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# The impact of school alcohol policy on student drinking

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## Abstract

Although it is common for secondary schools to implement alcohol policies to reduce alcohol misuse, there has been little evaluation of the efficacy of these policies. The purpose of this study was to test the impact of the degree and type of alcohol policy enforcement in state representative samples of secondary students in Washington State, USA, and Victoria, Australia ( $n = 1848$ ). Multivariate logistic regressions were used to examine the prospective association between student reports of school alcohol policy in Grade 8 and self-reported alcohol use in Grade 9, controlling for age, gender, state, family socioeconomic status and Grade 8 alcohol use. The likelihood of students drinking on school grounds was increased when students perceived lax policy enforcement. Student perceptions of harm minimization alcohol messages, abstinence alcohol messages and counselling for alcohol policy violators predicted reduced likelihood of binge drinking. Students perceiving harm minimization messages and counselling for alcohol policy violators had a reduced likelihood of experiencing alcohol-related harms. Perceptions of harsh penalties were unrelated to drinking behaviour. These results suggest that perceived policy enforcement may lessen drinking at school 1 year later and that harm minimization

messages and counselling approaches may also lessen harmful drinking behaviours as harm minimization advocates suggest.

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## Introduction

There has been increasing public health concern regarding youth alcohol use worldwide. Data collected by the World Health Organization show that rates of underage drinking are rising in the majority (71%) of the 73 countries assessed and that hazardous and harmful drinking patterns in particular are increasing [1, 2]. Given that alcohol is a key risk factor for the global burden of disease in young people [3], strategies to reduce youth alcohol use are warranted.

Research conducted in the past three decades has identified important influences on adolescent alcohol use and risk factors categorized at the individual, peer and family levels have been established [4]. Contextual factors in the broader social environment, such as norms and policies in the community and school settings, have also been found to be important [4, 5]. Rates of student alcohol use have been shown to vary between schools, even when differences in the composition of the student body are taken into account, indicating that schools have an influence above and beyond individual-level risk factors for youth alcohol use [6, 7]. School

normative attitudes towards alcohol (i.e. the acceptability of alcohol use within a school) have been related to student drinking [5, 6, 8, 9]. Students are more likely to find under-age alcohol use acceptable and drink more when placed in schools that have high aggregated rates of student drinking.

The relevance of school context to student alcohol and other health risk behaviours has informed numerous school-based interventions that address the school environment, such as the Health Promoting Schools scheme [10, 11]. One key aspect of these interventions is the development and implementation of relevant health policies [12, 13] and indeed the majority of secondary schools in developed countries have alcohol policies in place [14, 15]. Such policies serve to regulate access to alcohol on school grounds and at school events and set standards for the acceptability of alcohol in the school community by helping shape normative values towards alcohol use more broadly. School alcohol policy might be expected therefore to have effects on both school-based drinking (deterrence) and general alcohol use (normative effect).

Deterrence reduces student drinking by increasing the cost to students of behaviour banned by the school policy [16]. Socially inappropriate behaviour such as drinking on school grounds can therefore be prevented by making non-compliance costly for individuals (for example through suspension or expulsion). Deterrence theory assumes that law breaking is inversely proportional to the swiftness, certainty and severity of punishment [17]. Thus, school policy might be most effective as a deterrent when banned behaviours are likely to be detected through policy enforcement and monitoring then consistently and rapidly acted upon with harsh penalties [18].

Normative social influences, such as peer encouragement and social modelling of behaviours, in childhood and early adolescence are some of the strongest predictors of adolescent drug and alcohol use [19]. By reducing exposure to drinking role models (both student and adult), school alcohol policies can influence student perceptions of the availability and acceptability of alcohol use and thus

contribute to the development of a non-drinking norm. In addition, the values espoused by the school in health education classes and more broadly might help shape adolescent attitudes and behaviours. For example, schools might adopt an abstinence approach with little further discussion of alcohol use and potential harms (as is common in policies across the United States), or they might be more accepting of adolescent experimentation and provide harm minimization strategies to encourage less harmful drinking patterns (as is common in Australia) [14].

Investigations of the impact of school substance use policies on student behaviour have to date focused largely on tobacco policy and student smoking [20, 21]. The few studies that explicitly investigated associations between school alcohol policy and student alcohol use compared the impact of a written policy status against less formal (non-written) policy influences on student drinking. In a study of Flemish secondary students, schools with clearly formulated and communicated rules had fewer regular drinkers than schools with less clarity surrounding alcohol rules [22]. Secondary school students in Wales attending a school with a written alcohol policy had a lower likelihood of frequent binge drinking compared with those attending a school without a written policy [23]. In contrast, a Dutch study did not detect differences in rates of heavy episodic (binge) drinking among secondary school students attending schools with a total ban on drinking compared with schools that permitted student drinking on certain occasions [24]. This study also investigated the impact of alcohol prevention programming and the severity of sanctions for violating alcohol policy and found no associations with student binge drinking.

