

# Does Hazardous Drinking in First-Year University Students Predict Academic Performance into Their Fourth Year? A Study of Students with and without a History of Reading Difficulties

*Supplemental notes for MacDougall and colleagues' poster presented at the Psychology and Neuroscience's 49th Annual Graham Goddard In-House Conference at Dalhousie University*

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June 20, 2025

## BACKGROUND

Research from the past decade has demonstrated that university students who have a history of reading difficulties face **unique academic challenges**, specifically when it comes to reading comprehension, concentration, and speed (Howard-Gosse et al., 2023).

A study by the [Language and Literacy Lab](#) found that these differences are associated with **unique drinking behaviour** in first year university. Specifically, in 2022, MacKay and colleagues found that students with a history of reading difficulties are more likely to **drink to avoid social rejection**.

Despite this difference in motivation, they **engaged in the same amount of hazardous drinking** as their peers (MacKay et al., 2022).

A large-scale **cross-sectional** study conducted by Bolin and colleagues on university students enrolled in a Southeastern American in 2017 university **established a link between heavy alcohol usage and decreased GPA**.

## OBJECTIVE

With that in mind, the current study seeks to **longitudinally examine** the relationship between **hazardous drinking** in first year university students and **GPA changes** by fourth year and whether this relationship is moderated by a history of reading difficulties.

## METHODS

### *Participants*

To understand this relationship, we recruited **93 first-year students** from an Atlantic Canadian university who were participating in two larger longitudinal studies. The mean age was a **little over 18 and a half** years and **gender composition was nearly equally** distributed between males and females.

### *Measures*

#### History of Reading Difficulties

To determine whether students had a history of reading difficulties, we used a sub-scale of the [Revised Adult Reading History Questionnaire](#) (See the Appendix in Parilla et al., 2007) that assesses **retrospective accounts** of the individual's reading experiences in childhood, including reading and spelling difficulties, the need for extra help (e.g., tutoring, special classes), reading speed and skill

compared to peers, attitudes toward reading, and the amount of reading done for pleasure. To classify students into the HRD or NRD groups, a proportion score was calculated for each participant, ranging from 0 to 1, where higher values indicated more reading difficulties. With this method, **46 participants were classified as having a history of reading difficulties and 47 were not**. An example item is displayed below (taken from Parilla et al., 2007, p. 219).

|   |      |          |      |             |              |
|---|------|----------|------|-------------|--------------|
| <b>1. How much difficulty did you have learning to read in elementary school?</b> | None | Not much | Some | Quite a bit | A great deal |
|---|------|----------|------|-------------|--------------|

#### Hazardous Drinking

To determine the degree to which students engaged in hazardous drinking, we administered the 10-item [Alcohol Use Disorders Identification Test](#) (Saunders et al., 1993; otherwise known as the AUDIT) in first year. Higher scores on this scale meant a higher level of hazardous drinking. This measure also has items that assess for drinking frequency and quantity.

#### Frequency of Drinking (AUDIT item)

|   |       |                 |                   |                  |                        |
|---|-------|-----------------|-------------------|------------------|------------------------|
| <b>1. How often do you have a drink containing alcohol?</b> | Never | Monthly or less | 2-4 times a month | 2-3 times a week | 4 or more times a week |
|---|-------|-----------------|-------------------|------------------|------------------------|

#### Quantity of Drinking (AUDIT item)

|  |        |        |        |        |            |
|--|--------|--------|--------|--------|------------|
| <b>2. How many drinks containing alcohol do you have on a typical day when you are drinking?</b> | 1 or 2 | 3 or 4 | 5 or 6 | 7 to 9 | 10 or more |
|--|--------|--------|--------|--------|------------|

We obtained first and fourth year GPA from the registrar's office. For each year, we used an average of the student's fall and winter term GPAs.

## **ANALYSIS & RESULTS**

We used a multiple linear regression to see whether hazardous drinking, a history of reading difficulties, and their interaction predicts changes in students' GPA from first to fourth year. In this model, Year 4 GPA was the dependent variable. We included Year 1 GPA as a control variable and our main independent variables were Hazardous Drinking, Reading Difficulty Status, and their interaction.

We found that hazardous drinking significantly predicted lower Year 4 GPA—even after accounting for Year 1 GPA. Reading difficulty and the interaction between drinking and reading difficulty didn't have a significant effect.

We wanted to know which aspects of hazardous drinking specifically predicted this decline, so we ran two follow-up regressions to see whether it was the *amount* of alcohol students drank (quantity) or *how often* they drank (frequency) that mattered more. Again, Year 4 GPA was the outcome Year 1 GPA was a control variable.

