







## Disclosures of harming others during their most recent drinking session: Findings from a large national study of heavy-drinking adolescents

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### Abstract

**Introduction.** The extant Alcohol's Harms to Others (AHTO) literature is largely comprised of reports from victims. We investigated AHTO from perpetrators' perspectives, including how harms were associated with individual characteristics, and alcohol quantities consumed during the perpetration incident. **Methods.** Participants (N = 2932) were 14–19 years old, recruited primarily through social media and screened as risky drinkers. They completed face-to-face (n = 594) or self-administered (n = 2338) surveys. They self-reported whether during their last risky drinking session (LRDS) they had perpetrated any verbal abuse, physical abuse or property damage. A multinomial logistic regression examined whether nine factors were associated with perpetrating zero, one or 2+ categories of AHTO. **Results.** Eleven percent (n = 323) reported perpetrating at least one form of AHTO (7.5% verbal, 1.9% physical and 4.6% property). Perpetration of AHTO at LRDS was uniquely associated with: younger age, male gender, experiences of childhood physical punishment, greater perpetration incident-specific drinking, concurrent illicit drug use, and less frequent use of safety strategies while drinking in the past 12 months. Controlling for the other variables, an increase of six Australian standard drinks (60 g of alcohol) increased the odds of perpetration by 15% [95% confidence interval (CI) adjusted odds ratio (AOR) 1.08, 1.23], and an increase of 15 Australian standard drinks increased the odds by 42% (95% CI AOR 1.20, 1.69). **Discussion and Conclusions.** Individual characteristics, larger quantities of alcohol consumed, and a disinclination to practice harm reduction amplified risk of AHTO perpetration. This has implications for health promotion and risk prevention/reduction strategies. [Lam T, Laslett A-M, Fischer J, Salom C, Ogeil RP, Lubman DI, Aiken A, Mattick R, Gilmore W, Allsop S. Disclosures of harming others during their most recent drinking session: Findings from a large national study of heavy-drinking adolescents. *Drug Alcohol Rev* 2021]

**Key words:** alcohol, Alcohol's Harms to Other, adolescent, violence, adverse childhood experience.

### Introduction

Globally, alcohol is the leading burden of disease and injury for young people, and interpersonal violence is the fifth leading cause [1]. Harms from alcohol are disproportionately experienced by others, rather than the user [2], with economic costs to others estimated to be

double those costed for individual drinkers [3]. Harms experienced by parties other than the individual drinker are known as Alcohol's Harms to Others (AHTO), and younger people are more likely to be both victims and perpetrators of AHTO [3].

In Australia, young people are more likely to exhibit risky drinking, aggressive behaviours and

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hold ‘violence-supportive’ attitudes [4]. There is a need to investigate how these elements may interact on an event level, and from the perpetrator’s perspective, in order to inform interventions for alcohol-related violence. Despite recent declines [5,6], a fifth of Australian 14–19-year-olds are still drinking quantities that place them at risk of single-occasion risk of harm at least monthly [7]. This study therefore sought to examine adolescent risky drinkers who perpetrate alcohol-related harms to inform strategies that may be implemented to mitigate harms to them and others.

Traditionally, there has been a widely held belief that alcohol can ‘cause’ alcohol-related behaviours, such as the use of intimidation, property damage and violence [8]. However, this view is increasingly being repudiated as a way of mitigating perpetrator’s responsibilities [9]. While alcohol is associated with increased risk of, and more severe, violence, beliefs that alcohol ‘causes’ aggression can encourage violent behaviour and serve for some as an excuse for violence [10].

Nevertheless, risky alcohol consumption is implicated in both victimisation and perpetration of violence [11,12], and while much of the extant literature is taken from the victim’s viewpoint, there are perpetrator studies, especially from the intimate partner/family violence field. The United Nations Multi-country Study on Men and Violence found that perpetration was associated with drinking along with other factors [13]. Male perpetrators who consume alcohol at risky levels, compared to those who do not, inflict more frequent violence [14,15], perpetrate more severe violence [16] and are more likely to inflict sexual violence [13]. A recent longitudinal study found that usual consumption of 1–4 drinks per session was associated with an increased risk of perpetrating violence in the past 12 months for both males and females; and when the usual quantity was five or more drinks, the risk increased for males, but remained similar for females [17]. In addition to gender, other demographic factors, such as younger age and being native-born compared to being overseas born, have been associated with AHTO perpetration [18,19].

Studies examining specific quantities of alcohol consumed during violent incidents are not as common as those reporting on the perpetrator’s regular drinking patterns, and it has been noted that the immediate temporal association between aggression and heavy drinking requires further research [20]. However, in one relevant study of 170 offenders charged with assault on the weekends, 88% were male and 51% were aged 18–25 years old. Of the 18–25-year-old males, 79% reported they were drinking in the 48 hours prior to the incident, at a median of 16 Australian standard drinks (160 g of alcohol) [19].