This study aims to extend understanding of the relationship between school alcohol policies and adolescent drinking behaviours. Unlike previous studies, this study relies on students' reports of school policies thereby reflecting students' actual perceptions of those policies and their implementation. The need for more research on students' perceptions of school policies has been voiced in prior reports on school tobacco policies [25] where it has

been demonstrated that student tobacco use is related to policy enforcement regardless of the school's formally documented policy [26–28]. In addition, this study extends previous cross-sectional findings by using longitudinal data to test associations between policy perceptions and alcohol use 1 year later (controlling for pre-existing alcohol use). Analyses incorporate measures of a range of alcohol use patterns including drinking on and off of school grounds and harmful patterns of use. This facilitates testing of the following research questions:

- (1) Do perceptions of strictly enforced school alcohol policies and harsh punishments deter students from drinking on school grounds?
- (2) Do perceptions of strictly enforced alcohol policies reduce student current drinking (in any context)?
- (3) Does exposure to abstinence policies reduce student current drinking?
- (4) Does exposure to harm minimization policies and remedial responses reduce harmful patterns of student alcohol use?

These research questions were addressed using data from 2 years of the International Youth Development Study (IYDS), a large ongoing longitudinal study of adolescent behaviours in state representative samples of youth in Washington State, USA, and Victoria, Australia. This sample is of particular utility for addressing issues of school policy orientation and punishment as the two states provide different contexts for policy approaches towards alcohol use (for example, the legal age for purchasing alcohol is 21 years in Washington State and 18 years in Victoria) and it has been shown previously that schools in the two states differ in their approaches to student alcohol use: school drug policies in Washington schools were more oriented towards total abstinence and more frequently enforced with harsh punishment (such as expulsion or calling law enforcement), whereas policies in Victorian schools were more reflective of harm-minimization principles [14, 29, 30].

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## Method

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### Study procedures and participants

Procedures for the IYDS sampling and student survey have been described in detail elsewhere [31]. Briefly, in 2002 the IYDS used a two-stage cluster sampling approach to recruit state representative samples of school students from three age cohorts. Within each state, public and private schools containing Grades 5, 7 or 9 were randomly selected; 152 Victorian schools (65% of schools approached) and 153 Washington schools (73% of schools approached) agreed to participate. Then, one class at the target year level within each school was randomly selected and invited to participate. Across the three age cohorts 2885 (74.8%) of eligible Washington State parents and students consented to participate and 2884 (73.5%) of eligible Victorian parents and students consented to participate.

Data from this study are drawn from the middle cohort of students who completed questionnaires on two consecutive years during the second (2003) and third (2004) year of the study when they were in Grades 8 and 9, respectively. The original participation rate for the middle cohort was 78.4% ( $n = 961$ ) in Washington and 75.6% ( $n = 984$ ) in Victoria. At the third follow-up in 2004, 1898 students (97.6%) were retained in the two states).

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### Ethics approval

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Ethics approval for this study was provided by the Royal Children's Hospital Ethics in Human Research Committee in Victoria and the University of Washington Human Subjects Review Committee in the United States. Permission was obtained from the relevant school authorities in each state and from the principal of each participating school.

### Measures

#### *Student alcohol use*

In Grade 9, students rated how many times in the past 12 months they had drunk alcohol in the school building or on school grounds during the school day or at a

school event (adapted from [32]). Response options were recoded from an 8-point scale to 'Never' (0) and 'one or two times' to '40 or more times' (1).

The measure of current alcohol use was a binary indicator of self-reported drinking (adapted from [33]). In Grades 8 and 9, students were asked how many occasions in the past 30 days they had more than just a few sips of an alcoholic beverage. Response options were recoded from an 8-point scale to 'Never' (0) and 'one or two times' to '40 or more times' (1).

For binge drinking, Grade 9 students were asked how many times in the past 2 weeks they had drunk five or more drinks in a row. Response options were recoded from an 8-point scale to 'Never' (0) and 'one or two times' to '40 or more times' (1) (adapted from [33]).

Alcohol harm was measured by asking the 892 (48.3%) Grade 9 students who indicated they had drunk alcohol in the past year eight questions about behaviour related to their alcohol use [34]. They were asked how often over the past year their alcohol use had caused them to: have trouble at school the next day; get into arguments with their family; get injured or have an accident; become violent or get into a fight; feel anxious or depressed; have sex with someone they later regretted; get so drunk they were sick or passed out. Students were also asked how often when drinking alcohol during the past year; had they found that they were not able to stop drinking once they had started and been unable to remember the night before. They rated these items on an 8-point scale from 'never' to '40 or more times'. Due to the skewed distributions, responses for each item were dichotomized to reflect no alcohol harm event (scored as 0) or an alcohol harm event present (scored as 1). The scale responses were summed and recoded to no/low-harmful alcohol use (0) (for sum scores of 1 or 0) or harmful alcohol use group (1) (for sum scores of 2 or more).

