The association between time perspective and alcohol consumption in university students: cross-sectional study

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Background: Heavy alcohol consumption is associated with significant morbidity and mortality. Levels of alcohol consumption among students and young people are particularly high. Time perspective describes the varying value individuals place on outcomes in the present and future. In general, it has been found that individuals prefer to receive a gain today rather than in the future. There is evidence that time perspective is associated with addictive health behaviours, including alcoholism and cigarette smoking, but less evidence of its association with non-addictive, but hazardous, levels of alcohol consumption. The objective was to determine if there is an association between time perspective and hazardous alcohol consumption. Methods: A cross-sectional survey using a self-completion questionnaire was administered to willing undergraduate students attending a convenience sample of lectures in two university faculties. Hazardous alcohol consumption was defined as a score of ≥8 on the Alcohol Use Disorders Identification Test (AUDIT) and time perspective was measured using the Consideration of Future Consequences Scale (CFCS). Participants were 322 undergraduate university students in two faculties at a university in Northern England, UK. Results: Hazardous alcohol consumption was reported by 264 (82%) respondents. After controlling for potential confounding by socio-demographic variables, greater consideration of future consequences was associated with lower odds of reporting hazardous drinking [odds ratio = 0.28; 95% confidence interval 0.15–0.54]. Conclusion: Interventions aimed at increasing future orientated time perspective may be effective in decreasing hazardous alcohol consumption in students.

Keywords: alcohol, alcohol consumption, students, consideration of future consequences, time perspective

Introduction

Alcohol consumption has been linked with the development of 60 diseases,² including high blood pressure, coronary heart disease and some cancers. After tobacco and hypertension, alcohol consumption is the third highest contributor to the burden of disease in developed countries.³ University students are at particular risk from alcohol-related harm because of their consistent tendency to drink higher than recommended levels.⁴,⁵

A wide range of possible explanatory variables have been explored in relation to students’ alcohol consumption levels but there remains unexplained variation to student alcohol consumption. To date, alcohol consumption has been reported as greater in male, younger⁶,⁷ and White students,⁸ people who have a hedonistic personality,⁹ those in social networks of heavy drinkers¹⁰ and where there is higher alcohol outlet density.¹¹

One further, but little explored, factor associated with alcohol consumption is future time perspective. Individuals vary how much they consider and value the future outcomes of their present day actions. Although a number of terms have been used to describe this,¹² we opt for ‘time perspective’ and the definition of Hensen et al. (2006): ‘the relative temporal orientation that motivates an individual’s typical actions and goals’ (p. 127).¹³ Individuals with more future-oriented time perspective are considered to be more influenced by considerations of the future outcomes of their actions than those with more present-orientated time perspective. The positive outcomes of engaging in less healthy behaviours and barriers to taking up healthier ones often occur in the short term. For example, the social engagement that occurs alongside having a cigarette break with friends, or the discipline required to avoid eating less healthy foods. In contrast, the health benefits of, so-called health-promoting behaviours, may not occur for years to come. Numerous health behaviours may, therefore, be strongly influenced by an individual’s time perspective and how they balance any short-term costs of such behaviours against longer term health benefits. In terms of existing theories of health behaviour, this proposal fits well with the suggestion in the Health Belief Model¹⁴ that the perceived benefits of a behaviour to an individual is one of the key determinants of behaviour. If the health benefits of a behaviour are delayed in time and an individual does not place a high value on such delayed outcomes, they are unlikely to engage in the behaviour.

There is substantial evidence that addictive health behaviours, such as smoking, opiate use and alcohol dependency, are associated with time perspective. Those engaging in these behaviours tend to place less value on future outcomes than others,¹⁵,¹⁶—reflecting the predictions of Becker and Murphey’s ‘theory of rational addiction’.¹⁷ There is also some evidence that other, non-addictive health behaviours, such as fruit and vegetable consumption, safer sex and regular physical activity are associated with time perspective. Those engaging in healthier behaviours tend to think about and value the future more.¹⁸,¹⁹

While the short-term outcomes of heavy drinking may be positive—providing euphoria and a chance for escape from life’s problems—²⁰—the longer term effects are often less positive—with negative effects on health, social and family relations, educational attainment and employment prospects.²¹ A rational decision to engage in heavy drinking
may, therefore, depend on individuals thinking about, or placing greater value on, the positive short-term effects more than they think about, or ‘dis-value’, the negative longer term effects—i.e. having more future-orientated time perspective.