The complex relationship between alcohol and violence is influenced by risky alcohol consumption, aggression, as well as childhood neglect and victimisation [10,20]. International evidence suggests that exposure to violence during childhood increases the risk of both experiencing and perpetrating violence later in life [21]. In Asia and Oceania, experiences of childhood trauma and hazardous alcohol use are associated with adult perpetration of intimate partner violence [22]. An estimated 8.5% of Australians have experienced childhood physical abuse, and these individuals are twice as likely to experience physical violence as an adult [23]. A recent meta-analysis of data from four Australasian cohort studies ( $N = 6706$ ) found that early aggression strongly predicted subsequent heavy episodic drinking, after adjustment for prior aggression and other confounders [20].

The ubiquity of alcohol-associated violence means that young people commonly and actively attempt to manage their risk of victimisation in the physical and social environments in which they consume alcohol [24]. They use strategies to ensure their personal and social safety, such as drinking in groups and staying away from certain venues, with males often particularly alert to violence in public settings and women to private settings [25]. It is possible that the harm reduction strategies that protect against experiencing personal alcohol-related harms [24] may also impact on the perpetration of alcohol-related harms.

### *Objectives*

This study recruited heavy-drinking adolescents to examine antisocial behaviours they disclosed perpetrating at their most recent risky drinking session. We sought to describe key associations with perpetration, such as socio-demographic characteristics, childhood experiences, harm minimisation strategy use and event-specific alcohol and other drug use, particularly whether there was a dose-dependent relationship between the quantity of alcohol consumed and incidence of violence.

### **Methods**

#### *Inclusion criteria*

The data for this study were gathered as a part of the Young Australians Alcohol Reporting System, a multi-jurisdiction collaboration that aimed to recruit young risky drinkers underrepresented in national surveys and overrepresented in harms [26]. Selection criteria were developed using relevant general population datasets to

identify the heaviest drinking 20–25% of 14–19-year-olds [27–30]. An Australian Standard Drink (ASD) equals 10 g of alcohol. Eligible participants were screened to be consuming 1 + ASD in a single sitting at least once a month (14–15-year-olds); 5 + ASD per occasion at least twice a month (16–17-year-olds), 7 + ASD per sitting at least twice a month (18–19-year-old females) or 9 + ASD per occasion at least twice a month (18–19-year-old males). This cross-sectional study reports upon the 2932 adolescents who responded to the perpetration of AHTO survey items.

### *Procedure*

As this study targeted a risky drinking adolescent population that represented approximately 1% of Australian residents, random sampling or stratified household sampling techniques were not practical [31]. Instead, targeted convenience sampling techniques were used. In particular, paid social media advertisements were targeted to 14–19-year-olds with jurisdiction-specific advertisements. Due to a heterogeneous recruitment strategy, response rates were unable to be calculated; however, participant recruitment sources were as follows: most (86%) were recruited via social media advertising, 14% were referred through a friend, 2% saw a poster at their educational facility and 1% were recruited through a youth service they used (more than one recruitment option could be reported).

Participants completed either a 45-min face-to-face interview ( $n = 594$ ) or a 20-min self-administered online survey ( $n = 2338$ ). Interviews were conducted in all eight Australian capital cities, primarily in public cafes, and participants were reimbursed \$AUD40. We were able to gather richer data through the longer face-to-face interviews, and the online modality allowed us to reach a population outside the capital city areas where interviewers were based. Data collection occurred in 2016 and 2017. Online surveys were anonymous, and interview preamble guaranteed confidentiality unless intent to harm themselves or others were disclosed. All participants provided informed written consent prior to interview commencement and all participating sites had institutional ethics approval: Curtin University (HR 52/2014), UNSW Sydney (HR 52/2014), Monash University (1032), University of Tasmania (H16018), Flinders University (OH-00111), ACT Health Research Records and Governance Office (ETH.9.16.185), Charles Darwin University (H16094) and University of Queensland (2016001535). Detailed descriptions of the study and procedure are available in the national and jurisdiction-specific reports [26,30].

### *Measures*

Participants were asked to recall their ‘last risky drinking session’ (LRDS). This was the most recent event where they consumed a minimum quantity of alcohol as defined in the above age- and gender-specific inclusion criteria.

### *Dependent variable—perpetration of AHTO*

Participants reported on the following AHTO outcomes from their LRDS (yes/no):

1. ‘I have become very rude, obnoxious, or insulting after drinking’ [32];
2. ‘I verbally abused someone because of my drinking’ [31];
3. ‘I physically abused someone or got into a fight because of my drinking’ [31,32];
4. ‘I stole or damaged private or public property (e.g. sign, fence) due to my drinking’ (derived from combining the stealing and vandalism item from [33]).