#### *Student report of school alcohol policies*

In Grade 8, students were asked 'If a student was found drinking alcohol at school, which of the

following would most likely happen?' Students indicated all responses they believed were most likely. Potential responses included that the student would be talked to by a teacher about the dangers of drinking alcohol; they would be suspended; they would be expelled; and that the police would be called. Responses for each outcome were either 'yes' (1) or 'not likely' (0).

As a measure of low policy enforcement and high alcohol acceptability at school, students were asked to rate their agreement with the following item: 'Many students drink alcohol on school grounds without getting caught'. The response set was rated on a 4-point scale from 'YES!' (4), through 'yes' (3) and 'no' (2) to 'NO!' (1).

To measure abstinence alcohol messages received at school, students were asked: 'please tell us how well the following statement describes your school: We are taught to say no to alcohol'. The response set was rated on a 4-point scale from 'YES!' (4), through 'yes' (3) and 'no' (2) to 'NO!' (1).

To measure harm minimization alcohol messages received at school students were asked: 'please tell us how well the following statement describes your school: We are taught how to use alcohol safely'. The response set was rated on a 4-point scale from 'YES!' (4), through 'yes' (3) and 'no' (2) to 'NO!' (1).

#### *Family socio-economic status*

A single composite measure of family socio-economic status (SES) was calculated from parent responses to questions on maternal and paternal education status and family income as described in [29]. In total, 97% of Washington State parents and 96% of Victorian parents completed interviews. The SES variable was a continuous measure (range 1.0–3.0) with a higher score indicating a higher level of SES.

#### *Student honesty*

A single measure of honesty (yes/no) was calculated based on student responses to three survey items including use of a fictional drug as described in greater detail in [35].

## Statistical analysis

Six students were no longer in school at the time of administration of the Grade 9 survey and were excluded from the analysis. Honesty criteria were used to remove 44 students from the sample. The final sample comprised 908 Washington State students and 940 Victorian students. Less than 3% of cases were missing data for each variable and so missing data were excluded from the analyses. Data analyses were conducted in Stata/IC for Windows 11 [36]. First, frequencies of the student reported school policy variables, alcohol use variables and control variables (gender, age, state, family SES and time 1 alcohol use) were calculated for each state. Means and standard deviations were used for continuous variables and percentages for categorical variables. Differences between Washington State and Victoria on mean scores for all variables were compared using independent samples *t*-tests for continuous measures and chi-square tests for categorical variables. Next, unadjusted logistic regressions were performed to examine the bivariate associations between each alcohol use outcome and each policy perception, as well as each control variable. Then, a series of partially adjusted logistic regressions were performed to estimate the predictive association between each alcohol use outcome and each policy perception while accounting for control variables. All logistic regressions accounted for the clustering of students within classes using the 'svy' command in Stata.

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## Results

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Table I presents the sample characteristics for Washington State and Victoria. At both testing occasions, the prevalence of current alcohol use was significantly higher among Victorian students compared with Washington State students, with rates being around twice as high in the Victorian sample. The rates of binge drinking and alcohol-related harms were higher in the Victorian sample. However, there was little difference between the state prevalences of alcohol-related harms among drinkers when non-drinkers were removed from

the sample (Victoria 42.0% versus Washington 44.0%,  $P = 0.56$ ).

In terms of alcohol policy perceptions, a greater proportion of Victorian students indicated that a student would be talked to by a teacher or suspended if they were caught drinking at school. More Washington State students reported that a student would likely be expelled or have the police called if they were caught drinking alcohol. As expected, significantly more Washington State students reported being taught an abstinence approach to alcohol use, while significantly more Victorian students reported being taught a harm minimization approach.

The unadjusted and partially adjusted logistic regression analyses examining the predictive associations between students' perceptions of school alcohol policy and student alcohol use 1 year later are presented in Tables II–V. Results in Table II show that the likelihood of students drinking alcohol on school grounds or at a school event was increased with perceptions that the police would likely be called and of low policy enforcement (as indicated by student reports that students drink alcohol on the school grounds without getting caught). An abstinence alcohol message was associated with a reduced likelihood of school-based drinking. Of the control variables, prior year alcohol use significantly increased the likelihood of drinking on school grounds, while higher family SES decreased the likelihood. The partially adjusted models show that, after accounting for the control variables, low enforcement was the only policy component that predicted students' alcohol use on school grounds or at school events.

Table III presents the predictive associations between students' perceptions of alcohol policy and current alcohol use (recent drinking in all contexts). At the bivariate level, perceiving that a student would likely be suspended and low enforcement were both associated with an increased likelihood of current drinking. Perceiving that a student would likely be expelled, that the police would likely be called, and that the school espoused an abstinence alcohol message all reduced the likelihood of current alcohol use. Of the control variables, Time 1