While there is some evidence that time perspective is associated with any alcohol use and total alcohol consumption, less is known about the association between time perspective and non-dependent consumption. As most alcohol consumption takes place outwith the context of dependency, explanatory variables associated with such non-dependent use are most relevant from a public health perspective. If time perspective is associated with non-dependent alcohol consumption, this could contribute to the development of effective interventions promoting healthier alcohol consumption patterns among high-risk groups—perhaps attempting to either change the time perspective among heavier drinkers or tailoring intervention messages to specific time perspectives e.g.23 We, therefore, aimed to explore the association between future time perspective and a marker of hazardous drinking. Given known relationships between health-related behaviours and time perspective, we hypothesized that people with a less future-orientated time perspective would be likely to have higher levels of alcohol consumption than those with a more future-orientated time perspective.

**Methods**

We conducted a cross-sectional study of the association between future time perspective and hazardous alcohol consumption among a group of students studying at a university in northern England. Information was collected by self-completion written questionnaire. The study was approved by the university research ethics committee.

**Participants and recruitment**

All students registered on courses with a taught component were eligible to take part. Sampling was conducted in three stages. Firstly, Deans of Undergraduate Studies in the Faculties of Humanities & Social Science and Agriculture & Engineering were asked to invite staff to volunteer around 10 minutes of lecture time for the research. Those lecturers who responded positively then made available a lecture of their choice. Finally, all students registered for these lectures were invited to take part.

**Data collection**

Data collection took place from February to April 2008. Following a brief explanation of the study by the researcher (JB), anonymous questionnaires were distributed to all students attending the selected lectures. It was stressed that participation was voluntary but return of a completed questionnaire would imply consent to take part. On return of questionnaires the researcher would test the appropriate area of ‘BlackBoard’ (an electronic course communications tool) to enable students who had not attended the lecture to take part in the study (returning the questionnaire by post or email).

**Variables of interest**

**Future time perspective**

Future time perspective was measured using the Consideration of Future Consequences Scale (CFCS).25 This 12-item instrument asks respondents to indicate their agreement with a series of statements on a five-point Likert-type scale from ‘very untrue of me’ (scored 1) to ‘very true of me’ (scored 5). Examples of statements include: ‘Often I engage in a particular behaviour in order to achieve outcomes that may not have a result for many years’ and ‘I only act to satisfy immediate concerns, thinking the future will take care of itself’. The CFCS has a reported Cronbach’s alpha of 0.76 to 0.86,25 a test–retest reliability of \( r(88) = 0.76, \) \( P < 0.001 \) over 2 weeks and \( r(102) = 0.72, \) \( P < 0.001 \) over 5 weeks24 and scores are associated with scores on a number of other markers of future time perspective.26 After reverse scoring of appropriate items, mean item score (mCFCS; range 1–5) was calculated with higher scores indicating greater consideration of future consequences.

**Hazardous alcohol consumption**

The Alcohol Use Disorders Identification Test (AUDIT) was used to identify hazardous alcohol consumption.27 This 10-item scale (score range 0–40) aims to identify the preliminary signs of hazardous and harmful drinking as well as possible dependence. It has been extensively assessed for validity, reliability, precision and sensitivity.28,29 As previously,28 we used a score of \( \geq 8 \) to identify those with hazardous alcohol consumption—which has a reported sensitivity of 92% and specificity of 94%.29 This includes participants who are also drinking at harmful (AUDIT score 16–19) and possibly dependent (AUDIT score of \( \geq 20 \) levels.

**Socio-demographic variables**

In addition to age and gender, year of study, religion, ethnicity and socio-economic position (SEP) were also measured as potential confounders of the relationship between future time perspective and hazardous alcohol consumption. Previous work has found that both CFCS and alcohol consumption vary according to age and gender.6,8 Year of study has been found to be associated with drinking behaviour60 and was felt to be potentially important as those in the latter stages of their course may be more focused on future ventures than those in earlier years of study. Hazardous alcohol consumption varies according to religion and ethnicity17 and CFCS may also be associated with religion or ethnicity, but this has not been previously explored. Both were measured using questions from the 2001 UK Census,31 collapsed into three religious groups (none, Christian and other) and two ethnicity groups (White British and other) for analysis. Finally, SEP has been previously reported to be associated with both alcohol consumption and time perspective.24 SEP was measured using the English Index of Multiple Deprivation 2004 (IMD)32 of student’s non-term address (e.g. their ‘home’ address) assigned using postcodes and grouped into fifths for analysis. The IMD is a small-area-based marker of deprivation determined from information on 37 indicators within seven domains. Although similar indices are available for other countries of the UK, these are not directly comparable and we assumed that the majority of students had home addresses in England.