These AHTO were categorised as verbal (being rude or verbal abuse), physical or property related. This study’s dependent variable reflected the perpetration of zero, one or 2+ of these categories of harm.

### *Independent variables*

Quantity of alcohol consumed at the LRDS was estimated using the ‘gold standard’ for self-reported quantity estimates, the beverage-specific response method [34]. Participants could select up to 12 categories of drink varying by beverage type and strength and were provided with size and packaging options for each. Using survey branching, only fields relevant to the participant were displayed. Each of these fields were associated with a standard drink multiplier, so if the respondent entered ‘1’ into the ‘pint of full-strength beer’ field, this would be converted into ‘1.8 standard drinks’, and summed by the software with any other beverage types selected. Use of an illicit drug or pharmaceutical drug not used as prescribed at the LRDS was recorded as present or absent.

The Brief Physical Punishment Scale has been validated for adolescent use and assesses childhood exposure to violence perpetrated by an adult [21]. The four childhood harms assessed were: hair pulling, ear pulling, slapping and being hit with an object (never, seldom, sometimes, often, very often). The items were summed so higher scores indicated greater exposure to

abuse. The scores were then split into quartiles so a score of zero indicating no reports of childhood punishment could be used as a reference category and for ease of interpretation (score 0 = 38% of the sample, score 1–2 = 26%, score 3–5 = 19%, score 6–16 = 17%).

The use of harm reduction strategies while drinking alcohol over the past 12 months was assessed using the Protective Behavioral Strategies Scale (PBSS). The PBSS is a 15-item-validated scale, strongly associated with the experience of alcohol-related problems, even after controlling for alcohol quantity [24]. Higher PBSS scores indicated more frequent use of strategies, and these were split into quartiles for ease of interpretation (scores < 40 = 28% of the sample, scores 40–47 = 24%, scores 48–56 = 27%, scores  $\geq$  57 = 21%).

Various demographic variables (age, gender, languages spoken at home) and survey modality (face-to-face vs. online) were included in the analysis. We controlled for socio-economic status with a reliable indicator of socio-economic advantage, the Socio-Economic Indexes for Areas, which is computed using home postcodes, and where a higher number indicates greater advantage [35]. Though there appears to be a relationship between disadvantage and offending, the effect is regarded as small [36].

#### Data analyses

We used multinomial logistic regression to explore how nine variables related to the perpetration of these three categories of AHTO (verbal, physical, property). The reference category of those who did not perpetrate any harms was compared to groups who perpetrated (i) one category of AHTO and (ii) 2+ categories of AHTO.

Regression model development was based on background knowledge and theoretical reasoning for the inclusion of predictor variables. Rather than fitting a series of binomial models for each category of harm, multinomial logistic regression was employed as a more efficient means of simultaneously estimating all level parameters with least residual error. Sensitivity analyses modelling each AHTO separately are available in the Supporting Information (Tables S1–S4).

Variables included in the analysis (further described in Tables 2 and 3) were:

1. Age;
2. Gender;
3. Socio-economic status decile;
4. Languages spoken at home;
5. Childhood physical punishment (Brief Physical Punishment Scale quartile);
6. Alcohol quantity at the LRDS;
7. Illicit or non-prescribed drug use at the LRDS;

8. Safety strategy score (PBSS quartile);
9. Survey modality.

All analyses were computed in IBM SPSS version 24, with *P* values < 0.05 considered significant.

## Results

### Participants

Just over half (58%) the participants were female, were an average of 17 years of age and most (85%) were students. Further characteristics are presented in Table 1.

### Data descriptions

The recall period for the LRDS was a mean of 11 days (59%  $\leq$  7 days and 78%  $\leq$  14 days between LRDS and survey). A mean of 15.7 ASD (95% confidence interval 15.24, 16.10) was consumed, and this was ‘a little less’ (25%), ‘a similar amount’ (47%) or ‘a little more’ (15%) compared to participants’ usual quantity. A quarter used an illicit or non-prescribed drug (Table 2).

At the LRDS, 4.7% reported that they ‘become very rude, obnoxious, or insulting after drinking’, 4.7% ‘verbally abused someone because of my drinking’, 1.9% ‘physically abused someone or got into a fight because of my drinking’ and 4.6% ‘stole or damaged private or public property (e.g. a sign or fence) due to my drinking’. Almost one (7.5%) in 13 reported either being rude or verbally abusive at the LRDS, and this being rude/verbal abuse was also commonly reported by those who also reported physical abuse/fighting (63%) and vandalism (33%). Harm prevalence was approximately six times higher when the reporting period included other occasions in the past 12 months (Table 1).