**Table I.** Descriptive statistics<sup>a</sup> of outcome, predictor and control variables by state

Variable	Victoria, N = 908	Washington, N = 940
<b>Control variables</b>		
Male	47.9 (435)	49.0 (461)
Mean Age (SD) at Time 1	14.0 (0.4)	14.1 (0.4)***
Mean Age (SD) at Time 2	15.0 (0.4)	15.1 (0.4)***
Median family SES (interquartile range)	1.9 (1.5–2.3)	2.0 (1.9–2.3)***
Time 1 past 30 days alcohol use	44.0 (395)***	21.6 (200)
<b>Outcomes (Time 2)</b>		
Alcohol use on school grounds	5.0 (45)	7.0 (65)
Past 30 days alcohol use	59.8 (538)***	31.7 (298)
Binge alcohol use	29.9 (269)***	15.3 (143)
Alcohol harm	25.6 (232)	15.6 (147)
<b>Predictors (Time 1)</b>		
Consequences if caught drinking...		
Talked to by teacher	53.3 (481)*	47.1 (437)
Suspended	78.1 (704)***	66.3 (615)
Expelled	21.3 (192)	44.0 (408)***
Police	8.3 (75)	48.7 (452)***
Low policy enforcement <sup>b</sup>	1.69 (0.67)	1.64 (0.68)
Abstinence alcohol message (SD) <sup>b</sup>	2.98 (0.88)	3.41 (0.75)***
Harm minimisation alcohol message (SD) <sup>b</sup>	2.75 (0.94)***	2.38 (1.05)

<sup>a</sup>Given as percentage of state sample (*n*) except where otherwise indicated. Based on non-missing values. Range of sample sizes was 897–903 for Victoria and 918–939 for Washington. <sup>b</sup>Range is 1 (NO!) to 4 (YES!). \**P* < 0.05, \*\*\**P* < 0.001; for cross-state comparisons.

**Table II.** Logistic regression analyses for the association between school alcohol policy variables and student alcohol use on school grounds (1 year follow-up)

Variable	Unadjusted			Partially adjusted <sup>a</sup>		
	N	Odds ratio	95% CI	N	Odds ratio	95% CI
<b>Control variables</b>						
State (Washington)	1826	1.41	0.91–2.18			
Gender (Female)	1826	1.13	0.76–1.70			
Age	1826	1.06	0.68–1.65			
Family SES	1770	0.49***	0.33–0.73			
Past 30 days alcohol use (T1)	1801	5.33***	3.32–8.58			
<b>Alcohol policy variables</b>						
If a student was found drinking alcohol at school...						
He/she would be talked to by a teacher about the dangers of drinking alcohol	1808	0.71	0.48–1.06	1742	0.94	0.60–1.45
He/she would be suspended	1808	1.13	0.71–1.81	1742	1.21	0.70–2.10
He/she would be expelled	1808	0.97	0.63–1.49	1742	0.92	0.57–1.49
The police would be called	1808	1.59*	1.05–2.42	1742	1.54	0.92–2.57
Low policy enforcement	1793	1.77***	1.30–2.40	1726	1.48*	1.07–2.05
Abstinence alcohol message	1802	0.77*	0.61–0.96	1736	0.85	0.66–1.10
Harm minimization alcohol message	1799	0.86	0.71–1.03	1733	0.90	0.73–1.10

<sup>a</sup>Adjusted for state, gender, age, family SES and Time 1 past 30 days alcohol use. \**P* < 0.05, \*\**P* < 0.01, \*\*\**P* < 0.001.

**Table III.** Logistic regression analyses for the association between school alcohol policy variables and student current alcohol use (1 year follow-up)

Variable	Unadjusted			Partially adjusted <sup>a</sup>		
	N	Odds ratio	95% CI	N	Odds ratio	95% CI
<b>Control variables</b>						
State (Washington)	1839	0.31***	0.25–0.39			
Gender (Female)	1839	1.16	0.95–1.42			
Age	1839	1.09	0.88–1.36			
Family SES	1783	0.61**	0.44–0.83			
Past 30 days alcohol use (T1)	1814	7.37***	5.77–9.42			
<b>Alcohol policy variables</b>						
If a student was found drinking alcohol at school...						
He/she would be talked to by a teacher about the dangers of drinking alcohol	1821	0.85	0.70–1.03	1755	0.86	0.68–1.08
He/she would be suspended	1821	1.35**	1.10–1.66	1755	1.07	0.84–1.36
He/she would be expelled	1821	0.77*	0.62–0.96	1755	1.12	0.86–1.47
The police would be called	1821	0.56***	0.45–0.69	1755	1.02	0.77–1.35
Low policy enforcement	1806	1.36***	1.17–1.60	1739	1.12	0.95–1.32
Abstinence alcohol message	1815	0.66***	0.59–0.75	1749	0.90	0.78–1.04
Harm minimization alcohol message	1812	1.03	0.93–1.14	1746	0.92	0.83–1.02

<sup>a</sup>Adjusted for state, gender, age and family SES and Time 1 past 30 days alcohol use. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

current alcohol use predicted an increase in the likelihood of Time 2 alcohol use, whereas higher family SES and being from Washington State decreased the likelihood of alcohol use. When accounting for the effect of the control variables in the partially adjusted regressions, none of the policy perception variables showed statistically significant associations with current alcohol use.

