV) of this study was the decision-making pattern of the participants, measured using the Iowa Gambling Task (IGT).

Participants

We recruited 60 participants for our study: 30 males and 30 females. Participants were allocated to each of the three groups — BDs, SDs, and NDs — with an equal number of males and females in each group. They were registered undergraduate students for the 2020 academic year at UCT and were recruited using convenience sampling through the Student Research Participation Program (SRPP). This is a program in which undergraduate students registered for any Psychology course are required to participate in research studies in exchange for SRPP points, which are required to write the final exam. Students who are not registered for any Psychology courses were therefore automatically excluded from our study.

We excluded participants who (a) had a history of any psychiatric disorder, (b) had a neurological disorder, or (c) obtained a score above 26 on the AUDIT. The first two criteria were chosen because those disorders were potential extraneous variables that would have affected the validity of our findings. The last criterion was chosen because scores above 26 suggest alcohol dependency, so we needed to exclude those participants to ensure validity. Had any participants obtained scores above 26, we would have referred them to Student Wellness Services (SWS) to ensure they received the help they needed. They would also have been rewarded with 1 SRPP point for participating in the first half of our study.

Materials

We utilised an adapted version of the Alcohol Use Disorders Identification Test (AUDIT) for our study. This measure is a 10-item screening tool created by the World Health Organisation (WHO) to assess alcohol consumption and drinking behaviours. Participants were asked to reflect on the past year and to select the responses that best described their patterns of alcohol consumption. Each of the 10 items is scored from 0 to 4, so the maximum attainable score is 40. Although the WHO recommends a cut-off of > 8, researchers have suggested a cut-off of > 12 for added specificity (Yoo & Kim, 2016); we utilised the latter for this study. Participants who obtained a score of 8 or less were assigned to the non-drinkers (NDs) group; those scoring between 8 and 12 (exclusive) were assigned to the social drinkers (SDs) group; and those scoring between 12 and 26 (inclusive) were assigned to the binge drinkers (BDs) group. Participants scoring above 26 were excluded, as such scores indicate potential alcohol dependence (Yoo & Kim, 2016). The AUDIT has been found to be a valid screening tool for at-risk drinking behaviours amongst university students (Campbell & Maisto, 2018).

The Iowa Gambling Task (IGT) is a psychometric test that assesses an individual's decision-making skills by introducing them to a novel task that simulates real-life decision-making (Bechara et al., 1994). This test was used to measure the DV in our study. Participants were asked to pick and reveal cards from four different decks (A–D). When they revealed each card, they either had to pay a penalty to the researcher or receive money from the researcher. Decks A and B were considered the 'advantageous' decks, as they had lower penalties but also lower gains, while decks C and D were considered the 'disadvantageous' decks, as they had high penalties as well as high gains (only the researcher knew which decks were advantageous and which were not). Participants had one practice trial before proceeding with the IGT, which consisted of forty 'official' trials.

Participants who learned to choose cards from the advantageous decks (A and B) over the disadvantageous decks (C and D) were considered to have relatively good decision-making skills (Bull et al., 2015).

Procedure

Prior to the administration of the Iowa Gambling Task (IGT), there was an online screening phase that required participants to provide informed consent before completing the online AUDIT questionnaire. Those who obtained scores below 26 on the survey were allocated to one of the three groups — BDs, SDs, or NDs — according to their scores. They were then contacted to schedule a time to come in for the face-to-face session at the Psychology Department, UCT. Those who obtained scores above 26 were referred to Student Wellness Services (SWS) to receive the help they needed.

Upon arrival at the face-to-face session, participants were required to fill out another informed consent form. Once participants had provided consent, the administrator explained how the IGT worked. A practice trial was administered before the forty 'official' trials to ensure that participants had a clear understanding of how the task worked. Participants received a credit of 2,000 and had to pick cards from one of the four decks (A–D) placed in front of them to try to make as much profit as possible. The cards had positive and negative amounts on them, indicating whether participants made a profit or a loss. If the card picked had a positive amount, the administrator gave the indicated amount to the participant (profit). If the amount was negative, the participant had to give the money to the administrator (loss). There was no time limit when picking cards from each of the decks, and once the forty 'official' trials were completed, participants were debriefed about the IGT.