Eleven percent of the sample reported perpetrating at least one category of harm (verbal, physical or property) at the LRDS—8.7% reported perpetrating only one category of harm, 1.8% two categories and 0.5% all three categories of harm.

### Regression

The multinomial logistic regression that modelled the relationship between nine independent variables and the perpetration of AHTO appeared to fit the data and explained up to 12% of variance. The seven variables that significantly and uniquely contributed to the model are reported below, with their 95% CI estimates and *P* values in Table 3.

For the perpetration of one category of AHTO (compared to the perpetration of none), the odds were higher amongst participants who were younger

**Table 1.** Participant characteristics and Alcohol's Harms to Others (AHTO) descriptives with original response options

| Participant characteristics   |   |              |
|---|---|--------------|
| Gender <sup>a</sup>   | Male  | 41%          |
|   | Female  | 58%          |
|   | Transgender   | 1%           |
|   | I do not identify as any of the above/prefer not to say | 1%           |
|   | Total, <i>n</i>   | 2932         |
| Age, years  | 14–15   | 15%          |
|   | 16–17   | 42%          |
|   | 18–19   | 43%          |
|   | Total, <i>n</i>   | 2932         |
| Occupation  | Student (at school, university or technical college)    | 85%          |
|   | School student  | 52%          |
|   | University student                                      | 30%          |
|   | Technical college student                               | 4%           |
|   | Employed full time                                      | 4%           |
|   | Trade apprentice  | 2%           |
|   | Unemployed  | 6%           |
|   | Other   | 3%           |
|   | Total, <i>n</i>   | 2932         |
|   | Languages spoken in home                                | English only |
| English and another language(s)   |   | 11%          |
| Total, <i>n</i>   |   | 2758         |
| Aboriginal and/or Torres Strait Islander heritage                                       | Yes   | 5%           |
|   | No  | 95%          |
|   | Total, <i>n</i>   | 2932         |
| Perpetration of an AHTO (original response options)                                     |   |              |
| I have become very rude, obnoxious, or insulting after drinking                         | Yes—at the last drinking session (LRDS)                 | 5%           |
|   | Yes—another time in the past 12 months                  | 25%          |
|   | Not in the last 12 months                               | 71%          |
|   | Total, <i>n</i>   | 2928         |
| I verbally abused someone because of my drinking  | Yes—at the last drinking session (LRDS)                 | 5%           |
|   | Yes—another time in the past 12 months                  | 21%          |
|   | Not in the last 12 months                               | 75%          |
|   | Total, <i>n</i>   | 2920         |
| I physically abused someone or got into a fight because of my drinking                  | Yes—at the last drinking session (LRDS)                 | 2%           |
|   | Yes—another time in the past 12 months                  | 10%          |
|   | Not in the last 12 months                               | 89%          |
|   | Total, <i>n</i>   | 2916         |
| I stole or damaged private or public property (e.g. a sign or fence) due to my drinking | Yes—at the last drinking session (LRDS)                 | 5%           |
|   | Yes—another time in the past 12 months                  | 25%          |
|   | Not in the last 12 months                               | 71%          |
|   | Total, <i>n</i>   | 2929         |

<sup>a</sup>Participants who were transgender, did not identify as male female or transgender, or preferred not to specify a gender are included in the overall sample and harms descriptions, but not as separate categories the regression analyses due to small cell size. LRDS, last risky drinking session.

(adjusted odds ratio [AOR] 0.87), only spoke English at home (AOR 2.55), reported the most experience of childhood physical punishment (AOR 1.72), consumed larger quantities of alcohol during the event (AOR 1.02) and least frequently used safety strategies while drinking (AOR 1.76).

Similarly, for the perpetration of two or more categories of AHTO, the odds were higher amongst participants who: were younger (AOR 0.69), male (AOR 4.29), reported the most experience of childhood physical

punishment (AOR 3.23), consumed larger quantities of alcohol (AOR 1.02) and used an illicit drug during the event (AOR 3.27), and least frequently used safety strategies while drinking (AOR 4.07).

#### *Sensitivity analyses*

Though gender was associated with the perpetration of multiple categories of AHTO, it was not significantly associated with the perpetration of one AHTO.