The unadjusted models in Table IV show that all policy perceptions except being suspended were significantly associated with binge alcohol use. Perceiving low policy enforcement increased the likelihood of binge alcohol use while the other remaining policy variables were each associated with a decrease in the likelihood. Of the control variables, prior year alcohol use significantly increased the likelihood of binge drinking, while being from Washington State and higher family SES decreased the likelihood. In the partially adjusted models, perceiving that a student would be talked to by a teacher about the dangers of alcohol use, receiving an abstinence alcohol message and receiving a harm minimization alcohol message decreased the likelihood of binge alcohol use.

Of the unadjusted logistic regression models for alcohol harms, as shown in Table V, both abstinence and harm minimization alcohol messages and perceptions that a student would likely be talked to by a teacher about the dangers of alcohol use were associated with a reduced likelihood of alcohol-related harms. Of the control variables, being female, older age, and prior year alcohol use increased the likelihood of alcohol harms and higher SES decreased the likelihood of harms. In the partially adjusted models, only perceiving that a student would likely be talked to by a teacher about the dangers of alcohol use and reporting a harm minimization alcohol message were associated with a decreased likelihood of alcohol harms.

## Discussion

This is the first longitudinal study to investigate the impact of student perceptions of school alcohol policies on adolescent drinking behaviours. It examined secondary students in Victoria Australia and Washington State, USA, two states that have been

**Table IV.** Logistic regression analyses for the association between school alcohol policy variables and student binge drinking (1 year follow-up)

Variable	Unadjusted			Partially adjusted <sup>a</sup>		
	<i>N</i>	Odds ratio	95% CI	<i>N</i>	Odds ratio	95% CI
<b>Control variables</b>						
State (Washington)	1835	0.42***	0.32–0.56			
Gender (Female)	1835	1.22	0.98–1.52			
Age	1835	0.97	0.75–1.24			
Family SES	1779	0.39***	0.26–0.57			
Past 30 days alcohol use (T1)	1810	6.71***	5.27–8.56			
<b>Alcohol policy variables</b>						
If a student was found drinking alcohol at school ...						
He/she would be talked to by a teacher about the dangers of drinking alcohol	1817	0.67***	0.53–0.84	1751	0.71*	0.55–0.92
He/she would be suspended	1817	1.12	0.88–1.44	1751	0.87	0.66–1.16
He/she would be expelled	1817	0.73*	0.57–0.94	1751	0.97	0.73–1.28
The police would be called	1817	0.74**	0.59–0.93	1751	1.31	0.97–1.78
Low policy enforcement	1802	1.37**	1.14–1.64	1735	1.14	0.94–1.38
Abstinence alcohol message	1811	0.65***	0.58–0.74	1745	0.84*	0.72–0.97
Harm minimization alcohol message	1808	0.90*	0.81–1.00	1742	0.82**	0.72–0.92

<sup>a</sup>Adjusted for state, gender, age, family SES and Time 1 past 30 days alcohol use. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .

**Table V.** Logistic regression analyses for the association between school alcohol policy variables and student alcohol harm (1 year follow-up)

Variable	Unadjusted			Partially adjusted <sup>a</sup>		
	<i>N</i>	Odds ratio	95% CI	<i>N</i>	Odds ratio	95% CI
<b>Control variables</b>						
State (Washington)	895	1.08	0.81–1.43			
Gender (Female)	895	1.38*	1.07–1.79			
Age	895	1.50*	1.06–2.14			
Family SES	873	0.59**	0.43–0.81			
Past 30 days alcohol use (T1)	885	2.61***	1.98–3.45			
<b>Alcohol policy variables</b>						
If a student was found drinking alcohol at school ...						
He/she would be talked to by a teacher about the dangers of drinking alcohol	887	0.66**	0.50–0.86	860	0.70*	0.52–0.94
He/she would be suspended	887	0.90	0.67–1.21	860	0.78	0.57–1.07
He/she would be expelled	887	1.21	0.89–1.65	860	1.39	0.91–1.96
The police would be called	887	1.26	0.94–1.68	860	1.40	0.96–2.02
Low policy enforcement	882	1.15	0.96–1.39	855	1.02	0.84–1.25
Abstinence alcohol message	882	0.80**	0.67–0.94	856	0.86	0.71–1.04
Harm minimization alcohol message	885	0.83**	0.73–0.95	858	0.83*	0.71–0.96

<sup>a</sup>Adjusted for state, gender, age, family SES and Time 1 past 30 days alcohol use. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ .



shown to have different policy approaches towards alcohol and found that adolescent alcohol use is predicted by students' perceptions of school alcohol policies.

The first research question asked whether student perceptions of strictly enforced school alcohol policies and harsh punishments deter students from drinking on school grounds. Results showed that policy enforcement is indeed predictive of student drinking on school grounds. More specifically, student perceptions of lax enforcement predicted an increased risk of self-reported drinking in Grade 9. This is the first test of this aspect of policy enforcement since prior investigations of school alcohol policy impact [22–24] did not measure student alcohol use on school grounds. However, two Canadian studies of school tobacco policy found similar effects of policy enforcement on school-based smoking [26, 37].