§ IV · Results

What We Would Have Found

Due to the COVID-19 pandemic, we were unable to collect data for this project. Ideally, we would have utilised descriptive statistics to describe and summarise the data in each of the three groups — binge drinkers (BDs), social drinkers (SDs), and non-drinkers (NDs) — over the forty trials to help us identify any patterns. For example, the performance data of the NDs on the Iowa Gambling Task (IGT) would have been used to report the average number of selections for each of the four decks (A–D) to investigate whether they managed to discern between advantageous and disadvantageous decks, and to compare these results with the BDs and SDs. In addition, the average net scores of the BDs, SDs, and NDs after the 40 trials would have been compared. Tables and bar graphs would have been included in the report to visually represent these comparisons and make it easier for the reader to see the patterns.

Inferential statistics would have been utilised to make inferences about the data across the three groups. A one-way ANOVA would have been used to investigate whether there were statistically significant differences between the average number of selections from each deck and the average net scores of the BDs, SDs, and NDs. This test would have allowed us to conclude

whether the differences observed (if any) were due to chance. It is important to note that a one-way ANOVA only shows that there are at least two group means that are significantly different, so we would have conducted Tukey's Honestly Significant Difference (HSD) post hoc test afterwards to determine which groups had statistically different means. Finally, the Pearson correlation coefficient would have been utilised to determine the strength of the relationship between binge drinking and decision-making, if any. We provide the two assumptions below.

Assumption 1 · Accept Hypothesis

Assumption 1 · Accept Hypothesis

If the results had supported us

This research study found that there is a relationship between binge drinking and risky decision-making. This was reflected through the three tests conducted — the one-way ANOVA, Tukey's HSD post hoc test, and Pearson's correlation. The one-way ANOVA showed that there were at least two group means that were statistically different from each other; however, it did not specify which ones, so we conducted Tukey's HSD to verify which groups had statistically different means. The test showed (with 95% certainty) that the means of the BDs and NDs groups were statistically significantly different, and so were the means of the BDs and SDs groups. Finally, the Pearson correlation showed that there was a correlation between binge drinking and risky decision-making.

Assumption 2 · Reject Hypothesis

Assumption 2 · Reject Hypothesis

If the results had pushed back

This research study found that there was no relationship between binge drinking and risky decision-making. This was reflected through the two tests conducted — the one-way ANOVA and Pearson's correlation. The ANOVA showed that the differences observed between the means of the BDs, SDs, and NDs were not statistically significant, meaning the differences across the three groups occurred by chance. Pearson's correlation showed that there was no correlation between binge drinking and risky decision-making, as indicated by an r value of 0.

§ V · Discussion

What the Results Would Mean

Assumption 1 · Accept Hypothesis

Assumption 1 · Accept Hypothesis

Interpreting the supportive case

This research would have found a significant difference between the preferences of the different drinking groups. The decision-making patterns of the non-drinkers and social drinkers would have improved as the task progressed, as they learned to choose from more advantageous decks. In contrast, the binge drinkers did not learn from past trials and continued to choose disadvantageous cards. Their poor performance in the task could be interpreted as poor decision-making skills. Binge drinkers disregard the negative outcomes and focus on the instant reward, so our findings would support the literature suggesting that binge drinking is negatively associated with decision-making and contributes to engaging in risky behaviours, especially amongst young adults. It is important to note that our findings would have contradicted the study conducted by Carbia et al. (2017), which suggested that there was no correlation between binge drinking and impaired decision-making.

Some of the limitations of the research could include the fact that the AUDIT would have been administered only once. It is a self-report measure, and participants may or may not be honest about their alcohol consumption, which would have skewed or affected the means of the different drinking groups. The fact that our sample size was small means that it was not representative of university students, so we cannot generalise our findings. This evokes the need to conduct further research that would take all of the above into consideration.

Assumption 2 · Reject Hypothesis

Assumption 2 · Reject Hypothesis

Interpreting the null case

This research would have found that there was a difference between the preferences of the different drinking groups. There were differences observed in the decision-making patterns of the non-drinkers, binge drinkers, and social drinkers; however, the tests conducted showed that the differences were simply due to chance. Our findings would support the study conducted by Carbia et al. (2017), which suggested that there was no correlation between binge drinking and impaired decision-making. It is important to note that our findings would have contradicted the majority of the studies mentioned in our literature review. The contrast in our findings could be accounted for by the fact that our sample size was very small.

With that being said, the sample size would have been one of the main limitations of this study. Another limitation would have been the nature of the AUDIT and the possibility that participants were dishonest with their answers. Future research studies could take these limitations into consideration and possibly provide findings that show whether there is a causal relationship between binge drinking and poor decision-making.

The real-world implications of this research could be slightly problematic, because if students found out that there was no relationship between their current patterns of alcohol consumption and their decision-making, it could potentially encourage them to continue down a dangerous path of detrimental alcohol consumption.