**Table 2.** Descriptives of variables included in the multinomial logistic regression model

| Categorical variables                                 | Perpetration of harms at the last risky drinking session (LRDS) <sup>a</sup> |                         |                 |                         |                    |                         |          |                         |
|---|--|-------------------------|-----------------|-------------------------|--------------------|-------------------------|----------|-------------------------|
|   | 0 AHTO category  |                         | 1 AHTO category |                         | 2+ AHTO categories |                         | Total    |                         |
|   | <i>n</i>   | %                       | <i>n</i>        | %                       | <i>n</i>           | %                       | <i>n</i> | %                       |
| <i>Gender</i>   |  |                         |                 |                         |                    |                         |          |                         |
| Male  | 1028   | 39.4                    | 119             | 46.9                    | 48                 | 69.6                    | 1195     | 40.8                    |
| Female  | 1549   | 59.4                    | 133             | 52.4                    | 17                 | 24.6                    | 1699     | 57.9                    |
| Total <sup>b</sup>                                    | 2609   | 100                     | 254             | 100                     | 69                 | 100                     | 2932     | 100                     |
| <i>Languages spoken at home</i>                       |  |                         |                 |                         |                    |                         |          |                         |
| English only  | 2173   | 88.5                    | 223             | 94.1                    | 54                 | 80.6                    | 2450     | 88.8                    |
| English and another language(s)                       | 281  | 11.5                    | 14              | 5.9                     | 13                 | 19.4                    | 308      | 11.2                    |
| Total   | 2454   | 100                     | 237             | 100                     | 67                 | 100                     | 2758     | 100                     |
| <i>Childhood physical punishment (BPPS quartile)</i>  |  |                         |                 |                         |                    |                         |          |                         |
| BPPS 0–16 (most physical punishment)                  | 391  | 15.3                    | 56              | 22.6                    | 27                 | 40.9                    | 474      | 16.5                    |
| BPPS 3–5  | 474  | 18.5                    | 59              | 23.8                    | 16                 | 24.2                    | 549      | 19.1                    |
| BPPS 1–2  | 693  | 27.1                    | 55              | 22.2                    | 8                  | 12.1                    | 756      | 26.3                    |
| BPPS 0 (no reported physical punishment)              | 999  | 39.1                    | 78              | 31.5                    | 15                 | 22.7                    | 1092     | 38                      |
| Total   | 2557   | 100                     | 248             | 100                     | 66                 | 100                     | 2871     | 100                     |
| <i>Illicit or non-prescribed drug use at the LRDS</i> |  |                         |                 |                         |                    |                         |          |                         |
| Yes   | 590  | 22.8                    | 82              | 32.5                    | 44                 | 64.7                    | 716      | 24.6                    |
| No  | 2000   | 77.2                    | 170             | 67.5                    | 24                 | 35.3                    | 2194     | 75.4                    |
| Total   | 2590   | 100                     | 252             | 100                     | 68                 | 100                     | 2910     | 100                     |
| <i>Safety strategy score (PBSS quartile)</i>          |  |                         |                 |                         |                    |                         |          |                         |
| PBSS < 40 (least use of safety strategies)            | 674  | 26.7                    | 92              | 37.7                    | 36                 | 55.4                    | 802      | 28.3                    |
| PBSS 40–47  | 590  | 23.4                    | 55              | 22.5                    | 13                 | 20                      | 658      | 23.2                    |
| PBSS 48–56  | 681  | 27                      | 58              | 23.8                    | 12                 | 18.5                    | 751      | 26.5                    |
| PBSS ≥ 57 (most use of safety strategies)             | 581  | 23                      | 39              | 16                      | 4                  | 6.2                     | 624      | 22                      |
| Total   | 2526   | 100                     | 244             | 100                     | 65                 | 100                     | 2835     | 100                     |
| <i>Survey modality</i>                                |  |                         |                 |                         |                    |                         |          |                         |
| Face to face  | 534  | 20.5                    | 45              | 17.7                    | 15                 | 21.7                    | 594      | 20.3                    |
| Self-administered                                     | 2075   | 79.5                    | 209             | 82.3                    | 54                 | 78.3                    | 2338     | 79.7                    |
| Total   | 2609   | 100                     | 254             | 100                     | 69                 | 100                     | 2932     | 100                     |
| Continuous variables                                  |  |                         |                 |                         |                    |                         |          |                         |
|   | <i>n</i>   | Mean<br>[95% CI mean]   | <i>n</i>        | Mean<br>[95% CI mean]   | <i>n</i>           | Mean<br>[95% CI mean]   | <i>N</i> | Mean<br>[95% CI mean]   |
| <i>Age</i>  | 2609   | 17.17<br>[17.12, 17.22] | 222             | 16.91<br>[16.72, 17.11] | 101                | 16.57<br>[16.30, 16.85] | 2932     | 17.13<br>[17.08, 17.18] |
| <i>SES decile</i>                                     | 2609   | 7.69<br>[7.59, 7.79]    | 222             | 7.50<br>[7.17, 7.84]    | 101                | 7.81<br>[7.28, 8.23]    | 2932     | 7.68<br>[7.59, 7.77]    |
| <i>Alcohol quantity at the LRDS<sup>c</sup></i>       | 2609   | 15.09<br>[14.68, 15.51] | 222             | 20.42<br>[17.98, 22.86] | 101                | 20.79<br>[17.62, 23.97] | 2932     | 15.67<br>[15.24, 16.10] |