Results did not, however, support the suggestion that student perceptions of harsh penalties predict less drinking on school grounds. Several other studies in school and college settings have found that harsh punishments are not necessarily linked to reduced problem behaviours [24, 30, 38–40] and criminology researchers have similarly failed to find clear support for a link between deterrence effects and harsh punishments [17]. Of additional concern is the growing body of research highlighting long-term negative impacts of these punishments on the individuals involved [35, 41, 42]. However, schools' use of harsh punishments is worthy of further empirical research since these types of responses are used widely by schools, especially in the United States [14, 15] and few studies have addressed this issue directly.

The second research question focused on whether student perception of strictly enforced policies would reduce student drinking in all contexts, i.e. outside and within the school. Such an effect might occur if exposure to other students getting away with drinking at school influences the broader normalization of drinking. This 'contagion effect' in which peer modelling and observational learning play an important role in the development of behaviours has been suggested as an important part of how school settings can

influence student behaviour [37, 43]. Indeed, some previous studies of the impact of school tobacco policies on student smoking have demonstrated broader effects and concluded that school officials can use policy to influence student smoking both inside and outside school grounds [25, 27, 44]. Our results partially support this effect: despite increased odds of current alcohol use in the bivariate model for students perceiving lax enforcement, there was no statistically significant effect when accounting for the effects of the covariates. Adding covariates sequentially to the model revealed that Time 1 alcohol use attenuated the significant bivariate effect (data not shown). Given that current alcohol use rates were already quite high at Grade 8/Time 1 (44% and 22% for Victoria and Washington, respectively), it is possible that our ability to detect the normative effect of the perception that other students drink at school on drinking initiation is diminished. Further studies of younger student samples in which fewer students would have initiated drinking are warranted. By also controlling for potential influences on alcohol use norms beyond the school (e.g. parent attitudes and drinking behaviour, exposure to alcohol advertising), these studies would further our understanding of the relative influence of school messages on adolescent alcohol use.

The protective effect of exposure to abstinence oriented alcohol messages on student drinking (research question 3) is again partially supported by the data. The bivariate model predicted lower likelihood of current alcohol use for students reporting exposure to abstinence messages provided at school, yet this effect was diminished and became statistically non-significant in the partially adjusted model. Testing of all covariates separately (data not shown) revealed that exposure to abstinence messages at Time 1 had no significant effect on current alcohol use at Time 2 when current alcohol use at Time 1 was taken into account. The possibility that pre-existing drinking levels in the Year 8 sample may have impeded the impact of abstinence messages could again be addressed by further studies of younger student samples. Abstinence messages did however predict a lower likelihood of binge drinking in this sample.

The final research question asked whether student perception of harm minimization messages and likely use of remedial responses to policy violations predict less harmful drinking patterns. Findings suggest this is indeed the case. The likelihoods of both binge drinking and alcohol-related harms were reduced among students reporting exposure to alcohol harm minimization messages. Similarly, reporting that alcohol policy violators in their school were likely to be counselled by a teacher on the dangers of alcohol use predicted reduced likelihood of binge drinking and alcohol-related harms. Of note is that this remediation approach is used in both states with equal frequency, with about half of the students endorsing this item. This finding supports an approach advocated by some that once student drinking becomes prevalent (at around age 13–14 years) abstinence approaches should be supplemented with harm minimization messages to reduce risky drinking (e.g. [45]).

As with all studies, there are limitations that need to be considered when discussing the findings. First, the study is not experimental but is correlational so that causal interpretations of the impact of policy should not be inferred. Second, biases might have been introduced in the study sample at a number of points including school participation, student participation and student follow-up. However, examination of characteristics of non-participating schools did not reveal any substantial differences in the samples from the state averages [31]. Third, it is possible that student perceptions of school policy might not accurately reflect school policy and procedures and poor inter-rater reliability of students within the same school on disciplinary measures has been reported [46]. Also, student perceptions of policy enforcement might be based on a number of factors including direct observation or experience or stories they have heard that may or may not be accurate. However, using student reports of policy avoids using reports from school administrators who might be potentially biased towards providing socially desirable answers. Ideally, school policy might be measured by triangulation including student reports, review and coding of actual policy documents, and on-site observations by research

staff, although this approach would be extremely costly and time-consuming in practice. Finally, use of self-report data for student drinking is a potential source of error but previous studies have shown students to be truthful and accurate when reporting their alcohol use in school surveys [47, 48] and the reported prevalences fall within the range reported for other Victorian and US national surveys [49, 50].

This study has a number of strengths. It draws on data provided by large statewide representative samples of students located in two states in different countries with marked differences in alcohol policy at the national level thereby increasing the variation in responses to questions on school alcohol policy. Survey instruments, data collection, data management and follow-up procedures in both states were matched and attrition of the sample was low [31]. It employed a range of alcohol use measures including drinking on and off of school grounds and harmful drinking patterns. Use of longitudinal data and control for earlier alcohol use strengthen the interpretation that student perceptions of alcohol policy precede their drinking behaviours.