We found that drinking quantity, but not frequency, significantly predicted GPA changes. In other words, how much students drank was related to lower GPA, but how often they drank was not.

## DISCUSSION

From these results, we can deduce that hazardous drinking in first year, particularly greater drinking quantity, predicts a decline in academic performance by fourth year, regardless of difficulty status.

This aligns with the aforementioned research showing that excessive drinking is linked to GPA declines. Other research has likewise shown that it is the *amount* of drinking that has the most impact on academic outcomes, compared to the *frequency* of drinking (An et al., 2017; Piazza-Gardner et al., 2016).

Additionally, building on MacKay's earlier study, we found that although the two groups differ in why they drink, they show similar levels of hazardous drinking, and hazardous drinking affects their GPA in similar ways. So, now, we can direct further research to understanding how these differences in drinking motives affects other outcomes, like mental health or social abilities.

Overall, these findings emphasize the need for university-based interventions that target excessive drinking behaviour to support academic outcomes, regardless of reading difficulty history. Some examples of interventions could be campus-wide posters or preventative presentations at first-year orientations.

## RESULTS + EXTRAS: QR CODE

Please see <https://erinlia.github.io/conference-poster-refs/> for references, more information about this study, a pdf of this poster, my contact information, and example items from the administered tasks (in the current document).

## REFERENCES

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## TABLES

**Table 1**

*Regression Coefficients in Multiple Regression looking at the impact of Hazardous Drinking, Reading Difficulty Status, and their interaction on Year 4 GPA, after controlling for Year 1 GPA.*

| Predictors                                     | B             | SE   | CI            | p     |
|--|---------------|------|---------------|-------|
| (Intercept)                                    | 1.86*         | 0.79 | 0.27 – 3.44   | 0.023 |
| Year 1 Average GPA                             | 0.29          | 0.20 | -0.12 – 0.70  | 0.159 |
| Hazardous Drinking (AUDIT Total)               | -0.20*        | 0.08 | -0.37 – -0.04 | 0.017 |
| Reading Difficulty Status                      | 0.45          | 0.23 | -0.01 – 0.91  | 0.054 |
| Hazardous Drinking x Reading Difficulty status | 0.08          | 0.05 | -0.03 – 0.19  | 0.142 |
| R <sup>2</sup> / R <sup>2</sup> adjusted       | 0.340 / 0.281 |      |               |       |

\*  $p < 0.05$  \*\*  $p < 0.01$  \*\*\*  $p < 0.001$

**Table 2**

*Regression Coefficients in Multiple Regression looking at the impact of Alcohol Consumption variables (a – Frequency; b – Quantity), Reading Difficulty Status, and their interaction on Year 4 GPA, after controlling for Year 1 GPA.*

| <i>Predictors</i>                              | <i>B</i>            | <i>SE</i> | <i>CI</i>     | <i>p</i>     | <i>R<sup>2</sup> / R<sup>2</sup> adjusted</i> |
|--|---------------------|-----------|---------------|--------------|---|
| a) (Intercept)                                 | 0.75                | 0.89      | -1.05 – 2.55  | 0.404        | 0.184 / 0.111                                 |
| Drinking Frequency                             | 0.91                | 0.70      | -0.49 – 2.31  | 0.196        |   |
| Year 1 Average GPA                             | 0.56 <sup>*</sup>   | 0.23      | 0.11 – 1.01   | <b>0.017</b> |   |
| Reading Difficulty Status                      | 0.56 <sup>*</sup>   | 0.26      | 0.04 – 1.08   | <b>0.037</b> |   |
| Drinking Frequency x Reading Difficulty status | -0.50               | 0.44      | -1.38 – 0.37  | 0.253        |   |
| b) (Intercept)                                 | 1.91 <sup>*</sup>   | 0.78      | 0.34 – 3.48   | <b>0.018</b> | 0.369 / 0.313                                 |
| Drinking Quantity                              | -0.87 <sup>**</sup> | 0.31      | -1.49 – -0.25 | <b>0.007</b> |   |
| Year 1 Average GPA                             | 0.32                | 0.20      | -0.08 – 0.71  | 0.112        |   |
| Reading Difficulty Status                      | 0.39                | 0.23      | -0.07 – 0.84  | 0.093        |   |
| Drinking Quantity x Reading Difficulty status  | 0.36                | 0.20      | -0.04 – 0.75  | 0.077        |   |
| * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$     |                     |           |               |              |   |