The total *N* denotes the largest sample size available for that variable, within the group that answered the Alcohol's Harms to Others (AHTO) items. <sup>a</sup>The three categories of AHTO perpetration were (i) verbal (perpetrated rudeness/insults OR verbal abuse); (ii) physical or (iii) property. That is, the 2+ category represents participants who perpetrated either two or three categories of AHTO. <sup>b</sup>The Gender total includes 38 participants who were transgender or preferred not to specify their gender—these participants are also included in the other descriptives in this table. <sup>c</sup>The mean alcohol quantity consumed amongst the 323 participants who perpetrated 1 + AHTO was 20.53 [18.60, 22.47] Australian Standard Drinks (1 Australian Standard Drink = 10 g of alcohol). BPPS, Brief Physical Punishment Scales; CI, confidence interval; LRDS, last risky drinking session; PBSS, Protective Behavioral Strategies Scale; SES, socio-economic status.

**Table 3.** Multinomial logistic regression with the perpetration of 1 or 2+ categories of AHTO (with no perpetration as reference category)

| Model                                   | Statistic            |
|---|----------------------|
| Likelihood Ratio $\chi^2$ -test (df, P) | 159.48 (26, <0.0001) |
| Cox and Snell $R^2$                     | 6.52%                |
| Nagelkerke $R^2$                        | 12.07%               |
| McFadden $R^2$                          | 8.68%                |
| Cases correctly classified              | 89.60%               |
| Cases in model (N)                      | 2364                 |

| Perpetration harms at the last risky drinking session (LRDS) <sup>a</sup> |                                       |                |      |      |        |  |                |       |       |        |
|---|---------------------------------------|----------------|------|------|--------|--|----------------|-------|-------|--------|
|   | 1 AHTO category (vs. no perpetration) |                |      |      |        | 2+ AHTO categories (vs. no perpetration) |                |       |       |        |
|   | AOR                                   | 95% CI for AOR |      |      | P      | AOR                                      | 95% CI for AOR |       |       | P      |
|   |                                       | LB             | UB   | UB   |        |  | LB             | UB    |       |        |
| Age (14, 15, 16, 17, 18, 19 years)  | 0.87                                  | 0.78           | 0.97 | 0.97 | 0.013  | 0.69                                     | 0.56           | 0.86  | 0.86  | 0.001  |
| Gender  |                                       |                |      |      |        |  |                |       |       |        |
| Male  | 1.23                                  | 0.90           | 1.67 | 1.67 | 0.195  | 4.29                                     | 2.19           | 8.37  | 8.37  | <0.001 |
| Female (reference)  |                                       |                |      |      |        |  |                |       |       |        |
| SES decile  | 0.98                                  | 0.92           | 1.04 | 1.04 | 0.499  | 1.08                                     | 0.95           | 1.23  | 1.23  | 0.248  |
| Languages spoken at home  |                                       |                |      |      |        |  |                |       |       |        |
| English only  | 2.55                                  | 1.32           | 4.94 | 4.94 | 0.005  | 0.62                                     | 0.29           | 1.33  | 1.33  | 0.220  |
| English and other language(s) (reference)                                 |                                       |                |      |      |        |  |                |       |       |        |
| Childhood physical punishment (BPPS quartile)                             |                                       |                |      |      |        |  |                |       |       |        |
| BPPS 6–16 (most physical punishment)                                      | 1.72                                  | 1.12           | 2.64 | 2.64 | 0.013  | 3.23                                     | 1.50           | 6.94  | 6.94  | 0.003  |
| BPPS 3–5  | 1.40                                  | 0.93           | 2.10 | 2.10 | 0.110  | 1.80                                     | 0.80           | 4.03  | 4.03  | 0.153  |
| BPPS 1–2  | 0.99                                  | 0.66           | 1.47 | 1.47 | 0.945  | 0.62                                     | 0.23           | 1.69  | 1.69  | 0.354  |
| BPPS 0 (no reported physical punishment; reference)                       |                                       |                |      |      |        |  |                |       |       |        |
| Alcohol quantity at LRDS <sup>b</sup>                                     |                                       |                |      |      |        |  |                |       |       |        |
| Illicit or non-prescribed drug use at LRDS                                | 1.02                                  | 1.01           | 1.04 | 1.04 | <0.001 | 1.02                                     | 1.00           | 1.04  | 1.04  | 0.014  |
| No illicit drug use at LRDS (reference)                                   | 1.28                                  | 0.92           | 1.78 | 1.78 | 0.147  | 3.27                                     | 1.79           | 5.97  | 5.97  | <0.001 |
| Safety strategy score (PBSS quartile)                                     |                                       |                |      |      |        |  |                |       |       |        |
| PBSS <40 (least use of safety strategies)                                 | 1.76                                  | 1.11           | 2.78 | 2.78 | 0.017  | 4.07                                     | 1.37           | 12.09 | 12.09 | 0.012  |
| PBSS 40–47  | 1.30                                  | 0.79           | 2.14 | 2.14 | 0.301  | 2.28                                     | 0.70           | 7.43  | 7.43  | 0.172  |
| PBSS 48–56  | 1.50                                  | 0.93           | 2.42 | 2.42 | 0.098  | 2.09                                     | 0.63           | 6.88  | 6.88  | 0.227  |
| PBSS ≥57 (most use of safety strategies; reference)                       |                                       |                |      |      |        |  |                |       |       |        |
| Survey modality   |                                       |                |      |      |        |  |                |       |       |        |
| Face to face  | 0.92                                  | 0.64           | 1.31 | 1.31 | 0.638  | 0.90                                     | 0.47           | 1.72  | 1.72  | 0.744  |
| Self-administered (reference)   |                                       |                |      |      |        |  |                |       |       |        |
| Intercept   |                                       |                |      |      | <0.001 |  |                |       |       | <0.001 |