Each school is responsible for developing its own alcohol policy which is reflective of local school conditions and values. While it can be assumed that all policies are designed to eliminate student drinking on school grounds, further aims of the policy, such as the retention and long-term welfare of students, zero tolerance, or alcohol safety and control skills beyond school, might differ between schools. The epidemiological approach adopted here aimed to test across a broad range of schools the impact of student perceptions of school policy on youth alcohol use. In overview, the predictive findings support a balanced approach to school policy that includes monitoring, communication and evaluation. Abstinence messages may be effective in early secondary school before large numbers of students start using alcohol or begin binge drinking. However, once alcohol use becomes more common harm minimization messages and remedial actions appear warranted. Policy enforcement practices that seek to ensure alcohol is not used on the school grounds are recommended. There is little support

for the use of harsh penalties and school exclusion in predicting later adolescent alcohol use or harmful use once prior use is controlled.

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### Conflict of interest statement

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None declared.

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### References

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- World Health Organisation. *Global Status Report on Alcohol and Health*. Geneva: WHO, 2011.
- World Health Organization. *WHO Expert Committee on Problems Related to Alcohol Consumption*. WHO Technical Report Series, No 944. Geneva, 2007.
- Gore FM, Bloem PJN, Patton GC *et al*. Global burden of disease in young people aged 10–24 years: a systematic analysis. *Lancet* 2011; **377**: 2093–102.
- Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychol Bull* 1992; **112**: 64–105.
- Roski J, Perry CL, McGovern PG *et al*. School and community influences on adolescent alcohol and drug use. *Health Educ Res* 1997; **12**: 255–66.
- Ennett ST, Flewelling RL, Lindrooth RC *et al*. School and neighborhood characteristics associated with school rates of alcohol, cigarette, and marijuana use. *J Health Soc Behav* 1997; **38**: 55–71.
- West P, Sweeting H, Leyland A. School effects of pupils' health behaviours: evidence in support of the health promoting school. *Res Papers Educ* 2004; **19**: 261–91.
- Kumar R, O'Malley PM, Johnston LD *et al*. Effects of school-level norms on student substance use. *Prev Sci* 2002; **3**: 105–24.
- Rountree PW, Clayton RR. A contextual model of adolescent alcohol use across the rural–urban continuum. *Subst Use Misuse* 1999; **34**: 495–519.
- Parsons C, Stears D, Thomas C. The health promoting school in Europe: conceptualising and evaluating the change. *Health Educ J* 1996; **55**: 311–21.
- World Health Organisation. *WHO's Global School Health Initiative: Health-Promoting Schools*. Geneva: WHO, 1998.
- World Health Organisation. *Local Action: Creating Health-Promoting Schools*. Geneva: WHO, 2000.
- St Leger L, Young I, Blanchard C *et al*. *Promoting Health in Schools: From Evidence to Action*. Saint Denis Cedex, France: International Union for Health Promotion and Education (IUHPE), 2010.
- Beyers JM, Evans-Whipp T, Mathers M *et al*. A cross-national comparison of school drug policies in Washington State, United States, and Victoria, Australia. *J Sch Health* 2005; **75**: 134–40.
- Everett Jones S, Fisher CJ, Greene BZ *et al*. Healthy and safe school environment, Part I: results from the School Health Policies and Programs Study 2006. *J Sch Health* 2007; **77**: 522–43.
- Clarke R. *Situational Crime Prevention*. Albany, NY: Harrow and Heston, 1997.
- Pestello HF. Deterrence: a reconceptualization. *Crime Delinq* 1984; **30**: 593–609.
- Goodstadt MS. Substance abuse curricula vs. school drug policies. *J Sch Health* 1989; **59**: 246–50.
- Graham JW, Marks G, Hansen WB. Social-influence processes affecting adolescent substance use. *J Appl Psychol* 1991; **76**: 291–8.
- Fletcher A, Bonell C, Hargreaves J. School effects on young people's drug use: a systematic review of intervention and observational studies. *J Adolesc Health* 2008; **42**: 209–20.
- Evans-Whipp T, Beyers JM, Lloyd S *et al*. A review of school drug policies and their impact on youth substance use. *Health Promot Int* 2004; **19**: 227–34.
- Maes L, Lievens J. Can the school make a difference? A multilevel analysis of adolescent risk and health behaviour. *Soc Sci Med* 2003; **56**: 517–29.
- Desousa C, Murphy S, Roberts C *et al*. School policies and binge drinking behaviours of school-aged children in Wales a multilevel analysis. *Health Educ Res* 2008; **23**: 259–71.
- Monshouwer K, Van Dorsselaer S, Van Os J *et al*. Ethnic composition of schools affects episodic heavy drinking only in ethnic-minority students. *Addiction* 2007; **102**: 722–9.
- Øverland S, Aarø LE, Lindbak RL. Associations between schools' tobacco restrictions and adolescents' use of tobacco. *Health Educ Res* 2010; **25**: 748–56.