**Statistical analysis**

Univariate relationships between all socio-demographic variables and both having an AUDIT score of \( \geq 8 \) and mCFCS were explored using Pearson correlation co-efficients, Pearson chi-squared tests, Mann–Whitney U-tests and Kruskal–Wallis tests, as appropriate. Those socio-demographic variables that showed statistically significant simple relationships with both mCFCS and having an AUDIT score of \( \geq 8 \) were identified as potential confounders in the relationship between mCFCS and having an AUDIT score of \( \geq 8 \). The relationship between
Results

Thirteen lectures were offered by 10 lecturers. Of a total of 679 students registered for these lectures, 474 (70%) attended and 458 (97%) of these returned questionnaires with at least one item complete. One questionnaire was returned by email from a student who did not attend a lecture they were registered for. The main source of missing data was IMD—with only 75% of respondents reporting a home postcode in England. Full data were available for 322 (70.3%) students. The characteristics of the sample on categorical variables are summarized in the first data column of table 1. Median (IQR) age was 20 years (19–21). More than half of respondents were women. Most students were in their first or second year of study, reported their ethnic group as White British and their religion as Christian. More than half of respondents had a non-term time address of one of the two most affluent IMD fifths. Median (IQR) mCFCS was 3.4 (3.1–3.8), and 264 (82%) respondents had an AUDIT score of 8. Of these, 126 (39%) were drinking at hazardous levels (AUDIT score 8–15), 71 (22%) at harmful levels (AUDIT score 16–19) and 67 (21%) had a score indicating they may be alcohol dependent (AUDIT score >19).

Univariate relationships between the categorical socio-demographic variables (that is, all socio-demographic variables except age) and mCFCS or having an AUDIT score ≥8 are also shown in table 1. Gender, year of study and age were the only socio-demographic variables associated with mCFCS. Women tended to have a higher mCFCS than men, mCFCS increased progressively as year of study increased and there was a significant association between age and mCFCS (rho = 0.21, P < 0.001). Having an AUDIT score of ≥8 varied significantly according to gender and ethnicity, but none of the other socio-demographic variables. A greater proportion of men than women had an AUDIT score of ≥8. More students who reported their ethnic group as White British had an AUDIT score of ≥8 than those of ‘other’ ethnicities. There was no difference in the distribution of age according to whether or not respondents had an AUDIT score of ≥8 (median (IQR) age in those with an AUDIT score <8 = 20 (19–21), median (IQR) age in those with an AUDIT score of ≥8 = 20 (19–20); U = 6681.50, P = 0.117).

As gender was the only socio-demographic variable significantly associated with both mCFCS and having an AUDIT score of ≥8, it was considered the only potential confounder to be controlled for in the logistic regression.

A summary of the logistic regression analysis exploring the relationship between mCFCS and having an AUDIT score ≥8, before and after controlling for gender, is shown in table 2. In the uncontrolled analysis (step 1) there was a statistically significant relationship between mCFCS and having an AUDIT score of ≥8. Greater mCFCS score was associated with lower odds of having an AUDIT score of ≥8. In step two, after controlling for gender, this relationship was only marginally attenuated and remained statistically significant. Thus, those who considered future consequences more were less likely to have an AUDIT score of ≥8. Gender did not remain significantly associated with having an AUDIT score of ≥8 in the final model.

### Table 1  Distribution and univariate associations between categorical socio-demographic variables and both mCFCS and AUDIT score of ≥8