<sup>a</sup>Multinomial logistic regression was run with 'no perpetration' as the reference category. The three categories of Alcohol's Harms to Others (AHTO) perpetration were (i) verbal (perpetrated rudeness/insults OR verbal abuse); (ii) physical or (iii) property. That is, the 2+ category represents participants who perpetrated either two or three categories of AHTO. <sup>b</sup>For ease of interpretation, the AOR was also calculated for other alcohol quantities—six drinks (AOR = 1.15 [95% CI 1.08, 1.23]), 10 drinks (AOR 1.26 [95% CI 1.13, 1.42]) and 15 drinks (AOR 1.42 [95% CI 1.20, 1.69]). AOR, adjusted odds ratio; BPPS, Brief Physical Punishment Scale; CI, confidence interval; LB, lower bound; PBSS, Protective Behavioral Strategies Scale; SES, socio-economic status; UB, upper bound.

Sensitivity analyses with each individual harm showed that gender was not significantly associated with insults or verbal abuse, but male gender was associated with vandalism and physical assault. Verbal harms were more common than, and substantially overlapped with, vandalism and physical assault—that is, females were more likely to perpetrate a single verbal harm, while males were more likely to perpetrate multiple categories of AHTO, including verbal harms.

## Discussion

This study sought to investigate alcohol-related harms to others, from the point of view of the alcohol-affected perpetrator. Eleven percent of our risky drinking teenage sample reported perpetrating at least one type of verbal, physical or property harm during their most recent risky drinking occasion.

Consistent with the literature, perpetrators of AHTO were younger, perhaps as individuals with early antisocial/oppositional behaviour also tend to commence heavier drinking earlier [37]. Participants who spoke only English at home were twice as likely to perpetrate an AHTO, consistent with research showing Australians born in Australia are overrepresented as risky drinkers and offenders [18]. Men are more likely to report a range of antisocial behaviours than women [19,22].

A unique question of this paper was whether there was a dose-dependent relationship between alcohol quantity and likelihood of perpetration, as much of the literature does not report on the estimated quantities of alcohol consumed during the incident, but simply whether or not alcohol was involved. The average quantity consumed at the LRDS for those who did not perpetrate any harm was 15.09 ASD, compared to 20.53 for those who did report perpetrating at least one AHTO. Controlling for other covariates, we found that the odds of reporting perpetration of an AHTO significantly increased (AOR 1.02; 2% greater than baseline) with every standard drink consumed. An increase of six standard drinks consumed increased the odds of harm by 1.15 (15% greater than baseline) and if 15 or more standard drinks were consumed, the odds increased to 1.42 (42% greater than baseline).

Our finding that greater experience of childhood physical punishment was associated with adolescent perpetration of AHTO was consistent with literature on how adverse childhood experiences, including corporal punishment, may manifest later in life as violence towards others [38,39]. Furthermore, as childhood abuse is associated with adult victimisation of AHTO [40], it is possible these young perpetrators are also at greater risk of being victims of AHTO [41], and the

same individual can be perceived as both a victim and perpetrator within the same event.