26. Lovato CY, Sabiston CM, Hadd V *et al.* The impact of school smoking policies and student perceptions of enforcement on school smoking prevalence and location of smoking. *Health Educ Res* 2007; **22**: 782–93.
27. Lipperman-Kreda S, Paschall MJ, Grube JW. Perceived enforcement of school tobacco policy and adolescents' cigarette smoking. *Prev Med* 2009; **48**: 562–6.
28. Moore L, Roberts C, Tudor-Smith C. School smoking policies and smoking prevalence among adolescents: multilevel analysis of cross-sectional data from Wales. *Tob Control* 2001; **10**: 117–23.
29. Evans-Whipp TJ, Bond L, Toumbourou JW *et al.* School, parent, and student perspectives of school drug policies. *J Sch Health* 2007; **77**: 138–46.
30. Evans-Whipp TJ, Bond L, Ukoumunne OC *et al.* The impact of school tobacco policies on student smoking in Washington State, United States and Victoria, Australia. *International Journal of Environmental Research and Public Health* 2010; **7**: 698–710.
31. McMorris BJ, Hemphill SA, Toumbourou JW *et al.* Prevalence of substance use and delinquent behavior in adolescents from Victoria, Australia and Washington State, United States. *Health Educ Behav* 2007; **34**: 634–50.
32. McBride N, Farrington F, Midford R *et al.* Early unsupervised drinking-reducing the risks. The School Health and Alcohol Harm Reduction Project. *Drug Alcohol Rev* 2003; **22**: 263.
33. Johnston LD, O'Malley PM, Bachman JG. *National Survey Results on Drug Use from the Monitoring the Future study, 1975–1997. Vol. 1. Secondary School Students.* Rockville, MD: National Institute on Drug Abuse, 1998.
34. Hibbert M, Caust J, Patton GC *et al.* *The health of young people in Victoria: Adolescent Health Survey.* Melbourne, Australia: Centre for Adolescent Health Monograph, 1996.
35. Hemphill SA, Toumbourou JW, Herrenkohl TI *et al.* The effect of school suspensions and arrests on subsequent adolescent antisocial behavior in Australia and the United States. *J Adolesc Health* 2006; **39**: 736–44.
36. Stata Corporation. *Stata Statistical Software*, Release 11. College Station, TX: StataCorp LP, 2009.
37. Leatherdale ST, Manske S. The relationship between student smoking in the school environment and smoking onset in elementary school students. *Cancer Epidemiol Biomarkers Prev* 2005; **14**: 1762–5.
38. Kelley MS, Fukushima M, Spivak AL *et al.* Deterrence theory and the role of shame in projected offending of college students against a ban on alcohol. *J Drug Educ* 2009; **39**: 419–37.
39. Kumar R, O'Malley PM, Johnston LD. School tobacco control policies related to students' smoking and attitudes toward smoking: national survey results, 1999–2000. *Health Educ Behav* 2005; **32**: 780–94.
40. Pentz MA, Brannon BR, Charlin VL *et al.* The power of policy: the relationship of smoking policy to adolescent smoking. *Am J Public Health* 1989; **79**: 857–62.
41. Taras HL, Frankowski BL, McGrath JW *et al.* Out-of-school suspension and expulsion. *Pediatrics* 2003; **112**: 1206.
42. Hemphill SA, Heerde JA, Herrenkohl TI *et al.* The impact of school suspension on student tobacco use: a longitudinal study in Victoria, Australia, and Washington State, United States. *Health Educ Behav* 2012; **39**: 45–56.
43. Flay BR. Approaches to substance use prevention utilizing school curriculum plus social environment change. *Addict Behav* 2000; **25**: 861–85.
44. Adams ML, Jason LA, Pokorny S *et al.* The relationship between school policies and youth tobacco use. *J Sch Health* 2009; **79**: 17–23.
45. McBride N, Farrington F, Midford R *et al.* Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP). *Addiction* 2004; **99**: 278–91.
46. Ma X, Willms JD. School disciplinary climate: characteristics and effects on eighth grade achievement. *Alberta J Educ Res* 2004; **50**: 169–88.
47. Winters KC, Stinchfield RD, Henly GA *et al.* Validity of adolescent self-report of alcohol and other drug involvement. *Int J Addict* 1990; **25**: 1379–95.
48. Brener ND, Collins JL, Kann L *et al.* Reliability of the youth risk behavior survey questionnaire. *Am J Epidemiol* 1995; **141**: 575–80.
49. White V, Szabo E, Hayman J *et al.* *Victorian Secondary School Students' Use of Licit and Illicit Substances in 2005: Results from the 2005, Australian Secondary Students' Alcohol and Drug Survey: Victorian Department of Human Services*, 2006.
50. Johnston LD, O'Malley PM, Bachman JG *et al.* *Monitoring the Future National Results on Adolescent Drug Use: Overview of Key Findings, 2006*, (NIH Publication No. 07-6202). Bethesda, MD: National Institute on Drug Abuse, 2007, 71.

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