<table>
<thead>
<tr>
<th>Variable</th>
<th>All respondents</th>
<th>mCFCS</th>
<th>Test statistic (P-value)</th>
<th>AUDIT score ≥8</th>
<th>Test statistic (P-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>Median (IQR)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>115 (89.1)</td>
<td>149 (77.2)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td>149 (77.2)</td>
<td>149 (77.2)</td>
</tr>
<tr>
<td>Men</td>
<td>129 (40.1)</td>
<td>3.27 (2.96–3.63)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>115 (89.1)</td>
<td>149 (77.2)</td>
</tr>
<tr>
<td>Women</td>
<td>193 (59.9)</td>
<td>3.50 (3.08–3.83)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>149 (77.2)</td>
<td>149 (77.2)</td>
</tr>
<tr>
<td>Year of study</td>
<td></td>
<td></td>
<td></td>
<td>149 (77.2)</td>
<td>149 (77.2)</td>
</tr>
<tr>
<td>1</td>
<td>136 (42.2)</td>
<td>3.38 (3.00–3.73)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>115 (84.6)</td>
<td>115 (84.6)</td>
</tr>
<tr>
<td>2</td>
<td>130 (40.4)</td>
<td>3.42 (3.06–3.75)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>106 (81.5)</td>
<td>106 (81.5)</td>
</tr>
<tr>
<td>3</td>
<td>56 (17.4)</td>
<td>3.67 (3.27–3.92)</td>
<td>H (2) = 10.74 (0.005)³</td>
<td>43 (76.8)</td>
<td>43 (76.8)</td>
</tr>
<tr>
<td>IMD fifth</td>
<td></td>
<td></td>
<td></td>
<td>43 (76.8)</td>
<td>43 (76.8)</td>
</tr>
<tr>
<td>1 (most deprived)</td>
<td>20 (6.2)</td>
<td>3.46 (3.29–3.67)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>13 (65.0)</td>
<td>13 (65.0)</td>
</tr>
<tr>
<td>2</td>
<td>41 (12.7)</td>
<td>3.58 (3.13–3.92)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>33 (80.5)</td>
<td>33 (80.5)</td>
</tr>
<tr>
<td>3</td>
<td>62 (19.3)</td>
<td>3.42 (3.06–3.83)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>49 (79.0)</td>
<td>49 (79.0)</td>
</tr>
<tr>
<td>4</td>
<td>108 (33.3)</td>
<td>3.33 (2.92–3.67)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>92 (85.2)</td>
<td>92 (85.2)</td>
</tr>
<tr>
<td>5 (least deprived)</td>
<td>91 (28.3)</td>
<td>3.50 (3.08–3.75)</td>
<td>H (4) = 9.07 (0.059)³</td>
<td>77 (84.6)</td>
<td>77 (84.6)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td>77 (84.6)</td>
<td>77 (84.6)</td>
</tr>
<tr>
<td>None</td>
<td>109 (33.9)</td>
<td>3.42 (3.00–3.75)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>91 (83.5)</td>
<td>91 (83.5)</td>
</tr>
<tr>
<td>Christian</td>
<td>203 (63.0)</td>
<td>3.42 (3.08–3.83)</td>
<td>U = 9558.00 (&lt;0.001)³</td>
<td>166 (81.8)</td>
<td>166 (81.8)</td>
</tr>
<tr>
<td>Other</td>
<td>10 (3.1)</td>
<td>3.13 (2.90–3.58)</td>
<td>H (2) = 2.31 (0.315)³</td>
<td>7 (70.9)</td>
<td>7 (70.9)</td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
<td></td>
<td>7 (70.9)</td>
<td>7 (70.9)</td>
</tr>
<tr>
<td>White British</td>
<td>310 (96.3)</td>
<td>3.42 (3.08–3.75)</td>
<td>U = 1760.00 (0.752)³</td>
<td>261 (84.2)</td>
<td>261 (84.2)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (3.7)</td>
<td>3.42 (3.02–3.83)</td>
<td>U = 1760.00 (0.752)³</td>
<td>3 (25.0)</td>
<td>3 (25.0)</td>
</tr>
</tbody>
</table>

a: Pearson chi-squared test
b: Mann-Whitney U-test
c: Kruskal-Wallis test
forced us to collapse these together. This could mask important differences across ethnic and religious groups. As we used IMD to measure SEP, we were only able to measure this for those with a non-term time address in England. This excluded a quarter of respondents from the analysis. Measuring SEP in students—who are in a life transition period—is problematic. However, given that IMD was not found to be associated with having an AUDIT score of ≥8, or mCFCS, this may not have substantially influenced our results.

Finally, as our data are entirely cross-sectional, we are unable to draw any conclusions related to the direction of causation between future time perspective and hazardous alcohol consumption.

**Interpretation of results in relation to previous findings**

Our results reflect those of others who have reported associations between measures of time perspective and any alcohol consumption or total alcohol consumption in young adults and undergraduates, but extend these to confirm an association between time perspective and hazardous alcohol consumption in a UK sample. The statistically significant difference in mCFCS score between men and women in this study reflects that of Petrocelli indicating that women consider future consequences more than men. However, this is not a consistent finding and the association between time perspective and gender may vary according to the population studied.

Although mCFCS in this sample was similar to that reported in other undergraduate populations, our results indicate very high prevalence of hazardous alcohol consumption with >80% of respondents reporting an AUDIT score of ≥8. Previous authors have reported the prevalence of AUDIT scores of ≥8 to be 65% in a sample of New Zealand students and 20% in a sample of American chiropractic students. These variations may well reflect differences in the age and gender composition of different samples and the differing legal and cultural status of alcohol consumption globally. Others have found similar gender variations in hazardous drinking as reported here.