Greater engagement in behaviours to protect personal safety while drinking was inversely associated with the perpetration of AHTO. In previous work with this sample [41], two-thirds of those who had been pushed or shoved by a drinker reported that they knew the perpetrator. Drinkers' attempts to protect themselves appeared to also benefit those around them, including friends, perhaps as those enacting safety strategies were more conscious of the potential harms to themselves, and thus to others.

## Implications

In neoliberal society, governments are only encouraged to intervene when the consequences of one's actions extend beyond those of the individual and cause harm to others [42]. Globally, research of AHTO is increasingly recognised as a potential driver of alcohol policy change [43].

Our findings demonstrate that the larger the quantity young heavy drinkers reported drinking, the more likely they were to report harming others. This information might be used in behaviour change campaigns that focus on how the individual risk generated from one's own drinking impacts upon others' lives. That is, there may be potential to employ public health messaging that emphasises the responsibility one has to others in their social network in being accountable for their own behaviour and choosing not to inflict violence [44]. Secondly, if there is recognition by young people that they are placing their social circle at risk, interventions predicated on potential victims' safety, and provision of support and services to assist in reducing their drinking, need to be made available and designed to be appropriate for heavy drinking youth [45].

However, crucially, given that these findings show that heavier drinking is substantially affecting not only drinkers themselves [26,41] but also those around them (and property), these findings also provide support for school-based interventions that reduce heavy drinking among young people [46] or facilitate earlier help-seeking [47]. Further, given that increasing pricing and decreasing availability have been shown to be mechanisms that are effective among young people, these broader strategies should be considered, introduced and evaluated as strategies to prevent and reduce harm to others [48].

## Strengths and limitations

Responses were from the individuals perpetrating AHTO and included event-specific influences, which



are uncommon in the literature. Further, they specifically described most of the harms (i.e. verbal abuse, physical abuse or vandalism) to be attributable to alcohol. The proportion of the attribution is unknown, but it is at least some part. This study used event specific data with a short recall period, so the quantity of alcohol consumed during the AHTO incident was able to be estimated. These alcohol quantities were estimated using one of the most accurate self-report techniques for estimating alcohol quantity, as estimates are provided for each type of drink (e.g. wine vs. beer), and less mental arithmetic is required on the part of the respondent [34].

This non-probability drawn sample is not intended to be representative of general population young Australians. In addition to being targeted for their risky drinking patterns and behaviours, there was an underrepresentation of non-capital city-based respondents, and postcodes associated with lower socio-economic advantage [30]. Of note, there were still higher absolute numbers of participants in the lowest socio-economic quintiles compared to the equivalent general population sample of 14–19-year-olds who drank *any* quantity of alcohol in the past 12 months [31], and we controlled for socio-economic status in our analyses.

This targeting of a higher risk sample allowed for the assessment of less common harms, such as perpetration of AHTO. This study was cross-sectional, so we are unable to confirm, for example, any temporal relationship between alcohol use, perpetration and adverse childhood experiences. Participants are generally more likely to report being victims [41,49] than causing harm, so our findings should be interpreted as underestimates of harm. Future research may seek to further develop phrasing that is more ‘familiar’ to perpetrators to reduce stigma-related underreporting, and to incorporate a wider range of influences, such as attitudes toward violence [4], that were not assessed in this study. This study used self-report; however, adolescent self-report on alcohol use is generally reliable [31] and we assessed incidents that may not be reported through other means, for example, as the consequences do not come to the attention of the authorities. Finally, here we have focused on the individual characteristics of perpetrators, not on the variety of other factors that influence violent incidents, such as the social and spatial environments. Further research is warranted on the influences of both individual and setting on AHTO.

## Conclusion

Our study found that young people were more likely to report harming others in social settings if they had been exposed to physical punishment in their childhood. Participants who were male, younger and spoke only English at home were also more likely to

perpetrate harm. Heavier drinking (as measured during the incident) and drug use were important factors associated with increases in reported perpetration. Regardless of whether intoxication is perceived as something that changes behaviour, or is used as an excuse for perpetration, this study provides further evidence that heavy drinking by young people is a marker of greater risk, and a behaviour that could be the focus of behaviour change.

Given drinkers themselves are also at higher risk of harm from others’ drinking, there is a twofold public health benefit to the promotion of modifiable behaviours, such as reducing alcohol quantity and use of drinking safety strategies—there are tangible benefits for the drinkers themselves as well as those around them.

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## Conflict of Interest

The authors have no conflicts of interest.

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## Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

**Table S1.** Logistic regression of associations with the perpetration of verbal abuse.

**Table S2.** Logistic regression of associations with being rude/obnoxious or insulting.

**Table S3.** Logistic regression of associations with physically assaulting someone.

**Table S4.** Logistic regression of associations with vandalism.