§ VI · Acknowledgements

With Thanks

We would like to acknowledge the guidance provided by our lecturer, Progress Njomboro, on how to conduct and report on our research. We would also like to add a special thanks to our tutor, Jade Mac Donnell, for providing guidance and support throughout our research. For further information about this research, feel free to contact us at *researchstudy15b@gmail.com*.

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APPENDIX A

Informed Consent Form

Title of Study

Relationship Between Binge Drinking and Decision-Making

Purpose of Study

You are being asked to participate in a study by Lebo Mwelase, Hannah Wittels, Mpho Mabitsela, Yolo Ngcakani, and Siziwe Busakwe, third-year Psychology students. This research seeks to create awareness amongst students of the effects of binge drinking, by providing accurate information and allowing students to understand that it has consequences on their body as well as on their cognitive functioning and decision-making, which could lead to risky behaviours or choices. The information gathered is part of an exercise we are required to undertake for an undergraduate course in Psychology at the University of Cape Town.

Procedure & Duration

You are being asked to fill out a survey online through the Vula SRPP Points tab, and then to come and participate in an IGT task at the Psychology building. The task and debriefing session will last approximately 30–60 minutes.

Recording & Storing of Data

With your permission, the data collected throughout your participation will be recorded. The data will be uploaded to a secure electronic folder, analysed, and interpreted. Only the course convener, lecturers, and tutors will have access to the data collected. The data will be kept on a password-protected computer system. Once the course is completed, the digital files will be destroyed.

Voluntary & Confidential Participation

Your participation is completely voluntary. You may stop participating in this research at any time, or choose not to answer any question, without penalty.

If you do not understand any part of what you are being asked to do, or the contents of this form, I am here to provide a complete explanation. Questions are welcome at any time.

I have been informed of any and all possible risks and discomforts. I have been given the opportunity to fully discuss my concerns and questions, and fully understand the nature and character of my involvement in this research.

I hereby give my permission to participate in this research. ■ Yes ■ No

I give my permission for my data to be used in this research investigation. ■ Yes ■ No

_____ _____

Research Participant *Date*

_____ _____

Researcher *Date*

APPENDIX B

AUDIT Questionnaire

The Alcohol Use Disorders Identification Test (AUDIT). Please circle the answer that is correct for you.

1. How often do you consume alcoholic beverages?

- Never
- Monthly or less
- 2–4 times a month
- 2–3 times a week
- 4 or more times a week

2. How many glasses of alcohol do you have on a typical day when drinking?

- 1 or 2
- 3 or 4
- 5 or 6
- 7 to 9
- 10 or more

3. How often do you have six or more drinks on one occasion?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

4. During the past year, how often have you found that you were not able to stop drinking once you had started?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

5. During the past year, how often have you failed to do what was normally expected of you because of drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

6. During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

7. During the past year, how often have you had a feeling of guilt or remorse after drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

8. During the past year, how often have you been unable to remember what happened the night before because you had been drinking?

- Never
- Less than monthly
- Monthly
- Weekly
- Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- No
- Yes, but not in the past year
- Yes, during the past year

10. Has a relative, friend, doctor, or other health worker been concerned about your drinking, or suggested you cut down?

- No
- Yes, but not in the past year
- Yes, during the past year

APPENDIX C

Visualisation of One Unit of Alcohol

One unit of alcohol is equivalent to approximately 10 ml of pure alcohol. The standard equivalents used in this study are shown below.

175 ml	½ pint	25 ml
Standard glass of wine	*Half a pint of beer*	*Single shot of spirits*

APPENDIX D

Proof of Participation

Participants who completed the study would have received 1 SRPP point as proof of their participation in the Student Research Participation Program.

APPENDIX E

Debriefing Form

Debriefing Protocol — Relationship Between Binge Drinking and Decision-Making

Dear participant,

Thank you for participating in this study. The aim of the study was to assess the different patterns of decision-making of binge-drinkers, social-drinkers, and non-drinkers respectively.

For us to be able to do that, we were required to ask you about your different drinking habits to determine which category you fall into. We managed to do that through our online survey, which you completed prior to this session.

We assure you that your identity and responses will be kept anonymous as well as confidential.

Please feel free to ask any questions you may have about the research or the procedure. You may also email us at *researchstudy15b@gmail.com*, or alternatively contact the UCT Psychology Department at *macdonnell.jade@gmail.com*.

Participant's Signature	*Date*
Researcher's Signature	*Date*