The finding of a relationship between time perspective and hazardous alcohol consumption is in accord with existing evidence demonstrating a relationship between time perspective and a range of unhealthy addictive and non-addictive behaviours related to health, including smoking, opiate use, alcohol dependency, alcohol use, total alcohol consumption, fruit and vegetable consumption, safer sex and regular physical activity. Given the consistency of these findings, it may now be useful to explore the relative importance of time perspective compared with other determinants of health behaviours, and whether and how time perspective should be integrated into existing models of health behaviour in order to increase their explanatory value.

**Implications for policy, practice and research**

Our findings indicate that, as hypothesized, future time perspective is associated with hazardous alcohol consumption. In a sample of students studying at a university in Northern England, those students who had greater future time perspective, and considered the future outcomes of their actions more, were less likely to have an AUDIT score indicative of hazardous alcohol consumption. Given the limitations of our work, we can not confirm that this finding is generalizable to the wider population of all students in England, or to the general population. Further work is required to explore the relationship between future time perspective and hazardous alcohol consumption in other students studying at other universities and in adults in the general population.

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**Table 2 Summary of logistic regression analysis of the relationship between mCFCS and having an AUDIT score of ≥8**

<table>
<thead>
<tr>
<th>Variable</th>
<th>OR (95% CI)</th>
<th>Wald χ²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mCFCS</td>
<td>0.25 (0.13–0.47)</td>
<td>18.51</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Constant</td>
<td>593.88</td>
<td>29.60</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Gender (female cf male)</td>
<td>1.89 (0.95–3.70)</td>
<td>3.43</td>
<td>0.064</td>
</tr>
<tr>
<td>Constant</td>
<td>308.72</td>
<td>22.64</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

LL (step 1) = 373.71; LL (step 2) = 331.92; Nagelkerke R² (step 1) = 0.11; Nagelkerke R² (step 2) = 0.12.

**Discussion**

**Summary of main findings**

In this cross-sectional study of the relationship between future time perspective and hazardous alcohol consumption among undergraduate students, we found that those with greater future-oriented time perspective were less likely to score above the threshold used to detect hazardous alcohol consumption.

**Strengths and limitations**

We used well-tested measures of both future time perspective (CFCS) and hazardous alcohol consumption (AUDIT). Whilst a number of measures of time perspective exist, many are based on money choice tasks, or investment behaviour and are likely to be influenced by both income and wealth. In contrast, the CFCS is an attitudinal scale that was developed in students and shows good correlations with a number of other measures of time perspective. The AUDIT tool is distinguished from other self-reported measures of alcohol-related harm because it detects problem drinkers at the less distinguished from other self-reported measures of alcohol-related harm. Unlike previous work using AUDIT allowed us to explore the role of time perspective in potentially hazardous alcohol consumption, rather than simply dependent or ever drinking.

Our data were entirely self-reported and the setting in which data were collected may have led to social desirability bias. Although we asked respondents not to discuss their answers as they completed the questionnaire, in practice it was impossible to prevent this. Students may over or under-report alcohol consumption or time perspective in order to appear in-line with perceived social norms.

Although there was a very high response rate (97%) among students who attended the lectures at which data collection took place, only 70% of students registered for the lectures actually attended leading to a possibility of non-response bias. Both hazardous alcohol consumption and lower future time perspective are potential reasons for non-attendance at lectures. Furthermore, the method used to recruit students led to our sample having a higher proportion of women and White British students than are registered with the university as a whole. Our results may not, therefore, be generalizable to the wider population of students at the university studied.

We made a careful attempt to measure, explore and control for a wide range of socio-demographic factors that may play a confounding role in any relationship between future time perspective and hazardous alcohol consumption. However other, unidentified, confounders may still be operating. In addition, despite using questions from the 2001 UK Census to measure religion and ethnicity, the very small numbers in many groups...
relationship is confirmed, longitudinal work may offer insight into the direction of causation between future time perspective and hazardous alcohol consumption. If future time perspective is confirmed as a predictor of hazardous alcohol consumption use in students, interventions aimed at altering future time perspective and helping students focus more on the longer term outcomes of their actions, may be beneficial in reducing harmful and hazardous drinking in this population.

Acknowledgements

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Conflicts of interest: None declared.

Key points

- Time perspective was associated with hazardous alcohol consumption in a group of undergraduate students.
- Those who considered future consequences more were less likely to report hazardous drinking.
- If future time perspective is confirmed as a predictor of hazardous alcohol consumption use in students, interventions aimed at altering future time perspective may be helpful in reducing hazardous drinking in this population.

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